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- Amiodarone IV Drip Chart 900 mg
- Diltiazem Drip 125 mg
- Dobutamine 1000 mg
- Dobutamine 500 mg
- Dopamine 800 mg
- Epinephrine IV 2mg
- Esmolol 2.5 gm
- Heparin 25,000 units (units per hour)
- Heparin 25, 000 units (units/kg/hr)
- Insulin 100 units
- Integrilin 0.75 mg
- Labetalol 500 mg
- Levophed 8 mg
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1.1 General Issues for Paramedics and EMTs
1.1.1 Intent and Use of these protocols:

**Purpose**: To define who is allowed to use the Leon County EMS/Tallahassee Fire Department protocols and identify any restrictions.

**Policy**:
1. The following medical protocols are to be used by Leon County EMS/Tallahassee Fire Department Medical Personnel including, EMTs, Paramedics, and Critical Care Paramedics, who hold a valid and current license/certificate from the state of Florida EMS office and meet all applicable agency requirements.
2. The purpose of these protocols is to serve as guidelines for evaluating and treating patients in the out-of-hospital (pre-hospital or interfacility transfer) setting. It is not possible to address every possible variation of disease or traumatic injury, but these protocols and procedures will apply to the vast majority of patients we encounter. If and when a situation is encountered that is not clearly covered by a protocol or procedures, contact medical control (ED MD, Sending MD, Receiving MD, EMS Medical Director) for clarification or assistance. Any orders provided must be within the scope of practice of the individual calling for the advice/assistance.
3. All Leon County EMS/Tallahassee Fire Department Medical personnel should become very familiar with the protocols and the reason for their use.
4. **Do not perform any step or steps in any standing order or protocol (particularly the procedure protocols) if you have not been trained to do so**.
5. These standing orders and protocols are to be followed only while on duty with and working for Leon County EMS/Tallahassee Fire Department.
6. Protocols are divided into the following three parts:
   a. **Basic Level care**: Actions authorized for the EMT or Paramedic that are supportive in nature. EMT (BLS), Paramedic (BLS and ALS) actions are specified within each of these protocols.
   b. **ALS Level 1**: Actions authorized only for the Paramedic prior to physician contact. EMTs successfully completing an IV course and signed off by a field training officer or supervisor may start and monitor an unmedicated IV.
   c. **ALS Level 2**: Actions authorized only for the Paramedic that require a physician consult.
7. Some patients may require treatment not specified herein. The treatment protocols should not be construed as prohibiting such flexibility. The paramedic must use his/her judgment in administering treatment in the following manner:
   a. The paramedic may determine that no specific treatment is needed; or
   b. The paramedic may consult medical direction before initiating any specific treatment; or
   c. The paramedic may follow the appropriate treatment protocol and then consult medical direction.
   d. The paramedic may contact medical direction at any time he/she deems necessary.
8. When the paramedic/EMT is unable to make contact with other forms of medical direction, he/she may contact the receiving hospital for consultation with the emergency department physician. It is recommended that the paramedic/EMT make contact with the physician for consultation on complicated patients whenever possible. When the paramedic is unable to make contact with a physician for medical direction,
the paramedic may administer BLS treatment according to his/her judgment. In this instance, the paramedic may administer ALS treatment only as authorized in the treatment protocols.

9. Many of the protocols will include additional medications not routinely carried on the units. In addition, some of the procedures suggested are beyond the scope of EMTs and paramedics. You are to perform only those procedures within the scope of your training and use those medications available to you. The additional medications and advanced procedures are to cover other critical care specialist who may on occasion accompany a patient on transfers and who have been provided the additional medications and equipment by the transferring facility.

10. Transport destination determination may include hospital and freestanding emergency departments.

11. The name of the physician authorizing ALS Level 2 orders must be documented in the patient care report (PCR). Physicians authorized to approve ALS Level 2 orders include the following individuals:

   1. EMS provider’s medical director (a).
   2. Receiving hospital emergency department physician (a).
   3. Physician present in his/her own office (b).
   4. Online medical control physician (a).
   5. Bystander physician personally known to the paramedic (c).
   6. Bystander physician who presents a valid M.D. or D.O. (c).
   7. Poison information center (d).

Note:
(a) Contact for ALS Level 2 orders by the EMS provider’s medical director, online medical control physician, or emergency department physician should be initiated in the following order:
   1. Telephone.
   2. Radio.
   3. Relay of information via dispatch.
(b) Only verbal or written orders that are signed by the physician that are given directly to the paramedic by a physician in his/her office are acceptable.
(c) A bystander physician, as described above, must accept full responsibility for patient care and accompany the patient in the ambulance to the hospital to give Level 2 orders.
(d) The Poison Information Center is authorized to direct all medical care (Supportive Care, ALS Level 1, and ALS Level 2) for the toxicology and hazardous material exposure patient. The Poison Information Center must be contacted via telephone at 800-222-1222.

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1.1.2 Definitions:

1. **Advanced (Critical Care) Paramedic**: Person currently registered as an EMT-Paramedic by the Department of Health who has completed an approved Critical Care Transport course such as the CCEMT-P course (or equivalent) and who has been approved by the medical director to function at this advanced level of care.

2. **ALS call/run**: Patient’s condition may require advanced pre-hospital care and ALS interventions such as IV therapy, cardiac monitoring, and drug administration, advanced airway management (oxygen beyond nasal cannula or simple face mask). Paramedic or critical care nurse will provide care. EMT-basics may assist as needed.

3. **AMA (Against Medical Advice)**: A competent patient (see definition of patient below) who was informed to the best of an EMT, Paramedic or Medical Control MD’s ability, the risk/benefit of refusing vs not refusing transport to a hospital, including evaluation and treatment from a physician, for an injury or illness. The patient has the capacity to refuse and is willing to accept the risk of further deterioration of their condition which could lead to permanent disability and/or death. See AMA / REFUSAL (Capacity to refuse) / DRY RUN CASES protocol for further details.

4. **BLS call/run**: Patient’s condition requires basic monitoring of vital signs, oxygen by nasal cannula or simple face-mask, suctioning of oral cavity, simple splinting and immobilization. Care can be provided by an EMT-basic. See EMT-B protocol below.

5. **Capacity**: refers to the intact ability to respond to a particular situation with appropriate appreciation and to act in one's own self-interest. A person may lack capacity for a number of different reasons: memory impairment (e.g. Alzheimer's Disease), inability to read or understand language (e.g. stroke), loss of brain functions related to judgment and planning and initiative (e.g. frontal lobe disorders), hopelessness and loss of self-worth (e.g. depression), altered mental status related to mind altering substances (e.g. alcohol, drugs, carbon monoxide). A person with otherwise intact mental faculties may have capacity compromised by "undue influence."

6. **Competency** (or competence): refers to the determination that a person retains the capacity for a specific action. Competency is a legal determination that addresses societal interest in restricting a person’s right to make decisions or do acts because of incapacity. The fundamental issue is whether the person can be held accountable for the consequences of his or her decisions and actions.

7. **Critical Care Transport call/run**: Patient’s condition fits the criteria of a critical care patient as per the agency specific Critical Care Team Activation Criteria which entails the services of critical care trained paramedics, when available. (CCT Protocols are available separately from this book) When critical care trained paramedic or nurse is not available, the medical director may direct, guide, and/or monitor via telemedical services or radio communications with an ALS paramedic, the care of a patient during transport. This type of transport may also require additional manpower to manage patient during transit.

8. **CX/Cancelled Call**: 1) Person does not meet definition of a patient, has no complaint of an illness or injury (and none is visible). 2) No patient found, no patient contact, cancelled call prior to arrival or prior to patient contact. 3) Non-medical assistance provided, i.e. lift assist (if after making patient contact, medic/EMT concerned an injury or illness is present, person becomes a patient and a refusal must be obtained if
patient declines transport). See AMA / REFUSAL (Capacity to refuse) / DRY RUN CASES protocol for further.

9. **EMT-B** - Person currently certified/licensed as an EMT-Basic by the Florida Department of Health.

10. **EMT-P** - Person currently certified/licensed as an EMT-Paramedic by the Florida Department of Health. Paramedics with Leon County EMS/Tallahassee Fire Department must keep current with ITLS, ACLS and PALS (or equivalent) standards and certification.

11. **Flight Physician**: A board certified physician (in emergency medicine or other specialty depending on patient’s need) approved by the medical director to accompany a patient and serve as a consultant to the medical crew during transfer from one facility to another. Physician should have some knowledge of basic flight physiology. Physician is available for advice and/or assists the medical crew as needed in managing the patient. Physician may be called upon to perform advanced procedures such as endotracheal intubation, chest needling, etc.

12. **Guardian**: Individual appointed by the court to make decisions for a patient/person deemed incompetent. Sometimes is referred to as a “Conservator of the patient (Note: conservator of the estate can only handle financial matters and not patient healthcare decisions). The request for treatment or no treatment (transport or no transport) should be honored regardless if patient agrees. See A patient with a Living Will, Power of Attorney, Guardianship protocol for further description.

13. **Healthcare Surrogate**: see power of attorney below

14. **On-line medical control** - Medical direction of pre-hospital ALS activities by direct radio, telephonic, or telemedical communications with an on-line medical control physician. This could be an ED physician, the sending MD, the receiving MD, or the EMS Medical Director (or his/hers designee).

15. **Patient**: A person will be considered a patient if: 1) a request (via first party caller) for medical assistance is made by an individual (or guardian/parent) for a perceived illness or injury. 2) Person who denies or declines medical assistance but with obvious signs and symptoms of an illness or injury (i.e. very minor MVA but reporting a little soreness in neck. Person claiming they are fine but sweating profusely and clutching their chest) 3) Person who denies/declines medical assistance, denies injury or illness, but the circumstances or mechanism suggest possibility or potential for a medical condition or injury (i.e. MVA with major damage but patient has no complaints or obvious signs of injury. Patient with no complaints after being pulled from a burning building but had risk of high CO exposure). See AMA / REFUSAL (Capacity to refuse) / DRY RUN CASES protocol for further elaboration.

16. **Power of Attorney/Healthcare Surrogate**: An individual chosen by patient (to make decisions on behalf of the patient when the patient later becomes incompetent or incapacitated. Request of a POA or Healthcare surrogate only apply when patient him/herself is incapacitated at the time of the request. See; A patient with a Living Will, Power of Attorney, Guardianship protocol for further.

17. **Protocols** - Guidelines for pre-hospital patient care. Orders not requiring medical control for approval prior to initiating are “standing orders”, and may be undertaken before contacting on-line medical control.

18. **Respiratory Therapist**: Certified/Registered Respiratory Therapist knowledgeable in treating patients with severe respiratory conditions that may be on a ventilator.
Respiratory therapist will on occasion accompany paramedics nurses in caring for patients on ventilators.

19. **Standing orders** - Advanced life support interventions, which may be undertaken before contacting online medical control.

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1.1.3 Documentation:

**Purpose:** To establish that all patients’ evaluated/treated/transported by Leon County EMS/Tallahassee Fire Department shall have a record documenting the encounter. For non-emergency calls, this record should detail as much as possible, what is it about this case that justifies the use of an ambulance? A thorough report should paint an accurate picture of what you encountered (including the immediate environment you found the patient in), your assessment, and how you managed a given situation. In general:

- A complete, accurate, and legible report is vital to assure appropriate ongoing care from subsequent care givers
- If it’s not documented, you didn’t do it

**Policy:**

1. All patient encounters require a written run report (including refusals).
   a. Patients who refuse care or transport shall have a run report generated that includes as much information regarding the chief complaint, reason for the call, events surrounding and leading up to the call, pmh, medication list, allergy list and as much an exam as the patient will permit. Include ancillary test (pulse ox, EKG, Temp, blood glucose, etc.) commensurate to their chief complaint. Document who you spoke to (supervisor, med control, med director) prior to patient signing refusal. Document that you explained the risk and benefits to the patient and the patient’s capacity to refuse.

2. All run reports are to be generated and exported by end of shift or (with supervisor approval) no later than 24 hours of patient encounter.

3. Please use the SOAP method for charting:
   - **S** - Subjective
   - **O** - Objective
   - **A** - Assessment
   - **P** - Plan

4. In particular, all patients who are transported will have a thorough and complete chart written or computer generated with emphasis on:
   a. Handwriting must be legible or the computer chart must be complete (including dates and response times).
   b. Personnel are subject to disciplinary action for failure to comply.
   c. In addition to the demographics section of the report, it is imperative to document:
      i. include medical diagnoses from transferring hospital if applicable
      2. “Monitoring required”, “for doctors appointment”, “none per patient”, etc. are not acceptable. The chief complaint will relate to the medical reason why patient is being moved by ambulance. For example, ESRD is a disease process and not a reason for ambulance transport. ESRD requiring dialysis is a correct chief complaint.
      ii. A chief complaint (quote the patient when possible),
iii. A brief history of the current problem (such as onset of symptoms, duration, description, any contributing factors,
iv. Any pertinent observations of the patient’s surroundings, (empty pill bottles, weapons, causative agents or objects, etc.),
v. Pertinent past medical history
vi. List of Medications and Allergies, do not leave blank, write “none” or “unknown” if applicable
vii. Vital signs (At least two sets if time of possession greater than 10 – 15 minutes),
viii. A brief description of the patient’s condition,
ix. Physical findings (focused exams allowed for isolated injuries).
x. All treatments provided. Document the time given/provided, dosages, routes and response to drugs/treatment given.
d. Careful documentation of all treatment and procedure times in chronologic order is crucial.
e. For patients with extremity injury, neurovascular status must be noted before and after immobilization.
f. For patients with spinal immobilization, document motor function before/after spinal immobilization.
g. For IV administration, the catheter size, site, number of attempts, type of fluid, and flow rate should be documented.
h. Any requested orders, whether approved or denied, should be documented clearly.
i. Any wasted narcotics should include the quantity wasted, where wasted, and name of the person who witnessed the waste.
j. If unable to leave a completed run report after delivering patient to care facility, and approved abbreviated short form should be left which has a minimum of the patient’s name, DOB, chief complaint, Brief history of present illness, Home meds, allergies, any procedures and medications given as well as response to tx. A competed patient care report will need to be available to the facility within 24 hours of the run being complete.
k. Only approved medical abbreviations may be used. See Approved Abbreviations
l. EKGs/monitor strips should be attached to the run report or made available for review with the run report.
m. All run reports are subjected to review by Leon County EMS Quality Assurance Personnel and the Medical Director.
n. It is imperative to document well on all patients who refuse transport and/or treatment

5. For non 9-1-1 related calls, including but not limited to; transports out of health care facilities (contractual agreements, facility preference), direct consumer request, non-emergency (scheduled and non-scheduled), etc., there are additional charting requirements.
General:
   a. **Patient Physical Assessment.** In addition to a complete patient assessment, a more targeted approached is required for non-emergency:
i. Why was transportation by any other means contraindicated for this patient, today?

ii. Reason for hospitalization

iii. Mental status during stay

iv. Why is the patient being transported by ambulance to another hospital or medical facility? Be Specific!

v. Can patient transfer without lifting assistance?

vi. Is patient unable to remain in fowler’s position secondary to sacral decubitus ulcers for duration of transport?

vii. Was medical monitoring required for risk of bleeding?

d. **Specific Assessment Items:**

i. Decubitus Ulcers – Must include Location of Ulcers, and Grade/Stages

1. Stage I: Sores are not open wounds. Skin may be painful, but it has no breaks or tears. Skin appears reddened and does not blanch

2. Stage II: the skin breaks open, wears away, arms and pulse are it can look like a scrape (abrasion), blister, or a shallow crater in the skin

3. Stage III the sore extends into the tissue beneath the skin forming a small crater. Fat may show in the sore, but not muscle, tendon, or bone.

4. Stage IV the pressure sure is very deep, reaching into muscle and bone and causing extensive damage. Damage to deeper tissues, tendons, and joints may occur.

ii. Paralysis (para, Hemi, quad)

iii. Contractures

iv. Non-Healing fractures – Be specific

v. Decrease LOC (due to…)

vi. Prone to seizures and required trained monitoring

vii. Isolation precautions – **REASON**?

viii. Attached tubes: Feeding, foley catheter, drains, chest tubes. What are they attached to? What’s being drained from or what’s being delivered to patient via a tube?

ix. IV Medicines – **Name of meds and purpose**?

x. Cardiac Monitoring Required, **WHY? Will monitoring be required at receiving facility?**

xi. Hemodynamic Monitoring required (maintaining adequate tissue perfusion with continuous monitoring of the movement of blood and the pressures being exerted in the veins, arteries and changers of the heart)

xii. Orthopedic devices (cast, external fixation devices, splints, etc)
xiii. Airway monitoring or suctioning


*Example: Patient was unable to monitor their own oxygen due to past Stroke with left sided hemi paralysis and residual weakness.*

xv. Danger to self or other (Elopement of Flight risk), included Patients with alarms pads (beds or wheelchair) who cannot be left unattended due to mental condition that places patient at risk (due to loss of safety awareness) for falls if poor gait is part of the issue. You must chart the presence of an Alarm pad(s) for these patients and their mental capacity for need of such monitoring.

xvi. Physical or chemical restraints anticipated.

xvii. Was any special handling required?

Example: “Patient had stage 4 decubitus ulcers on buttocks with special positioning required to put patient on left lateral recumbent, with a pillow placed under hip for comfort and protection of ulcers”.

xviii. Patient using Medical Support Chairs: State the type of chair being used by Patients.

1. **Wheelchairs, conventional,** can patient be left unattended?
   
   Does pt required an alarm pad or restraint? Can they maintain an upright position on their own?

2. **Dialysis Chair,** list by chair type (not just found in chair)

3. Other types: Life Chairs, Geri Chair, Recliner Wheelchairs, Bariatric Geri Chair, Cardiac Chair, etc. Chart the medical reason the patient condition is such they require special medical support chair. Why they can’t sit in regular chair?

C. **Supportive Documentation:**

i. ER Transport form / Transfer form (EMTLA)

ii. Physician Certifying Statement (PCS) form is required for ALL hospital to hospital and non-emergent interfacility transfers

iii. EKG Strips

iv. Hospital face sheet.

v. H&P
1.1.4 PARAMEDIC VS. EMT ATTENDANT:

Purpose: To define when (on an ALS unit) the EMT can tech the patient while the paramedic drives the unit.

Polity: Patients will be attended by a paramedic or higher-level caregiver if:

1. Patients are ill/injured enough to have any procedure, monitoring, receive any medication (of any kind), or on-going care that is beyond the scope of a basic EMT-B training. (Refer to the EMT-B (BLS transport) protocol for details concerning what can be done by an EMT-B). Examples of skills or procedures for paramedics include but not limited to; starting IVs in the field (even if started by the EMT), cardiac monitoring, any IV with medication drips, endotracheal intubation/ventilator patients.

2. Any patient being transferred to a facility for higher level of care. If any doubt, highest level attends unless discussed with supervisor or medical director.

3. The condition of the patient is likely to deteriorate and require ACLS intervention prior to arrival at the hospital.

4. Paramedics who allow an EMT to attend to a patient that falls into one of the categories described above, will be responsible to review the run report generated by the EMT to assure accuracy and completeness of documentation.
1.1.5 EMT-B (BLS Crew) Responsibilities Protocol (Scope of Practice)

**Purpose:** To describe those duties and functions/scope of practice allowed by an EMT-B (BLS Crew) Transport Crew.

1. Basic Definitions/Rules: (Note: reference used: Florida State Administrative Code)
   a. BLS: A level of pre-hospital care involving non-invasive life support measures.
   b. EMT-B Functions
      i. Patient Assessment
      ii. Taking and recording vital signs
      iii. Properly lifting and moving patients
      iv. Opening and maintaining a patent airway using simple airway maneuvers.
      v. Cardiopulmonary Resuscitation
      vi. Simple management of a cardiac emergency, NOT including use of manual defibrillation, administration of fluids, or administration of drugs by any means, except those drugs or substances listed below;
      vii. Application and use of an AED
      viii. Acquiring and transmitting 12-lead EKG (if AED is capable)
      ix. Administration of activated charcoal and glucose paste
      x. Administration of Aspirin for suspected cardiac chest pain
      xi. Assistance with self-administration of nitroglycerin, auto-inhalers, and auto-injection epinephrine.
      xii. Spine Motion Restriction
      xiii. Long bone fracture immobilization
      xiv. Joint dislocation immobilization
      xv. Application of pneumatic anti-shock garment
      xvi. Control of bleeding and shock through positioning, direct pressure, and tourniquet, NOT including suturing or administration of IV fluids.
      xvii. Use of hemostatic agents
      xviii. Splinting, including traction splinting
      xix. Bandaging
      xx. Assistance with emergency childbirth, NOT including any surgical procedure whatsoever
      xxi. Use of Bag-valve Mask
      xxii. Use of oropharyngeal, and Nasopharyngeal, (In Florida, EMT-B can insert extra-glottic airway such as the Combi-Tube or King Airways)
      xxiii. Use of mouth to mask device with or without supplemental oxygen
      xxiv. Administration of supplemental oxygen via cannula or mask, including use of PULSE OXIMETRY devices
      xxv. Capillary puncture for the purpose of blood glucose monitoring including use of digital blood glucometer
      xxvi. Maintenance of heparin locks and saline locks on interfacility transports (Paramedic must attend if started in the field)
      xxvii. Use of suction equipment
      xxviii. Patient extrication
xxix. Scene management, such as directing traffic, but only when scene management activities do not interfere with patient care duties and law enforcement personnel are not at the scene

xxx. Responding appropriately to mass casualty incident, hazardous material incident, and triage situation

xxxi. Taking appropriate infection control precautions

c. General rule for EMT-B crews:
   i. Any patient being transferred from a higher level of care to a step down level of care, e.g. primary care hospital to a nursing home or rehabilitation facility (except if patient is on a ventilator)
   ii. Transfers between facilities of similar or higher care capability as long as patient is stable and not receiving advanced life support care such as IV medications, ventilator support, cardiac monitoring, and special equipment such as chest tubes.
   iii. An EMT-B should be able to manage non-critical/stable patients with chronic indwelling or attached devices (because there is no intervention needed with these devices) such as in-dwelling foley catheters, peg tubes or other feeding tubes, colostomy or ileostomy bags, artificial limbs, trach stomas with or without trach tube (on non-vent dependant patients), simple IV fluids at KVO. (Of course any of these patients who are found to be unstable and require skills not listed above, should be transported by an ALS crew)
   iv. Any deviation from the above will need to be approved on a case-by-case base, by the medical director.

d. Florida State Administrative Code permits: (64J-1.004 Medical Direction,)
   i. Under medical director approval:
      1. Can start a non-medicated IV in the presence of a Paramedic, provided the EMT-B has had required training equivalent to the required U.S. D.O.T. EMT-I National Standard Curriculum relating to IV therapy. The documentation must be on file in the office.
      2. Use an automatic or semi-automatic defibrillator
      3. Performance of esophageal intubation/blind airway insertion device
      4. On inter-facility transports, monitor and maintain non-medicated IV
1.1.6 Students

**Purpose:** To define what skills and procedures EMT and Paramedic students are allowed to perform and when riding with the Leon County EMS/Tallahassee Fire Department.

**Procedure:**

A. EMT and Paramedic students are allowed to perform any BLS skills and/or BLS procedures under the direct supervision of any Leon County EMS/Tallahassee Fire Department (EMS) EMT or Paramedic.

B. Paramedic Students are only allowed to perform the Paramedic procedures during their scheduled clinical time while under the direct supervision of a Paramedic Preceptor, Paramedic Field Training Officer or Field Supervisor and only then, when they have been cleared by the Institution’s Paramedic Instructor to do the individual skill.

C. Paramedic/EMT students are not allowed to perform ALS/paramedic procedures at any other time (outside of class time), specifically those individuals who are employed here (Leon County EMS/Tallahassee Fire Department) part time or full time as an EMT and are working with a certified Paramedic.

D. Students are required to wear their assigned student uniform when riding with EMS.
1.2 General Patient Care Issues
1.2.1 GENERAL GUIDELINES FOR TREATING PATIENTS

**Purpose:** To explain/review some general guidelines for treating patients that will enhance the care provided.

**Policy:**

1. The patient history should not be obtained at the expense of treating the patient. Life-threatening problems detected during the primary assessment must be treated first.
2. Cardiac arrest due to trauma may not respond to treatment from medical cardiac arrest protocols. Trauma patients should be transported promptly with CPR (if not going to pronounced in the field), control of external hemorrhage, cervical spine immobilization, and other indicated procedures attempted en route (i.e. IVs). If any doubt about the onset of the cardiac arrest (i.e. before vs. after the trauma), contact the medical control or medical director for guidance.
3. In patients with non-life-threatening emergencies who require IVs, only two attempts at IV insertion should be attempted in the field. Further attempts must be approved by medical control. If life saving drugs or IV fluids to treat severe hypotension is needed emergently, place an I/O if unable to obtain peripheral IV access.
4. Patient transport, or other needed treatments, must not be delayed for multiple attempts at endotracheal intubation. A King Airway may in fact be quicker to insert and secure an airway.
5. Verbally repeat all orders received prior to their initiation. This is especially true for drug orders given over the phone or radio. On ALL instances when you receive a medication order from a physician, you are to repeat the order to the physician, including the name of the drug as well as the dosage and route ordered. This is to ensure the physician you understood the correct dose of the correct medication.
6. Any patient with a cardiac history, irregular pulse, unstable blood pressure, dyspnea, or chest pain should be placed on a cardiac monitor.
7. If the patient’s condition does not seem to fit a protocol or protocols, always contact medical control or medical director.
8. NEVER HESITATE TO CONTACT MEDICAL CONTROL OR MEDICAL DIRECTOR FOR ANY PROBLEM, QUESTION, OR FOR ADDITIONAL INFORMATION.
9. Always show respect to the patient and family. Treat every patient with dignity and modesty.
10. If any jewelry is removed from a patient, please document in the record the disposition of the item(s) i.e. gave to family member, placed in patient’s pocket or purse, etc. Have this witnessed by your partner, AND DOCUMENT IT IN THE PCR.
11. Care of cardiac dysrhythmias is based on standards established by the American Heart Association committee on emergency cardiac care.
12. In terms of cardiac patients always treat the patient, not the monitor.
13. Protocols for cardiac arrest situations presumes that the condition under discussion continually persists, that the patient remains in cardiac arrest, and that CPR is always performed.
14. Adequate airway, ventilation, oxygenation, chest compressions, and defibrillation are more important than administration of medications and take precedence over initiating an intravenous line or injecting medications.

15. The new biphasic defibrillators (i.e. Zolls) are designed to deliver shocks at fewer joules than the monophasic defibrillators. Some of the new biphasic defibrillators are pre-set to deliver current at 120, 150, and 200 joules. Medtronic (Life Pack) Monitors can be dialed up to deliver 200, 300, and 360 joules in accordance with the new 2015 ACLS guidelines.

16. If patient has unstable vital signs:
   a. If patient is severely injured, with systolic blood pressure <90 mmhg in adults, or children with capillary refill time >2 seconds:
      - Airway with cervical spine control
      - Breathing
      - Circulation/perfusion with hemorrhage control
      - Disability determination (AVPU, motor, posturing)
      - Exposure
   b. Perform a rapid, abbreviated full-body assessment in order to identify any major injuries.
   c. If extrication required, perform quickly with spinal immobilization.
   d. Transport.
   e. Start 2 IVs (in adults) of lactated Ringer's or NS en route and run wide open up to 2 liters in trauma, 1 liter for medical then contact medical control for further. Recheck vital signs and lung sounds after each 250 cc bolus
   f. Contact medical control en route.

17. If the patient has stable vital signs
   a. If the patient's systolic pressure is initially and continuously stable, without significant signs or symptoms of shock, more time may be taken for field assessment:
      - Airway with cervical spine control.
      - Breathing.
      - Circulation/perfusion with hemorrhage control.
      - Disability determination (AVPU, motor, posturing).
      - Exposure
   b. Administer oxygen to maintain Pulse O2 > 94% (unless otherwise noted)
   c. Attach cardiac monitor and pulse oximeter.
   d. Perform a rapid, full-body assessment in order to identify any major injuries.
   e. If extrication required, perform with spinal motion restriction if indicated.
   f. Start an IV of lactated Ringer's en route at 150 ml/hour.
   g. Complete splinting and packaging.
   h. If head or spinal injury present, see Head Injury/Spinal Injury Protocol.
   i. If pelvis or femur fractures present, see Extremity Injury Protocols.
   j. If chest trauma present, see Chest Trauma Protocol.
   k. Transport.
   l. Contact medical control for any questions or problems.
1.2.2 MULTIPLE PATIENTS / TRAUMAS

**Purpose:** To briefly explain how to manage a situation involving more than one patient until more help arrives.

**Policy:**

1. **SITUATIONAL GUIDELINES**
   a. The first paramedic on the scene will become the scene director and others arriving later will follow his or her lead until a formal incident command system (ICS) is in place.
   b. Try to keep ambulance crews and equipment together to minimize confusion when several ambulances are present at the scene.
   c. Notify dispatch of the need for more help when the estimated number of injured can be determined.
   d. Note any hazards (chemical spills, downed power lines, etc.)
   e. Begin rendering emergency care with airway being the first priority, followed by oxygenation, and hemorrhage control. Call trauma alert on patients that meet criteria.
   f. Begin transporting severely injured, but salvageable, patients first. Dead and hopelessly dying patients should not be transported until salvageable patients are removed.
   g. In airplane crashes, be sure to leave a marker noting the position of the patient before removing them from the scene.
   h. If more than 5 patients or more than 3 trauma alerts, start triage system and declare a multiple casualty incident.
1.2.3 SPECIAL CONSIDERATIONS

**Purpose:** General guidelines for patients who need IV/IO therapy and/or endotracheal intubation.

**Policy**

1. **IV Therapy** (see [IV procedure](#) protocols for actual procedure)
   a. All trauma patients should receive at least one, and preferably two, IV’s of lactated Ringer’s via large bore (14 or 16 gauge) catheters. Trauma patients with a systolic blood pressure < 90 mmHg should receive wide-open fluids until the systolic blood pressure is > 90 mmHg. If after 2 liters the systolic blood pressure is < 90 mmHg, notify medical control. Trauma patients with a systolic blood pressure > 90 mmHg should receive fluids at a “to keep open (TKO)” rate or as directed in the applicable protocol. Trauma alert is to be called on all patients who meet the regions trauma alert criteria. Patients with closed head injury should maintain systolic BP of 110-120 mm/hg per ITLS recommendations.
   b. Intraosseous infusion may be performed (see [IO procedure protocols](#)) on pediatric and adult patients with the EZ-Io or the BIG I/O intraosseous needles when life saving drugs or IV fluids is needed in critical situations and a peripheral IV was unavailable. It is not necessary to place an I/O “just in case”, as unlike a peripheral vein, the bone will always be there even when the patient is in shock. **Only place the I/O when fluids and/or drugs are actually going to be administered.**
   c. Only paramedics, AEMT (pediatric I/Os) and critical care nurses who have obtained the required education in intraosseous needle placement and whom the system medical director has approved may place intraosseous needles.
   d. EMTs can start non medicated IVs once they have completed an approved IV course, have been observed by a paramedic starting 10 – 12 IVs and authorized by the medical director to do so.
   e. All pediatric peripheral IVs should be started with a minidrip administration set.
   f. All initial IV attempts are to be peripheral.
      i. The external jugular vein is considered a peripheral vein. DO NOT PLACE BILATERAL EXTERNAL JUGULARS. If an external jugular infiltrates with IV fluid or medication on one side, do not stick the other side.
      ii. Access of indwelling central lines (i.e. Hickman Catheters, Quinton cath) is permitted only in patients where peripheral IV attempts have been unsuccessful or would be inappropriate and the needs of intended therapy outweigh the risks.
      iii. Only Paramedics who are trained in accessing [Central Access IV ports](#) (Port-o-cath) may do so when medications and/or IV fluids are needed. Note: these central port catheters require special access needles. Do not attempt access if you do not have the special needles that are required and/or if you are unfamiliar with this technique.
   g. An IV lock or medication access point may be used in lieu of an IV bag in some patients, when appropriate. However, if no IV fluid or medication is anticipated to be given to the patient pre-hospital, please do not sick patient for an IV routinely. If patient decompensates and immediate intervention is needed and a peripheral IV is not accessible, give fluids and/or medication via an I/O which can be placed at the time it is needed.
h. Dial-a-flows are not to be used in lieu of an IV Pump unless approved by medical director.

i. Each IV site should be labeled with the following data:
   i. Time and date of IV start
   ii. IV cannula size
   iii. Initials of paramedic who started the IV

j. On all interfacility transfers:
   i. If by ground: all medication drips and IV fluids that are ordered to be administered at a specific rate (except KVO) must be on an IV pump to regulate the dosage/rate unless approved by the medical director.

k. For pre-hospital scene calls:
   i. IV piggyback medications administered via the ground service (with the exception of closely monitored Lidocaine drip initiated during treatment of a cardiac arrest in the field) should be on an IV pump, if possible, to control the rate. If time permits, place the Lidocaine drip on a pump.

l. After each intravenous medication, give a 20- to 30-ml bolus of intravenous fluid and immediately elevate the extremity. This will enhance delivery of the drug to the central circulation.

2. Endotracheal Intubation (See Endotracheal procedure protocols for more details)
   a. Proper endotracheal tube placement must be documented by at least three different methods. These include:
      i. Presence of bilateral breath sounds
      ii. Absence of breath sounds over the epigastrium
      iii. Presence of condensation on the inside of the endotracheal tube
      iv. End-tidal carbon dioxide monitoring (Mandatory as one of the three)
      v. Use of an endotracheal esophageal detector
      vi. Visualizing the tube passing through the cords
      vii. Continuous normal pulse-ox reading
   b. All three verification methods must be documented in the medical record!!
   c. Following endotracheal intubation, tube placement should be re-verified every time patient is moved, by noting bilateral breath sounds, noting condensation of ET tube, observing rise and fall of chest wall, monitoring continuous end-tidal carbon dioxide readings and monitoring pulse ox.
   d. See confirmation/re-confirmation protocol for more details.
   e. Remember, Lidocaine, Epinephrine, Atropine, Vasopressin and Naloxone can be administered via the endotracheal tube as a last resort if IV or IO cannot be established. Diazepam (Valium) should NOT be administered via an endotracheal tube.
   f. When administering drugs via the endotracheal tube, administer 2.0 - 2.5 times the IV dose. Also, dilute the drug in enough normal saline to result in a total volume of at least 10 mL. This will facilitate endotracheal instillation and aid in increased drug delivery to the respiratory tissues.
1.2.4 AMA / REFUSAL / DRY RUN CASES:

**Purpose:** To define who is considered to be a patient and how to go about allowing a patient to decline treatment and/or transportation to the hospital based on being competent and having the capacity to refuse.

**Policy:**
1. Any patient (See definition of patient below) refusing treatment must be informed of the risk of potential worsening of their condition, which could possibly lead to death or permanent disability. If patient is competent (see below) AND has no signs of being under the influence of an intoxicating substance AND is alert and oriented to person, place and time AND is not a minor AND has the capacity to refuse (see below) AND is not homicidal or suicidal, AND still refuses, he/she must sign a refusal form indicating they understand and are accepting the risk of refusal and cannot hold anyone responsible for any bad outcome as a result of their refusal.

If there are any questions or concerns about a patient’s state of mind (competency, intoxication or altered mental status) that is refusing care or transport, request the help of family or notify law enforcement. **Notify the supervisor or medical director of ALL refusals at the time of the incident.**

2. **Definition of a patient:** an individual will be considered a patient if, once contact with an individual by EMS is made and:
   a. They have an obvious injury or illness
   b. They have a medical or traumatic complaint
   c. They appear in some type of distress, i.e. short of breath, diaphoretic, in obvious pain, etc.
   d. Any individual with an obvious altered mental status
   e. Any individual where the EMT/Paramedic suspects injury due to mechanism of injury
   f. Any individual who, for any reason, requests to be transported to the hospital for evaluation.
   g. A person who denies injury or has no complaint, however, there is a significant mechanism in which it is conceivable that someone could have been injured from such a mechanism, such as a long fall, MVA with significant damage to vehicle, etc.

3. **For the purpose of EMS, a competent patient is defined as:**
   a. At least 18 years old (unless emancipated minor) AND
   b. Alert, responsive, oriented to person, place, time and situation AND
   c. Has no signs of injury or illness which may impair the ability to make an informed decision AND
   d. No signs of being under the influence of an intoxicating/mind altering substance (including carbon monoxide) AND
   e. Not suicidal or homicidal and does not want to hurt themselves AND
   f. Patient must have the capacity to refuse. Patient must demonstrate an understanding of:
      1. Diagnosis, possible diagnosis, or current medical problem; does the patient understand the condition/medical problem for which the specific treatment/transport is being offered?
2. Nature and purpose of treatment; is the person able to explain the nature of the treatment and understand relevant information?
3. Risk and benefits of proposed treatment/transport; is the person aware of the possible outcomes of treatment, alternatives or lack of treatment (and is able to verbalize the potential danger/risk to their health and well-being by refusing transport/care)?
4. Is the person able to make a decision and communicate a choice, and or the expectations realistic?
5. Is the person able to manipulate the information rationally?

4. For **minor patients** who meet criteria of “patient” above, refusal can be granted if:
   a. The patient exhibits no historical or physical findings of potentially life or limb or organ threatening injury or illness.
   b. Patient is not intoxicated, has no alterations in mental status, level of consciousness, or vital signs.
   c. The responsible parent/legal guardian is competent and available in person. It is reasonable for a refusal to be given by phone to two witnesses. If no parent/legal guardian is available in person or by phone, contact medical director or medical control for advice.
   d. Refusal by phone can be obtained from a parent, adult sibling, or legal guardian and must be witnessed by two paramedics or paramedic and EMT.

5. **Emancipated minors** can consent for themselves. Emancipated minor includes:
   a. A self-sufficient minor
   b. A married minor
   c. A minor in the military

6. Notify shift supervisor or medical director of all refusals at the time of the incident. Be prepared to discuss the case and provide pertinent information related to the nature of the call, scene size up, your assessment, including but not limited to: physical exam of involved anatomy, vital signs, applicable test such as EKG, pulse ox, glucose, and temp, etc. Report the reason for the refusal. It may be prudent for the supervisor and/or the medical director or med control MD to speak to the patient to reiterate the importance of transport to the hospital, depending on the situation.

7. Inform patients (family) of the risk of potential worsening of their condition, which could lead to loss of limb, death, or permanent disability

8. Ensure that the following information is provided:
   a. That the release is against medical advice
   b. That it applies to this instance only
   c. Patient should be instructed to request EMS to return (call 911) should they change their mind or their condition worsen.
   d. They should follow up with their primary care MD as soon as possible.
   e. Have appropriate “Refusal of Care” form signed and witnessed.

9. **IF Law enforcement calls EMS to a scene to “check out”, “clear”, “evaluate”, or whatever terminology is used to request an EMS unit to respond to the scene to evaluate a patient.**

   In general, when we are requested by law enforcement, this is because the law enforcement officer has some concern about the individual in question. On occasion, they would like the individual examined to determine if the individual needs to go to
the hospital or can safely be transported to jail. Whatever the case may be, because the law enforcement agency is responsible for the safety of the individual, you will treat this individual as a patient and obtain a refusal if the individual declines an evaluation and/or treatment and/or transport to the hospital. **You MUST document your encounter.** Your documentation should include the reason you were requested. You should then proceed to document as much as possible (see documentation protocol 1.1.3) in as much as the situation and/or the patient allows. If the patient is uncooperative and/or belligerent and/or is threatening, this must be documented as to explain why the report is incomplete.

**NOTE:** Never document in your run report that “patient is cleared to be taken by law enforcement” or “patient is cleared to be taken to jail”, etc. You cannot do a sufficient exam in the field to “clear” anyone. You should only document what you see, feel, hear, etc. At the time of your examine, if there are no obvious signs and symptoms of an illness or obvious injury, you should document **“based on the current vital signs and current exam, there is no apparent life threatening illness or injury identified”**. If the law enforcement officer ask you if the patient is “cleared”, simply repeat the phase above. If they insist on the patient being “cleared”, this will entail a trip to the hospital for evaluation by a physician. The refusal should be discussed with the supervisor on duty at the time of the refusal and if it is high risk, can be discussed with the medical director prior to clearing the scene.

10. **IF a healthcare provider on behalf of a patient under their care request EMS to transport the patient.**

An individual for whom EMS was summoned by a healthcare provider (who is caring for the individual) will be classified as a patient for the purpose of documentation and as such, **a patient care report shall be generated.** Should the individual have the capacity to refuse and does indeed refuse evaluation and/or treatment and/or transport, the patient care report should be completed to the best of your ability with regards to documenting a chief complaint, past medical history, medications, allergies, vital signs and a physical exam. Remember an EKG, pulse ox, and blood glucose should be included if applicable and allowed. The refusal should be discussed with the supervisor on duty at the time of the refusal and if it is high risk, can be discussed with the medical director prior to clearing the scene. If patient is uncooperative, combative, belligerent, etc., this should be included in the report.

11. **IF a family or witness to a medical or traumatic event who is present when EMS arrives on scene.**

If a witness (family or other individual) to an event is present when EMS arrives on scene, the individual for whom EMS was summoned will be considered a patient and as such, **a patient care report shall be generated.** Should the individual have the
capacity to refuse and does indeed refuse evaluation and/or treatment and/or transport, the patient care report should be completed to the best of your ability with regards to documenting a chief complaint, past medical history, medications, allergies, vital signs and a physical exam. Remember an EKG, pulse ox, and blood glucose should be included if applicable and allowed. The refusal should be discussed with the supervisor on duty at the time of the refusal and if it is high risk, can be discussed with the medical director prior to clearing the scene. If patient is uncooperative, combative, belligerent, etc., this should be included in the report.

12. CX/Cancels:
   A Cancel will be defined as any of the following
   a. Canceled Prior to Arrival
   b. Canceled Upon Arrival (NO PATIENT CONTACT)
   c. Handled by Law Enforcement (NO MEDICAL CARE NEEDED)
   d. Handled by Fire Department (NO MEDICAL CARE NEEDED)
   e. Standby For: ______________ (NO PATIENT CONTACT)
   f. Patient Refuses Care, Third Party Caller but not present on scene when EMS arrives, No Obvious Injuries, (AOx4, and does not meet definition of a patient).

   THE CANCEL SHOULD BE DOCUMENTED IN THE PATIENT CARE FORM AS “CANCELLED” AND/OR “SERVICES NOT NEEDED, NO PATIENT”. A CANCEL IS NOT TO BE USED FOR ANY PATIENT THAT HAS RECEIVED CARE OR THAT IS REFUSING CARE FOR OBVIOUS INJURIES (TREAT AS PATIENT REFUSAL). REMEMBER, IF EMS IS CALLED BY A THIRD PARTY WHO IS NOT ON SCENE WHEN EMS ARRIVES AND THE INDIVIDUAL FOR WHOM EMS WAS CALLED IS DENYING ILLNESS OR INJURY AND IS REFUSING TRANSPORT, MAY BE DECLARED A NON-PATIENT /"CANCEL”.

   FOR SEIZURE PATIENTS WHO REFUSE TRANSPORT, provided the patient has the capacity to refuse, you MUST!!! Inform patient (and if family is on scene, make them aware as well) that patient is NOT to drive any kind of vehicle, operate any kind of machinery, work at any heights, take a bath or swim alone (shower OK) until they are cleared by their medical doctor (or a medical doctor) to do so. You MUST document in the report that you informed him/her of these very words.
1.2.5 DNR / POLST / RESUSCITATION CONSIDERATIONS / DOA

**Purpose:** To guide the paramedic and EMT in making resuscitation decisions on patients who are pulseless, apneic or who are in a condition where death is eminent if immediate advanced care is not provided.

**Policy:**

1. **Do Not Resuscitate (DNR)/POLST (Physician Orders for Life-Sustaining Treatment)** orders should be honored when valid. If a patient’s family presents you with a DNR order signed by the patient’s physician, on a state approved DNR form, the following procedures should be followed:
   a. Honor the DNR/POLST and do not resuscitate. A DNR/POLST may be revoked at any time by the patient, if signed by the patient, or the patient’s health care surrogate, or proxy or court appointed guardian or person acting pursuant to a durable power of attorney established pursuant to Section 709.08, F.S. Pursuant to Section 765.104, F.S., the revocation may be in writing, by physical destruction, by failure to present it, or by orally expressing a contrary intent.
   b. Contact medical control or medical director for any questions, problems or concerns such as family reports patient is a DNR but does not have the papers available.
      i. If the patient is in cardiac arrest upon EMS arrival, initiate BLS (basic life support) until family provides you with the DNR/POLST paperwork or medical control is contacted. If proper DNR/POLST paperwork is provided, discontinue resuscitation.

2. Resuscitation should not be attempted in the field in cases of:
   a. Rigor mortis
   b. Decapitation
   c. Decomposition
   d. Dependent lividity.
   e. Incineration
   f. Obvious massive head or trunk trauma, which is incompatible with life (provided the patient does not have vital signs.)
   g. If asystole on the cardiac monitor and all four (4) of the following MUST be present:
      i. Vital signs absent
      ii. Pupils fixed and dilated
      iii. Pulseless
      iv. Unresponsiveness
   In addition, no resuscitation should occur if:
   v. Advanced age and/or general physical condition of the patient would indicate no resuscitative measures should be taken.
   vi. The length of time in arrest with no resuscitative measures is longer than compatible with life
   vii. No independent influences are evident such as drugs or cold
   viii. Terminal illness that indicates no resuscitative measures should be taken
   h. Other obvious signs of death
      i. The victim of blunt trauma who is pulseless, apenic, and without a palpable blood pressure or heart tones upon arrival of BLS or ALS providers.
ii. The victim of a multi-casualty incident in cardiopulmonary arrest whose use of pre-hospital care resources would jeopardize the care, health, or well-being of other critically ill or injured patients or the providers at the scene of accident, injury, or illness.

iii. The patient who, upon arrival of EMS personnel, is attended by a physician licensed in the State of patient’s residence; AND where the physician is willing to write a statement of his relationship to the patient, a "do not resuscitate" order, and a rationale for this order on the run report. EMS personnel must attempt to verify the identity of the physician before withholding cardiopulmonary resuscitation.

iv. A patient whose personal physician communicates via telephone that resuscitative effort should not to be initiated or resuscitative efforts should be discontinued. The physician must agree to accept the responsibility for pronouncing the patient dead to at least two (2) emergency personnel (EMT, paramedic, and law enforcement) via the telephone. The witnesses MUST sign the EMS Run Report.

3. Consider the potential for organ donation. Patients who have sustained mortal injuries may still warrant emergent care until a determination can be made whether the patient may be a potential organ or tissue donor.

4. When possible, place the quick look paddles or the ECG leads to confirm asystole or an agonal rhythm and attach a copy of the strip to the run report.

5. IF resuscitation was initiated, consider discontinuing efforts (after contacting medical control) in the field if:
   a. A patient remains in asystole in three leads after twenty minutes (for unwitnessed arrest) or thirty minutes (for witnessed arrest) despite being properly intubated, ventilated, and given several rounds of ACLS drugs (epinephrine) consider discontinuing resuscitation efforts per asystole protocol or contact medical control for guidance.
   b. Effective spontaneous ventilation and circulation have been restored.
   c. Resuscitation efforts have been transferred to persons of no less skill than the initial providers.
   d. The rescuer is exhausted and physically unable to continue resuscitation.

6. EMTs and paramedics are responsible for the medical judgment as to whether a patient is obviously dead or resuscitation efforts should be initiated. A Paramedic, if on scene should make this determination. Otherwise, the senior field EMT (BLS response) can make this decision. Contact Medical Director for any questions or concerns.

7. If an EMT or paramedic has a question as to how to proceed with any EMS situation involving the start or termination of resuscitation, immediately contact the EDMCP. Provide the physician with a concise but comprehensive assessment of the situation.

8. When pre-hospital personnel pronounce a patient dead on-scene, they must remain with the deceased until the arrival of appropriate law enforcement agencies (unless in a nursing care facility).
   a. All invasive apparatus must be left in place, and the body and scene not further disturbed
   b. In cases of possible homicide or suicide, do not remove or cut clothing unless absolutely necessary. Do not disturb the death scene unless absolutely required to do so. Do not dispose of clothing that has been removed.
9. EMTs and paramedics are responsible for the medical judgment regarding the termination of resuscitative efforts for patients in public settings such as restaurants, sporting venues, or other areas where spectators are present.
   a. As a general guideline, patients in these types of settings should have resuscitative efforts continued and should be transported to the nearest receiving facility.
1.2.6  A patient with a Living Will, Power of Attorney, Health Care Surrogate, Guardianship:

**Purpose:** Describes how to manage patients with a living will, power of attorney, health care surrogate or guardianship.

**Policy:**

1) A patient with a **Living Will** shall have this document honored UNLESS the patient or immediate family member(s) provide verbal or written instruction to the contrary.
   
   i) **Definition of a Living Will:** an advanced directive, prepared when an individual is alive, competent, and able to make decisions, regarding that person’s specific instructions about end-of-life care. Living wills allow people to specify whether they would want to be intubated, ventilated, treated with pressor drugs, shocked with electricity (to stop life-threatening heart rhythms), and fed or hydrated intravenously (if unable to take food or drink). Some also specify the person or persons who have power of attorney to make health care decisions on the patient’s behalf, if the patient is no longer competent to make choices for himself or herself.
      
      (1) Living Will may be revoked at any time by the patient or designated health care surrogate. If so, follow their wishes and resuscitate if requested.
      
      (2) If any doubt exists as to the applicability or validity of a Living Will, EMS personnel will initiate full treatment measures.

2) **Definition of a Durable Power of Attorney for Health Care:** An advanced directive that designates another person to make health care decisions regarding how aggressive treatment should be if the patient becomes incompetent or unable to make decisions in the future, for example, in the case of coma or a persistent vegetative state. The document also lists medical treatments that the person would not want to have done. Durable power of attorney goes into effect when the document is signed. A power of attorney for health care must be "durable." Durable is a legal term that means a power of attorney remains in effect even when you become incapacitated. A **health care power of attorney is not used unless patient is incapacitated.** If a person does not have the capacity to execute a power of attorney (and does not already have a durable power in place), often the only way for another party to act on their behalf is to have a court impose a conservatorship or a guardianship.
   
   i) If POA is presented
      
      (1) Verify the identity of the person who claims to be POA
      
      (2) Patient MUST be incapacitated for POA to be effective

3) **Health Care Surrogate**

   i) **A Health Care Surrogate** designation is a document in which the patient designates someone else to make health care decisions if the patient is unable to make those decisions. Unlike a Power of Attorney, a health care surrogate
decision-maker has no authority to act until such time as the attending physician has determined the patient lacks the capacity to make informed health care decisions.

(1) Patient must be incapacitated for health care surrogate to make decisions.

4) A **Legal Guardian** (In some states, conservatorships are called adult guardianships, but the terms mean roughly the same thing) is a person appointed by court, who has the legal authority (and the corresponding duty) to care for the personal and property interests of another person, called a ward. Usually, a person has the status of guardian because the ward is incapable of caring for his or her own interests due to infancy, incapacity, or disability. The guardian of the ward's person may exercise those rights that have been removed from the ward and delegated to the guardian, such as providing medical, mental and personal care services and determining the place and kind of residential setting best suited for the ward. The guardian of the person must also present to the court every year a detailed plan for the ward's care along with a physician’s report. If the court finds the ward partially incapacitated, it will appoint a limited guardian to perform only those rights which the ward is incapable of exercising.

   i) Identify if guardianship is limited or total
      (1) If limited, be sure it covers health care decisions
   ii) Verify the identity of the “legal guardian”
   iii) You may follow the wishes of the legal guardian, regardless of patient’s mental status.

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1.2.7 Load and Go Situations:

**Purpose:** To identify conditions where scene time should be as brief as possible. Majority of care should be provided in back of ambulance while in route to the hospital.

**Policy:**
1. The following is a list of situations that should generally be considered as load and go situations (not limited to):
   a. **Medical Conditions:**
      i. Complicated Childbirth
      ii. New onset unresponsiveness with no gag reflex
      iii. Altered Mental Status, etiology cannot be established
      iv. New onset stroke < 5 hours
      v. Elevated intracranial pressure per signs/symptoms
      vi. Uncontrolled bleeding
      vii. Shock (hypoperfusion)
      viii. Chest pain with SBP < 100 mm/Hg
      ix. Chest pain with EKG evidence of ↑ or ↓ ST segment
      x. Severe uncontrolled pain > 8
      xi. Impending respiratory failure
      xii. Uncontrolled airway
      xiii. Transport time > 35 minutes
      xiv. Status epilepticus
   b. **Trauma Priority Patients (Follow local Trauma Alert Criteria)**
      i. Based on initial assessment
      ii. Rapid trauma assessment
      iii. Mechanism of injury
      iv. Burn factors
      v. Contributing factors
1.2.8 Transporting patients to step down/lower acuity settings

**Purpose:** This policy addresses all patient transports that involve moving a patient from any care facility to a step down or lower acuity setting (hospital to nursing home, hospital to residence, dialysis center to home, hospital to hospital for equal or lower acuity care, etc.). This policy serves to identify patients whose condition may have deteriorated from time of request for transfer to the actual arrival of the EMS unit.

**Procedure:**

1. Upon arrival on scene, make patient contact within a reasonable time period (should be within 3 – 5 minutes)
2. Record a set of vital signs. Can use a set of vital signs taken by care facility IF they were taken within the previous 10-15 minutes prior to your arrival; otherwise obtain a set of vitals prior to moving patient. Include; BP, P, RR, Temp, pulse ox.
3. Make contact with patient’s nurse for report and final approval for departure. MAKE SURE THE CURRENT/MOST RECENT SET OF VITAL SIGNS AND THE CURRENT MENTAL STATUS ARE IN LINE WITH WHAT ARE IN THE PATIENT’S RECORD OR FROM THE NURSING REPORT. If there is a significant discrepancy in vitals (BP now very low or very high, pulse ox very low, tachy or Bradycardic, febrile, etc) or a change in baseline mentation, this MUST be discussed with the nurse prior to departing. If it is determined that no corrective action needs to be taken (hopefully the nurse discussed it with the patient’s doctor), you are to document this in your report and include the name of the nurse.
4. If you arrive at the patient’s bedside and find the patient in a potentially unsafe condition (i.e. severe respiratory distress, low pulse ox, in need of suctioning) and take emergency corrective action (i.e. suction airway, open airway, or change the oxygen setting from baseline), you must notify the nurse of such corrective action and have the nurse re-assess the patient prior to loading. If it is determined that there is no change in the patient’s condition from pre-discharge status, you may proceed with the transfer but document the event and provide the nurses name.
5. If it is expected that patient will potentially decline and even succumb after leaving the hospital (i.e. terminally ill, on hospice), you may proceed with the transfer as per physician’s order.

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1.3 Scene / Response Guidelines
1.3.1 HOSPITAL DIVERSION/BY-PASS:

Purpose:

1. To establish guidelines under which receiving hospital emergency departments divert fire-rescue and ambulance patients when it has been determined, through pre-established criteria, that the hospital is unable to accommodate additional patients.
2. To define procedures for communicating changes in diversion status.
3. To establish guidelines for fire-rescue, ambulance and other out-of-hospital provider operations when a receiving hospital is on diversion.
4. To define exceptions to the Hospital Diversion Status when hospitals follow procedures defined herein.
5. DIVERSION CATEGORIES

a. ELECTIVE: Defined as all patients requiring bed space, except critical patients. Minor Care patients shall be defined as follows:
   1. Any patient who can safely wait in the emergency department waiting room for an extended period of time.
   2. Any patient that does not require continuous ongoing medical therapy, such as oxygen or intravenous treatment.
   3. Any patient who at any point is not felt to be of urgent need of assistance, as determined by any level of healthcare provider.
   4. Any patient who does not have respiratory or cardiac complaints.
   5. Any patient who does not have uncontrolled or significant hemorrhage.

b. CRITICAL: Defined as all patients requiring critical care support. Clinical conditions that may be considered are:
   1. Potentially life threatening dysrhythmias.
   2. Hypotension with shock.
   4. Hypothermia.
   5. Altered mental status unresponsive to Dextrose 50% Water.
   7. Any condition determined by the paramedic to be of a critical nature.
   
   NOTE: Cardiac or Respiratory Arrest, and Trauma Alerts, are NOT subject to CRITICAL CARE DIVERSION.

   c. TECHNICAL: Defined as all patients in need of technical or specialty evaluation, for which the receiving facility is unable to provide. This may include:
      1. Malfunction or repair of medical equipment.
      2. Unable to accommodate a particular type of patient because of resource unavailability.
      3. Emergency Department is rendered inoperative due to loss of infrastructure facilities, such as loss of power, or flooding. Such a
situation must be noted, at which time ALL patients will be diverted away from affected facility.

Policy/DIVERSION PROCEDURE:
1. Activation of diversion will be done by the ED Supervisor after he/she has assessed the need for hospital diversion and the hospital’s capacity to accommodate such patients. EMS systems that are impacted will be notified. Previously identified individuals or dispatch systems, as declared by each EMS system, will be the point of contact.
   a. Hospitals must give notice in advance of the transport of patients to their facility. Depending on how close the EMS unit is to the hospital, we may be unable to divert if we are being notified (for the first time) of a diversion status while enroute to the hospital with a patient on board. If you are unable to divert due to patient condition or patient request, proceed to the hospital that can then provide a medical screening exam and transfer patient to another facility as per EMTALA.
   b. The dispatcher will log information relating to the divert status, including time/date on and off divert status, and name of notifying house supervisor.
   c. Log any information related to any actual ambulance diversions, including patient name, diverting hospital, ER physician, destination hospital, and reason for diversion.
2. EXCEPTIONS
   a. During an actual patient call, patients (or authorized representative) will be notified/advised of the diversion status of a hospital and may request an override of diversion. They will then be asked if there is an alternative choice of hospitals to be taken to.
      i. If the patient (or authorized representative) refuses transport to any alternative hospital, they will be informed of a possible substantial delay in care and possible adverse affects on their health if taken to the hospital on diversion.
      ii. If patient (or authorized representative) still refuses to be taken to an alternative hospital, they will be taken to the hospital of their choice and will need to sign acknowledgement/release of liability form indicating they understand the risk of their actions (see Hospital Diversion Form in Forms Section in back). This will be granted if the patient believes it to be necessary to be transported to a particular facility because their medical records and physician may be exclusive to that facility. From time to time one or more hospital emergency departments may go on by-pass or diversion of various services or for various reasons. Usually a particular service or department is saturated and cannot safely handle additional patients. The patient will be taken to the hospital of their choosing and the hospital will be notified of the patient’s decision.
1.3.2 AEROMEDICAL EVACUATION (HELO)

**Purpose:**
This protocol will serve to guide the EMS personnel on utilizing an air ambulance to transport patients to the hospital. The objective will always be to consider what is best for the patient. EMS personnel should ask themselves the following three questions when considering aero medical transport:

1. Is there anything about the location/logistics of the call that would delay transporting patient by ground?
   a. Remote geographic location with a reasonable location to land a helicopter.
   b. Prolonged extrication (from vehicle or building).
   c. Relative location of the patient (and all the equipment [monitors, IV bag, oxygen]) to the ground unit as well as the terrain (in the middle of a field, pasture or wooded area that would require substantial manpower to carry the patient and equipment back to the ground unit).
   d. Known/anticipated traffic issues
      i. “Rush Hour”
      ii. Road construction/closures

2. Is there anything about the patient’s condition that would benefit from rapid transport to the hospital?
   a. I.E. Patients with MIs or Strokes who would benefit from rapid administration of thrombolitics or intra-arterial catheterization to resolve a blood clot blocking a vessel. The sooner this can be done, the more CELLS can be saved
   b. Studies have shown that trauma patients have a much greater chance of survival if resuscitative care is provided during the “golden period” immediately following significant trauma. This includes getting patient to the operating room rapidly.
   c. In general, if a patient with a critical, life threatening condition can be delivered to an appropriate hospital, such that there is a savings of twenty minutes or more, using an air resource vs a ground resource, then it is reasonable for a ground crew to request air transport. So the question to ask…if an air resource is used, can they arrive at the hospital twenty minutes quicker than if patient went by ground (see Early Activation Algorithm)?

3. Is there anything about the mechanism of injury (or illness) that would potentially cause the patient to rapidly deteriorate before arrival at the hospital (even though they look stable on first arrival)?
   b. I.E. by mechanism; a patient involved in a motorcycle accident or sporting accident (football helmet to the abdomen) who has severe left or right upper quadrant abdominal pain and tenderness (ruptured spleen or liver laceration). Diving accident with a “stinging” sensation in the neck and tingling in arms and/or legs

If the answer to question 1 is yes AND the answer to either question 2 or 3 is yes, then a request for aero medical transport is reasonable (b).
Other considerations for the EMT/Paramedic on-scene to consider in requesting aero medical transport:

1. **Physiologic criteria:**
   a. Multisystem blunt or penetrating trauma with unstable vital signs
   b. Greater than 25% TBS burns, burns to the face, hands, feet, or genital area and/or possible transport directly to a burn center
   c. Paralysis or spinal injury
   d. Amputation proximal to wrist or ankle
   e. Flail or crushed chest

2. **Situational Criteria:**
   a. High energy mechanisms
   b. Prolonged entrapment
   c. Multiple casualty incident
   d. Transport time by ground exceeds air transport time

3. **Medical criteria**
   a. Any critically ill patient with unstable vitals, unstable airway, unstable cardiac rhythm > 30 minutes travel time by ground or transport time by ground exceeds air transport time
   b. Patients who may be suffering from an acute stroke or myocardial infarction and would benefit from rapid transport to the hospital for definitive care such as thrombolytic therapy or intra-arterial catheterization.

**Procedure:**

1. EMS dispatcher will request the helicopter based on; the nature of the call and/or information received during the initial call taking, request from law enforcement, fire department personnel or EMS personnel while enroute (based on nature of call) or after arrival on scene. EMS personnel should consider EARLY ACTIVATION of the air resource based on information received prior to arrival on scene (if auto lauch criteria was not utilized) or as soon as possible after arrival if it is anticipated that scene time will be signigicantly delayed and there is a significant distance to the hospital. All correspondence with the helicopter service dispatcher should go through the EMS dispatcher as not to duplicate (and potentially confuse the helicopter service dispatcher) with request from other agencies on the same call.

2. A landing zone will be identified and secured by fire department and/or law enforcement personnel (aka the Marshaller) who have been trained by the helicopter service in helicopter scene safety.

3. When instructed to by the EMS dispatcher (in conjunction with the helicopter service dispatcher), the ground crew will communicate with the helicopter pilot/crew to coordinate and facilitate the landing. The same type of communication will be needed for lift off from the scene.

4. The Marshalling(a):
   a. Positioning:
      i. Will stand at the outer edge of the landing zone perimeter on the windward side with his/her back to the wind.
      ii. Apparatus Lieutenant/Captain will have the primary responsibility for the marshalling duties.
iii. An additional firefighter who is assigned to the Marshaller will maintain constant radio contact with the helicopter as well as visual and verbal contact with the Marshaller.
iv. Remain in eye contact with the pilot at all times.
v. DO NOT approach the helicopter; remain vigilant at your post.

Note:
(a) The Marshaller is one of several tools that are at the disposal of the Pilot in Command (PIC) for the accomplishment of a safe landing and departure. There are several factors the PIC considers when making an approach or departure into a confined area. This being the case, he/she may not always follow the exact direction of the Marshaller. It should be noted that most approaches will be to the ground, not to hover. The PIC, at his/her discretion may elect to land without the assistance of a Marshaller and may request that the Marshaller remain clear of the LZ until after the helicopter has landed. If the PIC does not follow the exact direction of the Marshaller, be assured there are reasons for his/her actions.

(b) The earlier you request the helicopter the better for the patient. The following is an optimistic average of how long it takes a helicopter to arrive on scene and move a patient to the hospital emergency room if there are no mitigating factors. The total time to get the patient to the hospital should be compared to how long it would take for a ground unit to move the same patient to the emergency room.

From time of request by field unit:

  1)  2 minutes Dispatch
  2)  7 minutes Safety checks warm up and lift off:
  3)  5-12 minutes Average flight time for a helicopter service to arrive on scene.
      Time will be extended if a helicopter from outside the local County is called. Flight arrival time will extend 12-15 minutes.
  4)  3-4 minutes Landing time
  5)  5-7 minutes Patient transfer, moving patient to helicopter stretcher
  6)  5-12 minutes Average flight time to hospital
  7)  10 minutes Average time to get from the pad to the emergency department.

  **39-50 minutes average total time**
Early Activation of Air Resources

Patient information suggests a critical patient – *(based on caller information and/or first responders on scene)*

EMS on scene or < 5 min ETA

- **Yes**: EMS assessment of patient
  - **Patient critical or unstable**
    - **No**: Early Activation
    - **Yes**: Consider EMS location relative to the scene AND patient location relative to hospital (paramedic judgment).
  - **No**: EMS arrives before Helo. Patient critical or unstable?
  - **Yes**: EMS arrives before Helo. Patient critical or unstable?
    - **Yes**: Helo arrives before EMS. Pt
    - **No**: Transport by ground

- **No**: EMS on scene or < 5 min ETA
  - **Yes**: Patient critical or unstable
    - **No**: Transport by ground
    - **Yes**: If transported by Helo, will there be a ≥ 20-25 minutes savings of time getting this patient to the appropriate hospital, taking into account travel time to scene, on-scene emergent treatment, packaging and/or extrication?
      - **Yes**: Transport by Helo
      - **No**: Transport by ground

Await EMS arrival

Early Activation
Landing Zone Criteria

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Review your Marshalling signals:

- Move Right
- Hold-Hover
- Marshall
- Move Left
- Takeoff
- Waveoff
- Move Forward
- Land
- Yes/Clear
- Move Rearward
- Move Upward
- O.K.
- Release Sling Load
- Move Downward
- No
1.3.3 Crime Scene Response

Purpose: The safety of EMS personnel and emergency care for the victim(s) remain the primary goals in all crime scene operations, however, preservation of the scene remains the most important secondary goal. Never compromise patient care to preserve a crime scene.

Procedure:
1. EMS responders should not approach any scene suspected of involving violence unless law enforcement personnel are on scene and the scene is reasonably secure. EMS responders should not approach any crime scene in which law enforcement personnel are not present, in which law enforcement personnel are in defensive positions, or when law enforcement personnel are presenting weapons.
2. EMS responders should approach every call with caution while being observant. This is particularly true of scenes that may involve a crime against person or property. Noise and light discipline should be used with emergency warning equipment. If possible, shut down some distance from the incident. EMS personnel should be very observant upon approach.
3. A portable radio to call for assistance is recommended. EMS should not approach any scene that appears suspicious without law enforcement personnel present.
4. Use caution when approaching buildings and never stand directly in front of doors when knocking for entry.
5. If a weapon is involved, try to secure the weapon unless the weapon is still in the assailant’s possession. The weapon should be secured in such a way that it does not jeopardize the patient or your life. The weapon as potential evidence should not be compromised if at all possible.
6. If your life is in danger it may be necessary to leave your patient behind. Always have a planned escape route.
7. All information regarding a call should be gathered. Calls involving crimes in progress, the use of weapons, or any suspicious call in high crime areas, should be treated with caution. It is suggested that EMS personnel wait till scene is declared safe by law enforcement personnel.
8. When approaching a crime scene with law enforcement present, ask for the best route to approach and avoid destroying what may be valuable evidence. Use only one route in and out of the scene and disturb only what is absolutely necessary. If law enforcement personnel refuse access to the crime scene, do not become confrontational. Notify the EMS Agency Supervisor and complete an incident report as required.
9. Avoid disturbing possible tire tracks or footprints, and avoid blood on any environmental surfaces.
10. REMEMBER, When on scene:
   a. Keep your medical equipment close to the victim.
   b. Stay close to the body.
   c. Keep your hands out of any blood that has pooled.
   d. Do not wander around the scene.
   e. Minimize destruction of the patient’s clothing. If the patient’s clothing has a puncture, do not use the hole in the clothing to start cutting. Begin
cutting at another part of the garment. Removed clothing should be left
with the patient or turned over to law enforcement personnel.
f. Do NOT go through the victim’s personal effects, clean the body, or cover
the body with a sheet or other material (if expired).
g. Do NOT move, take, or handle any object at the scene or litter the crime
scene with medical equipment, dressings, bandages, or other supplies.
Do not disturb items present on the scene unless absolutely necessary.
h. If resuscitation efforts are deemed necessary, transfer the victim from the
scene to the vehicle expeditiously and stabilize the victim in the vehicle,
when possible.
i. If the patient relates any information relating to the crime while in transit
to the medical facility, inform law enforcement personnel at once.

11. Remove any medical items brought into the scene.
12. When possible, place any victim(s) to be transported on a clean sheet. When the
victim is removed at the hospital, retain this sheet and any others for law
enforcement investigators. This is particularly important in crimes in which
trace evidence may be transferred from the suspect to victim. Retain, preferably
wrapped in a clean sheet or placed in an unused paper bag, any clothing or other
items removed by EMS personnel while in the ambulance. DO NOT place
blood-contaminated items in a plastic bag as this may ruin their value as
evidence.
13. Do not touch or handle items, particularly weapons, found at a crime scene
unless absolutely necessary. Do not handle expended bullets or casing with
metal forceps if they should be found in the clothing or on a sheet. Retain them
in the sheet or clothing they are found in and notify law enforcement
investigators.
14. It may be required that EMS personnel enter a crime scene to confirm an
obvious death. However, this procedure can be accomplished with minimal
scene disturbance. Coordinate with law enforcement personnel in preserving the
crime scene to the greatest extent possible.
15. Be aware of any statements made by victims, suspects, or others present at a
crime scene. Make certain to scan the scene noting how it appears upon your
arrival, particularly the victim, and remember any changes made to the crime
scene during patient assessment and/or treatment.
16. Make copious notes outside your PCR (patient care report) following the
incident regarding actions and observations made during the incident. Any
statements made outside the presence of law enforcement personnel by the
victim or suspect should be carefully noted and notify law enforcement
investigators. Enforce HIPPA laws.
17. If a scene appears suspicious, then await the arrival of law enforcement
personnel before approaching.
18. Documentation: A detailed report that covers all aspects of your involvement at
the crime scene is suggested and is important in case you are later called to
testify in court. These narratives should cover your observations and
conversations with the family or person present at the scene, location of
response vehicles and equipment, furniture, weapons, or clothing that has
moved, items that were handled by EMS responder, and your route to the
victim. This narrative should be a separate report from your Patient Care Form,
perhaps on a form that you keep in a file in the event you are called to testify in a case.

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1.3.4 Hazardous Material Incidents

**Purpose:** EMS personnel may be first on the scene of a hazardous materials situation because of shorter response time or no knowledge of dispatch that hazardous materials are involved. This protocol is intended to guide EMS personnel who do not normally function in hazardous materials scenes, and are only trained to the awareness level. The protocol is intended to compliment any existing hazardous materials guidelines of fire agencies. If the two are in conflict, the existing fire department protocol stands.

- If the scene you are responding to is a known or suspected (based on information from dispatch) hazardous materials situation, stage and wait for the hazardous materials personnel.
- When you have arrived at the scene and find out during scene assessment that hazardous material are involved, stage and wait for the hazardous materials personnel.

All scenes (MVC, industrial, etc.) should be considered as being a potential hazardous materials situation. The following approach should be used:

**Procedure:**

1. **Approach (All Scenes):**
   - Utilize a cautionary approach at all times.
   - The reported location may be inaccurate and response into contaminated area might occur.
   - Approach upwind and upgrade if possible. If unable to approach from upwind/upgrade, approach at 90 degrees to wind/grade if possible with safety in mind.
   - Position vehicle well away from problem and headed away from the incident.
   - Communicate your actions or intended actions with EMS dispatch.
   - Remember. Contaminated and/or exposed response personnel may add to the overall problem and reduce their effectiveness to help.

2. **If at any time you suspect a hazardous materials situation:**
   - If first-in responder, confirm that fire and police have been notified.
   - The agency responsible for hazardous materials response may respond with different levels of personnel and equipment based upon the information received. Do not always expect a hazardous materials team to respond.
   - If you are the first-in responder, first priority is scene isolation. KEEP OTHERS AWAY! KEEP UNNECESSARY EQUIPMENT FROM BECOMING CONTAMINATED.
   - If you believe that you or your vehicle is contaminated, stage in an isolated area.

3. **Person in Charge (PIC)**
   - If the EMT/Paramedic is the first medical person on the scene, he/she assumes the role of PIC of medical care (not necessarily scene control) until hazardous materials trained EMT/Paramedic arrives. Everyone should work as a team.
   - The EMT/P will direct all patient care.
   - The EMT/P, in concert with the incident commander, will determine the method of transport of the exposed patient(s) (air vs. ground)
   - The EMT/P will determine who will provide care during transport

4. **Patient care for the contaminated patient**
a. Types of incidents which may require decontaminations of the patient(s): 1) Radiation, 2) Chemical, 3) Biological hazards, 4) Toxic substances.
b. Contamination can occur through: 1) Smoke, 2) Vapor, 3) Direct contact, 4) Run-off
c. Transporting contaminated patients should be a serious concern to those involved. Patients who have been in contact with, or who are even suspected of having been in contact with, hazardous substances should be transported for evaluation.
d. The hazardous materials team must be contacted about removal of contaminated clothing and packaging of the patient with regard to your protection and the patient’s
e. Determine the hazardous substance involved and provide treatment as directed by EMT/P in charge. Refer to the hazmat treatment protocols for specific treatment.

5. Ambulance Preparation
   a. The EMT/P shall determine the process needed for ambulance preparation.
   b. Remove any supplies and equipment that would not be needed for patient care, i.e. extra medical kits, etc.
   c. Seal cabinets and drape interior, including floor and squad bench, with plastic or visqueen (if available from hazardous materials team).
   d. Prepare stretcher for removing foam pad and placing down long backboard. Cover with plastic and tape in place if needed (if available from hazardous materials team).

6. Transport and arrival at hospital
   a. If an ambulance has transported a patient from an incident that is subsequently determined to involve hazardous materials exposure, scene personnel must immediately relay all relevant information to the transporting unit(s) and/or receiving facility(s) involved.
   b. On-line medical direction and the receiving hospital should be contacted as soon as possible. The EMT/P should communicate the material involved, degree of exposure, decontamination procedures used, and patient condition.
   c. The ambulance should park in an area away from the emergency department or go directly to a decontamination center or area.
   d. Patient(s) should not be brought into the emergency department before EMT/P receives permission from the hospital staff.
   e. Once the patient(s) has been released to the hospital, follow the EMT/Ps direction and if necessary double bag the plastic sheeting used to cover the gurney and the floor into plastic bags. Double bag any equipment that may have become contaminated.
   f. After unloading patient from ambulance, check with the fire department incident commander to see where the ambulance can be safely decontaminated and whether or not there is equipment available for this purpose. Do not begin decontamination until after consultation with Hazardous Materials Team Leader.
   g. Following decontamination recommendation from the “hazardous materials team”, decontaminate the ambulance and the personnel before returning to the incident scene. If returning to the incident scene, bring bags containing
contaminated materials, equipment, clothing, etc. and turn over to the hazardous materials team.

7. EMT/P Exposure
   a. If an EMT/P is exposed or is concerned with the possibility of exposure, medical help should be sought immediately
   b. Report all exposures to the hazardous materials team, Poison Center, and your risk manager or supervisor.
   c. Do not return to service until cleared to do so by the fire department incident commander or Poison Center, and your supervisor

8. The Poison Information Center is authorized to direct all medical care (Supportive Care, ALS Level 1 and ALS Level 2) for toxicology and hazardous material exposure patient. Poison Information Center number 800-222-1222.

9. Refer to section 08 Hazardous Material Exposure for additional and specific management of various hazardous exposures.

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1.3.5 Orders from Transferring/Receiving Physicians

Purpose: To provide guidelines to EMTs and Paramedics who may receive orders from a transferring physician concerning the patient at a care facility being transferred to another facility.

Policy:

1. During inter-facility (hospital, clinic, or physician’s office) transport, medical crews will be asked to continue treatment initiated at the transferring facility. It is the responsibility of the transferring MD to provide written orders to cover the needs of the patient during transport. These orders should be in writing. Please attach a copy of these orders to your run report and submit with your other reports at the end of your trip.

2. Verbal orders must be written on an order sheet by the medical crew and indicate these are “verbal orders” from Dr. ___ (name of physician). Attached a copy to the run report. Ideally, the transferring physician should sign these orders.

3. If, at any time the Paramedic or Critical Care Transport Crew questions orders from a referring or receiving physician, on-line medical control or medical director MUST be contacted.

4. Likewise, anytime a transferring or receiving physician asks the Paramedic or Critical Care Transport crew to carry out medical treatment for which they have not been trained (beyond their scope), or which appears to be in conflict with established treatment protocols, on-line medical control or medical director MUST be contacted before initiating care.

5. If orders are given to administer larger quantities of a drug than we carry on our units, you must obtain the additional drug from the facility before leaving with the patient.
1.3.6 ON-SCENE PHYSICIANS

**Purpose:** To provide guidelines to EMTs and Paramedics who may encounter physicians on scene. This will include patients in a physician’s office or clinic.

**Policy:**

1. A physician on scene prior to EMS arrival:
   a. May retain medical control/responsibility for his/her patient provided he/she accepts full responsibility (medical/legal) and accompanies the patient to the hospital in the ambulance.
   b. Verify the physician (on scene at an accident or outside of a physician’s office) is a qualified M.D. or D.O. to give orders/assist EMS crew. If necessary, have the on-scene physician call and talk with medical control or the medical director.
   c. If orders given by the on-scene MD differ from our written protocols, call medical control or medical director to approve the orders.

2. Physician on scene after EMS arrival:
   a. If a physician arrives on scene and offers assistance, verify the physician is a qualified M.D. or D.O. If necessary, have the on-scene physician call and talk with medical control or the medical director.
   b. Any assistance offered must comply with current medical protocols. Any deviation from protocols must be approved by the medical director or the on line medical control physician.
   c. Final authority for approving orders given by on scene physician assistance rest with the medical control or medical director.

3. Patients in physician’s office
   a. If this is an established patient of the physician, and he/she knows the patient’s health history, and if the chief complaint or current medical problem is within the scope of practice of the physician (e.g. chest pain patient in a cardiologist office), then the physician can provide assistance/guidance and orders to the EMT and Paramedic provided the orders are within the scope of practice of the medical crew and do not deviate significantly from these protocols. Any deviations or concerns of the medical crew, contact medical control or medical director for advice.
   b. Physicians who may not be familiar with the patient (e.g. new patient) or patient’s medical problems (specialist not involved with patient’s general medical care) such that patient’s chief complaint is not routinely treated by the physician (e.g. patient who develops chest pain while having a urological procedure by a urologist) will most likely allow the Paramedic and EMT to carry out their duties as trained. You may allow the physician to assist unless inappropriate orders are given at which time you are to continue treating the patient according to your training and the protocols. Any problem, refer the physician to medical director or medical control.

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1.3.7 On-Scene times

**Purpose:** To establish guidelines for managing on-scene times. To define what constitutes on-scene times.

**Procedure:**

1. For a given ambulance or unit assigned to a call, on-scene time will be defined as the time from patient contact until the time the transport to the receiving facility (wheels rolling) is initiated or from patient contact until hand-off of patient to another healthcare agency (helicopter service for example). In cases of patient refusal, on-scene time will be defined as the time from patient contact until the time patient signs the refusal.

2. It is reasonable to expect on-scene times to be ≤ 25 minutes 80% of the time.
   a. For scene times that exceed 25 minutes, it should be explained in the run report. Acceptable reasons for prolonged (> 25 minutes) scene times include, but not limited to:
      i. Multiple patients needing evaluation and treatment
      ii. Extrication from vehicle, building, or other location
      iii. Significant distance separating patient from ambulance (pasture, field, wooded area)
      iv. Morbidly obese patients over various terrain

3. Crews who fail to provide satisfactory reasons for a prolonged scene time will receive counseling and follow up monitoring for compliance.

4. Regarding inter-facility transfers
   a. On-scene times for inter-facility transfers should be kept to a minimum as much as possible. There are multiple factors that can contribute to the on-scene time of an inter-facility transfer that are not in the EMT/paramedic’s control. A reason should be documented in the run report when a scene time exceeds 30 minutes on an inter-facility transport. There may be opportunity for EMS Administrative follow up to educate the staff and assist in minimizing delays in transport.

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1.3.8 Standard Medical Communications

Purpose: To assure proper radio communication for the duration of a call. To ensure proper notification as well as providing adequate patient information to the receiving medical facility

Procedure:

I. Reports on Scene

A. Ensure all patient care assessment information and treatment provided is conveyed in an accurate, precise, and timely manner to the attending Paramedic upon arrival at a scene.

1. Upon arrival of the attending Paramedic from Leon County EMS (EMS), First Responder, EMT, or Paramedic administering patient care, will provide a detailed report of all signs, symptoms, vital signs, and history of the patient. The report may be a combination of verbal and written documentation. The attending Paramedic is responsible for receiving and documenting this information, while ensuring pertinent questions are addressed relating to information that requires additional clarification. All participating health care professionals are expected to maintain the highest level of professionalism, courtesy, and compassion when interacting with other agencies, the patient’s family members and good Samaritans specifically involved in this incident.

2. The Leon County EMS (EMS) Paramedic will be in charge of managing the patient upon their arrival. All participating agencies are expected to honor and abide by this prescribed standard. The proper care, management, and expeditious transport of the patient should always be the primary focus of all involved agencies. Concerns about scene or patient management that do not present an immediate threat to the health and well-being of the patient should be addressed with your immediate supervisor at a more opportune time.

3. If a situation arises where the course of treatment being rendered is “considered or perceived” as inconsistent with normal practices/protocols, the other medical personnel on scene should address this with the primary care provider immediately. If the suggestion or recommendation is not accepted, then the attending Paramedic will have the final decision on proper course of treatment. The On-duty Supervisor and the highest-ranking Fire official on scene will be notified on any scene irregularities. Contingent upon the situation, this individual will notify their immediate Supervisor and/or Medical Director(s) for further guidance and direction.

II. Radio Reports to Hospitals

A. The ideal radio report should relate all pertinent information regarding both the patient and the plan for treatment in less than two minutes. The report itself must be prefaced with an explanation of the type of report to follow. Reports must be described as emergent or non-emergent. This statement must be followed by noting if on-line physician orders are to be requested or if the report is for information only. It is understood that some pre-hospital situations preclude providing a complete report to the destination facility. However, paramedics should strive to furnish a complete report at the
earliest possible opportunity, and deviations from this standard must be for the benefit of the patient.

B. Ambulance identification
   1. Vehicle identification
   2. Paramedic name (if asked)
   3. Location of vehicle, including description of scene (if on site) and estimated time of arrival to the destination facility.

C. Patient data
   1. Patient's age, sex, and chief complaint
   2. Brief history of the present illness; include past medical history, medications, and allergies only if relevant to the chief complaint.
   3. Vital signs (to include pulse, respiratory rate and depth, blood pressure, cardiac rhythm, and oxyhemoglobin saturation as appropriate).
   4. General appearance (including level of consciousness) and pertinent physical findings.
   5. Care in progress.
   6. Request for orders and confirmation of same.

D. Contacting the Hospitals:
   1. Radio report should be given to the hospitals via their respective radio system(s).
   2. If unable to contact a hospital via their assigned radio channel;
      1. You may attempt to make contact via telephone;
      2. If unsuccessful or unavailable, you may relay a short report to dispatch and they will relay the information to the hospital. Provide only the following information, if possible:
         a. Age
         b. Sex
         c. Patient(s) condition & chief complaint
         d. ETA to the hospital

Examples: “Advise Hospital Name that we are en-route to them with a stable, 21 y/o male, c/o chest pain, ETA 7 minute.”

“Advise Hospital Name that we are en-route to them with an unstable, 8 month old female with severe difficulty breathing, ETA 3 minutes.”

“Trauma Alert to Hospital Name, 35 y/o male, GCS less than 12, ETA 15 minutes.”

“Setup Hospital Name for a Cardiac Arrest, 55 y/o female, ETA 20 minutes.”

III. Arrival at Facility
   A. The attending paramedic will immediately advise the appropriate nursing station that they have arrived, request a room number, and request that the appropriate staff be sent to the room.
B. Arrival at Room with Patient

1. Patients, which can be safely moved to the hospital stretcher without additional assistance, will be placed in the designated bed.
2. The side rails will be placed in the “up” position and any treatment modalities (oxygen, monitor, etc.) will be appropriately reconnected to hospital equipment.
3. The attending paramedic will either give report to the hospital staff in the room or the non-attending crewmember will remain with the patient and the paramedic will report to the nursing station and ask the physician /nursing staff if there are any further questions.
4. Upon completion of the verbal report, the attending paramedic will advise the hospital staff that the patient is formally released to their care.
5. The attending paramedic will return to the room to release their partner.
6. The crew will then restock and begins the documentation.
7. EMS employees should avoid performing any procedures within the receiving hospital, once the patient is placed in a hospital bed. Therefore, the timely response of hospital staff is essential.

IV. Documentation of Delays in Accepting Patients

A. Crews should advise dispatch of any unreasonable delays in the hospital staff accepting patients so it will be documented in CAD. This will allow for extended turnaround times to be more closely analyzed.
B. Delays of > 30 minutes for hospital to accept or direct EMS patient to a hospital room, gurney or wheelchair, and release the EMS crew, will be brought to the attention of the shift supervisor immediately. EMS personnel will continue to provide any emergency care necessary to ensure the safety and well being of the patient (e.g. oxygen, cardiac monitor, monitor IV fluids, in necessary, administration of an emergency drug (e.g. epinephrine, atropine) to prevent further deterioration of a patient’s condition. It is NOT the responsibility nor is it appropriate for EMS to remain in the hospital and continue to monitor the patient for any extended period of time. This puts the community in jeopardy if too many EMS crews are tied up in emergency departments awaiting transfer of patient care to the hospital personnel. There is a possibility the hospital may incur a monetary assessment to cover the cost of the EMS crew to continue monitoring and/or providing care to the patient for times beyond 30 minutes of arrival of the EMS units(s).

1. EMS Shift Supervisor will assess the situation and try to resolve the issue with the hospital staff.
   As a last resort, Leon County EMS (EMS) may choose to assign one paramedic or EMT to remain with patient, re-equip the EMS Unit with a stretcher, supplies and personnel to respond to additional calls in the community.
1.3.9 COMMUNICATION PROBLEMS

Purpose: To provide guidance to the paramedic and/or EMT (concerning treatment of a patient) and they are unable to contact medical control or the medical director while on scene.

Policy:

1. In the event an EMT and/or Paramedic cannot contact medical control or medical director (i.e. mass casualty or radio/telephone problem), all protocols become standing orders. Likewise, in the event that a medical control physician cannot respond to the radio/telephone within two minutes of the call, all protocols are considered standing orders. An emergency department nurse at the medical control hospital may relay orders from the emergency physician in cases where it is impractical for the physician to come to the radio/telephone. It is not necessary to speak with a medical control physician concerning treatment modalities that are considered to be standing orders except if a question arises concerning the planned treatment.

2. In the event medical control cannot be contacted, and treatment protocols were carried out as standing orders, the record should be pulled for review by the medical director. Following review, the medical director indicating retroactive approval will sign the record.
1.3.10 Trauma Transport Protocol

A copy of the trauma transport protocols for Leon County EMS/Tallahassee Fire Department is kept on file with Leon County EMS and can be requested via the Leon County EMS Field Operations division.

Return to:  Contents at top  Admin Guidelines  Scene response index
1.3.11 TFD Paramedics Riding in with LCEMS (to the Hospital)

**Purpose:** This policy defines situations when the TFD Paramedic rides with LCEMS to the hospital to assist with patient care

**Policy:** The TFD Paramedics may ride to the hospital with LCEMS paramedic, at the discretion of the LCEMS paramedic, under the following conditions/circumstances:

- TFD Paramedic called the trauma alert
- TFD Paramedic administered narcotic medication at the scene. If patient requires additional dose of narcotic en route to the hospital, the TFD paramedic can continue administering the unused portion of the narcotic that was opened (reduces waste by preventing LCEMS from having to open the same narcotic from their own stock). An exception can be made if you know for certain that no additional dose of the narcotic will be needed by LCEMS en route to the hospital.
- Multiple patients transported in one EMS unit where any of the other patients (other than the primary patient) requires evaluation and treatment (and not just a ride to the hospital).
- Any critical patient such as a cardiac arrest, critical trauma patient or any hemodynamically unstable patient that will require on-going aggressive care and monitoring.
- If requested by LCEMS paramedic for whatever reason
- Any TFD paramedic can ride in with any patient at anytime, at the discretion of the LCEMS crew, as the LCEMS crew is responsible for patient care upon their arrival.
1.4 Mass Casualty Incident
1.4.1 Mass Casualty Incident Response Protocol

First Ambulance on scene

Incident Command established?

- Yes: Report to IC for orders
- No: Notify Communication Center for additional resources:
  - Law enforcement
  - Fire
  - HazMat
  - Additional EMS units
  - Supervisors

Is scene safe?

- Yes: Maintain a safe distance & prepare to receive patients after they are moved to a safe staging area
  - Safety ensured via Hazmat decontamination or law enforcement intervention
  - First Paramedic on scene assumes medical command responsibility
  - Begin Primary Triage (see START flowchart)
  - Re-triage patients in treatment area
  - Begin moving patients to treatment area
  - Transport according to patient urgency
- No: Is scene safe?

1.4.1 Mass Casualty Incident Response Protocol

First Ambulance on scene

Incident Command established?

- Yes: Report to IC for orders
- No: Notify Communication Center for additional resources:
  - Law enforcement
  - Fire
  - HazMat
  - Additional EMS units
  - Supervisors

Is scene safe?

- Yes: Maintain a safe distance & prepare to receive patients after they are moved to a safe staging area
  - Safety ensured via Hazmat decontamination or law enforcement intervention
  - First Paramedic on scene assumes medical command responsibility
  - Begin Primary Triage (see START flowchart)
  - Re-triage patients in treatment area
  - Begin moving patients to treatment area
  - Transport according to patient urgency
- No: Is scene safe?
1.4.1 Mass Casualty Incident Response Protocol

I. PURPOSE.
To efficiently triage, treat and transport victims of mass/multiple casualty incidents (MCIs). The following protocol is applicable to all multiple victim situations. This protocol is intended for the everyday MCI when the number of injured exceed the capabilities of the first arriving unit, as well as large scale MCIs. The number of casualties may exceed the capabilities of the local jurisdiction and will require assistance from other EMS providers.

II. PROCEDURE.
A. The officer of the first arriving unit will establish COMMAND and;
   1. Perform a size up:
      a. Estimate the number of victims.
      b. Request a Level 1, 2, 3, 4, or 5 response (see 2.D).
      c. Request additional units and/or specialized equipment as required.
   2. Identify a staging area.
   3. If it is an active shooter incident or any tactical environment with a MCI establish a Unified Command (UC) with Law Enforcement (LE). Consider establishing Liaisons for FD and LE, the Liaisons can interact with each other allowing the transfer of info between agencies. Law Enforcement will make entry with their contact team and provide feedback to the UC and the decision may be made to establish a Rescue Task Force (team of LE officers providing forced protection for rescue personnel). The Rescue Task Force will initiate triage and provide immediate life saving treatment (i.e hemorrhage control).
   4. If area is deemed safe to enter, direct the remaining crewmembers and any additional personnel arriving to initiate triage.
      a. Triage will be performed in accordance with START or Jump START.
      b. Tag victims utilizing the color-coded ribbons as either:
         • Red - Immediate
         • Yellow - Delayed
         • Green - Ambulatory (minor)
         • Black - Deceased (non-salvageable)
   5. Locate and remove the walking wounded to one location away from the incident, if possible. These victims need to be assessed as soon as possible. Assign someone to keep the walking wounded together.
   6. Active shooter incidents considerations: Be on high alert for suspicious individuals, packages, vehicles or potential IEDs. Integrated active shooter/assailant response should include the critical actions contained in the acronym THREAT
      Threat suppression
      Hemorrhage control
      Rapid Extrication to safety
      Assessment by medical providers
      Transport to definitive care
B. As additional units arrive, COMMAND will designate the following officers:
   1. TRIAGE (Initially the responsibility of the First Arriving Officer).
   2. TREATMENT.
   3. TRANSPORT.
   4. STAGING.
C. Additional officers may be required depending on the complexity of the incident. These officers may include, but are not limited to:
   1. MEDICAL BRANCH.
   2. LANDING ZONE.
   3. EXTRICATION.
   4. HAZ MAT.
   5. REHABILITATION.
   6. SAFETY.
   7. Public Information Officer (PIO)
   8. MEDICAL INTELLIGENCE – to assist with WMD events for de-con antidotes and treatment.

D. Predetermined Response Plan.
   1. Considerations:
      a. An MCI shall be classified by different levels depending on the number of victims. The number of victims will be based on the initial size-up, prior to triage.
      b. Levels of response will augment the units already on the scene. Units on scene or enroute will be included in the assignment. The exception will be when in conjunction with a Fire Alarm assignment (e.g. Fire with multiple victims may be a Second Alarm with a MCI Level 3 response – this will be two separate assignments).
      c. COMMAND can downgrade or upgrade the assignment at any time.
      d. All units will respond to the Staging Area unless otherwise directed by COMMAND.
      e. When announcing an MCI, specify the general category (trauma, HAZMAT, smoke inhalation, heat exhaustion, etc.) and number of patients.
      f. Any victim meeting Trauma Transport Criteria must be reported to a State-Approved Trauma Center for determination of a transport destination. Trauma Transport Criteria will be determined during the secondary triage in the Treatment Phase. When the trauma center(s) are overwhelmed they will notify MedCom of the need for units to transport to other trauma centers or non-trauma centers.
      g. All units are to respond to the Staging Area in emergency response mode unless otherwise directed by COMMAND.
      h. Consider air transport for special needs, mass transit resources for multiple “walking wounded,” and private BLS transport units.
      i. Consider Mobile Command Vehicles, Medical Supply Trailers and Communication Trailers.
j. Upon n of a MCI – Medical Control (Medcom/MRCC) will gather each hospital's capability and relay this information to the Transport Officer or Medical Communication Officer.
k. On a large-scale incident, consider sending a Hospital Coordinator to each hospital to assist with communications.
l. Request Law Enforcement to set up a safety perimeter

2. Definitions:

a. Active shooter assailant: The Department of Homeland Security’s (DHS) definition of an active shooter is an individual actively engaged in killing or attempting to kill people in a confined, populated area; in most cases, active shooters use firearms and there is no pattern or method to their selection of victims.
b. Active shooter assailant Incident: Active shooter assailant situations are unpredictable and evolve quickly; most are over within 10 to 15 minutes.
c. Casualty Collection Point (CCP): A safe location(s) where fire rescue personnel can receive victims. Victims may have to be carried or dragged to the CCP. This may be inside a structure or exterior. This may be the same as the treatment area if located in the cold zone.
d. Concealment: Concealment is a law enforcement term that represents an object that only provides protection from observation.
e. Contact Team: Contact team is a law enforcement term used to designate the team of law enforcement officers that make entry with the specific intention of ONLY going after and neutralizing the perpetrator.
f. Cover: Cover is a law enforcement term that represents an object or location that provides protection from direct gunfire.
g. Improvised Explosive Device (IED): The Department of Defense (DOD) definition of an IED is a device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military components, but is normally devised from nonmilitary components.
h. Litter Bearer: A team of personnel assigned to Triage to move victims from the incident site to the treatment area or Transport Units.
i. Rescue Task Force: Rescue personnel and Law Enforcement personnel formed to make entry into a structure to triage victims and provide life saving immediate treatment as needed i.e stopping hemorrhage.
j. Strike Team: Five of the same type of units, including common communications and a leader (i.e., an ALS Transport Unit Strike Team would consist of five ALS Transport Units with a leader).
k. Tactical Environment – Any environment that Law Enforcement has a tactical objective due to a threat assessment (which may require a Fire Rescue/EMS component).
l. Task Force: Five different types of units, including common communications and a leader. MCI Task Force: May be two ALS Transport Units, two BLS Transport Units, and one Suppression Unit, including common communications and a leader.

m. THREAT: acronym for Threat suppression, Hemorrhage control, Rapid Extrication, Assessment by medical providers, and transport to definitive care.

n. Zones in relation to Active Shooter/Mass Casualty Incidents:
   1. Hot Zone – Direct Threat Care/Care Under Fire - This zone shall be designated at the area of the structure that has not been cleared by law enforcement or the area that the perpetrator is currently in.
   2. Warm Zone – Indirect Threat Care/Tactical Field Care - This zone shall be designated at any area of the active shooter incident that has been declared available for entry by Fire Rescue/EMS personnel with armed LE coverage to perform immediate life saving treatment and triage to victims prior to their removal from the initial hazard.
   3. Cold Zone – Evacuation Care/Tactical Evacuation Care - This zone extends beyond the warm zone and is not reachable by the perpetrator. This zone shall encompass positions such as the command post, staging and other functional groups.

3. MCI LEVEL 1 (5–10 victims)
   4 ALS Transport Units
   2 Suppression Units
   1 Battalion Chief
   1 EMS Supervisor

   Note: The 2 closest hospitals & Trauma Center to the incident will be notified by Medical Control (MedCom or local communication center).

4. MCI LEVEL 2 (11–20 victims)
   6 ALS Transport Units
   3 Suppression Units
   2 Battalion Chiefs
   2 EMS Supervisors

   Note: The 3 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control.

5. MCI LEVEL 3 (21–100 victims)
   8 ALS Transport Units
   4 Suppression Units
   3 Battalion Chiefs
   3 EMS Supervisors
   1 Operations Chief
   1 Command Vehicle
1 Supply Trailer

Note: The 4 closest hospitals & 2 Trauma Centers to the incident will be notified by Medical Control. The Warning Point will notify the Emergency Management Agency.

6. MCI LEVEL 4 (Over 100 victims)
   5 MCI Task Forces
   2 ALS Transport Unit Strike Teams
   1 Suppression Unit Strike Teams
   2 BLS Transport Unit Strike Teams
   2 Mass Transit Buses
   5 Battalion Chiefs
   3 EMS Supervisors
   1 EMS Chief
   1 Operations Chief
   1 Command Vehicle
   2 Supply Trailers
   1 Communications Trailer

Note: The 10 closest hospitals & 5 Trauma Centers to the incident will be notified by Medical Control. The Warning Point will notify the Emergency Management Agency. Metropolitan Medical Response System (MMRS) may be notified.

7. MCI LEVEL 5 (Over 1000 victims)
   10 MCI Task Forces
   4 ALS Transport Unit Strike Teams
   2 Suppression Unit Strike Teams
   4 BLS Transport Unit Strike Teams
   4 Mass Transit Buses
   10 Battalion Chiefs
   6 EMS Supervisors
   2 EMS Chiefs
   2 Operations Chiefs
   2 Command Vehicles
   4 Supply Trailers
   1 Communications Trailer

Note: The 20 closest hospitals & 10 Trauma Centers to the incident will be notified by Medical Control. The Warning Point will notify the Emergency Management Agency, Metropolitan Medical Response System (MMRS), Disaster Medical Assistance Team (DMAT), and International Medical & Surgical Response Team (IMSuRT).
III. OFFICER RESPONSIBILITIES.

A. COMMAND.

1. Established by the First Arriving Officer.
2. Radio designation: COMMAND.
3. If active shooter or tactical environment incident get briefing from LE, establish a Unified Command and co-locate with LE. Consider establishing Liaisons for FD and LE, the Liaisons can interact with each other allowing the transfer of info between agencies.
5. Remain in a fixed and visible location, uphill and upwind of incident.
6. Determine the MCI Level (1, 2, 3, 4, or 5). If unknown victims in an active shooter/tactical environment initiate a MCI level 2 until a count can be determined.
7. Designate a Staging Area.
8. Assign positions to perform the functions of TRIAGE, TREATMENT, TRANSPORT and STAGING.
9. Advise Communications Center of the number of victims and their categories once triage is complete.
10. During large scale or complex MCIs (e.g. fire with multiple victims, victims/tactical environment incident), designate a Medical Branch to reduce the span of control.
11. If the incident is due to Weapons of Mass Destruction (WMD), establish a Medical Intelligence Officer to assist with documentation, antidotes and treatment of victims. (WMD FOG #8)
12. If active shooter/tactical environment refer to FOG #9
13. Ensure proper security of the incident site, treatment area, and loading area; also provide for traffic control and access for emergency vehicles, including law enforcement.

B. MEDICAL BRANCH.

1. Radio designation: MEDICAL. Follow FOG #2.
2. Work directly with COMMAND. Work with Command, and direct and/or supervise on-scene personnel from agencies such as the Medical Examiner’s Office, Red Cross, private ambulance companies, and hospital volunteers.
3. Assure TRIAGE, TREATMENT and TRANSPORT have been established. If established by COMMAND, TRIAGE, TREATMENT and TRANSPORT will report to MEDICAL.
4. Direct and/or supervise on-scene personnel from agencies such as Medical Examiner’s Office, Red Cross, ambulance companies and hospital volunteers.
5. Ensure activation of Medical Control (Medcom/MRCC).
6. If the incident is due to a known or suspected WMD, refer to WMD FOG #8 and designate a Medical Intelligence Officer to assist with decontamination, antidotes, and treatment of victims.
7. If active shooter/tactical environment refer to FOG #9
8. Ensure proper security of incident site, treatment area, and loading area; also provide for traffic control and access for emergency vehicles, including law enforcement.
C. TRIAGE OFFICER.
Reports to Command or the Medical Branch. Supervises the Triage Personnel, Rescue Task Force (if needed) and Litter bearers. Also directs Medical Examiner personnel locate deceased victims.

1. Radio designation: TRIAGE.
2. Follow FOG #3.
3. Organize the Triage Team to begin initial triaging of victims, utilizing the START/JumpSTART triage system. Assemble the walking wounded and uninjured in a safe area.
4. Advise COMMAND (or MEDICAL if establish), as soon as possible, if there is a need for additional resources.
5. Coordinate with TREATMENT to ensure that priority victims are treated first.
6. Ensure that all areas around the MCI scene have been checked for potential victims, walking wounded, ejected victims, etc., and that all victims have been triaged.
7. Supervise the Triage Personnel, Litter Bearers and Morgue/Medical Examiner Personnel.
9. If a RTF (Rescue Task Force) is formed designate a Triage Aide to communicate with the RTF.
10. If there is more than one RTF team, designate the teams as RTF 1, RTF 2 etc. Have the RTF mark the doors with the victim count using a grease pencil R=__, Y=__, G=__, B=__ (greens should have left the area but may stay to assist with care or supervision, i.e. a teacher).
11. Provide periodic status reports to COMMAND or MEDICAL.
12. Report to COMMAND or MEDICAL upon completion of duties for further assignments.

D. TREATMENT OFFICER.
Reports to COMMAND or MEDICAL. Supervises the TREATMENT RED, YELLOW, GREEN Manager. Coordinates the re-triage and tagging of all victims and on-site medical care. Directs movement of victims to loading areas.
1. Radio designation: TREATMENT.
2. Follow FOG #4.
3. Consider assigning a "Documentation Aide" to assist with paperwork.
4. Direct personnel to either begin treatment on the victims where they lay or establish a centralized Treatment Area.
5. Considerations for a Treatment Area:
   a. Capable of accommodating the number of victims and equipment.
   b. Consider weather, safety and the possibility of hazardous materials.
   c. Designate entrance and exit areas, which are readily accessible (funnel points).
   d. On large-scale incidents, divide Treatment Area into three distinct areas based on priority. Designate a Treatment Manager for each area (Red, Yellow, Green). Use color tarps if available.
6. Complete a “Treatment Log” as victims enter the area.

7. Ensure that all victims are re-triaged through a secondary exam and the assessment is documented on the Triage tag (Disaster Management System Tag [DMS Tag] or METTAG). The rescuer filling out the DMS Tag or METTAG will keep a corner of the METTAG for future documentation.

8. All Red tagged victims will be transported immediately as transport units become available. These victims should not be delayed in the Treatment Area.

9. Ensure that enough equipment is available to effectively treat all victims.

10. Establish communicates with TRANSPORT to coordinate proper transport of the appropriate victims. Direct movement of victims to ambulance loading areas.

11. Provide periodic status reports to COMMAND/MEDICAL.

Note:
RED, YELLOW, GREEN TREATMENT MANAGERS – report to the TREATMENT Officer and are responsible for the treatment and continual re-triaging of victims in their assigned areas. Notify TREATMENT Officer of victim readiness and priority for transportation. Assure that appropriate victim information is recorded.

E. TRANSPORT OFFICER.

Reports to COMMAND or MEDICAL. Supervises the Medical Communication Coordinator and Documentation Aide(s). The TRANSPORT Officer is responsible for the coordination of victims and maintenance of records relating to victim identification, injuries, mode of transportation and destination.

1. Radio designation: TRANSPORT.

2. Follow FOG #5.

3. Assign a Documentation Aide with a radio to assist with paperwork and communications.

4. Assign a Medical Communication Coordinator to establish continuous contact with Medical Control (MedCom or MRCC).

5. Establish a victim loading area. Advise STAGING of the location and direction of travel. Consider Law Enforcement for security of loading area.

6. Arrange for the transport of victims from the Treatment Area.

Maintain "Hospital Transportation Log" #5B. Keep piece of triage tag for future documentation.

7. Communicate with the Landing Zone (LZ)/ Helispot Officer and relay the number of victims to be transported by air.

   a. Air transported victims should be assigned to distant hospitals, unless the victim's needs dictate otherwise (eg.Trauma Center, burn unit, etc.).

F. MEDICAL COMMUNICATION COORDINATOR.

Reports to the TRANSPORT Officer and is responsible for maintaining communication with Medical Control to assure proper victim transport information and destination.
1. Radio designation: MEDICAL COMMUNICATION.
2. Follow FOG #5A.
3. Establish communication with Medical Control. Advise Medical Control of the overall situation (e.g. smoke inhalation, trauma, burns, Hazmat exposure, etc.), amount and category of victims.
4. Medical Control will survey area hospitals to determine their capabilities and capacities, and then relay this information.
   Document this information on the Hospital Capability Worksheet #5C and maintain this for the duration of the incident.
5. When units are prepared to transport, advise Medical Control and supply them with the following information:
   a. The unit transporting.
   b. The number of the victims being transported.
   c. Their priority:
      Red - Immediate
      Yellow - Delayed
      Green - Ambulatory (minor)
   d. Any special need victims (e.g. cardiac, burns, trauma, etc.).
6. The Medical Communication Coordinator, in conjunction with Medical Control, will determine the most appropriate facility.
   Ground transported victims should be assigned to hospitals on a rotating basis.
7. Once Medical Control receives the information from the Medical Communication Coordinator, Medical Control will notify the appropriate hospital.
8. Transporting units will not contact the individual hospital on their own, unless there is a need for medical direction/care outside of protocols.

G. MEDICAL SUPPLY COORDINATOR.
   Reports to MEDICAL and is responsible for acquiring and maintaining control of all medical equipment and supplies.
   1. Radio designation: MEDICAL SUPPLY.
   2. Follow FOG #6.
   3. Assure necessary equipment is available on the transporting vehicle.
   4. Provide an inventory of medical supplies at the Staging Area for use on scene.

H. STAGING OFFICER.
   Reports to COMMAND and is responsible for managing all activities within the Staging Area.
   1. Radio designation: STAGING.
   2. Follow FOG #7.
   3. Establish the location of a Staging Area and notify the Communications Center to direct any incoming units.
   4. Maintain a "Unit Staging Log"#7A.
   5. Ensure that all personnel stay with their vehicles unless otherwise directed by COMMAND.
a. If personnel are directed to assist in another function, ensure that the keys stay with each vehicle.

6. Coordinate with the TRANSPORT Officer the location for a victim loading area and best route to the area.

7. Maintain a reserve of at least 2 transport vehicles. When the reserve is depleted request additional units through COMMAND.

IV. DOCUMENTATION.

A. The Incident Commander will, at the completion of the incident, coordinate the gathering of all pertinent documentation.

B. A Post Incident Analysis (PIA) should be completed on all MCIs.

Note
(a) MRCC - Medical Resource Coordination Center - prime function is to maintain a status as to the number of victims and the hospital readiness status to accept victims, coordinate transportation and direct them to the appropriate hospital during a disaster or other situation requiring a high demand of medical resources.

V. MCI KITS.

Each Unit will carry an MCI bag. Included in the MCI bag will be:

A. Two (2) Triage packs with:
   1. Two (2) combine dressings
   2. Six (6) 4x4’s
   3. Six (6) pairs of gloves
   4. One (1) pediatric face mask, assorted oropharyngeal (OPA) and nasopharyngeal (NPA) airways
   5. Two (2) clip rings containing triage ribbons paired in red and yellow, green and black. There are 15 ribbons of each color per ring.
   6. Trauma Tourniquets (2)
   7. Hemostatic Dressing (2)
   8. Chest Decompression Needles (2)
   9. Chest Seals (2)

B. One (1) additional set of triage ribbon.

C. Fifty (50) Triage tags – Disaster Management Tags (DMS tags) or METTAGs.

D. Three (3) mechanical pencils and three (3) grease pencils.

E. MCI paperwork for each Officer Vest Color
   1. COMMAND FOG #1 White
   2. MEDICAL FOG #2 Blue
   3. TRIAGE FOG #3 Yellow
   4. TREATMENT FOG #4 Red
   5. TREATMENT Log #4A
   6. TRANSPORT FOG #5 Green
   7. MEDICAL COMMUNICATION COORD. #5A Green Stripped
   8. HOSPITAL TRANSPORTATION Log #5B
   9. HOSPITAL CAPABILITIES WORKSHEET #5C
   10. MEDICAL SUPPLY #6
   11. STAGING FOG #7
VI. MCI SUPERVISOR KIT
   A. Complete vest set with the following identification vests:
      1. White for Command.
      2. Blue for Medical Officer.
      3. Yellow for Triage Officer.
      4. Red for Treatment Officer.
      5. Green for Transport Officer.
      6. Green for Medical Communication Coordinator.
      7. Blue for Medical Supply Officer.
      8. Orange for Staging Officer.
   B. Clipboard which contains paperwork for each officer, pens/pencils/grease pencils, and paper.
   C. EMS Command Board.
   D. Tarp set: red, yellow, green, black tarps.
   E. Patient tracking device/Scanner (if available)
   F Bullhorn (if available)
1.4.1b BASIC MCI COMMAND STRUCTURE FOR MEDICAL RESPONSES

Command

- Triage
- Treatment
- Transport
- Staging

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1.4.1b COMPLEX MCI COMMAND STRUCTURE
FOR MEDICAL RESPONSES

Medical Branch

Medical Supply

Triage Group

- Triage Units
- Litter Bearer Teams
- Medical Examiner Personnel

Treatment Group

- Treatment Teams
- Red Team Manager
- Yellow Team Manager
- Green Team Manager

Transport Group

- Documentation Aide
- Medical Communication Coordinator

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1.4.2 FIELD OPERATIONS GUIDE

**Purpose:** To provide a brief explanation and description of the various positions/roles of the team leaders in a mass casualty incident

I. COMMAND - FOG 1

A. Don the appropriate vest and use the radio designation “COMMAND.” Establish the Command Post in a visible and fixed location.

B. Perform the initial size-up. Determine any special needs such as fire suppression, Hazmat, extrication, etc. and request additional units as needed.

C. Approximate the number of victims and category of injury (trauma, burns, smoke inhalation, chemical exposure, etc.).
   1. Level 1 5-10 victims.
   2. Level 2 11-20 victims.
   3. Level 3 21-100 victims.
   4. Level 4 Over 100 victims.
   5. Level 5 Over 1000 victims.

D. Request additional units early, as needed.

E. Establish staging area as soon as possible.

F. Utilize the EMS Tactical Command Worksheet when available.

G. Assign positions to perform the following functions:
   1. MEDICAL BRANCH (as needed).
   2. TRIAGE.
      a. Litter Bearers.
   3. TREATMENT.
      a. RED, YELLOW, GREEN Treatment Managers.
   4. TRANSPORT.
      a. Documentation Aide.
      b. Medical Communication Coordinator.
   5. STAGING.
   6. MEDICAL SUPPLY, REHAB, SAFETY (as needed).

H. Ensure proper security, traffic control and access for emergency vehicles.

J. When applicable, have a liaison of each involved party at the Command Post. Some examples would include: Law Enforcement, Medical Examiner, Emergency Management Agency, Occupancy owner/representative, etc.

II. MEDICAL - FOG 2

A. Don the appropriate vest and use the radio designation “MEDICAL.”

B. Establish in a fixed and visible location or co-join command post.

C. Set-up the EMS Tactical Command Worksheet.

D. Verify that COMMAND has requested appropriate number of units.

E. Assign positions to perform the following functions (if not done by COMMAND):
   1. TRIAGE.
      a. Litter Bearers.
   2. TREATMENT.
      a. RED, YELLOW, GREEN Treatment Managers.
   3. TRANSPORT.
      a. Documentation Aide.
b. Medical Communication Coordinator.

4. STAGING.
F. Advise the Communication Center of the exact number of victims and their categories, once reported from TRIAGE.
G. Determine amount and type of additional medical supplies needed. Consider Medical Supply Officer.

III. TRIAGE OFFICER - FOG 3
A. Don appropriate vest and use the radio designation “TRIAGE.”
B. Direct personnel to triage and tag victims where they lie if the scene is safe.
C. Prioritize victims using colored triage ribbons.
D. Request Litter Bearer Teams from MEDICAL COMMAND to assist with movement of victims from the incident site to the Treatment area.
E. Assign personnel to triage the "walking wounded."
F. Report to MEDICAL COMMAND the number and category of victims.
G. Ensure that all areas of the incident have been checked for victims and that all victims have been triaged.
H. Once triage is completed contact COMMAND for further assignment.

IV. TREATMENT - FOG 4
A. Don appropriate vest and use the radio designation “TREATMENT.”
B. Direct personnel to either begin treatment on victims where they lie OR establish a centralized Treatment Area.
C. Coordinate the movement of victims into the Treatment Area with the Litter Bearers.
D. Consider obtaining a Documentation Aide to assist with paperwork. E. Request additional medical supplies as necessary from the MEDICAL SUPPLY Coordinator.
F. Ensure personnel perform a secondary triage and tag victims with a triage tag. Personnel will then remove the colored ribbon and remove a portion of the triage tag for future documentation.
G. If the incident size warrants it, designate a "Treatment Team Manager" for each color category (RED, YELLOW, GREEN).
H. Advise TRANSPORT of victim(s) requiring immediate transportation.
I. Account for all victims triaged and treated on the Treatment Log.
J. Advise MEDICAL COMMAND as to any changes in the victim count or category.

V. TRANSPORT OFFICER - FOG 5
A. Don appropriate vest and use the radio designation “TRANSPORT.”
B. Obtain a Medical Communication Coordinator to maintain continuous communication with Medical Control and document the hospital information on the Hospital Capability Worksheet.
C. Obtain a Documentation Aide.
D. Establish a Victim Loading Area accessible to the Treatment Area and preferably having clear entry and exit points.
E. Consult with TREATMENT on the amount and priority of victims.
F. Coordinate the loading of patients by priority to transport units and helicopter – if needed coordinate with the Landing Zone officer/Helispot.
G. Record the triage tag number and destination hospital for each victim on the Hospital Transport Log. Keep a portion of the triage tag.
H. Request additional transport units from STAGING.

VI. MEDICAL COMMUNICATION - FOG 5A
A. Don appropriate vest and use the radio designation “MEDICAL COMMUNICATION.”
B. Establish early contact with Medical Control.
C. Advise Medical Control of overall situation (e.g. smoke inhalation, trauma, burns, HazMat exposure, etc.) amount and priority of victims.
D. Medical Control will gather hospital capabilities and capacities. Document this hospital information on the Hospital Capability Worksheet.
E. When units are prepared to transport, advise Medical Control and supply them with the following information:
   1. The unit transporting.
   2. The number of victims to be transported.
   3. Patient priority:
      a. RED = Immediate.
      b. YELLOW = Delayed.
      c. GREEN = Ambulatory (minor).
   4. Any special need victims, cardiac, burn, trauma, etc.
F. Ground transported victims should be assigned to hospitals on a rotating basis.

VII. MEDICAL SUPPLY - FOG 6
A. Don appropriate vest and use the radio designation “MEDICAL SUPPLY.”
B. Assure necessary equipment is available on the transporting vehicle.
C. Consult with TREATMENT on the need for medical supplies in the Treatment Area.
D. Provide an inventory of medical supplies at the Staging Area.

VIII. STAGING OFFICER - FOG 7
A. Don appropriate vest and use the radio designation “STAGING.”
B. Maintain Staging Area established by COMMAND or establishes a location and notifies the Communication Center to direct all incoming units.
C. Establish a visible location in the Staging Area.
D. Maintain a Unit Staging Log.
E. Ensure that personnel stay with their vehicle unless otherwise directed.
F. If personnel leave their vehicle, keep the keys with each vehicle.
G. Coordinate with TRANSPORT the need for units and direct units to the Loading Zone.
H. Maintain a reserve of at least 2 transport units. Should this go down, advises COMMAND.
1.4.3 START and JumpSTART System of Triage

I. Purpose:
This procedure will be based on the Simple Triage and Rapid Treatment or START method for adult victims and the JumpSTART adaptations for the pediatric victim. These methods of triage are designed to assess a large number of victims objectively, efficiently, and rapidly and can be used by personnel with limited medical training.

II. Procedure:

A. Initial Triage – Using the START or JumpSTART methods (Sections III or IV).
1. Locate and direct all of the walking wounded into one location away from the incident if possible. Assign someone to keep them together (Fire Rescue Personnel, Law Enforcement Officer, or capable bystander).
2. Begin assessing all non-ambulatory victims where they lay.
3. Utilize the Triage Ribbons (color-coded plastic strips). One should be tied to an upper extremity in a VISIBLE location.
   a. RED - Immediate.
   b. YELLOW - Delayed.
   c. GREEN - Ambulatory (minor).
   d. BLACK - Deceased (non-salvageable).
4. Independent decisions should be made for each victim. Do not base triage decisions on the perception of too many REDs, not enough GREENs, etc.
5. If borderline decisions are encountered, always triage to the most urgent priority (e.g. GREEN/YELLOW patient, tag YELLOW).

B. Secondary Triage.
1. Performed on all victims during the Treatment Phase. If a victim is identified in the initial triage phase as a RED and transport is available, do not delay transport to perform a secondary assessment.
2. Utilize the Triage Tags (Disaster Management System Tag [DMS Tag] or METTAGs) and attempt to assess for and complete all information required on the tag (time permitting). Affix the tag to the victim and remove ribbon.
3. The Triage priority determined in the Treatment Phase should be the priority used for transport. If trauma related, the Trauma Criteria will be applied to trauma victims during the secondary triage in the Treatment Phase.

START TRIAGE (refer to the START flowchart).

NOTE: Remember the pneumonic RPM (Respirations, Perfusion, and Mental Status). The first assessment that produces a RED stops further assessment. Only corrections of life-threatening problems, such as airway obstruction or severe hemorrhage should be managed during triage.

<table>
<thead>
<tr>
<th>START modified 9/2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move the Walking Wounded</td>
</tr>
</tbody>
</table>
No Respiration after head tilt | BLACK

**Control Severe Bleeding**

| Respiration over 30/min/ Respiratory Distress | RED
| Perfusion (No radial pulse) | RED
| Mental Status (unable to follow commands) | RED
| Stable RPM/Walking | GREEN
| Stable RPM/Non ambulatory | YELLOW

*Conduct Secondary Triage in the Treatment Phase*

A. Assess **RESPIRATIONS:**
   1. If respiratory rate is 30/min. or less go to PERFUSION assessment.
   2. If respiratory rate is over 30/min, Prioritize RED.
   3. If victim is not breathing, open the airway, remove obstructions, if seen, and assess for (1) or (2) above.
   4. If victim is still not breathing, Prioritize BLACK.

B. Assess **PERFUSION:**
   1. Performed by palpating a radial pulse or assessing capillary refill (CR) time.
   2. If radial pulse is present or CR is 2 seconds or less, go to MENTAL STATUS assessment.
   3. No radial pulse or CR is greater than 2 seconds, Prioritize RED.

   NOTE: Any major external bleeding should also be controlled at this time.

C. Assess **MENTAL STATUS:**
   1. Assess the victim's ability to follow simple commands and their orientation to time, place, and person (COAx3).
   2. If the victim does not follow commands, is unconscious, or is disoriented, Prioritize RED.
   3. If the victim follows commands, oriented X3, Prioritize GREEN.

   NOTE: Depending on injuries (e.g. burns, fractures, bleeding) it may be necessary to Prioritize YELLOW.

**JumpSTART TRIAGE (refer to the JumpSTART flowchart).**

**NOTE:** Physiological differences in children necessitate the need to adapt the standard START triage method to children =8 years of age or those victims with the anatomical or physiological features of a child in the age group. The same parameters (R.P.M.) will be utilized with the adaptations indicated.

A. Assess **RESPIRATIONS:**
   1. If respiratory rate is between 15 and 45/min. go to PERFUSION assessment.
   2. If respiratory rate is over 45/min or under 14/min, Prioritize RED.
   3. If victim is not breathing, open the airway, remove obstructions, if seen, and assess for (1) or (2) above.
4. If victim is still not breathing and no obstructions are present, check a peripheral (radial or pedal) pulse. If peripheral pulse is present, provide five (5) ventilations (approximately 15 seconds) via any type of barrier device. If spontaneous respirations resume, Prioritize RED.

5. If victim is still not breathing, Prioritize BLACK.

B. Assess **PERFUSION:**
   1. Performed by assessing a peripheral pulse.
   2. If peripheral pulse is present, go to MENTAL STATUS assessment.
   3. If peripheral pulse is absent, Prioritize RED.

**NOTE:** Any major external bleeding should also be controlled at this time.

C. Assess **MENTAL STATUS:**
   1. Assess the child through AVPU scale. Assess whether the victim is either ALERT, responds to VERBAL stimuli, responds to PAINFUL stimuli, or is UNCONSCIOUS.
   2. If the victim is unconscious or only responds to painful stimuli, Prioritize RED.
   3. If the victim is alert or responds to verbal stimuli, assess for further injuries, Prioritize YELLOW or GREEN.

**NOTE:**
   a) Infants who are developmentally unable to walk should be triaged using JumpSTART algorithm either during initial triage or in the GREEN area if carried out by a non-rescuer. During triage, if they do not fulfill the criteria of a RED victim and no other outward signs of significant injury, they may be triaged as a GREEN victim.

   b) START Triage system developed by Newport Beach Fire Rescue and Hoag Hospital. JumpStart Triage system developed by Lou Romig, MD (Miami Children’s Hospital).
1.4.3a JumpSTART TRIAGE

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1.4.3b SIMPLE TRIAGE AND RAPID TREATMENT PROTOCOL

Ambulating at scene?

- yes → Minor GREEN tag
- no → Position Airway

Position Airway

- no → Is patient breathing?
- yes → Immediate RED tag

Is patient breathing?

- yes → Immediate RED tag
- no → Deceased BLACK tag

Immediate RED tag

- Is Respiratory rate > 30 per minute?
  - yes → Assess perfusion
  - no → Control any major bleeding

Assess perfusion

- Is radial pulse absent?
  - yes → Immediate RED tag
  - no → Assess Mental Status

Assess Mental Status

- Is patient able to follow simple commands?
  - no → Delayed YELLOW tag
  - yes → Immediate RED tag

Deceased BLACK tag

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2 ADULT MEDICAL PROTOCOLS
2.1 Adult Initial Assessment & Management

Overview: Protocols in Section 2.1 are designed to guide the EMT or paramedic in his or her initial approach to assessment and management of adult patients. Supportive Care is specified as EMT and Paramedic (BLS) and Paramedic Only (ALS).

Protocol 2.1.1 should be used on all adult patients for initial assessment. During this assessment, if the EMT or paramedic determines that there is a need for airway management, Protocol 2.1.2 should be used for the management of the adult airway. These protocols are frequently referred to by other protocols, which may or may not override them in recommending more specific therapy.

Protocol 2.1.3 presents the basic components of preparation for transport of medical patients. Due to the significant differences in priorities and packaging in the pre-hospital care of trauma and hypovolemia cases, a separate Trauma Supportive Care protocol has been developed. After following Protocol 2.1.1, this Medical Supportive Care protocol may be the only protocol used in medical emergency situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 2.1.4 presents the basic components of preparation for transport of trauma patients. Due to the significant differences in priorities and packaging in the pre-hospital care of medical cases, a separate Medical Supportive Care protocol has been developed. After following Protocol 2.1.1, this Trauma Supportive Care protocol may be the only protocol used in trauma or hypovolemia situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 2.1.5 should be used by paramedics ONLY for pain management.
2.1.1 Initial Assessment Protocol: EMT and Paramedic (4)
Adult Medical Protocol

**Purpose:** This will be the initial protocol followed by EMTs and Paramedics on all calls you are dispatched to (or that you roll up on).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Scene size up.**
   a. Review of dispatch information
   b. Assess need of body substance isolation
   c. Assessment of scene safety
   d. Determine mechanism of injury
   e. Determine the nature of the illness.
   f. Determine location of patients
   g. Determine need for additional resources
   h. Consider c-spine immobilization.

2. **Initial assessment.**
   a. General impression of patient
   b. Assess mental status (AVPU) – Maintain spinal immobilization PRN.
      i. A = alert
      ii. V = responsive to verbal stimuli
      iii. P = responsive to painful stimuli
      iv. U = unresponsive
   d. Assess Airway
   e. Assess Breathing.
   f. Assess Disability- Movement of extremities
   g. Expose and Examine Head, Neck, Chest, Abdomen, and Pelvis (check back when patient is rolled on side).
   h. Identify Priority Patients.
      1. Poor general impression.
      2. Unresponsive patients.
      3. Responsive but does not or cannot follow commands.
      4. Difficulty breathing
      5. Hypoperfusion or shock
      6. Complicated child birth
      7. Chest pain with a systolic BP below 100 mm Hg.
      8. Uncontrolled bleeding
      9. Severe pain anywhere
      10. Multiple injuries

3. **Initial Management**
   a. [Airway Management (2.1.2)] Protocol/C-spine stabilization p.r.n.
   b. [Medical Supportive Care (2.1.3)] and/or [Trauma Supportive Care (2.1.4)] Protocols

4. **Secondary Assessment**
   a. Conduct a head-to-toe survey
   b. Neurological Assessment
1) Pupillary response
2) Glasgow Coma score

c. Assess Vital Signs
   1) Respirations
   2) Pulse
   3) Blood Pressure
   4) Skin Condition
       • Color
       • Temperature
       • Moisture
       • Capillary Refill
   5) Lung Sounds

d. Obtain a Medical History
   1) S – Symptoms, Chief Complaint
      a. O- Onset and Location
      b. P – Provocation
      c. Q – Quality
      d. R-Radiation
      e. R- Referred
      f. R- Relief
      g. S- Severity
      h. T-Time
   2) A – Allergies
   3) M – Medications
   4) P – Past Medical History
   5) L – Last Oral Intake
       6) E – Events leading to illness or injury

e. Refer to specific medical/trauma protocols for continued management

5. Other assessment techniques to be used as the situation warrants:
   a. Cardiac Monitoring (EMT can connect patient to monitor while paramedic performing other task)
   b. Pulse Oximetry
   c. Glucose Determination
   d. Monitor Core Temperature
   e. Capnography

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2.1.2 Airway Assessment/Management Protocol

Purpose: Airway assessment and management is the most important and first order of business when patient contact is made (immediate removal from unsafe scene may on occasion trump airway management). An algorithm for general airway assessment/management provides a general overview and road map for the EMT/Paramedic to follow if needed. This algorithm will in turn direct the EMT/Paramedic to either a Non-breathing Airway Protocol or a Breathing Patient Airway Protocol. If a decision is made to intubate a patient, follow the Universal Airway Algorithm. Once the airway is controlled/secured, attention can be given to the other medical/trauma problems and care directed according to the appropriate protocol. New 2015 ACLS guidelines recommend titrating oxygen delivery to maintain pulse ox at >90% when acute coronary syndrome is suspected. In addition, EMS should administer oxygen if the patient is dyspneic, is hypoxic, or has obvious signs of heart failure. Because the usefulness has not been established in normoxic patients with suspected or confirmed ACS, providers may consider withholding supplementary oxygen therapy in these patients.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Assessment Protocol 2.1.1
2. If spontaneous breathing is present without compromise:
   a. Monitor breathing during transport
   b. Administer oxygen via nasal cannula (2-6 L/min) to maintain pulse ox ≥ 94% (unless ACS is suspected then ≥ 90%)
   c. Avoid over oxygenation; Wean oxygen concentration as tolerated
3. If spontaneous breathing is compromised:
   a. Maintain airway patency (e.g. modified jaw thrust)
   b. Administer oxygen to maintain pulse ox ≥ 94% via nasal cannula (2-4 L/min), simple mask (4-6 L/min) or non-rebreather mask (10-15 L/min)
   c. If unconscious, insert oropharyngeal or nasopharyngeal airway PRN (If patient accepts oropharyngeal airway, consider the need for subglottic airway (EMT or Paramedic) or intubation (ALS Level I)
   d. Assist ventilations with bag-valve-mask device (BVM) attached to supplemental oxygen at 15 – 25 L/min PRN
4. Suction PRN
5. Monitor pulse oximetry and capnography, as soon as possible
6. If spontaneous breathing is absent or markedly compromised:
   a. Maintain airway (e.g. modified jaw thrust)
   b. If unconscious, insert oropharyngeal or nasopharyngeal.
   c. Assist ventilation with a BVM device attached to supplemental oxygen at 15-25 L/min as needed. Maintain O2 saturation of 94% or greater. Avoid over oxygenation: Wean oxygen concentration as tolerated.
   d. Suction PRN
   e. If unconscious and intubation is not available, insert King Airway (or other approved blind intubation/extra glottic device) (a).
   f. Monitor pulse ox and capnography or ETCO₂ monitoring device, as soon as possible

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Consider CPAP (AEMT, EMT-I, Paramedic) if severe distress and patient able to cooperate with use of CPAP. See CPAP Protocol
2. If indicated go to SMART AIRWAY MANAGEMENT, perform endotracheal intubation (stabilize C-spine prn) (a).
   a. Confirm ETT placement by three methods and document
3. Secure ETT with commercial device
   a. Apply cervical collar for additional security
   b. Go to post intubation management
4. Attach end-tidal CO2 monitoring device
5. Monitor SpO2 with pulse oximeter.
6. If unable to intubate and patient cannot be adequately ventilated by any other means, perform a cricothyroidotomy (see Surg Cric Protocol or Needle Cric Protocol) and transport rapidly to the hospital. (b)

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for questions or concerns.

NOTE:
(a) An individual medical director may authorize other airway devices for use.
(b) Once decision to intubate has been made, follow Universal Airway Algorithm on all intubations (see Smart Airway Management Protocol for more algorithms and direction)

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Universal Airway Algorithm
Adult Airway Assessment

Assess Airway (C-spine precaution as indicated)

- Patent Airway?
  - yes
  - no
    - Airway maneuvers successful?
      - yes
        - Heimlich maneuver successful?
          - yes
            - Success?
              - yes
                - Foreign Body Obstructed Airway Protocol
              - no
                - Needle/surgical cricothyroidotomy if indicated for upper airway obstruction
            - no
              - Supplemental Oxygen if indicated
                - Risk of Respiratory Failure? RR > 35 or <8 with inadequate depth?
                  - yes
                    - Bag-Valve-Mask Procedure if indicated
                  - no
                    - Monitor airway and ventilatory status. CPAP, Nebulize Meds
                      - Deterioration or poor clinical course expected?
                        - yes
                          - Enter appropriate airway protocol
                        - no
                          - Monitor airway and ventilatory status. CPAP, Nebulize Meds
                - no
                  - Place Nasal/Oral Airway if indicated

- no
  - Is patient at risk for failure of airway protection or maintenance?
    - yes
      - Needle/surgical cricothyroidotomy if indicated for upper airway obstruction
    - no
      - Supplemental Oxygen if indicated
        - Risk of Respiratory Failure? RR > 35 or <8 with inadequate depth?
          - yes
            - Bag-Valve-Mask Procedure if indicated
          - no
            - Monitor airway and ventilatory status. CPAP, Nebulize Meds
              - Deterioration or poor clinical course expected?
                - yes
                  - Enter appropriate airway protocol
                - no
                  - Monitor airway and ventilatory status. CPAP, Nebulize Meds

Nonbreathing or agonal Patient (Crash Airway Protocol)

Breathing Patient Airway Protocols (RSI, Difficult Airway)
Airway Assessment Protocol: Non-Breathing Patient

Orotracheal Intubation via direct laryngoscopy procedure (C-spine precautions as indicated)

Success?

Yes

Insert King Airway or other approved blind intubation device

Success?

Yes

Confirmation-Reconfirmation Protocol

No

Oropharyngeal and/or nasopharyngeal airway

Can patient be ventilated?

Yes

Bag-Valve-Mask

No

Cricoidthyroidotomy via needle, surgical, or approved device

Continue to assist ventilations

Yes

No
Airway Assessment Protocol: Breathing Patient

1. Patient in respiratory distress but able to resist procedure?
   - yes
     - Success?
     - yes
     - Approved Staff?
     - yes
     - Oropharyngeal and/or Nasopharyngeal Airway. Assist respirations with Bag-Valve-Mask
     - no
     - Paralytic facilitated intubation
     - yes
     - Sedation facilitated intubation: Etomidate 0.3mg/kg
     - no
   - no
   - yes
   - King Airway or other approved blind intubation device/extra-glottic device

Place on CPAP (if patient is candidate), monitor for fatigue or deterioration. If unable to tolerate CPAP or if patient deteriorates attempt orotracheal intubation via direct laryngoscopy. (C-spine precautions as indicated)

Assess patient for difficult Airway:
1. Obesity
2. Short muscular neck
3. Mallampati of 3 or 4
4. Less than 2 fingerbreadths space between the patient’s teeth
5. Thyromental distance less than 3 fingerbreadths
6. Decreased neck mobility
7. Decreased jaw mobility
8. Wired jaw
Airway Confirmation-Reconfirmation Protocol:

- Tube placed per protocol

Confirm with at least 3 of the following:
1. Visualization of ETT passing through the vocal cords
2. End-tidal CO2 change
3. Esophageal detection device tube check
4. Auscultation of all lung fields to confirm adequate breath sounds and symmetric chest wall expansion
5. Auscultation of the epigastrium for absence of breath sounds
6. Condensation present in the ET tube during ventilation

- Confirmed?
  - Yes
    - Secure tube and minimize head/neck movement, including the use of backboard and/or cervical collar
    - Document:
      1. Tube size
      2. Tube depth at the lip line
      3. Clinical signs of improved oxygenation and ventilation
      4. Tube confirmation method
  - No
    - Remove ET tube immediately

At minimum, Reconfirmation should occur:
1. Once the patient is prepared for transport
2. Anytime patinet is moved
3. Anytime dislodgement of tube is suspected
4. Any change in the patinet's condition
5. When responsibility for care is transferred to another provider
2.1.3 Medical Supportive Care

Adult Medical Protocol

**Purpose:** This protocol is used in conjunction with the Initial patient Assessment Protocol 2.1.1 and Airway Management Protocol 2.1.2.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial assessment protocol 2.1.1**
2. If spontaneous breathing is present without compromise:
   a. Monitor breathing during transport
   b. Administer oxygen via nasal cannula (2-6 L/min) to maintain pulse ox > 94% (unless ACS is suspected then > 90%)
   c. Avoid over oxygenation. Wean oxygen concentration as tolerated
3. If spontaneous breathing is compromised:
   a. Maintain airway patency (e.g. modified jaw thrust)
   b. Administer oxygen to maintain pulse ox ≥ 94% via nasal cannula (2-4 L/min), simple mask (4-6 L/min) or non-rebreather mask (10-15 L/min)
   c. If unconscious, insert oropharyngeal or nasopharyngeal airway PRN (If patient accepts oropharyngeal airway, consider the need for subglottic airway (EMT or Paramedic) or intubation (ALS Level I)
   d. Assist ventilations with bag-valve-mask device (BVM) attached to supplemental oxygen at 15 – 25 L/min PRN
4. Suction PRN
5. Monitor pulse oximetry and capnography, as soon as possible
6. If spontaneous breathing is absent or markedly compromised:
   a. Maintain airway (e.g. modified jaw thrust)
   b. If unconscious, insert oropharyngeal or nasopharyngeal.
   c. Assist ventilation with a BVM device attached to supplemental oxygen at 15-25 L/min as needed. Maintain O2 saturation of 94% or greater. Avoid over oxygenation: Wean oxygen concentration as tolerated.
   d. Suction PRN
   e. If unconscious and intubation is not available, insert King Airway (or other approved blind intubation/extra glottic device) (a).
   f. Monitor pulse ox and capnography or ETCO2 monitoring device, as soon as possible
7. EMT should apply the AED
8. Establish hospital contact for notification of an incoming patient.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Perform endotracheal intubation and document the following:
   a. Confirm ETT placement via three methods
   b. Secure ETT with commercial device
      1) Full spinal immobilization is recommended
   c. Attach end-tidal CO2 monitoring device
   d. Monitor SpO2 with pulse oximeter
2. If unable to intubate and patient cannot be adequately ventilated by other means, perform cricothyroidotomy (see Surgical Cric Protocol or Needle Cric Procedure).

3. Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol.

4. In a critical medical patient, an intraosseous (IO) line may be considered (Medical Procedures 4.17) OR Medication may be administered intranasal (IN) via the MAD device. (Medical Procedure, IM/IO Med Admin)

5. Monitor ECG as needed.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director if any concerns or questions.

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. A large-bore intracatheter should be used for unstable patients. Avoid use of access sites below the diaphragm.

(b) An IV lock or MAP may be used in lieu of an IV bag in some patients, when appropriate.
2.1.4 Trauma Supportive Care
Adult Medical Protocol

Purpose: This protocol is used in conjunction with the Initial Assessment Protocol 2.1.1.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Assessment Protocol 2.1.1, Initiate “Trauma Alert” if applicable
3. Correct any open wound/sucking chest wound (occlusive dressing)
4. Control hemorrhage
5. Immobilize fractures
6. Determine if the patient is taking any anticoagulant such as warfarin (Coumadin) or antiplatelets such as dabigatran (Pradaxa). (b)
7. Immobilize C-spine (if unable to clear in field) and secure patient to backboard per protocol Spinal Motion Restriction/Spinal Motion Restriction Clearance
8. Expedite transport
9. The following steps should not delay transport:
   a. Complete bandaging, splinting and packaging PRN
   b. Establish hospital contact for notification of incoming patient and for the Paramedic to obtain consultation for level 2 orders

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Correct any massive flail segment that causes respiratory compromise (intubate)
2. Correct any tension pneumothorax with needle decompression as per Needle Decompression protocol.
3. Establish IV of normal saline with a regular infusion set (a) (b), unless overridden by the specific protocol.
4. In a critical trauma patient, an intraosseous (IO) line may be considered (Medical Procedure, IM/IN Med Admin)
5. Monitor ECG as needed.

**ALS LEVEL 2: MEDICAL CONTROL**
5. Call medical control or medical director if any concerns or questions.

(a) Authorized IV routes include all peripheral venous sites. External jugular veins may be utilized when other peripheral site attempts have been unsuccessful or would be inappropriate. Two IVs using large-bore intracatheters should be initiated in unstable patients. Avoid use of access sites below the diaphragm.
(b) If the exam reveals any new deficit, or if a witness actually saw the patient strike their head, consideration shall be given to transport to the nearest appropriate Trauma Center as a High Index of Suspicion Patient. Should the patient deteriorate enroute, to the point where they meet Trauma Alert criteria, an immediate upgrade should be called into the Trauma Center.
(c) Consider the Pre-Hospital Elder Gray Area Non-Trauma Alert criteria with regard to destination determination where appropriate. (Appendix
2.1.5  Pain (GENERAL) Management
Adult Medical Protocol

**Purpose:** This protocol is to be used for managing pain in patients with the following conditions:

- Isolated Extremity Fracture from a low mechanism of injury (simple fall)
- **Acute** back strain
- Renal colic (kidney stone)
- Soft tissue injuries, burns, bites and stings.
- Discomfort related to attached devices or inserted tubes such as a foley catheter, NG tube, chest tube, etc. This will apply to intra-facility transfers.

Do not use this protocol without going through med control if there is multisystem trauma or hemodynamic instability or if injury was from a high transfer of energy (i.e. MVA, long fall). Keep in mind that severe back pain can sometimes be indicative of a condition that may require emergency surgery such as appendicitis, ruptured or dissecting aneurysm, ruptured ectopic pregnancy, etc. Be sure you do a good abdominal exam on patients complaining of back pain. If any abdominal tenderness is found, do not give pain med until advised by medical control or medical director. If patient has severe enough back pain that you are considering giving pain medication for, be sure the history is consistent with back strain, e.g. lifting heavy material and felt a pull. **DO NOT USE TORADOL ON ANY PATIENT THAT MAY REMOTELY BE GOING TO SURGERY**, e.g. fractured extremities, serious soft tissue injures. If you’re not sure, call med control for advice. Kidney stone patients may report a history of kidney stones and may or may not have hematuria (blood in urine). Use caution in the elderly with “kidney stone” pain, as this is how aneurysm problems can present. Always monitor respiratory status and pulse ox after administration of a narcotic. Intervene as needed to keep pulse ox ≥ 95 %

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1.  **Initial Patient Assessment Protocol 2.1.1**
2.  **Airway Assessment/Management Protocol 2.1.2.** If indicated, Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 91%).
3.  Attach cardiac monitor and pulse oximeter if indicated

**ALS LEVEL 1: PARAMEDIC ONLY**

1.  Initiate IV lactated Ringer’s or Normal Saline at 100ml/hr.
2.  If pain is from an isolated extremity injury or from discomfort related to attached devices or inserted tubes:
   a.  Assess for circulation compromise (note color, swelling, sensation, palpable pulses)
   b.  Reposition for comfort, reassess for circulatory compromise
   c.  If extremity wrapped in a dressing, consider (per med control) removing dressing to assess for cause of pain
   d.  Elevate affected extremity if edematous
   e.  If extremity has obvious deformity and is not splinted, splint it.
   f.  If pain from attached device or inserted tube, be sure they are functioning properly.
   g.  If pain persist despite above, proceed as below
3. If systolic BP > 90 mm Hg give one of the following over several minutes:
   a. **Toradol** 30 mg IV or 60 mg IM (if patient is > 65 y/o limit dosage to 15mg IV or 30mg IM). After 30 minutes, the IV dose can be repeated x 1 PRN.
   b. **Fentanyl** 50 – 100 mcg IV or IM or IN (a). For doses beyond 100 mcg (when given for pain control), you will need written MD order or contact medical control.
   c. **Morphine** 2 – 10 mg IV or IM (give in 2 mg increments) or PR. For doses beyond 10 mg, you will need written MD order or contact medical control. **Rectal route:** 10 – 20 mg per rectum. Consider lower dose, longer duration if elderly or patients < 50 kg.
   d. **Dilaudid** 1 – 2 mg IV or IM (not all service areas carry this drug). For doses beyond 2 mg, will need written MD order or contact medical control.
   e. **Ketamine** 0.1 – 0.5 mg/kg IV/IO or 5 mg/kg IM or 0.5 mg/kg IN (a)

4. If nausea also present from pain or the pain medication give one of the following:
   a. **Zofran** 4 – 8 mg IV or IM
   b. **Benadryl** 25 mg IV or IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director if any concerns or any questions.

**NOTE:**

   (a) Intra-nasal medications must be administered via a medication atomizer device (MAD). Maximum amount allowed is 1 ml per nostril

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2.2
Adult Respiratory Emergencies

Assessment of the adult patient in respiratory distress requires specific attention to the function of the respiratory system. The EMT’s and paramedic’s assessment should be more concentrated in this area, to include the following considerations:

1. Assessment of chest wall movement, including the rate and depth of ventilation as well as the presence of symmetrical rise and fall.
2. Assessment of accessory muscle use.
3. Auscultation of bilateral lung sounds.
4. Use of pulse oximetry.
5. Use of EtCO2, monitor wave form.

The paramedic must be able to determine the adequacy of ventilation and understand its relationship to respiration. If signs of hypoxia and respiratory distress are present, immediate airway and ventilatory management should be initiated. These signs include altered mental status, tachypnea, and use of accessory muscles, nasal flaring, pursed lips, abnormal lung sounds, tachycardia, and cyanosis. In addition, the general signs of shock may be seen. Other signs of respiratory insufficiency that should alert the paramedic to the need for immediate airway and ventilatory management, including placement of an advanced airway, are respiratory rate below 10/min or above 36/min, SpO2 below 94%, or EtCO2 outside the normal range of 35-45mmHg.

In patients with chronic respiratory disease, the paramedic must be able to differentiate between what is chronic and what is acute, as it pertains to the respiratory assessment. Specific questions about the chief complaint and accompanying symptoms may prove to be invaluable in this setting. Assessment of lung sounds should be combined with patient history. For example, a patient with a history of CHF who has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient.” The paramedic must remember that patients with CHF may also present with wheezing. If this patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF.

Specific treatments for the different causes of respiratory distress are outlined in the following protocols. When the paramedic is unsure as to which protocol to follow, he/she should follow the protocols in Section 2.1 and contact medical control for further direction.
2.2.1 Airway Obstruction
Adult Medical Protocol

**Purpose:** This protocol is to guide you in management of a patient with an airway obstruction. Causes of upper airway obstruction include the tongue, foreign bodies, swelling of the upper airway due to angio-neurotic edema (from allergic reaction) and trauma to the airway. Differentiation of the cause of the upper airway obstruction is essential to determining the proper treatment.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Patient Assessment Protocol, 2.1.1](#)
2. [Airway Assessment/Management Protocol, 2.1.2](#) Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. If air exchange is inadequate and there is a reasonable suspicion of foreign body airway obstruction (FBAO) (see FBAO protocol), apply abdominal thrust (chest thrust if pregnant or obese).
   a. If air exchange is adequate with a partial airway obstruction, do not interfere and encourage patient to cough up obstruction. Continue to monitor for adequacy of air exchange. If air exchange becomes inadequate continue with protocol.
   b. If patient becomes unresponsive then begin CPR, starting with compressions. Continue CPR with the addition of looking in the mouth before delivering breaths.
4. Attach cardiac monitor and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If unable to relieve FBAO, visualize with laryngoscope and extract foreign body with McGill forceps.
2. If obstruction is due to trauma and/or edema, or if uncontrollable bleeding into the airway causes life-threatening ventilatory impairment, utilize an advanced airway.
3. If unable to intubate and patient cannot be adequately ventilated by other means, perform Cricothyroidotomy (only if you have received training) (see procedure [Needle Cric or Surgical Cric](#))
4. Establish an IV: give normal saline KVO

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.

Return to:  [Contents at top](#)  [Admin Guidelines](#)  [Adult Medical Protocols](#)  [Adult Resp Emerg](#)
2.2.2 Asthma/Bronchospasm
Adult Medical Protocol

**Purpose:** This protocol is used for patients who are complaining of dyspnea and who are wheezing. Whenever possible, allow these patients to assume whatever position is comfortable (they may not tolerate laying flat). A patient with a history of CHF that has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient”. If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma) (See CHF/Pulmonary Edema protocol)

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
   - Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Place patient in Fowler’s position and assist ventilations as needed
4. Attach cardiac monitor and pulse oximeter.
5. Transport to designated hospital.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If severe distress consider CPAP with in-line nebulized medication may or may not help (keep in mind, it is the medications that will work best to break the bronchospasm)
2. Administer Albuterol (Ventolin) 2.5mg (in 2.5cc normal saline) by nebulizer. May repeat twice PRN. DO NOT GIVE ALBUTEROL OR IPRATROPIUM BROMIDE IF THE HEART RATE IS > 140
3. May add Ipratropium Bromide (Atrovent) 0.5 mg (0.5ml) to the Albuterol nebs (x 3 doses).
4. If indicated, start IV of Normal Saline or Lactated Ringer’s at TKO
5. For persistent respiratory distress after several albuterol nebs, give Methylprednisolone Sodium Succinate (Solu-Medrol) 80 mg IV.
6. For severe dyspnea, Epinephrine (1:1000) 0.4 ml IM Adult (Peds: 0.01 ml/kg.) Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease (call med control if you have any concerns)
   - Consider need for endotracheal intubation.
7. For cases of persistent, severe, respiratory distress, you may consider Magnesium Sulfate 2 gms IV (mixed with 50ml of D5W given over 10 – 15 minutes)

**ALS LEVEL 2: MEDICAL CONTROL**

1. Repeat Epinephrine (1:1000) 0.4 mg IM

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult Resp Emerg
2.2.3 COPD/Emphysema /Bronchitis (with Dyspnea) will
Adult Medical Protocol

**Purpose:** This protocol is used for patients with a history of emphysema and/or chronic bronchitis that complain of dyspnea. If at any point, the patient’s respiratory status deteriorates, consider CPAP or endotracheal intubation and administration of Albuterol via the ET tube as a mist, and transport immediately. See [Oxygen Tolerance in COPD](#) in Appendix

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment** 2.1.1
2. **Airway Assessment/Management Protocol** 2.1.2.
3. Oxygen via nasal cannula @2-4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
4. Place the patient in the Fowler’s position and assist ventilations as needed
5. Attach cardiac monitor and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If patient is in moderate to severe distress and is still alert and cooperative, consider CPAP (with in-line nebulized medication) per [CPAP Protocol](#).
2. Administer Albuterol 2.5 mg in 2.5ml of normal saline and Atrovent (Ipratropium) 0.5mg via nebulized breathing treatment, may repeat q 20 minutes as needed x 3 doses total. Discontinue therapy if patient develops marked tachycardia (HR > 140) or chest pain.
3. If signs of severe hypoventilation despite CPAP and/or Nebulized bronchodilators: (See [Airway Assessment Protocol, 2.1.2](#))
   a. Assist ventilations with BVM with 100% oxygen.
   b. Consider an advanced airway
4. Initiate IV lactated Ringer's or normal saline TKO.
5. For persistent respiratory distress after several albuterol nebs, give Methylprednisolone Sodium Succinate (Solu-Medrol) 80 mg IV

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.
2. Consider (per med control) Valium 2-5 mg or Versed 1-2 mg IVP for anxiety, however patient may then need to be intubated. MUST FIRST attempt to correct the hypoxia which may be causing the anxiety.

Return to: [Contents at top](#)  [Admin Guidelines](#)  [Adult Medical Protocols](#)  [Adult Resp Emerg](#)
2.2.4 Pulmonary Edema /CHF (Congestive Heart Failure)

Adult Medical Protocol

**Purpose:** This protocol is used for patients who are exhibiting signs/symptoms of pulmonary edema – CHF including: tachypnea, orthopnea, JVD, edema, dyspnea with rales and/or wheezing (cardiac asthma). The patient may also have diminished air exchange. In severe case, patient may be pursed lip breathing. Other treatment for the causes of pulmonary edema-CHF should be considered (e.g. supraventricular tachycardia, myocardial infarction and cardiogenic shock). A patient with a history of CHF that has wheezing on auscultation of lung sounds should not be automatically classified as an “asthma patient”. The paramedic must remember that patients with CHF may also present with wheezing. If the CHF patient does not have a history of asthma or allergic reaction, the more prudent assessment would be that of CHF (cardiac asthma).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol. 2.1.1**
2. **Airway Assessment/Management Protocol.2.1.2** Put patient in position of comfort (likely the fowler’s position). Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Administer CPAP (if available). Titrate to 10cm of pressure (see CPAP Protocol) (a)
2. If patient’s respiratory status deteriorates (fatigues, does not respond to CPAP, obvious persistent distress), assist ventilations with BVM with 100% oxygen and consider an advanced airway. If patient has end-stage disease and has previously expressed to family (verbally or in writing) he/she does not want to be intubated, and then continue assisting with BVM or CPAP.
3. Initiate IV lactated Ringer’s or Normal Saline TKO.
4. If systolic BP > 100 mm Hg; give Nitroglycerine 0.4mg sublingual (spray or tablet) followed by Nitroglycerin paste 1 inch to chest wall (Avoid if patient used Viagra, Cialis, Levitra or other ED drugs. (May repeat sublingual Nitro every 3 minutes up to 3 doses total if patient is hypertensive or has chest pain). (b) (c)
5. Do 12 Lead EKG. Transmit if abnormal and time permits

**ALS LEVEL 2: MEDICAL CONTROL**

1. Lasix 40-80 mg IV.
2. Contact medical control or medical director for any concerns or questions.

**Note:**

(a) The CPAP mask must be tight fitting. Some patients may not tolerate CPAP at 10 cm H2O PEEP initially, in which case you may start with lower pressures (5 – 7.5cm H2O PEEP. CPAP should not be used if the patient’s systolic BP below 100 mm Hg.

(b) Consider withholding if the clinical presentation of the patient indicates signs of hypovolemia (e.g., poor skin turgor, decreased capillary refill, and elevated temperature).
(c) It is preferred to have an IV in place prior to NTG administration. However, if you are unable to establish IV access, NTG may be administered with caution.
2.2.5 Pneumonia (SUSPECTED)
Adult Medical Protocol

Purpose: Patients complaining of dyspnea should be suspected of having pneumonia when they present with fever, productive cough, and possible pleuritic chest pain, history of being bedridden, known immunocompromise, diabetes, elderly and lung sounds indicative of consolidation (rales and/or rhonchi with egophony over area of consolidation).

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Check temperature if able

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Consider CPAP (per CPAP protocol) for severe dyspnea/air hunger. It may or may not help but will not harm.
2. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
3. If dyspnea noted, administer Albuterol 2.5 mg in 2.5ml of normal saline and Atrovent (Ipratropium) 0.5mg via nebulized breathing treatment. Do not give if HR ≥ 140. Repeat every 20 minutes as needed x 3 doses total. Discontinue therapy if patient develops marked tachycardia (HR > 140) or chest pain.
4. If signs of severe hypoventilation despite CPAP and/or Nebulized bronchodilators: (See Airway Assessment Protocol 2.1.2)
   a. Assist ventilations with BVM with 100% oxygen.
   b. Consider advanced airway
5. AVOID USE OF DIURETICS!!

**ALS LEVEL 2: MEDICAL CONTROL**
1. Notify medical control or medical director for any problems or concerns.
2.3
Adult Cardiac Dysrhythmias
2.3 CARDIAC CARE: UNIVERSAL ALGORITHM

Assess responsiveness

Not Responsive:
Call for Defibrillator
Assess Breathing

Responsive:
Observe, treat as indicated

Assess Breathing?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Pulse?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Quick Look

VF/VT Present on Monitor?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Assess responsiveness

Breathing?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Pulse?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Quick Look

VF/VT Present on Monitor?  

Not Responsive:  
Call for Defibrillator
Assess Breathing
Give 2 slow breaths
Assess circulation

Responsive:  
Observe, treat as indicated
If unconscious and no trauma, place in recovery position

Pulse?  

Focused patient assessment, Transport decision, Ensure oxygenation; spO2, Cardiac monitoring, IV procedure: KVO 12 lead EKG

Suspected cause

Dysrhythmia?

Too Fast

Go to TACHYCARDIA PROTOCOL

Too Slow

Go to BRADYCARDIA PROTOCOL

Electrical activity?

Go to VF/VT PROTOCOL

Go to ASYSTOLE PROTOCOL

Go to PEA PROTOCOL

Chest Pain? SEE PROTOCOL

Pulmonary Edema? SEE PROTOCOL

Sustained cause

Dysrhythmia?

Return to:  Contents at top Admin Guidelines Adult Medical Protocols Adult cardiac dysrhy
2.3.1 Cardiac Dysrhythmias: ASYSTOLE (Algorithm)

Adult Medical Protocol

**Purpose:** Use this protocol for patients who are in asystole on the cardiac monitor.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Consider criteria for death/no resuscitation (1.2.5 DNR / RESUSCITATION CONSIDERATIONS / DOA)
2. **Initial Patient Assessment Protocol. 2.1.1**
3. Look for no breathing or only gasping and check pulse (simultaneously)
4. If no pulse, begin CPR using cycles of 30 compressions and 2 breaths for 2 minutes while monitor is being attached.
5. Attach cardiac monitor and pulse oximeter as soon as possible.
6. Oxygenate with 15-25 L/min via bag-valve mask (BVM) with an appropriate airway adjunct (Airway Assessment/Management Protocol 2.1.2.)
7. Do not interrupt the 2 minutes of CPR to check the heart rhythm.
   **Continuous uninterrupted CPR is paramount to patient survival.**
8. Check the heart rhythm; confirm asystole in two leads.
9. Resume 2 minutes of CPR at a rate of 100-120 per minute; check the heart rhythm. Initiate BLS/High quality CPR as indicated. Therapies are designed around periods of 5 cycles (two minutes) of uninterrupted CPR until an advanced airway is placed
10. Consider the H’s and T’s.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Intubate or Insert (or other extra glottic device)
2. Establish IV of Lactated Ringers or Normal Saline via Peripheral IV Site or Intraosseous site. Bolus with 250 ml then 100cc/hr. Bolus may be repeated up to one liter.
3. Confirm asystole in more than one lead.
4. Administer Epinephrine (1:10,000) 1mg every 3-5 minutes IV or IO. Follow each intravenous drug bolus with 20 milliliters of IV fluid and elevate extremity.
5. If unable to establish IV or IO access, administer Epinephrine at twice the IV dose (maximum 0.1mg/kg) endotracheal.
6. For known pre-existing metabolic acidosis or possible hyperkalemic such as renal failure patient, consider giving Sodium Bicarb (8.4%) 1mEq/kg IV or IO.
7. Consider possible causes:
   **Possible cause:**
   **Treatment:**
   - Hypovolemia
   - Hypoxia
   - Hyperkalemia (increased potassium)
   - Hypokalemia (decreased potassium)
   - IV/IO fluid bolus, 250 ml increments
   - Oxygenate and Ventilate
   - NaHCO₃, CaCl
   - ABCs and transport
H+ (Pre-existing Acidosis)  NaHCO₃
Hypoglycemia  D10W
Drug overdose (narcotic, CCB, Beta Block)  Narcan, Calcium, Glucagon
Hypothermia  Re-warming
Tension Pneumo  Needle decompression
Tamponade, cardiac  Load and go,
Toxins  Obtain hx, treat accordingly
Thrombosis, pulmonary  Load and go
Thrombosis, coronary  AMI protocol
Trauma  Load and go

8. In the event that a patient who presents in asystole remains in asystole after 20 minutes (for unwitnessed) or 30 minutes (for witnessed) of ACLS, including an advanced airway, IV/IO access, and at least three doses of Epinephrine, you may discontinue resuscitation efforts. (Refer to administrative section Resuscitation Considerations for further information on discontinuation procedures) Be sure to note the time of death in the PCR.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for any further directions or questions.

NOTE:
(a) Provide a 30:2 compression to ventilation ratio.
   Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) If EtCO2 less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO2 = 12 - 25mm Hg: Goal during resuscitation.
   If EtCO2 = 35 - 45mm Hg: Check for ROSC
(c) If ROSC achieved, wean down oxygen to maintain a SpO₂ equal to greater than 94%

See Asystole Algorithm on next page.

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Adult Card Dysrhythmias  DNR Proto  External Pacer
Adult Cardiac Arrest Algorithm—2015 Update

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Rhythm shockable?
   - Yes
   - VF/PVT
   - Shock
   - CPR 2 min
     - IV/IO access
   - Rhythm shockable?
     - Yes
     - Shock
     - CPR 2 min
       - Epinephrine every 3-5 min
       - Consider advanced airway, capnography
     - Rhythm shockable?
       - Yes
       - Shock
       - CPR 2 min
         - Amiodarone
         - Treat reversible causes
     - Rhythm shockable?
       - No
       - CPR 2 min
         - IV/IO access
         - Epinephrine every 3-5 min
         - Consider advanced airway, capnography
     - Return to 2
   - No
   - Asystole/PEA

3. Shock
4. CPR 2 min
   - IV/IO access

5. Rhythm shockable?
   - Yes
   - Shock
   - CPR 2 min
     - Epinephrine every 3-5 min
     - Consider advanced airway, capnography
   - Rhythm shockable?
     - Yes
     - Shock
     - CPR 2 min
       - Amiodarone
       - Treat reversible causes
     - CPR 2 min
       - IV/IO access
       - Epinephrine every 3-5 min
       - Consider advanced airway, capnography
   - Rhythm shockable?
     - No
     - CPR 2 min
       - Treat reversible causes
   - CPR 2 min
     - IV/IO access
     - Epinephrine every 3-5 min
     - Consider advanced airway, capnography

6. CPR 2 min
   - IV/IO access

7. Rhythm shockable?
   - Yes
   - Shock
   - CPR 2 min
     - Epinephrine every 3-5 min
     - Consider advanced airway, capnography
   - Rhythm shockable?
     - Yes
     - Shock
     - CPR 2 min
       - Amiodarone
       - Treat reversible causes
     - CPR 2 min
       - IV/IO access
       - Epinephrine every 3-5 min
       - Consider advanced airway, capnography
   - Rhythm shockable?
     - No
     - CPR 2 min
       - Treat reversible causes
   - CPR 2 min
     - IV/IO access
     - Epinephrine every 3-5 min
     - Consider advanced airway, capnography

8. CPR 2 min
   - IV/IO access

9. Asystole/PEA

10. CPR 2 min
    - IV/IO access

11. CPR 2 min
    - IV/IO access

12. If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
    - If ROSC, go to Post-Cardiac Arrest Care

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CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If PetCO₂ <10 mm Hg, attempt to improve CPR quality.
  - Intra-arterial pressure
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J; if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO dose:
  - 1 mg every 3-5 minutes
- Amiodarone IV/IO dose:
  - First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PetCO₂ (typically >40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
Note: The National Association of EMS Physicians (NAEMSP) supports out-of-hospital termination of resuscitation for adult, nontraumatic cardiac arrest patients who have not responded to full resuscitative efforts. The following factors should be considered in establishing termination of resuscitation protocols: 1) Termination of resuscitation may be considered for any adult patient who suffers sudden cardiac death that is likely to be medical. 2) Unwitnessed cardiac arrest with delayed initiation of cardiopulmonary resuscitation (CPR) beyond 6 minutes and delayed defibrillation beyond 8 minutes has a poor prognosis. 3) In the absence of "do not resuscitate" or advanced directives, a full resuscitative effort including CPR, definitive airway management, medication administration, defibrillation if necessary, and at least 20 minutes (unwitnessed) or 30 minutes (witnessed) of treatment following Advanced Cardiac Life Support (ACLS) guidelines should be performed prior to declaring the patient dead. 4) A patient whose rhythm changes to, or remains in, ventricular fibrillation or ventricular tachycardia should have continued resuscitative efforts. Patients in asystole or pulseless electrical activity should be strongly considered for out-of-hospital termination of resuscitation. 5) Logistic factors should be considered, such as collapse in a public place, family wishes, and safety of the crew and public. 6) Online medical direction should be established prior to termination of resuscitation. The decision to terminate efforts should be a consensus between the on-scene paramedic and the online physician. 7) The on-scene providers and family should have access to resources, such as clergy, crisis workers, and social workers. 8) Quality review is necessary to ensure appropriate application of the termination protocol, law enforcement notification, medical examiner or coroner involvement, and family counseling.
2.3.2 Cardiac Dysrhythmias: BRADYCARDIA (Algorithm)
Adult Medical Protocol

**Purpose:** This protocol is to be used for patients with heart rates < 50 per minute and any of the following signs and symptoms:
- Chest pain
- Shortness of breath
- Acutely Decreased level of consciousness
- Low blood pressure (< 90 mm Hg)
- Shock
- Pulmonary edema
- Congestive heart failure
- Acute MI or acute ischemia on 12 lead EKG
- Ventricular escape beats

*If patient is asymptomatic, do not treat unless ordered to do so by medical control.*
Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular infarction (confirmed by 12 lead EKG V4R ST Elevation). When an inferior wall MI is associated with right ventricular MI, avoid use of nitrates (Nitroglycerin). If bradycardia and hypotension exists, pacing and IV fluids may improve the patient’s hemodynamic status.

Consider the potential causes:
- Acute myocardial infarction
- Calcium-channel blockers
- Head injury
- Clonidine
- Atrio-ventricular block
- Digitalis (e)
- Hypoxia
- Toxins
- Hypoglycemia
- Sick sinus syndrome
- Medications (beta blockers)
- Spinal cord lesion
- Trauma

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient/Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Assess CABs and vital signs
4. Attach cardiac monitor and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Start IV or IO of lactated Ringer's or normal saline TKO. Bolus with 250ml increments up to 1 liter as needed for hypotension. Check vitals and breathe sounds between each bolus.
2. Perform 12 lead EKG (transmit to hospital if capable). If inferior wall MI is identified, perform additional 12 lead EKG with V4R to confirm/rule out concurrent right ventricular MI
3. **IF no inferior wall MI,** administer **Atropine** 0.5 mg IV or IO. May repeat IV or IO **Atropine** every 3-5 minutes up to: (a)(c)(e)
   - 2 mg for patients weighing less than 110 pounds (<50 kg)
   - 3 mg for patients weighing 110-165 pounds (50-75 kg)
   - 4 mg for patients weighing 165-220 pounds (75-100 kg)
4. If inferior wall MI with right ventricular infarction is present and is associated with bradycardia and hypotension, Consider calling med control for Dopamine if available (prior to pacing).

5. Pace with external pacer per External Cardiac Pacing protocol.

6. IV fluid bolus 250ml increments up to 1 liter with vital sign and lung exam between each bolus

7. For 2nd degree AV block type II and 3rd degree AV block, omit Atropine and go to External Cardiac Pacing protocol.

8. If patient is conscious and aware of situation during pacing, administer one of the following benzodiazepines:
   a. Diazepam (Valium) 5mg IV or IO, may repeat once PRN (up to max of 10 mg). (e)(d)
   b. Midazolam (Versed) 2mg IV or IO, may repeat once PRN (up to max. 4 mg). (e)(d)

9. If patient experiences pain from external cardiac pacing, may give Fentanyl 25 – 50 mcg IV slow, may repeat q 5 minutes up to 100 mcg then contact med control for additional dosing if needed.

ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control or medical director for any questions or problems.

2. If pacer is unavailable or ineffective, Dopamine infusion @ 5-20 mcg/kg/min (1600 mcg/ml infusion concentration = 15 – 60 gtts/min). Titrate to maintain a minimum systolic BP of 90 mm Hg with good capillary refill. Maximum BP 120 mm Hg (Maximum dose 20 mcg/kg/min)

3. Consider Glucagon 1-2 mg IV x 1 if on Beta Blockers

4. Consider Calcium Chloride 1-2 gms IV over 10 min if on Calcium Channel Blockers

NOTES:
(a) Consider pacing before giving the maximum dose of atropine.
(b) –blank-
(c) Use atropine with caution in the presence of myocardial ischemia.
(d) Administer benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.
(e) If suspected digitalis toxicity, Atropine improves AV nodal conduction. Caution should be used with pacing because it can lower the fibrillatory threshold and induce arrhythmias. Refer to treatment of dig toxicity in Protocol 2.6.2 Toxicology.
(f) If pacing is chosen as the second-line treatment and it is also ineffective, begin an infusion of dopamine or epinephrine.

See Bradycardia Algorithm next page
Adult Bradycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradycardia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. Persistent bradycardia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?
   - Monitor and observe

4. No
   - Atropine
     If atropine ineffective:
     - Transcutaneous pacing or
     - Dopamine infusion or
     - Epinephrine infusion

5. Yes
   - Consider:
     - Expert consultation
     - Transvenous pacing

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Doses/Details

**Atropine IV dose:**
First dose: 0.5 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg.

**Dopamine IV infusion:**
Usual infusion rate is 2-20 mcg/kg per minute. Titrate to patient response; taper slowly.

**Epinephrine IV infusion:**
2-10 mcg per minute infusion. Titrate to patient response.
2.3.3 Cardiac Dysrhythmias: STABLE NARROW COMPLEX TACHYCARDIA-SVT (JUNCTIONAL OR ATRIAL TACH) (Algorithm)

**Purpose:** Patients suffering from tachycardia may or may not exhibit symptoms. It is important to note that narrow complex tachycardia has many origins. The atrial rate may be helpful in differential interpretation of these types of tachycardia. The following rates should be considered:

- Sinus Tachycardia ranges from 100 - 160 per minute
- Junctional tachycardia ranges from 100 - 180 per minute
- Atrial tachycardia ranges from 150 - 250 per minute
- Atrial flutter ranges from 250 – 350 per minute
- Atrial fibrillation starts at 350 per minute (atrial rate)

In addition, wide complex tachycardia (QRS \( \geq \) 0.12 seconds) should initially be considered as ventricular in origin, unless proven otherwise (e.g. documented QRS morphology consistent with pre-existing BBB).

Those patients who present with SVT may have evidence of cardiovascular dysfunction. Those patients who present with symptomatic signs and symptoms may be treated with medications. Those patients who present with “unstable” signs and symptoms should be cardioverted immediately. The following table shows stable to unstable signs and symptoms:

<table>
<thead>
<tr>
<th>Symptomatic (Stable)</th>
<th>Critical (Unstable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Alert and oriented</td>
<td>• Decreased level of consciousness</td>
</tr>
<tr>
<td>• SBP equal to greater than 90 mm Hg</td>
<td>• SBP below 90 mm Hg (shock)</td>
</tr>
<tr>
<td>• Mild chest discomfort</td>
<td>• Chest pain</td>
</tr>
<tr>
<td>• Mild to Moderate Shortness of breath</td>
<td>• Severe Shortness of breath</td>
</tr>
<tr>
<td></td>
<td>• Diaphoresis</td>
</tr>
<tr>
<td></td>
<td>• Pulmonary edema/CHF</td>
</tr>
</tbody>
</table>

**Procedure:**
PSVT (JUNCTIONAL OR ATRIAL TACHYCARDIA) AND HR \( \geq \) 150/MIN

**BASIC LEVEL**: EMT and PARAMEDIC
1. Initial Patient/Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor (Verify narrow complex tachycardia. If wide-complex tachycardia, see Ventricular Tachycardia Protocol) and pulse oximeter.

**ALS LEVEL 1**: PARAMEDIC ONLY
1. Start IV of lactated Ringer's or normal saline TKO.
2. If the patient is asymptomatic, provide medical supportive care and transport immediately.
3. For symptomatic patients, attempt vagal maneuvers (see procedure: Vagal Maneuver Protocol) if not contraindicated (have patient do a Valsalva maneuver).
4. If above fails or is contraindicated and the patient is not in A-fib or Aflutter, place patient in supine position and give **Adenosine Triphosphate (Adenocard)** 6mg rapid IVP followed by 20ml of NS flush.

5. If, after 1-2 minutes, no response noted, administer **Adenosine** 12 mg IV push over 1-3 seconds, followed by 20ml of NS flush.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Administer **ONE** of the following antiarrhythmic drugs:
   a. **Verapamil** 2.5 – 5 mg over 2 minutes. May repeat 5 – 10 mg after 15 – 30 minutes. Max dose 20 mg.
   b. **Diltiazem (Cardizem)** 0.25mg/kg IV (over 2 minutes) (20mg for average patient) for narrow complex SVT. Do not use if patient has history of WPW. May repeat dose at 0.35mg/kg IV over two minutes (25mg for the average patient)
   c. **Amiodarone** 150mg in 50ml of D5W over 10 minutes if available. May repeat x 1 in no response to the first dose.
Adult Tachycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically ≥150/min if tachyarrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

3. Persistent tachyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Synchronized cardioversion
   - Consider sedation
   - If regular narrow complex, consider adenosine

5. Wide QRS? ≥0.12 second
   - Yes
     - IV access and 12-lead ECG if available
     - Consider adenosine only if regular and monomorphic
     - Consider antiarrhythmic infusion
     - Consider expert consultation
   - No

6. No
   - IV access and 12-lead ECG if available
   - Vagal maneuvers
   - Adenosine (if regular)
   - β-Blocker or calcium channel blocker
   - Consider expert consultation

Doses/Details

Synchronized cardioversion:
- Initial recommended doses:
  - Narrow regular: 50-100 J
  - Narrow irregular: 120-200 J
  - Biphasic or 200 J monophasic
  - Wide regular: 100 J
  - Wide irregular: defibrillation dose (not synchronized)

Adenosine IV dose:
- First dose: 6 mg rapid IV push; follow with NS flush.
- Second dose: 12 mg if required.

Antiarhythmic Infusions for Stable Wide-QRS Tachycardia

Procaainamide IV dose:
- 20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given.
- Maintenance infusion: 1-4 mg/min.
- Avoid if prolonged QT or CHF.

Amiodarone IV dose:
- First dose: 150 mg over 10 minutes.
- Repeat as needed if VT recurs.
- Follow by maintenance infusion of 1 mg/min for first 8 hours.

Sotalol IV dose:
- 100 mg (1.5 mg/kg) over 5 minutes.
- Avoid if prolonged QT.

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2.3.3.1 Cardiac Dysrhythmias: NARROW COMPLEX TACHYCARDIA- STABLE
A-FIB or A-FLUTTER (Tachycardia Algorithm)

Adult Medical Protocol

Purpose: This protocol is for patients who are in an atrial fibrillation or atrial flutter rhythm and considered stable (BP > 90 mm Hg, no chest pain, no dyspnea or diaphoresis). The ventricular rate in a-fib will be irregular and the p-waves may not be discernable. P-waves in a-flutter may have a saw tooth appearance and a rapid +/- regular ventricular rhythm. Adenoscard generally does not work on A-fib/a-flutter. If HR ≥ 150 proceed with protocol.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient/Assessment Protocol. 2.1.1
2. Airway Assessment/Management Protocol. 2.1.2
3. Attach cardiac monitor (Verify narrow complex tachycardia. If wide-complex tachycardia, see Ventricular Tachycardia Protocol) and pulse oximeter.

ALS LEVEL 1: PARAMEDIC ONLY
1. Start IV of lactated Ringer's or normal saline TKO. Bolus as needed with 250mls of IV fluid. Repeat as needed up to 1 liter. Check vital signs
2. Administer one of the following anti-arrhythmic drugs: Do not use if patient has history of WPW.
   - Diltiazem (Cardizem) 0.25mg/kg IV (over 2 minutes) (20mg for average patient) for narrow complex SVT. May repeat dose in 15 minutes at 0.35mg/kg IV over two minutes (25mg for the average patient) in no response from the first dose.
   - Verapamil 2.5 – 5 mg over 2 minutes. May repeat 5 – 10 mg IV after 15–30 minutes. Max dose 20 mg.

ALS LEVEL 2: MEDICAL CONTROL
1. Amiodarone 150mg in 50ml of D5W over 10 minutes if available. May repeat x 1 if no response to the first dose.
2. Contact medical control or medical director for any questions or problems.

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2.3.3.2 Cardiac Dysrhythmias: **UNSTABLE A-fib and A-Flutter and PSVT (NARROW COMPLEX TACHYCARDIAS)** *(Tachycardia Algorithm)*

**Adult Medical Protocol**

**Purpose:** This protocol is used for patients considered to be unstable with narrow complex tachycardia. Consider patient to be unstable and prepare for immediate cardioversion if patient exhibits any of the following signs or symptoms:

- Crushing chest pain, diaphoresis, heart rate ≥ 150
- Significant Shortness of breath
- Decreased level of consciousness
- Low blood pressure / shock (sys ≤ 90 mm Hg)
- Pulmonary edema / congestive heart failure
- Acute MI

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient/Assessment Protocol. 2.1.1**
2. **Airway Assessment/Management Protocol. 2.1.2**
3. Attach cardiac monitor (Verify narrow complex tachycardia. If wide-complex tachycardia, see Ventricular Tachycardia Protocol [w/pulse] or V-Fib and V-tach w/o pulse) and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. **NOTE:** If the rhythm is a rapid atrial fibrillation and onset of a-fib has been greater than 48 hours, contact medical control for assistance with medication vs cardioversion! If ordered to cardiovert, proceed. All other unstable tachyarrhythmias proceed as below.
2. Start IV of lactated Ringer's or normal saline TKO. Bolus as needed with 250mls of IV fluid for systolic BP < 90 mm Hg. Repeat as needed up to 1 liter. Check vital signs in between each bolus.
3. If patient is conscious and aware of situation, sedate with one of the following benzodiazepines:

   - Midazolam *(Versed)* 2 – 4 mg IV, IO, IM, IN, may repeat once PRN (up to max. 4mg.)
   - Diazepam *(Valium)* 5mg IV, IO, IM may repeat once PRN (up to max. of 10 mg).
4. **Synchronized cardioversion**, start at:

   - 50 - 100 joules for a-flutter and PSVT (if no response try 200 joules)
   - 120 - 200 joules for a-fib (if no response try 300 joules)

**ALS LEVEL 2: MEDICAL CONTROL**

1. Overdrive pacing (see procedure: External Cardiac Pacing protocol)
2. Contact medical control or medical director for any questions or problems.

Return to: **Contents at top Admin Guidelines Adult Medical Protocols Adult Cardiac Dysrhythmia**
2.3.4 Cardiac Dysrhythmias: PREMATURE VENTRICULAR ECTOPY (PVC’S)
Adult Medical Protocol

Purpose: Treatment of ventricular arrhythmias after MI has been a controversial topic for two decades. Similarly, management of ventricular arrhythmias during the acute phase of MI continues to evolve as treatment strategies are reviewed in the context of new information and changing epidemiological data during the era of adjunctive medical and reperfusion therapy. At present, the treatment of asymptomatic premature ventricular ectopy (PVC’s) is not recommended. Current ACLS protocols recommend amiodarone for the treatment of hemodynamically stable VT and prevention of recurrent VF.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient/Assessment Protocol, 2.1.1
2. Airway Assessment/Management Protocol, 2.1.2
3. Attach cardiac monitor

ALS LEVEL 1: PARAMEDIC ONLY
1. Start IV of lactated Ringer's or normal saline TKO. Bolus as needed with 250mls of IV fluid if systolic BP < 90 mmHg. Repeat as needed up to 1 liter. Check vital signs following each bolus.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for further orders and any questions or problems

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult Cardiac Dysrhythmia
2.3.5 Cardiac Dysrhythmias: PULSELESS ELECTRICAL ACTIVITY (PEA) (Algorithm)
Adult Medical Protocol

Purpose: This protocol is used for pulseless electrical activity.

The most frequent cause of PEA includes:
- **Hypovolemia**
- **Hypoxia**
- **Hydrogen Ion- Acidosis**
- **Hyper-/Hypokalemia**
- **Hypothermia**

The most frequent cause of PEA includes:
- Tablets (drug OD, accidents)
- Tamponade, cardiac
- Tension pneumothorax
- Thrombosis, coronary (ACS)
- Thrombosis, pulmonary (PE)

Treatment should be given with respect to the identifiable cause and therefore, may not reflect the sequence suggested below.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
- Initial Patient/Assessment Protocol. 2.1.1
- Airway Assessment/Management Protocol. 2.1.2
- Attach cardiac monitor
- High quality CPR as indicated

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Start IV or IO of lactated Ringer's or normal saline and give initial bolus in 250ml increments of IV fluid up to 1 liter. Check vital signs and lung sounds between boluses. Repeat as needed with second liter.
2. **Epinephrine** (1:10,000) 1mg IV or IO and repeat every 3-5 minutes for duration of pulselessness. Can give via ETT at twice IV dose if no access
3. Consider cause and possible treatment options (see specific protocols).
4. For known pre-existing metabolic acidosis, or renal failure with possible hyperkalemia, consider **Sodium Bicarbonate** (8.4%) 1mg/kg IV or IO
5. If patient taking calcium channel blocker, give **Calcium Chloride 10%** 1gm or 10ml IV or IO over 10 minutes.
6. If Return of Spontaneous Circulation (ROSC) go to Return of Spontaneous Circulation Protocol

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for any questions or problems.
2.3.6. Cardiac Dysrhythmias: WIDE COMPLEX TACHYCARDIA WITH PULSE (V-TACH WITH PULSE) (Tachycardia Algorithm)

Adult Medical Protocol

**Purpose:** This protocol is for patients with V-tach and a pulse. If patient is stable (good vitals, no chest pain), treat with medication as per STABLE PATIENT below. If Unstable (systolic BP < 90 mm Hg, chest pain, dyspnea, CHF, altered mental status) treat with cardioversion per UNSTABLE PATIENT BELOW.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Airway Assessment/Management Protocol. 2.1.2
2. Attach cardiac monitor

**ALS LEVEL 1: PARAMEDIC ONLY**

**FOR STABLE PATIENT:**

1. Start IV or IO of lactated Ringer's or normal saline TKO. Bolus as needed in 250ml increments of IV fluid up to 1 liter. Repeat as needed with second liter. Check vital signs and lung sounds between boluses
2. Administer ONE of the following antiarrhythmics:
   a. If you are unsure if the wide complex tachycardia is V-tach vs an SVT with aberrancy; NOTE: 2015 ALS Guidelines allow for Adenosine (Adenocard) in the initial diagnosis and treatment of stable, undifferentiated REGULAR, monomorphic wide-complex tachycardia (DO NOT USE FOR IRREGULAR WIDE COMPLEX TACHY). If it is clearly V-tach, proceed as follows.
   b. Amiodarone 150mg in 50 - 100 ml of D5W over 10 minutes IV or IO. May repeat every 10 minutes to maximum dose of 2 gm.
   c. Lidocaine 1 – 1.5 mg/kg IV or IO. Repeat every 3 minutes at half initial dose (0.5 – 0.75 mg/kg) to a maximum total dose of 3mg/kg PRN. If Lidocaine converts rhythm, start Lidocaine maintenance infusion @ 2 – 4 mg/min. Drip based on total bolus dose given. IF:
      - 1mg/kg = 2mg/min
      - 1.5 - 2mg/kg = 3mg/min
      - 2.5 - 3mg/kg = 4mg/min
      - Reduce infusion by 50% for patients over age of 70 with CHF or liver disease.
   d. Procainamide 30mg/min., to maximum dose of 17 mg/kg. If Procainamide converts rhythm, start Procainamide maintenance infusion @ 1 – 4 mg/min (Reduce maintenance infusion by 50% for patients with kidney disease). Ending point for Procainamide administration includes:
      - Dysrhythmia is suppressed
      - 17mg/kg total loading dose
      - QRS widens by 50% of original width

OR if Amiodarone unavailable

OR
• Systolic BP drops 10 mm Hg or more

3. Use only one antiarrhythmic medication. If patient does not convert with maximum dose, treat as unstable (synchronized cardiovert).

FOR UNSTABLE PATIENT: (systolic BP < 90 mm Hg, chest pain, dyspnea, CHF, altered mental status).

1. Start IV or IO of lactated Ringer's or normal saline TKO. Bolus as needed for systolic BP < 90 mm Hg in 250ml increments of IV fluid up to 1 liter. Repeat as needed with second liter. Check vital signs between boluses

2. If patient is conscious and aware of situation, sedate with one of the following benzodiazepines:
   a. **Midazolam (Versed)** 2 – 4 mg IV, IO, IM, IN may repeat once PRN (up to max. 8 mg.)
   b. **Diazepam (Valium)** 5 mg IV, IO, IM may repeat once PRN (up to max. of 10 mg).

3. **Synchronized cardioversion** @ 100, 200, 300, 360 joules if monomorphic V-tach. If polymorphic V-tach, treat as V-fib. If unsure if rhythm is polymorphic or monomorphic and patient is unstable, deliver unsynchronized defibrillation shock (200 joules)

4. If patient converts rhythm, give **Amiodarone** 150mg in 50 - 100 ml of D5W over 10 minutes IV or IO. Or **Lidocaine** 1 - 1.5 mg/kg IV.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for any questions or problems.

SEE **TACHYCARDIA ALGORITHM**

Return to:  **Contents at top**  **Admin Guidelines**  **Adult Medical Protocols**  **Adult Cardiac Dysrhythmia**  **Cardiogenic Shock**
2.3.7 Cardiac Dysrhythmias: V-FIB and/or PULSELESS V-TACH (cardiac arrest algorithm)

**Purpose:** Use this protocol for patients in V-Fib and V-Tach with no pulse. Changes in ACLS treatment of cardiac arrest have been designed to minimize interruptions in chest compressions for rhythm check, pulse check, and ACLS therapies. To minimize interruptions in chest compressions, the team leader should plan interventions such as rhythm check, insertion of an airway, and even drug administration around uninterrupted periods of CPR. There is much less emphasis on drug therapy during cardiac arrest and much more emphasis on CPR with minimal interruptions in chest compressions.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

- **Initial Patient/Assessment Protocol. 2.1.1**
- **Airway Assessment/Management Protocol. 2.1.2**
- Attach cardiac monitor

**Early CPR**

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Verify the patient is in V-fib (check for loose electrodes). Do CPR while defibrillator is charging!

2. **If a shock CAN be delivered within 4 minutes of the onset of V-fib/pulseless V-Tach (onset occurs in presence of EMS), then give one shock at 200 joules (biphasic defibrillator) or 360 joules (monophasic defibrillator) followed immediately by two minutes of CPR (5 cycles of 30:2 compressions: breaths) before checking for a pulse and assessing the rhythm on the monitor.**

   **If a shock CAN NOT be delivered within 4 minutes of onset of V-fib/pulseless V-tach, or if it is unknown how long patient has been in V-fib/pulseless V-tach at the time of patient contact, do 5 cycles (about 2 minutes) of CPR BEFORE delivering the first shock at 200 joules, immediately followed by two more minutes (5 cycles [30:2]) of CPR before checking for pulse and analyzing the rhythm.**

3. Analyze rhythm/check pulse; if still in V-fib/pulseless V-tach, resume CPR, and perform the following actions with minimal interruptions in CPR.

4. **Endotracheal Intubation** or **King Airway** (or other blind insertion device). If an advanced airway is inserted, rescuers should no longer deliver “cycles” of CPR. Chest compressions should be delivered continuously (100 per minute) and rescue breaths delivered at a rate of 8 to 10 breaths per minute (1 breath every 6 to 8 seconds).

5. Establish **IV** or **IO** with Normal Saline or Lactated Ringers at KVO.

6. If establishing the IV/IO and administering the drug(s) cannot be done during the 5 cycles (or two minutes) of CPR prior to the second shock, give the second shock (if shockable rhythm), then immediately do another 5 cycles (or two minutes) of CPR and continue working on getting the IV/IO established and the drugs administered.
7. Give the following drug (drugs should be administered during uninterrupted CPR after the first or second shock):
   a. **Epinephrine (1:10,000) 1 mg** IV or IO (if no access, give via ETT at twice the IV dose, max 0.1mg/kg). May repeat every 3 – 5 minutes for duration of pulselessness.

8. Continue the sequence, escalating the shocks IF the monitor is capable:
   a. CPR (5 cycles of 30:2 ratio or two minutes) → Rhythm check/Charge (✔) defibrillator to 200 joules (while checking rhythm) → shock → CPR (5 cycles of 30:2 ratio or two minutes) → Rhythm check/✔ defib to 300 joules (→ shock → CPR…..3rd shock would be 360 joules

   b. All subsequent shocks at 360 joules.

**NOTE:** Drugs may be administered during the CPR that is performed while the defibrillator is charging, or during the CPR performed immediately after the shock is delivered.

9. Continue defibrillating at 200 joules during the appropriate time in the sequence after each medication is administered for the duration of the VF or VT without pulse

10. Continue with **Epinephrine** as above but also give (if V-fib/pulseless V-tach persist) one of the following:
    a. **Amiodarone 300mg IV or IO** (rapid IV push if pulseless/no BP, otherwise dilute in 50 ml of D5W and give over 10 minutes to decrease risk of hypotension). May repeat once at 150 mg in 3 – 5 minutes. If successfully converted after bolus, administer Amiodarone drip at 1mg/min. Mix 100mg Amiodarone in 100ml of D5W and administer at rate of 15gtts/min OR if Amiodarone not available
    b. **Lidocaine 1 - 1.5 mg/kg IV or IO, repeat in 3 – 5 minutes to maximum dose of 3 mg/kg.** If Lidocaine converts rhythm, start **Lidocaine maintenance infusion** @ 2 – 4 mg/min. Drip based on total bolus dose given. IF:
       - 1mg/kg = 2mg/min
       - 1.5 – 2mg/kg = 3mg/min
       - 2.5 – 3mg/kg = 4mg/min
       - Reduce infusion by 50% for patients over age of 70 with CHF or liver disease.
       OR
    c. **Procainamide 30 mg/min** to maximum of 17mg/kg IV or IO. If Procainamide converts rhythm, start **Procainamide maintenance infusion @ 1 – 4 mg/min** (Reduce maintenance infusion by 50% for patients with kidney disease). Mix 100mg (1ml) in 100ml of D5W or NS and administer 15 – 60 gtts/min with a microdrip. Ending point of Procainamide administration includes:
       - Dysrhythmia is suppressed
       - 17mg/kg total loading dose
• QRS widens by 50% of original width
• Systolic BP drops 10 mm Hg or more

11. Give 1 – 2 amps of **Sodium Bicarb (8.4%) 1mEq/kg IV or IO** if V-fib/pulseless V-tach is refractory to above meds and possible pre-existing acidosis or hyperkalemic.

12. If Torsades de Pointes: give **Magnesium Sulfate 1– 2 gms IV or IO** (dilute in 100ml D5W) over 1 – 2 minutes. If magnesium converts rhythm, start **Magnesium Sulfate maintenance infusion** (1 gm in 250 D5W) @ 30 – 60 gtts/min

13. If Return of Spontaneous Circulation (ROSC) go to **Return to Spontaneous Circulation Protocol**

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.

See: **ADULT CARDIAC ARREST CIRCULAR ALGORITHM 2015 UPDATE**

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Adult Cardiac Arrest Circular Algorithm—2015 Update

- Start CPR
  - Give oxygen
  - Attach monitor/defibrillator

2 minutes

Check Rhythm

If VF/pVT Shock

Return of Spontaneous Circulation (ROSC)

Post-Cardiac Arrest Care

Drug Therapy
- IV/IO access
  - Epinephrine every 3-5 minutes
- Amiodarone for refractory VF/pVT

Consider Advanced Airway
- Quantitative waveform capnography

Treat Reversible Causes

Continuous CPR

Monitor CPR Quality

CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If PETCO₂ <10 mm Hg, attempt to improve CPR quality
  - Intra-arterial pressure
    - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO dose: 1 mg every 3-5 minutes
- Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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V-fib/Pulseless V-Tach
2.3.8 Return of Spontaneous Circulation (ROSC)
Adult Medical Protocol

**Purpose:** Post-resuscitation is an extremely unstable period for the patient, so the patient should be monitored closely and reassessed frequently. The immediate goals of post-resuscitation care are as follows:
- Provide cardio-respiratory support to optimize tissue perfusion, especially to the brain.
- Institute antiarrhythmic therapy to prevent recurrence of the arrest.
- Attempt to identify the precipitating cause of the arrest.
- Rapidly transport the patient to the closest appropriate facility.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Assessment Protocol 2.1.1.**
2. Reassess the CABs and vital signs.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Maintain an open airway with an appropriate airway adjunct device, administer 100% O2 (then wean FiO2) to maintain SpO2 greater than or equal to 94%, and monitor with electronic EtCO2 capnography/waveform.
2. Ventilate at 10-12 BPM; **avoid hyperventilation** (d).
3. Determine the patient’s hemodynamic stability.
   a. If systolic blood pressure below 90 mm and lungs are clear, administer IV NS 500 ml; may repeat once to maintain systolic BP above 90 mm Hg (a).
   b. If systolic BP remains below 90 mm Hg:
      i. Give a **Dopamine infusion** at 5 – 10 mcg/kg/min; titrate to maintain minimum systolic BP of ≥ 90 mm Hg and a maximum systolic BP of 120 mm Hg.
4. Manage dysrhythmias according to the specific protocol.
5. If the cardiac arrest was the result of VF or VT, manage the patient as follows:
   a. If an antiarrhythmic medication was not used to convert the heart rhythm, administer **Amiodarone** 150 mg in 50 mL or 100 mL of D5W over 10 minutes IV/IO (b).
   b. If Amiodarone was administered during resuscitation, do not administer additional Amiodarone.
   c. If the patient is having frequent PVC or runs of VT, or if the transport time will exceed 30 minutes, start an **Amiodarone drip** (150 mg in 50 mL of D5W = 3:1 concentration). Using a 60
gtt/mL set, initiate the flow at 1 gtt every 3 seconds (20 gtts/min = 60 mg/min).

6. Transport the patient to the closest interventional cardiac/ice facility(c).

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.

**NOTES:**

(a) If rales or crackles are auscultated in the lungs or the patient’s systolic blood pressure remains less than 90 mm Hg despite fluid therapy, proceed directly to dopamine administration.

(b) Do not use Amiodarone if the patient has a heart rate less than 60, second-degree type II AV block, third-degree AV block or if patient is hypotensive

(c) If the patient’s airway is compromised or crews are unable to manage the patient, transport the patient to the nearest facility.

(d) If EtCO2 is less than10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   
   If EtCO2 = 12-25mm Hg: Goal during resuscitation.
   
   If EtCO2 = 35-45mm Hg: Check for ROSC

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2.4

Other Adult Cardiac Emergencies
2.4.1 Cardiogenic Shock
Adult Medical Protocol

**Purpose:** This protocol is to be used for a patient that is hypotensive (systolic BP < 90 mm Hg) with signs and/or symptoms that are cardiac in origin, e.g. Pulmonary Edema-CHF (dyspnea with rales and/or wheezing), suspected acute myocardial infarction (ST segment elevations on EKG, severe substernal chest pain). If cardiogenic shock is suspected, medical control will need to help guide you in management. The treatment options will need to take into account medications that affect the contractile force of the heart, as well as pre-load and after-load concerns.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol, 2.1.1
2. Airway Assessment/Management Protocol, 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Consider possible causes (e.g. the H’s and T’s)

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV/IO lactated Ringer’s or normal saline TKO.
2. If patient is short of breath with signs of pulmonary edema (dyspnea, wheezing, rales, tachypnea)
   a. Assist ventilations with BVM with 100% oxygen.
   OR
   b. Apply CPAP Mask if patient awake enough and able to tolerate and systolic BP > 90 mmHg.
   OR
   c. Consider advanced airway
3. If hypotensive:
   a. Be sure to remove any transdermal nitroglycerine patch and inform medical staff that you have done so.
4. Obtain 12 lead EKG and transmit if capable.
5. If the patient is not experiencing pulmonary edema, administer a fluid challenge of 500 mL normal saline. If this measure does not improve the patient’s systolic blood pressure, the fluid challenge may be repeated once (a).
6. If the fluid challenge does not improve blood pressure, or if the patient is experiencing rales (or pulmonary edema), administer a Dopamine infusion at 5-20 mcg/kg/min (b).
7. Titrate Dopamine to maintain a minimum systolic SBP of 100 mm Hg and a maximum systolic BP of 120 mm Hg.
8. If the heart rate is slow, less than 60/min, Adult Protocol 2.3.2, Bradycardia
9. If the heart rate is fast, greater than 150/min, Adult Protocol 2.3.3, Narrow Complex Tachycardia, or Adult Protocol 2.3.6, Wide Complex Tachycardia with a Pulse, as appropriate.
10. Treat dysrhythmias per the appropriate protocol.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for further orders as needed.

Notes:

(a) Avoid giving fluids if an anterior wall MI is suspected (evidenced by ST elevations in leads I, AVL, V1 through V6).
(b) Dopamine 1600 mcg/mL infusion concentration = 15-60 gtts/min with a 60-gtt set. The maximum dose is 20 mcg/kg/min.

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2.4.2 Chest Pain-Suspected Acute MI-Acute Coronary Syndrome-Angina
Adult Medical Protocol

**Purpose:** This protocol is used for patients experiencing chest pain or discomfort suspicious for cardiac cause (angina pectoris or suspected MI). Pain may be described as dull, aching, squeezing, fullness, band-like sensation, tightness, and sensation of someone or something sitting on chest. The pain may or may not radiate to the neck, jaw, left shoulder or down left arm. The patient can also have the following symptoms with or without chest pain; diaphoresis, nausea/vomiting, short of breath, feel a sense of doom, weak, fatigued. Treat patients for possible cardiac cause of pain if any of the following:

- Age > 30 (or if < than 30 with personal history of coronary artery disease)
- History of: HTN, Smoking, morbid obesity, Diabetes, Positive Family history of cardiac issues (when family member was same age as patient at onset of problem), hypercholesterolemia, cocaine use.
- Anyone with abnormal/suspicious findings on the cardiac monitor or EKG.

All other chest pain patients less than 30 yrs of age do not need to be treated with nitroglycerine and aspirin. If you have any doubt, contact medical control for guidance. Consider other causes in young patients such as musculoskeletal strain, respiratory (bronchitis, pneumonia, bronchospasm), trauma, GI (reflux, gall stones), etc.

If nontraumatic chest pain other than angina/AMI is suspected consider other potential causes; dissecting aortic aneurysm, pericarditis, spontaneous pneumothorax, pulmonary embolism, pneumonia, pleurisy, costochondritis, hiatal hernia, esophageal spasm, peptic ulcer, cholecystitis, pancreatitis, and cervical disk problem. These conditions should not be treated under this protocol, refer to specific protocol and utilize Appendix 6.7, Chest Pain Differential.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol. 2.1.1**
2. **Airway Assessment/Management Protocol. 2.1.2** Oxygen via nasal canula @ 2-4 LPM to maintain > 94% (use non-rebreather @ 15 LPM if SpO2 < 90%)
3. Attach cardiac monitor and pulse oximeter.
4. BLS crews can assist patients in taking their own home meds such as aspirin or sublingual nitroglycerine (see EMT-B, AEMT responsibilities). The total dose of NTG should not exceed three doses (tablets or spray), including doses that the patient may have taken prior to your arrival. Do NOT administer Nitroglycerin if the SBP less than 100 mm Hg or The patient has taken erectile dysfunction medications within the last 24 hours (Viagra) or within the last 48 hours (Levitra or Cialis) or withing the last 12 hours (Stendra).
5. Place in position of comfort

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Obtain (and transmit if capable) 12 lead EKG within 10 minutes of patient contact or as soon as possible. Notify medical control of any findings suggestive of acute myocardial infarction or other grossly abnormal tracing. For all arrhythmias identified, refer to the appropriate protocol. If ACUTE MI IS IDENTIFIED, NOTIFY THE APPROPRIATE RECEIVING FACILITY
AND CALL A “CODE STEMI” (d). If inferior wall MI is identified, perform additional 12 lead EKG with V4R to confirm/rule out concurrent right ventricular MI. (b).

2. Initiate an IV of lactated Ringer’s or normal saline at a TKO rate. May require IV Bolus if hypotensive (systolic BP < 90 mm Hg). Give boluses in 250ml increments with vital sign and breath sound recheck in-between each bolus.

3. Administer 1 Aspirin tablet (325 mg) PO or chew 4 Baby Aspirin if patient not allergic to Aspirin and does not have ulcer disease and has not taken a 325 mg dose within the past 24 hours. (a).

4. Administer 1 Nitroglycerin tablet or spray (0.4mg) sublingually if systolic blood pressure greater than 100 mm Hg (avoid if HR < 50/min, or HR > 150/min). IT IS NOT NECESSARY TO WITHHOLD NITROGLYCERIN UNTIL YOU HAVE AN IV IN PLACE AS LONG AS SYSTOLIC BP IS > 100 mm Hg. If BP drops after administration of nitroglycerine, and you haven’t been able to start an IV, consider placing an I/O and bolusing with IV fluids. If BP remains systolic > 100 mm Hg, may be repeated every 5 minutes until:
   a. 3 tablets/sprays have been administered,
   b. Pain is relieved, or,
   c. Systolic blood pressure falls below 100 mm Hg. 
   NOTE: DO NOT GIVE NITRO IF PATIENT HAS TAKEN Viagra, Cialis, Levitra or any other medication for erectile dysfunction in past 24-48 hours.

5. If pain was relieved by sublingual nitro, place 1 inch of nitroglycerine paste to chest wall).

6. If pain continues and patient is not hypotensive (systolic BP < 100 mm Hg), administer one of the following (Fentanyl first-line)
   a. Fentanyl may be given 50 mcg IN increments every 3-5 minutes to a maximum of 200 mcg IN
   OR
   IM/IV dose 1mcg/kg SLOW IV increments every 3-5 minutes up to a maximum initial dose of 100 mcg, titrated to pain and BP remains above 90 mm Hg. 
   Second dose if needed, maximum total dose of 200mcg IV/IN/IM. 
   If Fentanyl was initially given IN and an IV is then established, one IV dose (50mcg) can be given if needed.
   b. Morphine Sulfate slow IV in 2mg increments every 3-5 minutes 
etrated to pain and BP > 90 mm Hg, up to maximum of 10 mg. Monitor respirations and blood pressure closely.

7. If patient becomes nauseated, give one of the following:
   a. Zofran 4 – 8 mg IVP
   b. Benadryl 25 mg IVP

8. Minimize venipunctures.

9. IF time permits and transporting to a non cardiac cath facility (do not delay treatment or transport), perform Fibrinolytic screening checklist (see forms). This may prevent a delay if hospital will be giving thrombolitics in the event cardiac catheterization is not immediately available.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control for further orders as needed.
NOTE:

(a) Allergies to ASA should be suspected in patients with anaphylaxis signs and symptoms (e.g., flushed itchy skin, increased heart rate, dyspnea, or urticaria).

(b) Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular MI (confirmed on 12 lead EKG - V4R ST elevation). When an inferior MI is associated with right ventricular MI, avoid use of nitrates (Nitroglycerin). If bradycardia and hypotension exists, pacing and IV fluids may improve the patient’s hemodynamic status.

(c) Other causes of non-traumatic chest pain include: angina pectoris, dissecting aortic aneurysm, pericarditis, spontaneous pneumothorax, pulmonary embolism, pneumonia, pleurisy, costochondritis, hiatal hernia, esophageal spasm, peptic ulcer, cholecystitis, pancreatitis, and cervical disk problem. The paramedic will not always be able to differentiate the cause of a patient’s chest pain. It is imperative for the paramedic to obtain a good history and perform a good physical exam including a chest exam/breath sounds, abdominal exam and evaluation of peripheral pulses, as well as monitor cardiac activity and vital signs in order to identify those patients who are hemodynamically unstable.

(d) AMI is probable when there is:
   1. A minimum of 1mm ST elevation in two or more related leads on the 12-lead ECG with a history suggestive of AMI, signs and symptoms regardless of onset time.
   2. A “new onset” left bundle branch block (LBBB) on the ECG with signs/symptoms and history suggestive of AMI.
   3. Patients meeting the above criteria should be transported to the nearest cardiac center and pre-alert the hospital of a Cardiac Alert.

(e) Minimize the Cardiac Alert on-scene time to 10 minutes or less.
Chest Pain Protocol Checklist

- Assure ABC’s.
- Administer oxygen via nasal cannula or non-re-breather, if indicated.
- Obtain symptom duration, time of onset or last time patient was seen normal.
- Obtain 12 lead EKG and transmit as soon as possible (if capable).
- Notify medical control of any findings that indicate MI or other abnormalities.
- Place patient in position of comfort.
- Pulse ox.
- Vital signs.
- Initiate intravenous line. Establish two, if indicated.
- Determine serum glucose level if history of diabetes or Altered Mental Status.
- Administer 1 Nitro spray (gr. 1/150) sublingually if systolic pressure greater than 100 mm Hg. (Do not give Nitro if patient has had Viagra or similar medication in the past 24-48 hours.
- Repeat Nitro till pain relieved, 3 tablets administered, or systolic pressure drops below 100 mm Hg.
- 1 inch of Nitro Paste to chest wall if pain is relieved.
- Administer 4 baby aspirin or 1 325mg tablet if patient is not allergic or have ulcers.
- Treat dysrhythmias per protocol.
- Consider Fentanyl 50 – 200 mcg IN, IM, or IVP or Morphine 2 mg IVP then titrate 1 mg prn up to 10mg.
- Consider Zofran 4 mg IVP for nausea.
- Transport. Document all items on run report.
**FIBRINOLYTIC INCLUSION/EXCLUSION CHECKLIST:**

Patient Name: ________________________________ Date: ____________

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patient ≥ 18 years old</td>
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<td>2. Ischemic discomfort ≥ 30 min. but not &gt; 12 hours</td>
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<tr>
<td>3. ST segment &gt; 1mm in ≥ 2 contiguous leads or ST elevation ≥ 2mm in ≥ 2 contiguous precardial leads or presumed new LBBB</td>
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</table>

<table>
<thead>
<tr>
<th>Exclusion Criteria</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any “YES ANSWER” to the below listed questions will “EXCLUDE” the patient from being a candidate for thrombolytic therapy. Paramedic must check each box as the question is answered.</td>
<td></td>
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<tr>
<td>1. Any active internal bleeding within the last 4 weeks (e.g. black tarry stools, hematemesis).</td>
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<td>2. History of CVA or TIA.</td>
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<td>3. ANY surgery within the past 4 weeks</td>
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<td>4. Brain tumor, AVM (arterial-venous malformation), Cerebral aneurysm</td>
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<tr>
<td>5. Hemophilia or any known bleeding disorder</td>
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<tr>
<td>6. Presenting hypertension, any blood pressure PRIOR to the delivery of thrombolytics that exceeds 180 systolic or 110 diastolic.</td>
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<td>7. Use of cocaine or amphetamines in the past 3 days</td>
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<tr>
<td>8. Patient in cardiogenic shock (BP &lt; 90), or intubated</td>
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<tr>
<td>9. Recent trauma, including CPR &gt; 2 minutes</td>
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<tr>
<td>10. Back Pain indicative of a Dissecting Aneurysm, presenting as a tearing or ripping pain, in the upper back, accompanied by unequal blood pressures or distal pulses.</td>
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<tr>
<td>11. Being treated for pericarditis, endocarditis</td>
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<tr>
<td>12. Pregnancy</td>
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<tr>
<td>13. Patient taking oral anticoagulation meds within the past 3 days</td>
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</tbody>
</table>

**Paramedic Signature:**

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2.4.3 Hypertensive Emergencies

Adult Medical Protocol

Purpose:

Hypertensive emergencies are commonly defined as accelerated blood pressures (systolic greater than 220 mm Hg, diastolic greater than 120 mm Hg) with signs and symptoms of end organ failure. Neurologic end-organ damage due to uncontrolled BP may include hypertensive encephalopathy and cerebral vascular accident. Cardiovascular end-organ damage may include myocardial ischemia/infarction, acute left ventricular dysfunction, acute pulmonary edema, and aortic dissection. Other organ systems may also be affected by uncontrolled hypertension, which may lead to acute renal failure, and eclampsia.

Hypertension is rarely treated in the prehospital setting. Treatment should focus on the patient’s presentation and not the blood pressure by itself. Blood pressures that should not be treated in the prehospital setting include:

- Transient hypertension secondary to pain, anxiety, hypoxia, or drug intoxication. (Treatment should be directed at the underlying causes, not antihypertensives)
- Chronic hypertension. (Rapid reduction of blood pressure in asymptomatic patients may cause more harm than benefit)
- Thrombotic stroke. (Elevated blood pressure is a normal physiologic response to brain ischemia, excessively lowering of blood pressure in these patients may extend the area of injury)

You are NOT trying to correct a patient’s chronic elevation of blood pressure on a one time EMS visit. You will NOT always see a significant change in blood pressure during the short time patient is in your possession. This protocol should be applied to patients who are:

Asymptomatic:

1. IF patient has a persistent systolic BP > 220 mm Hg and/or a diastolic BP > 130 mm Hg after 2 separate readings, 5 minutes apart, proceed as below. (If possible, take BP in other arm for one of the readings). DO NOT delay transport for BP readings/treatment. The goal is to gradually lower the BP to a more manageable range of a systolic ≤ 180 mm Hg and a diastolic BP ≤ 95. Should you arrive at the hospital before both readings are obtained, inform ED staff and treatment can be provided by the ED staff. If either of the two BPs falls below the 220 systolic or 130 diastolic, do not treat unless you contact medical control first.

Symptomatic:

1. IF patient has systolic BP >180 mm Hg and/or diastolic BP > 110 mm Hg AND has Chest pain and/or CHF/Pulmonary Edema symptoms, follow protocol for symptoms (Suspected AMI/Acute Coronary Syndrome, and/or Pulmonary Edema/CHF). High blood pressure will be treated by following those protocols.
2. IF systolic BP > 180 mm Hg and/or diastolic BP > 110 mm Hg AND patient has epistaxis (nosebleed), follow protocol below
3. IF systolic BP > 180 mm Hg and/or diastolic BP > 110 mm Hg AND patient has severe headache with or without blurred vision, follow protocol below. If you suspect a stroke (protocol CVA/Stroke), do not lower BP unless ordered to do so by medical control.
4. Eclampsia should be considered with female patients in their third trimester or postpartum who are hypertensive and/or seizing (Refer to 2.7.4 Eclampsia Protocol)

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter

ALS LEVEL 1: PARAMEDIC ONLY
1. Establish an IV of Lactated Ringers or Normal Saline at KVO prn.
2. For nose bleed;
   a. Hold pressure against nostril on affected side. (Apply ice pack if possible).
   b. Keep head of bed elevated between 45 – 90 degrees.
   c. Verify elevated BP with two separate readings (one in each arm or one in same arm 5 minutes apart). If elevated BP (systolic >180 mm Hg or diastolic > 110 mm Hg) x 2 readings, proceed to #4 below.
3. For severe headache with or without blurred vision;
   a. Review patient’s home medications and inquire if any medications are taken for high blood pressure.
   b. Inquire if patient has taken their high blood pressure medication as scheduled. If patient has not yet taken their blood pressure medication and is due a dose now or over the next 2 -3 hours, have them take a dose of their prescribed medication if no nausea/vomiting. Transport and report the name of medication taken by patient to ED Staff
   c. Inquire if patient has taken any medication for the headache in the past 6 hours (Tylenol, Motrin/Ibuprofen, any prescribed pain Rx), if not, give or assist patient with taking 1 gm of Tylenol (if not allergic) po.
   d. Examine patient for stroke symptoms (Cincinnati Stroke Scale). Do not lower BP if stroke suspected without med control
   e. After above measures, verify elevated BP with two separate readings (one in each arm or one in same arm 5 minutes apart). If elevated BP (systolic >180 mm Hg or diastolic > 110 mm Hg) x 2 readings, proceed to #4 below.
4. Administer Nitroglycerine 0.4mg (1 tab or spray) sublingually. Repeat q 5 - 10 min prn x 3. Monitor vital signs every 3-5 minutes. Make sure patient

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has not taken any erectile dysfunction drugs in previous 24 – 48 hours prior to giving nitro
5. Apply 1 inch of Nitro paste to patient’s chest.
6. If blood pressure falls too low (systolic < 90), remove the Nitro Paste and give IV fluid as needed to maintain systolic between 90-110

ALS LEVEL 2: MEDICAL CONTROL
1. Labetalol (Normadyn) (Trandate) 10- 20 mg IV slowly over 2 minutes for HTN not associated with CVA. May repeat q 10 minutes to max dose of 300mg. Contact medical control if pulse < 60.
2. Clonidine (Catapress) 0.1 mg p.o. May be repeated in 30 – 60 minutes. Max dose 2.4mg/day
3. Contact medical control or medical director if any concerns or any questions.
2.4.4 Hypotension/Shock (Unknown Cause or Immediate Cause Not Identified)
Adult Medical Protocol

Purpose: This protocol is to be used for patients who are found to be hypotensive (Systolic BP ≤ 90 mm Hg) and the immediate cause may not be known. Possible causes include (but not limited to):

1. **Medications** (As per intended purpose such as any of the antihypertensive medications or as an adverse reaction or side effect of a non-antihypertensive medication):
   a. Beta Blockers
   b. Calcium Channel Blockers
   c. ACE Inhibitors
   d. Diuretics

2. **Cardiac Causes**
   a. Low Cardiac Output (e.g. Myocardial Infarction, myocarditis)
      i. Cardiogenic Shock
   b. Cardiac Tampanode

3. **Low Volume States**
   a. Severe Dehydration
   b. Anemia acute or chronic
   c. Acute hemorrhage (e.g. Acute GI bleed, ruptured Aortic Aneurysm)

4. **Medical Causes**
   a. Sepsis
   b. Anaphylaxis
   c. Endocrine Derangements (Adrenal Crisis)

5. **Traumatic Causes (refer to appropriate trauma protocol)**
   a. Acute traumatic hemorrhage

6. **Neurologic causes**
   a. Head Injury
   b. Spinal Cord Injury
   c. CVA
   d. Vasovagal Fainting

Signs and Symptoms:
1. Hypotension (systolic ≤ 90 mm Hg)
2. Normal or Decreased LOC
3. Tachycardia (may not be present due to certain medications)
4. Tachypnea and Bradycardia may be seen in spinal cord injuries
5. NOTE: Spinal Shock: Clinical presentation differs from hemorrhagic shock in that there is no catecholamine release, thus:
   a. No pallor
   b. No tachycardia or diaphoresis
   c. Decreased blood pressure with normal or slow heart rate
   d. Skin warm, dry and pink
   e. Patient may be more alert than expected for his/her blood pressure.
If an immediate or obvious cause can be identified, refer to the appropriate protocol for additional guidance, e.g. if trauma involved, refer to the appropriate trauma protocol, for cardiac causes, refer to the appropriate cardiac protocol.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
3. Attach cardiac monitor and pulse oximeter.
4. Consider placing in Trendelenburg

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV of Normal Saline (or Lactated Ringers if trauma related). If BP Systolic ≤ 90 mm Hg, bolus with 250 ml IV fluid and repeat up to 1 liter (2 liters if trauma). Check vital signs and breath sounds in-between each bolus.
2. If patient develops pulmonary edema during fluid bolus, discontinue bolus and follow cardiogenic shock protocol.

**ALS LEVEL 2: MEDICAL CONTROL**
1. If after first liter (or second liter for trauma) of IV fluid bolus (and no obvious cause of hypotension), and patient’s systolic BP is still ≤ 90 mm Hg, contact medical control for advice on giving a second liter of fluid bolus or starting a Dopamine drip. Start Dopamine 5 – 10 mcg/kg/min (1600 mcg/mL infusion concentration = 15 – 60 gtt/min). It will depend on the circumstances.
1.3.12 Left Ventricular Assist Devices

**Purpose:** The purpose of this protocol is to guide the EMS crew with managing a patient tethered to a left ventricular assist device. A ventricular assist device is a mechanical pump that is used to support heart function and blood flow in people who have weakened hearts. The device takes blood from the lower chamber of the heart and helps pump it to the body and vital organs just as a healthy heart would. Patients and family members are well versed on the management of these devices and should be able to guide you in management. Be sure when transporting patients with LVADs, that ALL the necessary supplies accompany the patient. This includes the extra batteries, chargers, and any other spare/backup components. Keep in mind, with many LVADs, you will not hear or detect a blood pressure. You will instead rely on the patient’s level of consciousness, and the skin color and condition. Pulses may or may not be palpable. When the chest is auscultated, you will hear the humming of the device.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol.** 2.1.1
2. **Airway Assessment/Management Protocol.** 2.1.2. Supplemental oxygen if any respiratory signs or symptoms are present
3. Attach cardiac monitor and pulse oximeter. Pulse ox may not work on these patients.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Auscultate Heart Sounds to determine if the device is functioning and what type of device it is. If it is continuous flow device, you should hear a “whirling sound”
2. Assess the device for any alarms.
3. Look on controller usually found around the waist of the patient to see what color tag and device it is.
4. Match the color on the device tag to the LVAD guideline Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.
5. Initiate IV of Normal Saline or LR at KVO.
6. Assess vital signs – Use Mean BP with Doppler – with the first sound you hear is the Mean Arterial Pressure (MAP).
7. If no Doppler, use the Mean on the non-invasive blood pressure machine. A manual blood pressure may not be obtainable, but with an automated cuff you will be able to obtain a pressure with a narrow pulse pressure.
8. Transport to closest VAD center if possible, otherwise to closest hospital if patient is hemodynamically unstable or to hospital of choice if patient is stable. Call the number on the device for the LVAD coordinator on call.
10. Bring the significant other if possible to act as an expert on the device in the absence of consciousness in the patient.
11. If the patient is unconscious, unresponsive to stimuli, and pulseless listen to the patient’s chest. If you hear the whirling sound of the LVAD, **DO NOT PERFORM CPR.** The LVAD device has been surgically placed into the left ventricle and CPR could dislodge this device, causing death. If you cannot hear the device then CPR should be performed per cardiac arrest protocol.
12. Monitor blood glucose level if any weakness, altered mental status or history of diabetes. Treat per Diabetes Protocol
13. Nothing by mouth, unless patient is known diabetic with hypoglycemia and is able to self-administer oral glucose paste, or a glucose containing beverage.
14. Above all else please remember that these patients, along with their families, have been well trained in the care of themselves and their devices. LISTEN TO THEM!
15. Evaluate a 12 lead ECG if chest pain or ischemic equivalent symptoms (i.e. abdominal pain above the umbilicus, nausea, dizziness, chest tightness or shortness of breath.)
16. If patient meets STEMI criteria on 12 lead ECG, follow Chest Pain Protocol
17. All dysrhythmias should be treated in accordance with appropriate Dysrhythmia Protocol.
18. For conscious electrical defibrillation, the patient may be sedated with **Versed** 1mg if the MAP is greater than 65mmHg.
19. Record and monitor continuous O2 saturation, sometimes not obtainable with LVAD patients. In addition you may utilize End Tidal Co2 capnography.
20. If evidence of dehydration, bolus 250 ml of Normal Saline with a max of 500 ml of NS until patient is normotensive, (= or > 65 MAP). If patient shows signs of Congestive Heart Failure (crackles on auscultation of lungs, JVD or peripheral edema) withhold fluid bolus.
21. If patient suffering from severe nausea or vomiting, follow Protocol Nausea and Vomiting.
22. Minimize on scene time when possible

**ALS LEVEL 2: MEDICAL CONTROL**

Return to:  **Contents at top**  **Adult medical protocols**  **Other Adult Cardiac Emergencies**
2.5
Adult
Neurological/Psychological/Behavioral Emergencies
2.5.1 Altered Mental Status/Coma

Purpose: This protocol is to be used for any patient with an altered mental status or unconscious for unknown reasons. Remember, the cause could be multifactorial. Look for clues at the scene, i.e. empty pill bottles, notes. Check for medical alert bracelets or necklace that may identify diabetics or other medical conditions. Use appropriate discretion regarding immediate intubation of patients who may quickly regain consciousness, such as hypoglycemics after D10 or opiate overdose cases after Narcan. Remember C-spine precautions if indicated.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Alcoholics with any evidence of head trauma and altered mental status must be considered to have a closed head injury until proven otherwise. Treat them as such including C-spine precautions.
5. Notify law enforcement for assistance with any combative or uncooperative alcoholic with an altered mental status. (b)
6. Assess for and document Glasgow Coma Scale
7. Consider restraining patient if a threat to self or others
8. Transport to designated hospital.

ALS LEVEL 1: PARAMEDIC ONLY

1. Consider need for advanced airway and always remain vigilant of the patient’s respiratory status. (a)
2. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardia and/or hypotensive, give a 250cc bolus then run at 100cc/hr.
3. Determine serum glucose level with Glucometer or Dextrostix;
   a. If sugar 60 mg/dl - 80 mg/dl; Sublingual glucose paste (if patient is able to swallow and handle secretions), or Hang 250 ml D10W and run 100 ml wide open (titrate to effect). Give second dose of 100 ml D10W if glucose still < 80 mg/d. when glucose rechecked in 5 minutes. If unable to establish IV consider Glucagon 1mg IM.
   b. If Blood sugar < 60 mg/dl; Hang 250 ml of D10W and run bolus of 200 – 250 ml wide open (titrate to effect). If no IV give Glucagon 1mg IM.
   c. If Blood sugar > 300mg/dL with signs of dehydration, administer bolus of IV normal saline 500cc then run in at 100cc/hr
4. If history of drug abuse, and patient has constricted pupils or respiratory depression, assist respirations as needed and administer Narcan 0.4 mg
IV/IM/IO/IN titrate to effect up to 2.0 mg (titrate to effect). Repeat as needed. Usual doses should not exceed 10 mg. (c), (d)

5. If history of Benzodiazepine usage, monitor/support respirations and report to Emergency Department staff.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact Medical Control or Medical Director for any questions or problems.

NOTE:
(a) Use appropriate discretion regarding immediate placement of an advanced airway in patients who may quickly regain consciousness, such as hypoglycemic after administration of D10 or opiate overdose cases after administration of Narcan. If the patient is conscious with control of the airway, oral glucose may be given
(b) Consider restraints if necessary for patient and/or personnel’s protection per restraint procedure protocol.
(c) Administration of Narcan to patients with chronic use of narcotics may induce withdrawal and/or violent behavior.
(d) Recent increase of synthetic opioids may require higher initial doses of Naloxone. Consider starting at 2 mg initial dose.
2.5.2 Behavioral / Violent / Psychiatric Emergencies

Purpose: This protocol is for patients with psychiatric problems. If patient is violent and an immediate threat to him/herself, EMS crew or bystander safety exists, restraints (chemical and/or physical) should be used to prevent patient from harming him/herself or others.

If patient is not violent, be observant for possibility of violence and avoid provoking patient. Particular caution should be exercised when any “non-lethal” law enforcement device (e.g. pepper spray, taser, etc.) has been employed. Respect the dignity of the patient. Teamwork between EMS personnel and law enforcement will improve patient care.

Typical findings for any violent and/or impaired patient:
- P – Psychological issues
- R – Recent drug / alcohol use
- I – Incoherent thought process
- O – Off (clothes) and sweating
- R – Resistant to presence / dialogue
- I – Inanimate objects / shiny / glass – violent
- T – Tough, unstoppable, superhuman strength
- Y – Yelling

Excited delirium syndrome is a state in which a person is in a psychotic and extremely agitated state. Mentally the patient is unable to focus and process any rational thought. The condition is brought on by overdose on stimulant or hallucinogenic drugs, drug withdrawal, or psychiatric patient not taking medication for significant amount of time.

Typical signs and symptoms to suspect excited delirium are elevated temperature, nudity, profuse sweating, and change from aggressive behavior to “instant tranquility.” These patients should be closely observed for cardiac and respiratory changes.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2, If indicated Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Rule out other causes other than psychiatric (e.g. hypoglycemia, hypoxia, CVA, drug overdose, ETOH).
4. If attempts at verbal control are unsuccessful, use reasonable physical restraints. Every attempt should be made to avoid injury to the patient when using physical restraint. If necessary, use standard restraining techniques and devices. Use sufficient padding on extremity restraints on elderly patients or others with delicate skin.

5. Avoid positional asphyxia!!! Do Not transport patient in a “hog tied” prone position. Transport patient lying on their side or supine. If patient still agitated, have law enforcement ride in back of ambulance. If law enforcement refuses to reposition a restrained prone patient on their side, law enforcement MUST ride in with patient.

6. Communicate in a calm and non-threatening manner.

7. Attach cardiac monitor and pulse oximeter if indicated (must be on any patient restrained, physical or chemical)

8. Monitor end tidal CO2 via nasal cannula on all physically and chemically restrained patients. If marked elevation or marked decrease, immediately assess your patient, and in particular, their respiratory status.

9. Constantly monitor and observe the patient to prevent injury.

10. Carefully document the rationale for the use of restraints.

11. All individuals being transported for psychological evaluation under the premise of a Baker Act (or equivalent document for involuntary evaluation/treatment) should be accompanied by a police officer. The paramedic in charge shall determine whether the police officer will ride in back or follow behind the EMS unit.

12. In those situations where a female patient is being transported and a female is not part of the EMS crew, the paramedic should attempt to have a female police officer accompany the patient to the hospital. This is imperative in situations such as possible rape. Also document beginning and ending mileage with dispatch via radio.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If altered mental status, determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give 100 ml **10% Dextrose** IV or **Glucagon** 1 mg IM or Sublingual glucose paste, May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 - 250 ml **10% Dextrose** IV or **Glucagon** 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to **Hyperglycemia Protocol**

2. Use chemical restraints in conjunction with physical restraint if the latter is unsuccessful in controlling violent behavior.

3. For Chemical restraint:
   a. Establish and IV of Lactated Ringers or Normal Saline at KVO (if patient’s extremity can be held down for the procedure [with assistance]), otherwise give medications IM
b. Administer one of the following:
   i. **Diazepam (Valium)** 5 – 10mg IV or IM. Higher dosing per medical control. (a)
   ii. **Midazolam (Versed)** 2 – 4 mg IV or IM or IN. May repeat x 1 PRN. Higher dosing per medical control. (a)
   iii. **Lorazepam (Ativan)** 2 mg IV/IM/IN; may repeat once (max dose of 4 mg) (a)
   iv. **Haldol (haloperidol)** 5 -10 mg IM and Benadryl 25 mg IM or IV.
   v. **Ketamine (Ketalar)** Up to 5 mg/kg IM x 1 dose (consider starting with 3 mg/kg IM) or 2 mg/kg IN (concentration 100 mg/ml) or IF IV established then give Ketamine 1 – 2 mg/kg IV slow over 30 – 60 seconds and titrate to effect. (Watch for increased bronchial secretions. If occurs, give Atropine 0.5 mg IV/IO every 5 minutes to maximum of 0.04 mg/kg or 3 mg total)

c. If additional sedation needed for severely agitated patient or if extrapyramidal side effects from medical control ordered Haldol, administer **Diphenhydramine (Benadryl)** 25 – 50 mg IV or IM. Use the higher dose for very large patients.

4. Consider Benzodiazepines (Versed, Valium or Ativan) after patient is sedated and restrained and IV access established for continued sedation if needed with respiratory and cardiac monitoring in place.
   a. **Diazepam (Valium)** 1-2 mg IV prn, (monitor cardiac, vitals and O2 sats, should be on Oxygen 2L/min NC)
   b. **Midazolam (Versed)** 0.5 – 1 mg IV prn, (monitor cardiac, vitals and O2 sats, should be on Oxygen 2L/min)
   c. **Lorazepam (Ativan)** 1 – 2 mg IV prn (monitor cardiac, vitals and O2 sats, should be on Oxygen 2 L/min)

5. Monitor any physically or chemically restrained patient closely for respiratory compromise and plan to intervene accordingly

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.

Note: Florida specific:
1. **BAKER ACT**
   Florida Statute Chapter 394.463—Mental Health relates to the authorization of police, physicians, and the courts to dictate certain medical care for persons who pose a threat to themselves or to others
2. **INCAPACITATED PERSONS LAW**
   Florida Statute Chapter 401.445 allows for examination and treatment of incapacitated persons in emergency situations. (Patients who are not capable of
informed consent as provided in FS Chapter 766.103 cannot refuse medical care.) Florida Statutes may be viewed online at www.leg.state.fl.us/statutes

(a) In some instances, IV administration may present a safety concern; in this case, IM or IN administration of sedatives may be the more desirable route.
2.5.3 Excited Delirium
Medical adult protocol

**Purpose:** This protocol is to be used on patients suspected of being in a state of excited delirium. Excited delirium is reported to result from substance intoxication (especially cocaine, Spice and Bath Salts), psychiatric illness, alcohol withdrawal, head trauma, or a combination of these. Excited delirium is sometimes called **excited delirium syndrome** if it results in sudden death (usually via cardiac or respiratory arrest), an outcome that is sometimes associated with the use of physical control measures, including police restraint and tasers. The signs and symptoms for excited delirium may include:

- Paranoia
- Insensitivity to pain
- Psychomotor agitation
- Anxiety
- Disorientation
- **Hyper-aggression**
- Tachycardia
- Hallucination
- Incoherent speech or shouting
- **Seemingly superhuman strength or endurance (typically while trying to resist restrain efforts)**
- Hyperthermia (overheating)/profuse sweating (even in cold weather)

Other medical conditions that can resemble excited delirium are panic attack, hyperthermia, diabetes, head injury, delirium tremens, and hyperthyroidism.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **THESE PATIENTS ARE HYPER-AGITATED AND CAN HAVE SUPER-HUMAN STRENGTH. EMS TEAM MEMBERS MUST WORK CLOSELY WITH LAW-ENFORCEMENT IN MANAGING THESE PATIENTS. EFFECTIVE TEAM COMMUNICATION IS KEY.**

2. **YOU MUST HAVE SUFFICIENT NUMBER OF TEAM MEMBERS TO MANAGE THESE PATIENTS.**

3. **Initial Patient Assessment Protocol 2.1.1** when able to gain control of patient

4. **Airway Assessment/Management Protocol 2.1.2.** Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%). (Patient is using a lot of oxygen during hyper-metabolic state)

5. Rule out other causes other than psychiatric (e.g. hypoglycemia, hypoxia, CVA, drug overdose, ETOH).

6. If attempts at verbal control are unsuccessful, use reasonable physical restraints until such time as patient can be medicated. Use the least
restrictive method of restraint; allow the patient to correct inappropriate behavior. Every attempt should be made to avoid injury to the patient when using physical restraint. If necessary, use standard restraining techniques and devices. Use sufficient padding on extremity restraints on elderly patients or others with delicate skin.

7. **Avoid positional asphyxia!!** Do not transport patient in a “hog tied” prone position. Transport patient lying on their side or supine. If patient still agitated, law enforcement should accompany the patient to the hospital in back of ambulance.

8. Communicate in a calm and non-threatening manner.

9. Attach cardiac monitor and pulse oximeter as soon as it is feasible (must be on any patient restrained, physical or chemical)

10. Constantly monitor and observe the patient to prevent injury.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If it is not possible to safely manage patient due to hyper-aggression and agitation, administer one of the following:
   a. **Versed** 2.5 – 5 mg IM/IN via atomizer (or IV if able to safely get an IV) may repeat 3 – 5 minutes PRN up to 10 mg.
   b. **Diazepam (Valium)** 5 – 10mg IM (or IV if able to safely get an IV) may repeat x 1 PRN.
   c. **Haldol 5 – 10 mg** IM (DO NOT GIVE HALDOL IV!) followed by **Diphenhydramine (Benadryl)** 25 mg IM or IV. Must be on cardiac monitor
   d. **Ketamine (Ketalar)** Up to 5 mg/kg IM x 1 dose, (consider starting with 3mg/kg IM) or 2 mg/kg IN via atomizer (concentration 100 mg/ml), OR alternatively, if the patient already has an IV, then give Ketamine 1 – 2 mg/kg IV slow over 30 – 60 seconds and titrate to effect. May repeat in 20 minutes if desire effects are not met.
   e. Watch for hypersalivation/increased bronchial secretions. Give **Atropine** 0.5 mg IV/IO every 5 minutes to maximum of 0.04 mg/kg or 3 mg total

2. After adequate sedation, if IV had not been established before, start IV of Lactated Ringers or NS at KVO. Bolus with 250 mg increments as needed for systolic BP < 90 mm Hg and/or HR > 120.

3. Consider Benzodiazapines (Versed, Valium) after patient is sedated and restrained and IV access established for continued sedation if needed with respiratory and cardiac in place.

4. If altered mental status, and when safe to do so, determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml **10% Dextrose** IV or **Glucagon** 1mg IM or Sublingual glucose paste, May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 - 250 ml **10% Dextrose** IV or **Glucagon** 1 mg IM
c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO

d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol

5. If patient body temperature exceeds 102° F, move patient to cooler environment, and remove clothing. Cool aggressively with wet sheets, cool packs, and/or evaporative airflow. Avoid ice packs and cold water immersion. Lower body temperature to 102° F (39C).

6. If patient goes into cardiac arrest, treat accordingly and administer 1 amp of Sodium Bicarb early as they are usually very acidic.

7. Monitor any physically or chemically restrained patient closely for respiratory compromise and plan to intervene accordingly

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.

Return to: **Contents at top**  [Adult Neuro/Psy/Behavior Index](#)
2.5.4 Seizures
Adult Medical Protocol

Purpose: This protocol should be used when the patient has witnessed continuous convulsions (generalized tonic-clonic seizure or Grand Mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation. Consider underlying etiology, such as: hypoglycemia, drug overdose, head injury, or fever. Other types of seizures include: absence (Petit Mal), simple partial (focal motor and Jacksonian), complex partial (Psychomotor or Temporal Lobe), atonic (drop attacks), and myoclonic. When the patient is continuously showing signs of these other types of seizures, medical supportive care should be initiated and the paramedic should contact medical control for further direction. Females in their second or third trimester of pregnancy (≥ 20 weeks gestation) that are seizing should be assumed to have eclampsia. It should also be noted that eclampsia can occur postpartum (≤ 1 week).

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ to 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Assess for and document the Glasgow Coma Scale
5. If not actively seizing:
   a. Open airway and suction PRN.
   b. Proceed with secondary survey.
   c. Obtain history.
6. If actively seizing:
   a. Protect patient from injury.
   b. Do not attempt to insert tongue blade or oral airway.
   c. Suction p.r.n.
   d. Nasopharyngeal airway may be useful.
7. If recent seizure, and patient is postictal:
   a. Place in recovery position.
   b. Suction p.r.n.
   c. Transport.

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1- 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. If Eclamptic female (go to Eclampsia Protocol), administer Magnesium Sulfate 4gms IV (mixed in 50 ml of D5W given over 5 – 10 minutes)
3. If seizing, administer one of the following benzodiazepines:
   a. **Midazolam (Versed) 5 mg IM or 10 mg IN (5mg/ml concentration) as first line or 1 – 2.5 mg IV/IO.** May repeat each x 1 PRN
   b. **Diazepam (Valium) 5 – 10mg IV/IO or IM**
   c. **Lorazepam (Ativan) 2 – 4 mg IV/IO or IM**

4. Determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; 100 ml **10% Dextrose IV or Glucagon 1mg IM.** May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250ml **10% Dextrose IV** (titrate to effect) or **Glucagon 1 mg IM**
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to **Hyperglycemia Protocol**

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.

Return to: [Contents at top](#)  [Adult Neuro/Psy/Behavior Index](#)  [Adult Medical Protocols](#)
2.5.5 CVA / Stroke
Adult Medical Protocol

**Purpose:** This protocol is used for those patients exhibiting signs consistent with acute stroke/CVA/"Brain Attack" (altered mental status, slurred speech, loss of function of any body part, hemiplegia, loss of vision, weakness of facial muscles, loss of sensation, drooling, etc.). Other causes should be ruled out (hypoglycemia, drug overdose, hypoxia, etc.).

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous stroke/TIA</td>
<td>Impaired understanding of speech</td>
<td>TIA</td>
</tr>
<tr>
<td>Previous neurological deficit</td>
<td>Aphasia/dysarthria</td>
<td>Seizure</td>
</tr>
<tr>
<td></td>
<td>Weakness/hemiparesis</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Facial droop</td>
<td>Drug ingestion</td>
</tr>
<tr>
<td>Heart disease</td>
<td>Poor coordination/balance</td>
<td>Tumor</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Loss of peripheral vision</td>
<td>Trauma</td>
</tr>
<tr>
<td>Anticoagulant medications</td>
<td>Syncope, dizziness/vertigo</td>
<td>Stroke:</td>
</tr>
<tr>
<td>Family history</td>
<td>Headache, vomiting, stiff neck seizures</td>
<td>• Ischemic</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td>• Hemorrhagic</td>
</tr>
</tbody>
</table>

**STROKE ALERT INCLUSION CRITERIA**

- Utilize the Rapid Arterial Occlusion Evaluation (RACE) scale
- Time last seen normal is less than 24 hours (Includes Wake Up Stroke). Many hospitals use 6 hours as cut off if not a comprehensive stroke center.
- Deficit not likely due to head trauma, TIA or stroke mimic.
- Blood glucose is greater than 60 OR symptoms don’t resolve after correction of BGL.
- Paramedic judgment; altered mental status, vision (loss of vision or double vision), loss of sensation, poor coordination & balance, severe headache, nausea & vomiting, dizziness/severe vertigo, dysarthria/expressive aphasia.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2: Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox of ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%)
3. When CVA is suspected, transport to the hospital should not be delayed. Determine if patient has facial droop, abnormal speech, or arm drift.
4. If possible place in Semi-Fowler’s position with head of bed elevated 30 degrees for transport (if patient unable to tolerate, transport flat).
5. Assess for and document Glasgow Coma Scale
6. Attach cardiac monitor and pulse oximeter.
7. Keep patient NPO.
8. Determine time last seen normal or without symptoms. If onset of symptoms is within 6 hours notify hospital of a “stroke alert”.(a)(b)
9. Try to ascertain if patient had a seizure prior to onset of “stroke” symptoms as he/she may have a condition called Todd’s paralysis, which is NOT treated with thrombolytics. Relay this information to the hospital

**TRANSPORT: DESTINATION DETERMINATION**

10. Cincinnati Pre-hospital Stroke Scale: (CPSS)
   a. Assess for the unilateral presence of at least one of the following:

   **Item Description**
   1. Facial droop: Ask the patient to smile. Watch for weakness on one side of the face.
   2. Arm drift: Ask the patient to hold both arms out with palms up and eyes closed for 10 seconds. Watch for a drift of one side. A positive result is present if there is weakness in one arm. Weakness in both arms or normal strength is a negative test result.
   3. Slurred speech: Ask the patient to repeat a simple sentence such as “The sky is blue in Cincinnati.” Inability to repeat the words correctly and intelligibly is a positive result.

   If CPSS positive, proceed to Rapid Arterial Occlusion Evaluation: (RACE)
   Any patient presenting with stroke symptoms of any kind, should, at minimum be transported to a designated stroke center (either Primary or Comprehensive).(a)(b)

11. Rapid Arterial Occlusion Evaluation: (RACE)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Instruction</th>
<th>Result</th>
<th>Score</th>
<th>NIHSS Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Palsy</td>
<td>Ask patient to show their teeth (smile)</td>
<td>Absent (symmetrical movement)</td>
<td>0</td>
<td>0-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mild (slight asymmetrical)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate to Severe (completely asymmetrical)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Arm Motor Function</td>
<td>Extending the arm of the patient 90° (if sitting) or 45° (if supine)</td>
<td>Normal to Mild (limb upheld more than 10 seconds)</td>
<td>0</td>
<td>0-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate (limb upheld less than 10 seconds)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe (patient unable to raise arm against gravity)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Leg Motor Function</td>
<td>Extending the leg of the patient 30° (in supine)</td>
<td>Normal to Mild (limb upheld more than 5 seconds)</td>
<td>0</td>
<td>0-4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate (limb upheld less than 5 seconds)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe (patient unable to raise leg against gravity)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Head &amp; Gaze Deviation</td>
<td>Observe eyes and head deviation to one side</td>
<td>Absent (eye movements to both sides were possible and no head deviation was observed)</td>
<td>0</td>
<td>0-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Present (eyes and head deviation to one side was observed)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Aphasia (R side)</td>
<td>Difficulty understanding spoken or written words. Ask patient to follow two simple commands: 1. Close your eyes. 2. Make a fist.</td>
<td>Normal (performs both tasks requested correctly)</td>
<td>0</td>
<td>0-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate (performs only 1 of 2 tasks requested correctly)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe (Cannot perform either task requested correctly)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Agnosia (L side)</td>
<td>Inability to recognize familiar objects. Ask patient: 1. “Whose arm is this?” (while showing the affected arm) 2. “Can you move your arm?”</td>
<td>Normal (recognizes arm, and attempts to move arm)</td>
<td>0</td>
<td>0-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate (does not recognize arm or is unaware of arm)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Severe (does not recognize arm and is unaware of arm)</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**RACE SCALE TOTAL**

12. For any patient with a Rapid Arterial Occlusion Evaluation (RACE) score of 5 or above, the patient should be transported to a Comprehensive Stroke Center, if available.
ALS LEVEL 1: PARAMEDIC ONLY

1. Advanced airway if patient does not have an intact gag reflex or for markedly decreased LOC, inability to maintain a patient airway, or for GCS <= 8.

2. Initiate IV lactated Ringer's or normal saline at 75cc/hr for patients 12 yrs. or older. Obtain two intravenous lines if possible.

3. Determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, may repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 - 250 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol

4. If a stroke patient is found to be hypertensive, do not treat in the pre-hospital setting unless ordered to do so by medical control. Hypertension could represent a compensatory response to the stroke to increase the cerebral perfusion pressure.

5. Treat seizures with one of the following Benzodiazepins:
   a. Versed 5 mg IM or 10 mg IN (5mg/ml concentration) or 1 – 4 mg IV/IO
   b. Valium 5-10 mg IV (may repeat x 1). Monitor respiratory efforts and intervene as indicated.
   c. Lorazepam (Ativan) 2 – 4 mg IV/IO or IM

ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control if seizure did not respond to Valium or Versed

2. Contact medical control for treatment of agitation with:
   a. Valium 2-5 mg IVP/IM. May repeat every 10 minutes to a maximum of 10 mg. Or
   b. Versed 2 mg IV/IM/IN. May repeat x 1 PRN.

3. In the presence of acute stroke (CVA), hypertension may be lowered in special circumstances only with a physician order.

The Cincinnati Prehospital Stroke Scale is a system used to diagnose the presence of a stroke in a patient. It tests three signs for abnormal findings which may indicate that the patient is having a stroke. If any one of the three tests shows abnormal findings, the patient may be having a stroke and should be transported to a hospital as soon as possible.

1. **Facial droop:** Have the person smile or show his or her teeth. If one side doesn't move as well as the other so it seems to droop, that could be sign of a stroke.
   - Normal: Both sides of face move equally
   - Abnormal: One side of face does not move as well as the other (or at all)

2. **Arm drift:** Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds. If one arm does not move, or one arm winds up drifting down more than the other, that could be a sign of a stroke.
3. **Speech:** Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. If the person slurs the words, gets some words wrong, or is unable to speak, that could be sign of stroke.

- **Normal:** Patient uses correct words with no slurring
- **Abnormal:** Slurred or inappropriate words or mute

Patients with 1 of these 3 findings as a new event have a 72% probability of an ischemic stroke. If all 3 findings are present the probability of an acute stroke is more than 85%

The **Rapid Arterial Occlusion Evaluation (R.A.C.E.)** is based on an abbreviated version of the National Institutes of Health Stroke Scale (NIHSS), the “gold standard” for evaluating stroke victims. The maximum score is 9 (not 11) because the evaluation of the final two components is done based on the left or right side presentation, not both simultaneously.

The NIHSS equivalent is provided for the benefit of receiving facility. The NIHSS score may be higher than the “snap shot” provided in the R.A.C.E. because the NIHSS evaluates additional areas not covered in the R.A.C.E. which is short by design for EMS field use. The R.A.C.E. is a universal **quantitative** tool that is needed to determine the severity of a stroke and to identify strokes with large vessel occlusions (LVO) which would benefit going to a Comprehensive Stroke Center (CSC). This is similar to a 12-lead EKG identifying a STEMI and being transported to a PCI Cardiac Center for intervention.

The Cincinnati (CPSS – which is incorporated into this protocol), the F.A.S.T., the Miami (MENDS), the Los Angeles (LAPSS) stroke scales are good scales that offer high degree of sensitivity for strokes, but they are all **qualitative** scores (positive or negative) and not **quantitative** (severity). The cut-score of 5 is based on the significant global accuracy of R.A.C.E. predicting an LVO and its close correlation to the NIHSS, as demonstrated in several peer reviewed, multi-center studies.

**NOTE:**
(a) Minimize the Stroke Alert on-scene time to 10 minutes or less.
(b) Continually reassess the patient to determine if his/her symptoms are worsening or improving, and advise the stroke center of any changes.
Stroke Protocol Checklist

☐ Assure ABC’s.
☐ Administer oxygen prn O2 sat < 94% by nasal cannula.
☐ Obtain symptom duration, time of onset or last time patient was seen normal.
☐ If patient is a “stroke alert” patient then transport in most expeditious mode possible.
☐ Position head of bed 30 degrees, if patient unable to tolerate, transport flat.
☐ If symptoms are within 5 - 6 hours of onset notify receiving facility of a “stroke alert”.
☐ Cardiac monitor. Document cardiac rhythm.
☐ Pulse ox.
☐ Vital signs.
☐ Initiate intravenous line. Establish two if possible. Run fluids on 12 yrs or older at 75cc/hour.
☐ Determine serum glucose level
☐ Treat seizures with Valium 5-10 mg.
☐ Keep patient NPO.
☐ History of seizures?
☐ Facial droop?
☐ Abnormal speech?
☐ Arm drift?
☐ Glasgow coma scale.
☐ Do not lower blood pressure in suspected strokes.
☐ Document all protocol items on run report.
☐ Bring a family member to the hospital if it is possible, to answer questions regarding the patients condition.
2.5.6 Syncope
Adult Medical Protocol

Purpose: This protocol should be used for patients with a chief complaint of syncope. Consider history and possibility of dysrhythmia, medication side effects, glucose imbalance, inner ear disorder, CVA, TIA, and MI. Bradycardia with hypotension may be due to inferior wall MI associated with right ventricular infarction (confirm on 12 lead ECG V4R ST elevation). When an inferior wall MI is associated with right ventricular MI, use extreme caution giving nitrates (Nitroglycerine). If bradycardia and hypotension exists, pacing and IV fluids may improve the patient’s hemodynamic status.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Obtain pertinent history:
   a. Time of syncopal episode and length of unconsciousness.
   b. Patient's position at time of syncope.
   c. Symptoms preceding event (dizziness, nausea, chest pain, headache, seizures, etc.)
   d. Medications / ETOH / drug usage
   e. Relevant past medical history.
4. Assess for and document the Glasgow Coma Scale
5. Attach cardiac monitor and pulse oximeter if indicated

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. Determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, may repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; give 100 - 250 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hypoglycemia Protocol.
3. Perform 12 lead ECG. Transmit 12 Lead ECG to destination hospital, if available. If inferior wall MI is identified (ST segment elevation in leads II,
III, and AVF), perform additional 12 Lead ECG with V4R to confirm/rule out concurrent right ventricular MI.

4. If any dysrhythmias, go to the appropriate protocol.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.

Return to: [Contents at top](#)  [Adult Neuro/Psy/Behavior Index](#)  [Adult Med Protocols](#)  [Hypertension](#)
2.6

Adult Toxicology Emergencies
2.6.1 Bites and Stings
Adult Medical Protocol

**Purpose:** This protocol is for patients who have been bitten or stung by snakes, animals, humans, insects, and spiders. If any marine life was involved please refer to the separate [Marine Envenomation Protocol](#). If you have any questions or concerns about the treatment of a particular bite or sting, Contact Poison Information Center (1-800-222-1222). The ALS Level 1 and 2 procedures below apply to all the bites and stings, no matter what the cause. Do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat. Apply sterile dressings to all wounds when appropriate.

**Procedure:**

**SNAKEBITE**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2.** If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain oxygen saturation ≥ to 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Kill the snake if concerned it is poisonous, if practical, and bring the dead snake to the emergency department (or identify). Do not mutilate the snake's head.
5. If bite on extremity, immobilize affected extremity in a neutral/level position. Patient should remain still. A constricting band may be of some use in a few circumstances such as immediate care not available or prolonged transport time. Contact med control for order/advise.
6. Remove watches, rings, and jewelry from affected extremity (or all jewelry if general anaphylaxis).
7. Wash area of bite with copious amounts of water.
8. Check temperature and pulse distal to bite on extremity and mark level of swelling and time with pen every 15 minutes
9. If obvious severe reaction developing from obvious poisonous snake, i.e. large amount of ascending edema and ecchymosis from bite of rattlesnake or water moccasin, alert medical control as early as possible so they can start acquiring anti-venom from the pharmacy, some of which takes time to prepare.

**General Information:**

*Pit Vipers:* rattlesnake, water moccasin, and copperhead typically cause puncture wounds. There may be ecchymosis at site, localized pain, swelling, weakness, tachycardia, nausea, shortness of breath, dim vision, vomiting, or shock.

*Coral Snakes:* Usually chewed wound. There may be slight burning pain, mild swelling, blurred vision, drooping eyelids, slurred speech, drowsiness, salivation and sweating, nausea and vomiting, shock, respiratory difficulty, paralysis, convulsions, and coma.
DOG, CAT, AND WILD ANIMAL BITES

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox greater than or equal to 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Remove stinger by scraping skin with edge of flat surface (e.g. credit card). Do not attempt to pull stinger out, as this may release more venom.
5. Clean area with soap and water.

INSECT STING (INCLUDING: CENTIPEDES, SCorpIONS, AND SPIDERS)

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox greater than or equal to 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Remove stinger by scraping skin with edge of flat surface (e.g. credit card). Do not attempt to pull stinger out, as this may release more venom.
5. Clean area with soap and water.

HUMAN BITES

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox greater than or equal to 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Clean area with soap and water.

ALS LEVEL 1: PARAMEDIC ONLY (For all the above causes):
1. Initiate IV (if indicated, in unaffected extremity) Lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1- 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. Refer to Allergic Reaction Protocol if indicated
3. If severe pain, refer to Pain Protocol.
ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director if any concerns or any questions.

Return to:  Contents at top       Adult Med Protocols       Adult toxicology index
2.6.2  Toxicology - (Drug Overdose /Poisoning)
Adult Medical Protocol

**Purpose:** This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure. A history of the events leading to the illness or injury should be obtained from the patient and/or bystanders to include: What drugs, poisons, or other substance(s) was the patient exposed? Consider multiple substances, especially on overdoses.

- Route of exposure (ingested, inhaled, injected, surface contamination.)?
- Type and amount of poison/drug?
- Duration of symptoms?
- Is patient depressed, suicidal? History of previous overdose?
- Accidental? Nature of accident?
- Duration of exposure (if applicable)
- Has patient vomited? If so, when?
- History of drug or ETOH usage.
- Pre-existing medical problems

Contact Poison Information Center (1-800-222-1222) as needed for assistance and advice. The following is a partial list of drugs/chemicals you may encounter in overdose/exposure situations and a brief review of the signs and symptoms.

**CNS DEPRESSANTS:** Altered mental status, respiratory depression, hypotension, bradycardia, pulmonary edema, coma, and constricted pupils (opioids only).

**Benzodiazepines:** generic (trade name)

- Alprazolam (Xanax)
- Chlordiazepoxide (Librium)
- Clonazepam (Klonopin)
- Clorazepate (Tranxene)
- Diazepam (Valium)
- Flunitrazepam (Rohypnol)
- Flurazepam (Dalmane)
- Halazepam (Paxipam)
- Lorazepam (Ativan)
- Midazolam (Versed)
- Oxazepam (Serax)
- Prazepam (Centrax)
- Quazepam (Doral)
- Temazepam (Restoril)
- Triazolam (Halcion)

**Barbiturates:** generic (trade name)

- Butabarbital sodium (Butisol Sodium)
- Mephobarbital (Mebaral)
- Pentobarbital sodium (Nembutal Sodium)
- Phenobarbital
- Secobarbital sodium (Seconal Sodium)

**Designer Drugs:**
- Blue nitro, GHB

**Opioids, Narcotics, Synthetics and Combinations:** generic (trade name)
- Acetaminophen & Codeine phosphate (Tylenol #3, Tylenol #4)
- Alfentanil HCL (Alfenta)
- Alfentanyl (Alfenta)
- Alphaprodine (Nisentil)
- Aspirin & codeine phosphate (Empirin with Codeine #3 and #4)
- Belladonna and opium (B & O Supprettes)
- Buprenorphine HCL (Buprenex)
- Butalbital, aspirin, caffeine, Codeine phosphate (Fiorinol or Fioricet with Codeine)
- Butorphanol (Stadol)
- Codeine
- Dextromethorphan
- Diamorphine (Heroin)
- Diacetymorphine (Heroin)
- Dihydrocodeine bitartrate, acetaminophen, caffeine (DHC plus)
- Diphenoxylate HCL, atropine sulfate (Lomotil)- no miosis
- Difenoxin HCL with atropine sulfate (Motofen)
- Fentanyl citrate (Sublimaze)
- Fentanyl transdermal (Duragesic)
- Fentanyl citrate & droperidol (Innovar)
- Hydromorphone HCL (Dilaudid, Hydrostat)
- Hydrocodone bitartrate (Lortab, Hycodan, Anexasia)
- Hydrocodone bitartrate & acetaminophen (Hydrocet, Loracet, Vicodin)
- Loperamide HCL (Imodium, Imodium A-D)
- Levorphanol tartrate (Levo-Dromoran)
- Meperidine HCl (Demerol) – no miosis
- MeperidineHCl & promethazine HCl (Mepergan) – no miosis
- Methadone HCl(Dolophine)
- Morphine sulfate (Astramorph/PF, Duramorph, Infumorph 200, Infumorph 500, MS Contin, MSIR, Oramorph, Resploc, Roxanol)
- Nalbuphine HCL(Nubain)
- Napsylate (Darvocet-N)
- Oxymorphone HCl (Numorphan)
- Oxycodone (Percodan, Percocet, Tylox, Roxicodone)
- Pentazocine HCl (Talwin, Talacen)
- Propoxyphene HCl (Darvocet-N)
- Propoxyphene HCl & acetaminophen (Wygesic)
- Sufentanil (Sufenta)

**Sedative Hypnotics:** generic (trade name)
- Compoz
- Estazolam (Prosom)
- Etomidate (Amidate)
- Ethchlorvynol (Placidyl)
- Propofol (Diprivan)
- Sleep-ez
- Sominex
- Zolpidem tartrate (Ambien)

**SSRI- Selective Serotonin Reuptake Inhibitors:** generic (trade name)
- Fluoxetine (Prozac)
- Paroxetine (Paxil)
- Sertraline (Zoloft)
- Fluvoxamine (Luvox)
- Citalopram (Celexa)

**CNS STIMULANT:** Dilated pupils, agitation, paranoia, bizarre behavior, PVCs, tachycardia, hypertension, hyperthermia, seizures, etc.

**Cocaine:**
- Crack
- Cocaine

**Amphetamines:**
- Amphetamine variants (DMA, PMA, PMMA, STP, MDA, MDMA, TMA, DOM, DOB)

**Designer Drugs:**
- Ecstasy

**DIGITALIS:** Digitalis toxicity should be suspected in patients who are taking digitalis and have a dysrhythmia associated with digitalis toxicity (e.g. bradycardia, AV blocks with rapid ventricular response, supraventricular tachycardia, ventricular ectopy, and other ECG changes: Wide PR interval, short QT interval-rate dependent, spoon-shaped ST segment, peaked T wave). The oleander tree can also cause a digitalis type toxicity, which will cause the same type of dysrhythmias and requires the same treatment.

**Digitalis:** generic (trade name)
- Digoxin (Lanoxicaps, Lanoxin, Digoxin)
- Digitoxin (Crystodigin)

**HALLUCINOGEN:** Illusions, hallucinations, poor perception of time and distance, possible paranoia, anxiety, panic, unpredictable behavior, emotional instability, possible flashbacks, dilated pupils, and rambling speech.
- LSD (acid, microdot)
- Mescaline and Peyote (mesc, buttons, cactus)
TRICYCLIC ANTIDEPRESSANTS: CNS depression, tachycardia, dilated pupils, respiratory depression, slurred speech, twitching and jerking, seizures, ST and T wave changes, wide QRS complex, R waves in lead AVR, S waves in leads AVL and lead I, and shock.

Tricyclic Antidepressant:
- Doxepin HCl (Adapin, Sinequan)
- Amitriptyline HCl (Elavil, Endep)
- Protriptyline HCl (Vivactil)
- Chlordiazepoxide & amitriptyline HCl (Limbitrol)
- Trimipramine maleate (Surmontil)
- Perphenazine & amitriptyline HCl (Etrafon, Triavil)
- Clomipramine HCl (Anafranil)
- Amoxapine (Asendin)
- Desipramine HCl (Norpramin)
- Nortriptyline (Pamelor, Aventyl)
- Imipramine pamoate (Tofranil)

Cyclic Antidepressants:
- Venlafaxine (Effexor)

ORGANOPHOSPHATES: Excessive; salivation, lacrimation (tears)/sweating, urinary incontinence, diarrhea, gastrointestinal distress, emesis and bradycardia (tachycardia may occur). CNS; anxiety, restlessness, emotional lability, tremor, headache, dizziness, mental confusion, delirium, hallucinations, and seizures.

Insecticides:
- Diazinon
- Orthene
- Malathion
- Parathion
- Chlorpyrifos

PHENOTHIAZINE: CNS; CNS depression, Dystonic reaction, extrapyramidal symptoms, tarsive dyskinesia, neuroleptic malignant syndrome. Cardiovascular; tachycardia, prolonged QT interval, widened QRS, AV blocks, torsade de pointes. Dilated pupils, seizures, cardiac dysrhythmias

- Chlorpromazine (Thorazine)
- Prochlorperazine maleate (Compazine)
- Trifluoperazine (Stelazine)
- Thioridazine (Mellaril)
- Thiothixene (Navane)

Procedure:
BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Assess for and document the Glasgow Coma Scale
5. Collect all pill bottles, empty or full, and check for suicide notes (if applicable). Transport any/all information or items that may assist in the treatment of the patient to the emergency department.
6. If inhaled poison:
   a. Assure personal safety.
   b. Remove patient to fresh air.
   c. Administer 100% oxygen via non-rebreather mask.
7. If skin or eye contamination:
   a. Assure personal safety.
   b. Remove contaminated clothes.
   c. Irrigate with water or normal saline.
8. If actively seizing:
   a. Protect patient from injury.
   b. If seizing before airway was controlled, do not attempt to insert tongue blade or oral airway. Nasopharyngeal airway may be useful.
   c. Suction p.r.n.

ALS LEVEL 1: PARAMEDIC ONLY
1. Consider need to support respirations/ventilation including need for intubation at any time if respiratory status deteriorates.
   a. Monitor respiratory status frequently.
   b. Use appropriate discretion regarding immediate intubation of patients who may quickly regain consciousness, such as hypoglycemics after D10 or opiate overdose after Naloxone.
2. If condition warrants, initiate IV lactated Ringer’s or Normal Saline at 125ml/hr (draw blood sample if possible prior to any drug administration). If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1 - 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children).
   a. Recheck vital signs and lung exam in-between each increment.
   b. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
3. If altered mental status, determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM. May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol.

4. Treat any dysrhythmias per appropriate protocol.
5. If actively seizing administer one of the following benzodiazepines:
a. Diazepam (Valium) 5 – 10mg IV or IM  
b. Midazolam (Versed) 5mg IM/IN or 2 mg IV. May repeat x 1 PRN.  
c. Lorazepam (Ativan) 2 – 4 mg IV/IO or IM

6. If patient is experiencing chest pain, go to chest pain protocol
7. If patient combative, consider need for physical and chemical restraints (see psychiatric emergency protocol)
8. If bronchospasm is present give an Albuterol (Ventolin) nebulized treatment, containing 2.5mg of Albuterol pre-mixed with 2.5 ml normal saline. May repeat x 2 PRN. Add Ipratropium Bromide (Atrovent) 0.5 mg (0.5 ml) to the first neb treatment only. Do not give Albuterol or Ipratropium Bromide if heart rate is ≥ 140.
9. If ingestion is suspected with unknown substance and there is no altered mental status and caustic ingestion can be ruled out, contact poison control (1-800-222-1222) for advise on using Activated Charcoal. If instructed to administer and if patient is willing/cooperative; place patient in Fowler’s position and administer Activated Charcoal 50 – 100 grams po. If the timing of the ingestion has been less than an hour of EMS’s arrival, hold off giving the charcoal until you discuss with medical control as some physicians may instead, choose to lavage the patient on arrival to the emergency department
10. For symptomatic CNS DEPRESSANT OVERDOSE:
   a. Do 12 lead ECG. If QRS complex is wide (> 0.12 seconds), administer Sodium Bicarbonate 1 mEq/kg IV  
   b. If respiration is depressed, administer Naloxone (Narcan) 0.4 mg titrat to effect up to 2mg IV/IO/IM/IN. May repeat Naloxone (Narcan) PRN, not to exceed 10 mg.(a),(b),(c)
11. For symptomatic STIMULANT OVERDOSE:
   a. If patient is hyperthermic (hot to touch), aggressively cool patient  
   b. NOTE: Beta-blockers are contraindicated in cocaine overdose!
12. For symptomatic DIGITALIS TOXICITY:
   a. Treat tachydysrhythmias with medication per specific protocol. Avoid the use of Calcium Chloride.  
   b. If unstable tachycardia > 150/min, synchronize cardiovert with energy settings between 5 – 20 jules  
   c. If unstable bradycardia with wide QRS (> 0.12 seconds), give Sodium Bicarbonate 1 mEq/kg
13. For symptomatic TRICYCLIC ANTIDEPRESSANTS OVERDOSE:  
   a. Do 12 lead ECG. If QRS complex is wide (> 0.12 seconds), administer Sodium Bicarbonate 1 mEq/kg IV  
   b. ROMAZICON, PROCAINAMIDE, AND LABETALOL (ALL BETA BLOCKERS) ARE CONTRA-INDICATED IN TRICYCLIC ANTIDEPRESSANT OVERDOSE.
14. If symptomatic **ORGANOPHOSPHATE POISONING**:
   a. **Atropine** 0.03 mg/kg IVP every 5-10 minutes until atropinization occurs. (Peds: 0.05 mg/kg IM [maximum 3 mg] or 0.02 mg/kg IV q 5-10 minutes till atropinization occurs).

15. If symptomatic **PHENOTHIAZINE** (Thorazine, Compazine, Stelazine, Mellaril, Navane)
   a. **Diphenhydramine (Benadryl)** 25-50mg IV or deep IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any problems or concerns.

Note:
(a) Use appropriate discretion regarding immediate intubation of patients who may quickly regain consciousness following treatment.
(b) If patient is a suspected opioid addict, the administration of Narcan should be titrated to increase respirations to normal levels without fully awakening patient to prevent hostile and confrontational episodes. Consider restraining patient. Narcan may need to be repeated in 20-30 minutes to maintain effect.
(c) If administering Naloxone (Narcan) via prepackaged product Nasal Spray then the dose is 4mg/0.1 ml spray IN.

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2.6.3 Marine Envenomations
Adult Medical Protocol

Purpose: This protocol is for patients who are injured by any type of marine life. Call Poison Information Center (1-800-222-1222) as needed for assistance. If non-scalding hot soaks are advised, do not delay transport. Soak enroute to hospital.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated, Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated

For Sponges:
1. Gently dry skin and remove spicule. Adhesive tape may aid in removal.
2. Soak with 5% vinegar.

For Coelenterates (JELLYFISH):
1. Rinse wound with saltwater or seawater
2. Do not rub skin, do not apply ice, and do not rinse with fresh water.
3. Inactivate toxin with 30 minute soak using a 5% vinegar soak.
4. Remove remaining nematocysts with razor.
5. Consider topical anesthetics once nematocyst is removed.

For Echinodermata (Starfish, sea urchins, sea cucumber):
1. Immerse in non-scalding hot water for pain relief for 30 – 90 minutes (do not delay transport, soak en-route)
2. Remove any remaining spines.
3. After hot water soak, 5% vinegar soaks.

For Mollusks (Cone shells):
1. Hot water (non-scalding) immersion for pain relief
2. Be prepared for cardiac or respiratory support

For Stingrays:
2. Hot water (non-scalding) soaks for pain relief.

For Scorpion fish:
1. Hot water (non-scalding) soaks for pain relief and venom inactivation.
2. Copious irrigation with removal of any visible spines.
3. Patient may require stonefish antivenin for severe envenomation.

For Catfish:
1. Hot water (non-scalding) soaks for pain relief and venom inactivation.
2. Copious irrigation with removal of any visible spines.

**For Sea Snakes:**

1. Immobilize bitten extremity.
2. Apply pressure immobilization bandage for venous occlusion. Wrap the limb with a broad pressure bandage, starting at the wound site and extending as high up the extremity as possible. The bandage should be wrapped to venous occlusive pressure (approximately 70 mm Hg) in a manner similar to wrapping a sprained ankle. An extremity splint completes the immobilization.
3. Keep patient warm and still.
4. Notify medical control, as hospital may need to acquire polyvalent sea snake antivenin.
5. Closely monitor cardiac and respiratory status.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Establish large bore IV of lactated Ringer’s to maintain systolic pressure > 90 mm Hg.
2. If any chest tightness, wheezing, shortness of breath, difficulty swallowing, intraoral swelling, and/or severe hives;
   a. Administer **Diphenhydramine (Benadryl)** 25-50 mg IV (for peds 2-12 yrs old, give 1-1.25mg/kg IV or IM).
   b. Consider **Epinephrine 1:1,000** 0.4ml IM or SQ (for peds; 0.01mg/kg, Max 0.3ml).
3. For severe pain consider one of the following:
   a. **Toradol** 30 mg IV
   b. **Morphine Sulfate** 2-6 mg IV or IM
   c. **Fentanyl** 50 – 100 mcg IV or IM
   d. **Ketamine** 0.1 – 0.5 mg/kg IV/IO or 5 mg/kg IM or 0.5 mg/kg IN
4. For nausea, give one of the following:
   a. **Zofran** 4 – 8 mg IV or IM
   b. **Benadryl** 25 mg IV or IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director if any concerns or any questions.
2.7
Adult OB/GYN Emergencies
Adult OB/GYN Emergencies General Guidelines

The paramedic should use these protocols to guide him/her through the treatment of patients who are pregnant. These protocols cover complications of pregnancy and normal and abnormal labor delivery. In addition to these protocols, the paramedic may need to refer to other protocols (e.g. protocols for seizures). The assessment of these patients should follow the normal approach to patient assessment as well as ask specific questions related to the history of the pregnancy. Questions for pregnancy history include:

1. Number of previous pregnancies (gravid).
   a. Miscarriages.
2. Number of previous live births (para).
3. Expected date of delivery or due date.
4. When did contractions begin?
5. Any history of labor complications?
   a. Premature births?
   b. C-section?
   c. Multiple births?
6. What are the duration and frequency of contractions?
   a. Duration is timed from when the contraction starts to when the contraction stops (e.g., 45 seconds, 1 minute).
   b. Frequency is timed from the beginning of one contraction to the beginning of the next contraction (e.g., 2 minutes apart, 4 minutes apart).
7. Evidence of blood show or spotting?
8. Did the water break?
   a. When?
   b. What was the color (e.g., clear, greenish, brownish)?
   c. Did it have an unusual odor?
9. Does the patient have an urge to push?
10. Does the patient feel like she has to move her bowels? If the patient complains of uterine contractions, an external visual examination for crowning should be done to determine if the delivery is imminent.
2.7.1 Childbirth – Complications

Purpose: This protocol outlines the specific treatment for complications to labor and delivery.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1.**
   - Secondary survey should include pertinent OB/GYN history:
     - Number of pregnancies/deliveries.
     - History of problems with pregnancy (vaginal bleeding, prior cesarean sections, high blood pressure, premature labor, premature rupture of membranes.
     - Last menstrual period and due date (if known).
     - Current complaints (onset of labor, timing of contractions, rupture of membranes, or urge to push.)
     - Past medical history (including medications.)

2. **Airway Assessment/Management Protocol 2.1.2.** Oxygen via nasal cannula.

3. Attach cardiac monitor and pulse oximeter.

4. Perineal examination (do not perform internal vaginal examination)
   - Vaginal bleeding or leakage of fluid.
   - Presence of meconium.
   - Crowning during a contraction.
   - Presenting part (head, face, foot, arm, cord.)

5. **IF HEAVY VAGINAL BLEEDING WITH SIGNS OF SHOCK (SYS BP < 90 mm Hg)**
   - Transport with patient in left lateral recumbent position.
   - Transport immediately, notify labor and delivery
   - ALS LEVEL 1: Cardiac monitor.
   - ALS LEVEL 1: IV lactated Ringer’s or normal saline Bolus as needed with two liters of IV fluid in 250 – 500 ml increments to maintain systolic BP > 90 mm Hg. Check vital signs frequently.

6. **IF CORD PROLAPSED:**
   - Place mother on back with hips elevated (pillow under her hips) or place her in knee/chest position.
   - Do not attempt to push cord back. Wrap cord in sterile saline soaked dressing
   - With a gloved hand, palpate the cord for pulse.
   - If pulse is absent in umbilical cord, and positioning of mother does not restore pulse, insert sterile gloved index and middle fingers into the vagina and push the infant up to relieve pressure on the cord. With the other hand, press on the mother’s lower abdomen in an upward and cephalic (towards head) direction. Push the fetus back only far enough to regain a pulse in the umbilical cord.
e. Transport and notify receiving hospital of impending arrival.

7. IF BREECH PRESENTATION:
   a. Do not pull on the newborn. Allow the delivery to proceed normally, supporting the newborn with the palm of your hand and arm, and allowing the head to deliver.
   b. If the head is not delivered within 3 minutes, place a gloved hand in the vagina with your palm towards the newborn’s face. Form a “V” with your index finger and middle finger on either side of the newborn’s nose and push the vaginal wall away from the newborn’s face to create airspace for the newborn until delivery of the head. Suction may be provided PRN.
   c. Transport immediately, while maintaining the airspace for the newborn.

8. IF LIMB PRESENTATION:
   a. Place mother in either the knee-chest position or supine position with a pillow under the buttocks.
   b. Transport immediately

9. IF SHOULDER DYSTOCIA:
   a. Determine presence of shoulder dystocia as follows: head will deliver normally and then it will retract back into the perineum because the shoulders are trapped between the symphysis pubis and the sacrum (this is called “turtle sign”).
   b. If this occurs, Do Not pull on head
   c. Have mother drop her buttocks off the end of the bed and flex her thighs upward to facilitate delivery.
   d. Apply firm pressure with an open hand immediately above the symphysis pubis
   e. If delivery does not occur, transport immediately

ALS LEVEL 1: PARAMEDIC ONLY
1. For any of the above complications do not delay transport. An IV in the mother is not necessarily going to help with any of the above complications except the heavy vaginal bleeding with signs of shock. Even then, any attempts at an IV should be done enroute to the hospital.

2. Monitor cardiac rhythm

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control for any questions or problem

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2.7.2 Childbirth – Normal Delivery
Adult Medical Protocol

Purpose: This protocol is to guide the EMS crew with delivering a newborn. If during your evaluation or during the delivery itself, if any complications arise, refer to the Childbirth-complications protocol that follows.

Procedure:
BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
   a. Secondary survey should include pertinent OB/GYN history:
      • Number of pregnancies/deliveries.
      • History of problems with pregnancy (vaginal bleeding, prior cesarean sections, high blood pressure, premature labor, premature rupture of membranes.
      • Last menstrual period and due date (if known).
      • Current complaints (onset of labor, timing of contractions, rupture of membranes, or urge to push.)
      • Past medical history (including medications.)
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Perineal examination (do not perform internal vaginal examination)
   • Vaginal bleeding or leakage of fluid.
   • Presence of meconium.
   • Crowning during a contraction.
   • Presenting part (head, face, foot, arm, cord.)
5. If active labor, and no vaginal bleeding or crowning:
   a. Check for fetal heart tones.
   b. Transport.
6. If active labor, no crowning and vaginal bleeding with no signs of shock (systolic >90 mm Hg):
   a. Transport.
   b. ALS LEVEL 1: IV lactated Ringer’s or normal saline at 100 ml/hour.
   c. ALS LEVEL 1: Cardiac monitor.
7. If imminent delivery:
   a. Place mother in lithotomy position.
   b. Drape mother.
   c. Prepare for neonatal resuscitation.
   d. Assist delivery. Gently and carefully assist expulsion of the newborn from the birth canal in its natural descent. Do not pull or push the newborn.
   e. Upon complete presentation of newborn’s head:
      • Instruct the mother to stop pushing.
• Inspect and palpate the newborn’s neck for the umbilical cord. If it is present, carefully unwrap the cord from the neck. If unable to remove the cord, apply two umbilical clamps and cut between the clamps to release the cord.
• Once the newborn’s cord is free from around its neck, instruct the mother to push on her next contraction to complete delivery.

f. Upon complete delivery of the newborn:
• Keep the newborn at the level of the vagina to prevent over or under transfusion of the blood from the cord
• Never “milk” the cord, after infant delivery wait at least 30 seconds up to 3 minutes or until the cord stops pulsating to clamp/cut the cord. Apply two umbilical cord clamps (2 inches apart and at least 8 inches from the navel), and then cut the cord between the clamps.
• Avoid holding the newborn by the legs, allowing the head to hang below the body, as this may cause cerebral hemorrhage to occur
• Only if the airway is compromised (obstructed), gently suction the newborn’s mouth and nose with the bulb syringe.
• If meconium is noted in the airway, see Pediatric Protocol 3.4.1, Newborn Resuscitation.
• Warm, dry, and stimulate infant.
• Wrap infant in sterile drape or dry blanket. Be sure to cover the newborn’s head, as this is a major source of heat loss.
• Check vitals: if compromised, initiate resuscitation

g. Evaluate Newborn:
• Note time of delivery and APGAR scores at birth and five minutes.
• If newborn is not breathing or APGAR < 7 see 3.4.1 Newborn Resuscitation Protocol.

ALS LEVEL 1: PARAMEDIC ONLY
1. Infuse mother with IV of lactated Ringer’s or normal saline at 125 ml/hour.
2. If excessive maternal bleeding, massage uterus gently
3. Transport, do not wait to deliver placenta. Do not pull on the umbilical cord.
4. If delivery completed before arrival, or in-field:
   a. Protect infant from fall and temperature loss.
   b. Check infant’s vital signs (perform CPR or assist ventilations as necessary.)
   c. Clamp cord in two places, six inches from infant, and cut cord between clamps.
   d. Suction, warm, dry, and stimulate infant.
e. Give infant to mother.

f. Massage uterus gently.

g. Do not pull on cord or attempt to deliver placenta.

h. Transport.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.

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2.7.3 Vaginal Bleeding (NON-TRAUMATIC)
Adult Medical Protocol

Purpose: This protocol should be used for female patients who may or may not be pregnant that present with non-traumatic vaginal bleeding. Examples of causes include: ante-partum hemorrhage (abruption placenta, placenta previa and uterine rupture), post-partum hemorrhage, ruptured ectopic pregnancy, ruptured ovarian cyst, spontaneous abortion, etc.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @ 15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Place all products of delivery (undeveloped fetus, placenta, etc) in a plastic bag and transport with patient to hospital. Do not discard any products on scene. If irretrievable, document the reason and contact supervisor or medical director prior to leaving the scene.

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for any problems or concerns.

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2.7.4 Eclampsia/Pre-Eclampsia

Adult Medical Protocol

**Purpose:** This protocol should be used for the patient in her second or third trimester of pregnancy (≥ 20 weeks gestation) that is exhibiting signs of pre-eclampsia or eclampsia. The signs of toxemia include proteinuria (dark colored urine), excessive weight gain, and hypertension. The presence of two of these signs constitutes pre-eclampsia and all three constitutes eclampsia. The seizing patient in her third trimester of pregnancy should be assumed to be eclamptic and treated as specified below. However, consideration of another underlying etiology, such as hypoglycemia, drug overdose, head injury, or fever, should also be considered. Eclamptic seizures can also occur postpartum (≤ 6 weeks). Witnessed continuous convulsions (generalized tonic-clonic seizure or Grand Mal) or repeating episodes without regaining consciousness or sufficient respiratory decompensation demonstrates a need for immediate treatment.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%)
3. Attach cardiac monitor and pulse oximeter

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Establish IV of lactated Ringer’s or normal saline at 125 ml/hr.
2. Determine serum glucose level with Glucometer or DextroStix.
   a. If glucose <80 mg/dl:
      i. If sugar 60 mg/dl - 80 mg/dl; Sublingual Glucose Paste, or Glucagon 1 mg IM or 100 ml 10% Dextrose IV. Give additional 100 ml D10W if glucose still < 80 mg/dl when glucose rechecked in 5 minutes (titrate to effect)
      ii. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
3. If seizing: give Magnesium Sulfate 4 gm IV or IO (mixed in 50 ml of D5W given over 5 – 10 minutes). May repeat once at 2 gm IV or IO (mixed in 50 ml of D5W given over 5 – 10 minutes) PRN. Remember, magnesium sulfate can cause respiratory depression with cardiovascular collapse. If patellar reflexes are absent, shut off the infusion and contact medical control immediately. Antidote is calcium chloride IV over 5 minutes.
4. If patient continues seizing, administer one of the following:
   a. Diazepam (Valium) 5 - 10 mg IV or IO (if unable to start IV or IO give Valium 10mg per rectum). May repeat PRN up to 20 mg maximum dose. Monitor respiratory status and intervene as needed.
   b. Midazolam (Versed) 2mg IV or IO or 5 mg IN (concentration 5mg/ml). May repeat once PRN (10 mg maximum dose).
c. **Lorazepam (Ativan)** 2 mg IV, IO, IM, or IN; may repeat once, up to max of 4 mg.

5. Monitor EKG, vital signs, fetal heart tones, level of consciousness, patellar reflexes, respiratory rate, and oxygenation status every 5 minutes.

6. Keep the patient in left lateral recumbent position.

7. Evaluate for pulmonary edema. If present, apply **CPAP** per protocol.

8. If patient seized and transport time is > 20 min, administer **Magnesium Sulfate** maintenance infusion. Place 10 grams of magnesium sulfate (20 ml of 50% solution) in 250 ml of LR or NS and infuse at 50 ml/hr (2 grams/hr).

### ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control or medical director if any concerns or any questions.

2. If patient is in third trimester and is hypertensive (systolic > 140 mm Hg or diastolic > 90 mm Hg) especially with no prior history of hypertension, call to discuss giving a dose of **Labetalol 20mg IV over two minutes**.
2.7.5 Pre-Term Labor
Adult Medical Protocol

**Purpose:** This protocol will be used during intra-facility transfers. On occasion a patient in pre-term labor will need to be transferred to a higher level of care. The transferring physician will have determined that the benefits out weigh the risk to the patient and should have initiated the proper EMTALA transfer paperwork. The key to this type of transfer is for the transferring physician to have done everything possible to arrest the labor process prior to EMS leaving with the patient. EMS should only have to continue the care and medications initiated by the transferring hospital. If the patient is ≤ 20 weeks gestation then there is very little chance of delivering a viable fetus. EMS should not transfer a patient in active labor as care for the fetus by the physician at the hospital is better than what can be provided by a paramedic in back of an ambulance (or in an aircraft) with little resources and the need to provide care for the mother as well. A neonatal team can then respond to the transferring hospital with specialty equipment to manage the neonate.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2**
   - Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Confirm with transferring physician that patient is NOT in active labor.
2. IV fluids should already be in progress per the hospital. If so, continue at the rate ordered by the transferring physician. If not initiate IV lactated Ringer’s or Normal Saline at 100ml/hr. Consider fluid bolus as initial tocolytic therapy. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1 - 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
3. Record frequency, character and duration of contractions, fetal heart tones, blood pressure, and pulse every 15 minutes.
4. Patient may be on one of the following tocolytics as ordered by transferring MD. Must be on an IV pump.
   a. **Magnesium Sulfate** 4 – 6 gms IV over 20 min. Then 2- 4 g / hr x 12- 24 hr.
   b. **Brethine (terbutaline)** 0.25mg SQ q 30 min. (Max: 1mg/4h); or 2.5-10 mcg/min IV up to max of 17.5- 30 mcg/min.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.
2.8
Other Adult Medical Emergencies
2.8.1 Allergic Reactions (ANAPHYLAXIS)

Adult Medical Protocol

**Purpose:** This protocol is to be used for patients who may be experiencing an allergic reaction. The reaction could be triggered by a contact with some object or substance, something ingested or something injected beneath the skin (sting, bite, IM, IV, or SubQ medication or chemical, etc). The reaction could range from a mild irritation and/or itching (with or without a rash) of a localized area of the skin/body to a full-blown anaphylactic reaction with respiratory and cardiovascular collapse.

Signs and symptoms consistent with allergic reaction:
- **Skin** – flushing, itching, hives, swelling, cyanosis.
- **Respiratory** – dyspnea, sneezing, coughing, wheezing, stridor, laryngeal edema, laryngospasm, bronchospasm.
- **Cardiovascular** – vasodilatation, increased heart rate, decreased blood pressure
- **Gastrointestinal** – nausea/vomiting, abdominal cramping, diarrhea
- **CNS** - dizziness, headache, convulsions, tearing

Treatment is outlined according to the severity of the allergic reaction (mild, moderate, and severe or anaphylaxis).

**Procedure:**

**MILD REACTIONS** (redness and/or itching, hives, stable vital signs with a systolic BP > 100 mm Hg without dyspnea)

**BASIC LEVEL:** EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol (O2 PRN) 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Transport to designated hospital.

**ALS LEVEL 1:** PARAMEDIC ONLY
1. Initiate IV of lactated Ringer’s or normal saline at TKO.
2. **Diphenhydramine HCL (Benadryl)** 25mg IV or 50mg IM (Peds; 1-2 mg/kg IV or IM)
3. **Ranitidine (Zantac)** 150 mg PO if able to swallow.

**ALS LEVEL 2:** MEDICAL CONTROL
1. Call medical control or medical director for any concerns or help

**MODERATE ALLERGIC REACTIONS:** (edema, hives, dyspnea, wheezing, “lump in throat” feeling, difficulty swallowing, facial swelling and stable vital signs with a systolic BP > 90 mm Hg)

**BASIC LEVEL:** EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Transport to designated hospital.
ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV of lactated Ringer’s or normal saline at 70cc/hr.
2. Diphenhydramine HCL (Benadryl) 25mg IV or 50mg IM (Peds; 1-2 mg/kg IV or IM)
3. Ranitidine (Zantac) 150 mg po (peds dose 2 mg/kg po)
4. Methylprednisolone Sodium Succinate (Solu-Medrol) 125mg IV/IO/IM
5. Epinephrine (1:1000) 0.4 ml IM Adult (Pedi: 0.01 ml/kg.) Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease (call med control if you have any concerns)
6. IF patient is on a Beta Blocker medication, give Glucagon 2 mg IV over 2-5 minutes. If you are not sure which drugs is a beta blocker, contact medical control to discuss.
7. If patient shows signs of respiratory distress give; Albuterol (Ventolin) 2.5mg mixed with 2.5ml of normal saline nebulizer treatment. May repeat twice PRN
8. May add Ipratropium Bromide (Atrovent) 0.5 mg (0.5ml) to the Albuterol nebs (x 3 doses).

ALS LEVEL 2: MEDICAL CONTROL
1. Call medical control or medical director for any concerns or help

SEVERE ALLERGIC REACTION/ANAPHYLAXIS (edema, hives, severe dyspnea and wheezing, unstable vital signs with systolic BP < 90 mm Hg, and possible cyanosis and laryngeal edema)

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Transport to designated hospital.

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV of lactated Ringer’s or normal saline bolus with 250cc prn up to 1 liter (reassess vitals and respiratory status between each bolus) then rate of 125cc/hr. (Bolus children with 20ml/kg then 40cc/hr)
2. Diphenhydramine HCL (Benadryl) 25mg IV or 50mg IM (Peds; 1-2 mg/kg IV or IM)
3. Ranitidine (Zantac) 150 mg po (peds dose 2 mg/kg po)
4. Methylprednisolone Sodium Succinate (Solu-Medrol) 125mg IV/IO/IM
5. Epinephrine (1:1000) 0.4 ml IM Adult (Peds: 0.01 ml/kg.) Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease (call med control if you have any concerns)

ALTERNATIVELY CONSIDER IV EPINEPHRINE FOR CRITICAL PATIENTS AS BELOW:
Epinephrine 1:100,000 (0.1 mg/10 mL) IV diluted; to dilute Epinephrine from 1:10,000 to 1:100,000;
  o Remove 9 ml of Epi 1:10,000 from the 10 ml prefilled syringe
  o Fill the syringe back up with 9 mLs of normal saline, You now have Epi 1:100,000
  o Administer the 10 mL Epinephrine (1:100,000) solution IV slowly over 5-10 minutes, titrate to clinical effect and systolic BP greater than 90. Close hemodynamic monitoring is required when providing Epinephrine 1:100,000 IV

A SECOND ALTERNATIVE FOR IV EPI ADMINISTRATION CAN BE CONSIDERED IF PATIENT IS CRITICAL
  • Mix 1 mg of Epeinephrine in 1000 cc of NS
    o 1 cc of 1:1,000
    o or
    o 10 cc of 1: 10,000
  • Start at 1 cc/min…….(if using 60 gtt IV drip set, 60 drops/min)
  • Piggyback into high flow IV
  • Titrate to effect q 1 min (starting dose is 1 – 2 mcg/min)
  • Monitor HR and BP

6. IF patient is on a Beta Blocker medication, give Glucagon 2 mg IV over 2-5 minutes. If you are not sure which drugs are beta blockers, contact medical control to discuss?

7. If patient shows signs of respiratory distress give; Albuterol (Ventolin) 2.5mg mixed with 2.5ml of normal saline nebulizer treatment. May repeat twice PRN

8. May add Ipratropium Bromide (Atrovent) 0.5 mg (0.5ml) to the Albuterol nebs (x 3 doses).

9. If the nebulized treatments do not significantly resolve the respiratory distress,

10. Consider need for intubation

ALS LEVEL 2: MEDICAL CONTROL

1. For refractory hypotension obtain order for Dopamine drip starting at 5 mcg/kg/min and titrate to effect. Dopamine infusion @ 5-20 mcg/kg/min (1600 mcg/ml infusion concentration = 15 – 16 gtt/min). Titrte to maintain a minimum systolic BP of 90 mm Hg with good capillary refill or a maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min)
2.8.2 Diabetic Emergencies (Hypo and Hyper-glycemic)
Adult Medical Protocol

**Purpose:** This protocol is used for diabetic patients with blood sugars below 80 mg/dl or blood sugars over 250 mg/dl. Keep in mind that low or elevated blood sugars (in diabetics) can be affected by medications, infections, stress, alcohol, etc.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol** 2.1.1
2. **Airway Assessment/Management Protocol** 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%)
3. Attach cardiac monitor and pulse oximeter

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Initiate IV of Lactated Ringer's or normal saline at 125ml/hr. Draw tube of blood (if tubes are available label the pre-treatment blood vial and provide it to the receiving hospital with the patient.). If patient is tachycardic (HR > 110) and/or hypotensive (systolic BP < 90 mm Hg), bolus with 1 – 2 liters of IV fluid in 250cc increments with vital sign recheck and lung exam between each increment. Discontinue bolus if HR slow < 110, systolic BP > 90 or if signs of pulmonary edema. If no sign/symptoms of pulmonary edema, resume rate at 125 ml/hr. If no IV access, consider an IO ONLY if patient is seriously ill (hypotensive and tachycardic). **Do not place IO simply for high or low blood sugar when patient is otherwise stable.**

2. Determine serum glucose level with Glucometer or DextroStix.

   **If glucose <80mg/dl and patient is:**

   **Asymptomatic** (No headache, nausea and/or altered mental status):
   ➢ **If sugar 60 mg/dl – 80 mg/dl;** No emergency treatment (OK for patient to drink a cola, juice or other oral form of glucose they may have with them.
   ➢ **If sugar < 60mg/dl;** Oral glucose (juice, piece of candy, or sublingual glucose)

   **Symptomatic** (Headache, nausea, and/or altered mental status):
   ➢ **If sugar 60 mg/dl - 80 mg/dl;** Sublingual glucose paste, or Hang 250 ml D₁₀W and run 100 ml wide open (titrate to effect). Give second dose of 100 ml D₁₀W if glucose still < 80 mg/dl. when glucose rechecked in 5 minutes. If unable to establish IV consider Glucagon 1mg IM.
   ➢ **If Blood sugar < 60 mg/dl;** Hang 250 ml of D₁₀W and run bolus of 200 – 250 ml wide open (titrate to effect). If no IV give Glucagon 1mg IM.

3. **If glucose > 80 mg/dl and < 250 mg/dl, no specific treatment, supportive care**

4. **If glucose > 250 mg/dl, and patient exhibiting altered mental status, Kussmaul respirations, dry skin with poor turgor, and/or ketotic breath:**
Bolus with 1 – 2 liters of IV fluid in 250cc increments with vital sign recheck and lung exam between each increment. Discontinue bolus if signs of pulmonary edema.

Asymptomatic patients with glucose > 250 mg/dl, just give IV fluids at 125ml/hr.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director if any concerns or any questions.

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2.8.3 **Abdominal Pain (NON-TRAUMATIC)**

**Purpose:** This protocol should be used for patients that complain of abdominal pain without a history of trauma. Assessment should include specific questions pertaining to the GI/GU systems. See **Abdominal Pain Differential** in Appendix

**Abdominal physical assessment includes:**
- Asking patient to point to area of pain (palpate this area last)
- Gently palpate for tenderness, rebound tenderness, distention, rigidity, guarding, and pulsatile masses. Also palpate the flank area for CVA tenderness.

**Abdominal History Includes:**
- Hx of pain (OPQRST)
- Hx of nausea/vomiting (color, bloody, coffee grounds)
- Hx of bowel movement (last BM, diarrhea, bloody, tarry)
- Hx of abdominal surgery
- Hx of acute onset of back pain
- SAMPLE (attention to last meal)

Additional questions should be asked of the female patient regarding OB/GYN history. All female patients of childbearing age complaining of abdominal pain should be considered to have an ectopic pregnancy (even if vaginal bleeding is absent) until proven otherwise.

Non-traumatic abdominal pain can be caused by: appendicitis, cholecystitis, duodenal ulcer perforation, diverticulitis, abdominal aortic aneurysm, pelvic inflammatory disease (PID), pancreatitis, mesenteric ischemia, renal stones, hepatitis, cirrhosis of the liver, bowel obstruction, gastroenteritis, etc.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2**
3. Attach cardiac monitor and pulse oximeter.
4. If patient pregnant and back boarded, tilt board 30 degrees left

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardic and/or hypotensive (SBP < 90 mm Hg) give a 250cc bolus. May repeat bolus for total of 2 liters of IV fluid. Assess vital signs and breath sounds in-between each bolus. If vital signs respond to the bolus(s) (pulse rate slowed down and/or blood pressure improved) run at 100cc/hr. If still hypotensive/tachycardic cautiously bolus a second liter in 250ml increments.
2. If patient is nauseated, give one of the following:
a. **Ondansetron** (*Zofran*) 4 – 8 mg IV or IM (If oral ODT form available, give sublingual)

b. **Diphenhydramine** (*Benadryl*) 25 mg IV or IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. This is one of the times you will need medical control for pain medication orders.
2. If pain medication requested, call and discuss with med control first.
2.8.4 Sickle Cell Crisis

Adult Medical Protocol

**Purpose:** This protocol is for patients with a history of Sickle Cell Disease. Sickle cell anemia is a chronic hemolytic anemia occurring almost exclusively in African-Americans and is characterized by sickle-shaped red blood cells. Sickle cell crisis results from the occlusion of a blood vessel by masses of sickle-shaped red blood cells. Pain is the principle manifestation, and this represents the most common type of crisis. Typical pain occurs in the joints and back. Hepatic, pulmonary, or central nervous system involvement can occur, each with its own group of symptoms. Keep in mind that patients with sickle cell disorder have a high incidence of life-threatening disorders at a very young age.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2** Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Offer emotional support

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Initiate IV lactated Ringer’s or Normal Saline. Give a fluid challenge of 500cc then set rate at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. If systolic BP > 90 mm Hg give one of the following: (NOTE: use Toradol as first line pain medication unless patient is allergy to it)
   a. **Toradol** 30 mg IV or 60 mg IM (if patient is > 65 y/o limit dosage to 15mg IV or 30mg IM). After 30 minutes, the IV dose can be repeated x 1 PRN.
3. If nausea also present from pain or the pain medication give one of the following:
   a. **Zofran** 4 – 8 mg IV or IM
   b. **Benadryl 25 mg** IV or IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control of any problems or concerns.
2. If patient unable to take Toradol for pain, use one of the following:
   a. **Fentanyl** 50 – 100 mcg IV/IM/IN
   b. **Morphine** 2 – 10 mg IV or IM

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2.8.5 Alcohol Emergencies
Adult Medical Protocol

**Purpose:** This protocol is to be used on patients who are suspected of being intoxicated with alcohol. Treat all intoxicated patients with respect even though they may be agitated and potentially violent. Just because you can smell ETOH on or around your patient, you MUST consider other possible causes for a patient’s abnormal behavior or altered mental status, such as head injury from trauma, co-ingestion of drugs, low blood sugar, and severe hypoxia (including carbon monoxide poisoning).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2**
3. Attach cardiac monitor and pulse oximeter.
4. Alcoholics with any evidence of head trauma and altered mental status must be considered to have a closed head injury until proven otherwise. Treat them as such including C-spine precautions. Be prepared to roll the backboard (if used) with the patient strapped to it on its side if patient begins to vomit.
5. Notify law enforcement for assistance with any combative or uncooperative alcoholic with an altered mental status.
6. Transport to designated hospital.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardic and/or hypotensive, give a 250cc bolus then run at 100cc/hr.
2. Determine serum glucose level with Glucometer or Dextrostix
   a. If sugar 60 mg/dl - 80 mg/dl; **Sublingual glucose paste, or Glucagon** 1mg IM or 100 ml **10% Dextrose IV**
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml **10% Dextrose** IV (titrate to effect) or **Glucagon 1 mg IM**
3. If history of drug abuse, and patient has constricted pupils or respiratory depression, assist respirations as needed and administer **Narcan** 1.0-2.0 mg IV
4. If patient begins to vomit, give one of the following:
   a. **Zofran** 4 – 8 mg IV or IM
   b. **Benadryl** 25 mg IV or IM

**ALS LEVEL 2: MEDICAL CONTROL**
1. **Contact Medical Control or Medical Director for any questions or problems.**
2.8.6 Dehydration
Adult Medical Protocol

**Purpose:** This protocol is for patients who have been unable to keep themselves sufficiently hydrated due to a decrease p.o. intake (inadequate intake to keep up with the fluid/metabolic demands of the body) or increase loss of water/electrolytes from the body from such conditions as vomiting, diarrhea, excessive sweating, burns, hyperventilation. Other conditions can lead to dehydration such as DKA (diabetic ketoacidosis), metabolic acidosis, serious infections, high fever, etc. Signs and symptoms may include: hot, very dry skin, poor skin turgor, dry mucus membranes, little or no moisture in eyes, sunken appearance of the eyes in the socket, tachycardia, and hypotension.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Patient Assessment Protocol 2.1.1.**
2. **Airway Assessment/Management Protocol 2.1.2.**
3. Attach cardiac monitor and pulse oximeter.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1 liter of IV fluid in 250ml increments until systolic BP > 90 mm Hg
Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or respiratory distress develop.
2. Monitor cardiac rhythm and vital signs
3. Determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, may repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for any questions or problems.

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2.8.7 Motion Sickness
Adult Medical Protocol

Purpose: This protocol is for patients who may become ill with nausea, vomiting and/or
dizziness due to motion sickness during a long transport. This may develop or be
aggravated by the rear facing position in back of the ambulance or on an aircraft.
Inquire if patient has a history of motion sickness.

Procedure:
BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment 2.1.1
2. Assure ABCs are stable. Position of comfort
3. Airway Assessment/Management Protocol 2.1.2. Oxygen if indicated via
   nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather
   @ 15 LPM if SpO2 < 90%).
4. Attach cardiac monitor and pulse oximeter if indicated
5. Provide appropriate comfort measures (i.e. cool cloth to forehead).

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV of lactated Ringer’s or NS at 125 ml/hr. Give 250 ml fluid bolus
   if systolic pressure < 90 mm Hg (20 ml/kg for children).
2. Be alert for dysrhythmias.
3. If patient nauseated or has recently vomited, administer one of the
   following:
   a. Zofran 4 – 8 mg IV or IM
   b. Benadryl 25 mg IV or IM.
4. If patient complains of dizziness or motion sickness, consider administering:
   a. Valium 2-10 mg IV
   b. Versed 2 – 4 mg IV/IO/IM/IN
   c. Ativan 2 – 4 mg IV/IO/IM

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director if any concerns or any questions.

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2.8.8  Nausea and Vomiting  
Adult Medical Protocol

**Purpose:** Use this protocol for patients who are nauseated and vomiting due to their illness, pain, side effect of medications, etc. If the patient’s nausea and vomiting is associated with an altered mental status or a seriously ill appearance, consider the cause to be a decompensation of their medical problem such as DKA (if diabetic)

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol
2. Airway Assessment/Management Protocol. If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Provide appropriate comfort measures (i.e. cool cloth to forehead).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. If patient nauseated or has recently vomited, administer one of the following:
   a. **Zofran** 4 – 8 mg IV or IM (or the ODT Tablet sublingual if available)
   b. **Benadryl** 25 mg IV or IM.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director if any concerns or any questions.

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2.8.9 Hyperkalemia (Elevated Potassium)

Purpose:
This protocol is to be used on patients with dangerously elevated levels of potassium (>7 mmol/L or 6.0-7.0 mmol/L with EKG changes). Potassium is an extremely important electrolyte and is involved in maintaining electrical potential across cell wall membranes. It is essential to the normal function of cardiac cells. Potassium levels can elevate for a variety of reasons, including but not limited to; problems with excretion (renal 90%, GI 10%), potassium distribution (Extracellular 2%, intracellular 98%), increased absorption/intake. Normal serum potassium levels range from 3.5 – 5 mmol/L.

Signs and symptoms of elevated potassium levels include but are not limited to:
1. Weakness that can progress to paralysis,
2. Dyspnea (owing to respiratory muscle weakness)
3. EKG findings of peaked T wave, prolonged pr interval, widening of QRS complex and eventual sinusoidal wave form

If you have concerns that a patient may be hyperkalemic based on the history, lab value (if available), AND the EKG findings, call and discuss with med control before initiating treatment. Transmit copy of EKG if possible.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol (O2 PRN) 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Transport to designated hospital

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children).
   Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.
2. Perform 12 lead ECG.
   a. Look for peaked T-wave, prolonged P-R interval, Widened QRS complexes, bradycardia (does not have to have peaked T waves in every lead)
   b. As potassium elevates further, EKG may show dropped P waves, very wide QRS (sinusoid wave form)
   c. Transmit 12 Lead ECG to destination hospital, if available. If inferior wall MI is identified (ST segment elevation in leads II, III, and AVF), perform additional 12 Lead ECG with V4R to confirm/rule out concurrent right ventricular MI.
3. If EKG suggest hyperkalemia or patient is very weak (and is a renal patient or taking potassium supplements), measure serum potassium if equipment available (I-STAT), or obtain value (if it’s been within two hours) from record at transferring facility. If level is > 7 mmol/L or 6.0 – 7.0 with EKG changes proceed to next step. If EKG changes suggesting elevated potassium levels after Succinylcholine was administered for RSI, proceed to next step.

4. Give one amp (if available) of **Calcium Gluconate (or Calcium Chloride)** IV over 1 – 3 minutes. Give only if EKG changes. Avoid if suspect Digoxin toxicity.

5. Give **Albuterol** (only) via neb x 1

6. Give **Sodium Bicarb** 1 amp IV over 10 minutes

7. Notify the hospital as additional treatment will be needed on arrival such as
   d. Reg Insulin and D50W
   e. Kayexelate PO
   f. Possible dialysis

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director for any problems or concerns.
2.8.10 Dystonic Reaction
Adult Medical Protocols

Purpose:
This protocol is to be used to treat patients who are experiencing extra-pyramidal or dystonic reactions related to side effects of certain drugs (phenothiazine, antipsychotic, neuroleptic). Dystonia is prolonged involuntary muscular contractions that may cause twisting (torsion) of body parts, repetitive movements, and increased muscular tone. Patients head may be twisted to one side due to uncontrolled muscle spasms of the neck. Patient may have abnormal movement or position of tongue due to spasm of the tongue muscle. This may also cause the patient with difficulty speaking. Patient’s eyes may also be deviated to one side.

Common medications that can cause acute dystonic reaction:

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Trade Name</th>
<th>General Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prochlorperazine</td>
<td>Compazine</td>
<td>Antiemetic, migraine headache</td>
</tr>
<tr>
<td>Hydroxyzine</td>
<td>Vistaril, Atarax</td>
<td>Antiemetic, antipruritic</td>
</tr>
<tr>
<td>Promethazine</td>
<td>Phenergan</td>
<td>Antiemetic, antipsychotic</td>
</tr>
<tr>
<td>Haloperidol</td>
<td>Haldol</td>
<td>Antipsychotic, Tourette’s syndrome</td>
</tr>
<tr>
<td>Thioridazine</td>
<td>Mellaril</td>
<td>Antipsychotic</td>
</tr>
<tr>
<td>Alprazolam</td>
<td>Xanax</td>
<td>Antianxiety</td>
</tr>
<tr>
<td>Metoclopramide</td>
<td>Reglan</td>
<td>Antiemetic</td>
</tr>
<tr>
<td>Droperidol</td>
<td>Inapsine</td>
<td>Antiemetic, antipsychotic</td>
</tr>
<tr>
<td>Fluphenazine</td>
<td>Prolxin</td>
<td>Neuralgia, antipsychotic</td>
</tr>
</tbody>
</table>

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol (O2 PRN) 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. Transport to designated hospital
5. Keep in mind, until patient is treated, he/she may be able to hear and understand you but will not be able to follow commands.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardic and/or hypotensive, give a 250cc bolus then run at 100cc/hr.
2. Determine serum glucose level with Glucometer or Dextrostix
   a. If sugar 60 mg/dl - 80 mg/dl: Sublingual glucose paste, or Glucagon 1mg IM or 100 ml 10% Dextrose IV
b. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM

3. If patient exhibiting signs and symptoms of dystonic reaction (extrapyramidal side effect) from one of the common medications listed above, give Benadryl (Diphenhydramine) 25 – 50 mg IV or IM

4. If history of drug abuse, and patient has constricted pupils or respiratory depression, assist respirations as needed and administer Narcan 0.4 mg IV/IO/IM/IN, titrate to effect up to 2.0 mg IV. Repeat PRN

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact Medical Control or Medical Director for any questions or problems.
2.8.11 Adrenal Insufficiency Emergencies

Adult Medical Protocols

Purpose:
This protocol is used for patients with a known history of Adrenal Insufficiency (Primary Adrenal Insufficiency aka Addison’s disease, Secondary Adrenal Insufficiency, Congenital Adrenal Hyperplasia aka CAH) who have or are currently experiencing an episode of high stress such as trauma, infection, or recent surgery. This protocol is to be used to prevent such stressful episodes from possibly causing a life-threatening condition known as an Adrenal Crisis, of which these patients are at extreme risk.

- Adrenal insufficiency or Addison’s disease is an endocrine disorder that occurs when the adrenal glands do not produce sufficient amounts of cortisol and other glucocorticoid hormones needed to respond to stress and inflammatory reactions.

- Early signs and symptoms of patients in crisis include pallor, dizziness, headache, weakness/lethargy, abdominal pain, nausea/vomiting and hypoglycemia.

Procedure:

**BASIC LEVEL: EMT AND PARAMEDIC**
1. Initial Patient Assessment Protocol
2. Airway Assessment/Management Protocol. Oxygen via nasal cannula @ 2-4 LPM to maintain pulse ox ≥ 94% (non-rebreather @ 15 LPM if SpO2 < 90%)
3. Attach cardiac monitor and pulse oximeter

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If the patient/care-taker is able to provide or is found with his/her own supply of prescribed Solu-Cortef, assist the patient/care-taker to administer the medication.
2. If the patient/care-taker is not able to administer the patient’s prescribed Solu-Cortef, administer the medication IM according to the dosage instructions provided with the Solu-Cortef (Peds dosing 2mg/kg IV/IM/IO) or contact Medical Control.
3. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardia and/or hypotensive, administer a fluid challenge of normal saline 500 cc IV or IO to maintain SBP of > 90 mmHg, repeat as needed x 1 – 2 liters.
4. If the patient has a known history of Adrenal Insufficiency but does not have his/her own Solu-Cortef, and the possibility of adrenal crisis exists, contact Medical Control for consideration of administering Solu-Medrol 125 mg IM/IO/IV (or 1 mg/kg for Peds – Max dose 125 mg)
5. If the patient has persistent hypotension, start Dopamine 5 – 10 mcg/kg/min (1600 mcg/mL infusion concentration = 15 – 60 gtts/min).
   - Titrate to maintain a minimum systolic BP of 90 mm Hg and maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min).
6. Determine serum glucose level with Glucometer. If patient is hyperglycemic or hypoglycemic, treat according to Diabetic Emergencies protocol.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact Medical Control or Medical Director for any questions or problems.

NOTE:
(a) Adrenal Crisis leading to death usually results from hypotension or cardiac dysrhythmias due to hyperkalemia. Remember that an ECG can provide evidence of hyperkalemia.
(b) In addition to treating with Solu-Cortef, treatment should be based on the clinical presentation and findings.
(c) Be alert for vomiting and have suction ready.
2.8.12 Sepsis Protocol  
Adult Medical Protocol

**Purpose:** This protocol is to be used on patients suspected of being severely septic. Sepsis is a clinical syndrome that results from the human body’s response to infection. While bacteria probably account for most cases, sepsis can also be the result of infection by fungi, viruses and parasites. 

*Systemic inflammatory response syndrome (SIRS)* is defined as an “abnormal, generalized inflammatory reaction remote from the initial insult.” Clinically, it is the presence of two or more of the following:

- Temperature less than 96.8°F or greater than 100.4°F;
- Heart rate greater than 90 bpm;
- Respiratory rate greater 20 or a PaCO2 less than 32 mmHg;
- White blood cell count less than 4,500 or greater than 10,000 l/mm.³

Sepsis is more likely to occur in several high-risk populations. Have a higher index of suspicion when evaluating the elderly or the very young, patients who are bed-confined or immobile, and patients who have had recent surgeries or invasive medical procedures.³ Be highly suspicious of patients receiving immunosuppressive treatments like chemotherapy or post-organ transplant medications. Recognize that some disease processes leave the patient naturally immunocompromised. This is the case with diabetes, liver cirrhosis, autoimmune disease and HIV/AIDS populations.³ Symptoms such as cough, increased work of breathing, stiff neck, ALOC, urinary pain or frequency, abdominal pain-distension-firmness, or inflamed joint may determine suspicion of infection.

**Severe Sepsis**
- Sepsis + Sepsis-induced organ dysfunction or tissue hypoperfusion
- Organ dysfunction or tissue hypoperfusion defined as either
  - Cardiovascular: Hypotension (Mean Arterial Pressure (MAP) less than 65 mmHg)(a)
  - Metabolic: Lactate greater than or equal to 4 mg/dL (if available)
  - ETCO2 less than 25 mmHg

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

4. [Initial Patient Assessment Protocol 2.1.1]
5. [Airway Assessment/Management Protocol 2.1.2]. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%). If sepsis is suspected, use nasal cannula capable of measuring end tidal CO2.
6. Attach cardiac monitor and pulse oximeter
7. Measure and/or record patient’s temperature
8. Assess for possible source of infection: Ask about recent illnesses, surgeries, invasive procedures or trauma. Has the patient had a respiratory infection or been feeling ill? Ask about symptoms of gastrointestinal or bladder infections, abdominal discomfort and unusual body or joint pain. Also ask about current or past prescriptions for antibiotics, steroids or immunosuppressants.

ALS LEVEL 1: PARAMEDIC ONLY
1. Notify receiving hospital of a possible sepsis patient (call sepsis alert if applicable) if patient meets the following three criteria:
   a. Suspected infection based on history and physical exam
   b. Two or more of the following:
      i. Temp > 38\(^0\) C (100.4\(^0\) F) or < 36\(^0\) C (96.8\(^0\) F)
      ii. Respiratory Rate > 20 breaths/min
      iii. Heart Rate > 90 beats/min
   c. ETCO2 ≤ 25 mmHg or Lactate level > 4 mMol
2. Initiate IV of Normal Saline. If BP Systolic ≤ 90 mm Hg, bolus with 250 ml IV fluid and repeat prn up to 2 liter. Titrate fluid volume to MAP of at least 70 mm Hg
3. Check vital signs and breathe sounds in-between each bolus.
4. If systolic BP remains < 90 mmHg after above IV bolus, start Dopamine infusion at 5 – 20 mcg/kg/min and titrate to systolic BP of 100. NOTE: If interfacility transfer, patient may have been stared on Levophed drip (usually 2 – 12 mcg/min) by the sending physician. Maintain patient on Levophed drip (See Levophed IV Drip Chart) according to the sending physician’s orders.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact Medical Control or Medical Director for any questions or problems.

NOTE: (a) Mean Arterial Pressure is located on your monitor or can be determined using the following formula
- MAP = [(2 x diastolic) + systolic] / 3

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2.9
Adult Environmental Emergencies
2.9.1 Diving (Scuba) Emergencies/Barotrauma (Decompression Sickness)
Adult Medical Protocol

Purpose: This protocol is for patients who suffer the effects of sudden changes in atmospheric pressure due to diving related activity. Barotrauma and decompression illness is caused by changes in the surrounding atmospheric pressure beyond the body’s capacity to compensate for excess gas load. These injuries are most commonly associated with the use of SCUBA (Self-Contained Underwater Breathing Apparatus). SCUBA diving emergencies can occur at any depth with the most serious manifesting symptoms after a dive. It should be understood that if a patient took a breath underwater, from any source of compressed gas (e.g. submerged vehicle, SCUBA, etc) while greater than 3 feet in depth, the patient might be a victim of barotrauma. Barotrauma may cause several injuries to occur including: arterial gas embolism (AGE), pneumothorax, pneumomediastinum, subcutaneous emphysema, and the “squeeze.” Decompression illnesses may also include decompression sickness (“Bends”).

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1.
2. Airway Assessment/Management Protocol 2.1.2. Administer Oxygen via non-rebreather @15 LPM
3. Attach cardiac monitor and pulse oximeter
4. Place the patient in a supine head-down left lateral decubitus position.
5. Complete the Dive Accident Signs and Symptoms Checklist and Rapid Field Neuro Exam Record (see appendix)
6. Start Dive History Profile (see blank forms), if possible (the patient’s dive buddy may be helpful in answering many of these questions
7. Protect against hypothermia and hyperthermia.
8. If applicable, have the local legal authority in charge secure all of the victims dive gear with proper chain of custody for testing, analysis, etc.
9. Monitor closely for complications (pneumothorax, shock, seizures) and treat per protocols.
10. Transport to the closest Emergency Department or Trauma Center. If transporting by helicopter, fly below 1000 feet (if traveling by fixed wind, request pilot pressurize the cabin to sea level). If applicable and pre-arranged agreement exists, consider transport to a hyperbaric facility. Provide hyperbaric personnel with a detailed history of the dive (depth and duration, timing and onset of symptoms, complications, and any treatment rendered).
11. Contact Diver’s Alert Network (DAN) at Duke University Medical Center at (919) 684-4326 for assistance as needed for further assistance.
12. Bring Dive Computer to the hospital, if available

ALS LEVEL 1: PARAMEDIC ONLY
1. Start an IV of lactated Ringer’s or normal saline TKO.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director if any concerns or any questions.

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2.9.2 Cold Related Emergencies/Hypothermia / Frostbite
Adult Medical Protocol

**Purpose:** This protocol is to be used for patients who suffer from hypothermia. Factors that predispose and/or cause a patient to develop hypothermia include: geriatric and pediatric patients, poor nutrition, diabetes, hypothyroidism, brain tumors or head trauma, sepsis, use of alcohol and certain drugs, and prolonged exposure to water or low atmospheric temperature. Hypothermia patients can be divided into three categories: Mild (temperature 94-96 degrees F), Moderate (Temperature 86 – 94), and Severe (Temperature < 86 degrees F). It should be noted that most oral thermometers would not register below 96 degrees F. There are some newer digital thermometers that will register lower temperatures.

**Frostbite** is local tissue freezing.

**Mild to Moderate Hypothermia:** Patients will generally present with shivering, lethargy.

**Severe Hypothermia:** Patients may be disoriented and confused to stupor and coma. Shivering usually stops and physical activity will be uncoordinated. In addition, severe hypothermia will frequently produce an Osborn J wave on an ECG, as well as dysrhythmias (bradycardia, ventricular fibrillation).

**Procedure:**

**BASIC LEVEL:** EMT and PARAMEDIC

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Remove all wet clothes and dry patient.
5. Protect from heat loss and wind chill.
6. Maintain in a horizontal position
7. Check core temperature if possible
8. Frost Bite cases:
   a. Protect injured areas from pressure, trauma, and friction. Bandage with dry sterile dressing if able. **Do not rub or break blisters.**
   b. Do not allow limb to thaw if there is a chance it will re-freeze.
   c. Do not allow patient to ambulate once the limb has started to thaw.
   d. Maintain core temperature by keeping victim warm with blankets.
   e. Warm fluids may be administered orally to conscious patients.
   f. Consider using the pulse oximeter probe to detect peripheral perfusion in affected tissues.

**ALS LEVEL 1:** PARAMEDIC ONLY
1) If severe pain, give Morphine 2-10 mg IM or IV, or Fentanyl 50 – 100 mcg IM or IV/IO/IN, or Ketamine 0.1- 0.5 mg/kg IV/IO, or 0.5 mg/kg IN or 5 mg/kg IM for pain control.

Mild to moderate (86 - 96°F): Hx of exposure to cold, altered LOC, shivering, muscle stiffness, stumbling or staggering gait, cool or cold skin, mottled or pale skin;

**BASIC LEVEL: EMT and PARAMEDIC**
1. Warm humidified oxygen 12-15 L/M by non-re-breathing mask. Maintain pulse ox > 95%
2. Remove wet garments
3. Cover with blankets
4. Gentle handling
5. Warm environment
6. If patient has normal LOC may give warm fluids to drink

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Large bore IV, warm saline at 75cc/hr
2. If altered mental status, determine serum glucose level with Glucometer or Dextro Stix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, may repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol 2.8.2.

Severe with vital signs present (<86°F): Same as mild to moderate but may not have shivering. Should have altered LOC and difficult to detect but present vital signs:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Same as above
2. NPO

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Same as above

Severe with absence of vital signs: Same as above but will be unresponsive with no detectable pulse or respirations:

**BASIC LEVEL: EMT and Paramedic**
1. Warm humidified oxygen by BVM
2. CPR (CPR only if core temp < 86°F)
3. May consider King Airway in lieu of intubation for ventilation
4. Gentle handling
5. Warm environment as much as possible

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Intubate (or insert King Airway) and ventilate with warm humidified oxygen, if possible
   Defibrillation and anti-dysrhythmic drugs should not be used until the core temp is > 86°F (30°C). Administration of one set of shocks is reasonable if the core temperature is unknown. Medication therapy may be ineffective due to the decrease in core temperature. Usually meds withheld till core temp warmed to >86°F. Just continue CPR till temp > 86°F. If temp > 86°F, follow appropriate dysrhythmia protocol.
2. Cardiac Monitor: If V-FIB and core temp unknown: defibrillate up to 3 times (200J, 300J, 360J); If biphasic defibrillator 120J, 150J, 200J; (Peds = 2J/kg, 4J/kg, 4J/kg). If core temp > 86°F, continue via V-fib protocol
3. Large bore IV or IO, warm saline at 75cc/hr

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director if any concerns or any questions.

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2.9.3 Heat Related Emergencies/Hyperthermia
Adult Medical Protocol

**Purpose:** This protocol is for patients suffering the effects of hyperthermia. Hyperthermia occurs when the patient is exposed to increased environmental temperature and can manifest as heat cramps, heat exhaustion, or heat stroke. Certain drugs may cause an increase in the body’s temperature (e.g. cocaine, ecstasy, certain psychiatric medications, etc.). Heat related injuries can be divided into one of the following:

**Heat Cramps:** Signs and symptoms include: muscle cramps in extremities and/or abdomen, hot sweaty skin, weakness, dizziness, tachycardia, normal BP, and normal temperature.

**Heat Exhaustion:** Signs and symptoms include: cool and clammy skin, profuse sweating, nausea/vomiting, diarrhea, tachycardia, weakness, dizziness, transient syncope, muscle cramps, headache, positive orthostatic vital signs, normal or slightly elevated temperature.

**Heat Stroke:** Signs and symptoms include: Hot dry skin (sweating may be present), confusion and disorientation, rapid bounding pulse followed by slow weak pulse, hypotension with low or absent diastolic reading, rapid and shallow respirations (which may later slow), seizures, coma, elevated temperature above 105°F.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2** Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Assess vital signs, including temperature, every 10 minutes.
5. Remove from warm environment and cool patient
6. For mild to moderate heat cramps and heat exhaustion, if patient is conscious and alert, encourage patient to drink water, follow by salt containing fluids (e.g. half-strength Gatorade or 10 K or equivalent drink)
7. If history and findings suggestive of heat stroke:
   a. Remove to cooler environment
   b. Remove the patient’s clothing, and wet the patient directly with ice water. Also, turn air-conditioning units and fans on high, and apply ice packs to the patient’s head, neck, chest, and groin. Cool with ice packs or moist sheets (must have good ambient air flow)
   c. Stop cooling measures when core body temp is 39°C (102.2°F).

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1- 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg.
Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or respiratory distress develop.

2. If altered mental status, determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, may repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol.

3. If seizures are present, and suspected to be heat-related:
   a. Protect airway with appropriate airway adjuncts.
   b. Valium 5-10 mg IV/IO, or Versed 2 – 4 mg IV/IO/IN or Ativan 2 – 4 mg IV/IO/IN.

ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control or medical director if any concerns or any questions.

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2.9.4 Near-Drowning

Adult Medical Protocol

Purpose: Near drowning patients are those who have been submerged in fresh or salt water and may or may not be conscious. Patients who ingested and/or aspirated water during the near drowning experience may initially decline to be transported to the hospital if after they have coughed, vomited and/or rested, they are feeling better following the incident. These patients should be strongly encouraged to be transported for evaluation as there are often delayed complications due to pulmonary edema or aspiration pneumonia. The terms wet drowning, dry drowning, active or passive drowning, near-drowning, secondary drowning, and silent drowning should be discarded. The proper terms should be drowning, fatal or drowning, non-fatal.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1. Immobilize cervical spine if trauma suspected
2. Airway Assessment/Management Protocol 2.1.2. If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Determine pertinent history (duration of submersion, depth, water temperature, possible seizure, drug and/or alcohol use).
5. Maintain body temperature, dry and warm patient. Start passive re-warming if patient hypothermic.
6. All non-fatal drowning patients should be transported to the hospital, regardless of how well they may seem to have recovered. Delayed death or complications due to pulmonary edema or aspiration pneumonia are not uncommon.

ALS LEVEL 1: PARAMEDIC ONLY
1. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1- 2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.

If apneic:
1. Initiate and maintain mechanical ventilation with 100% oxygen.
2. Advanced airway as needed, i.e. Endotracheal intubation (with in-line cervical immobilization) or deploy a King Airway (or other extra-glottic device).
3. Treat any dysrhythmias per appropriate protocol.
4. Transport and contact medical control en route.

If apneic and pulseless:
1. Initiate and maintain mechanical ventilation with 100% oxygen.
2. CPR.
3. Endotracheal intubation (with in-line cervical immobilization), or extraglottic device (King Air).
4. Treat any dysrhythmias per appropriate protocol.
5. Transport and contact medical control en route.
6. If altered mental status, determine serum glucose level with Glucometer or Dextrostix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml 10% Dextrose IV or Glucagon 1mg IM or Sublingual glucose paste, May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml 10% Dextrose IV (titrate to effect) or Glucagon 1 mg IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to Hyperglycemia Protocol

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director if any concerns or any questions.
2. If BP remains < 90 mm Hg, despite above IV fluid challenge, initiate Dopamine drip if patient unresponsive to fluid challenge. Begin infusion at 2.0 µg/kg/min and titrate to maintain systolic BP >90 mm Hg.

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2.9.5 Electrical Emergencies / Lightning Strike

Adult Medical Protocol

**Purpose:** This protocol is for patients who suffer the effects of an electrical injury. A wide range of injuries can be caused from a lightning strike or contact with electricity. Electrical injury can occur from direct contact, an arc, or a flash of the electricity and a direct hit or splash from lightning. The movement of electrical current through the body can cause violent muscle contractions that can lead to fractures, and therefore, the C-spine should be protected. The thermal energy can cause external burns, but in many cases the majority of thermal damage is internal, with few external signs of injury. Dysrhythmias are also common (e.g. ventricular fibrillation). The rescuer should be sure that the patient is no longer in contact with the electrical current before initiating treatment. **Asystole is a common presentation with lightning strike. These patients should be aggressively resuscitated unless injuries are incompatible with life.** Immense electrical energy enters the body and acts like a massive defibrillation. As with a standard defibrillation, the electrical energy depolarizes the myocardium and produces a period of asystole. Thus, the initial presenting rhythm immediately following the event is asystole. Eventually, the inherent automaticity property of the cardiac conduction system produces electrical impulses and the heart begins to contract. However, the respiratory center in the medulla remains shut off (takes longer for the diaphragm to recover). For a brief period, the patient may have a heartbeat but not be breathing. Due to lack of adequate ventilation, the heart begins to become severely hypoxic and acidic resulting in a secondary cardiac arrest from ventricular fibrillation. Contrary to the normal thinking in initial rhythms in cardiac arrest, the lightning strike victim may be more viable in the initial asystolic cardiac rhythm. The ventricular fibrillation rhythm may reflect a severely acidic and hypoxic state associated with a secondary cardiac arrest that may be more difficult to resuscitate.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**. C-spine precautions if indicated. Move patient to a protected area (to prevent additional lightning strike).
2. **Airway Assessment/Management Protocol 2.1.2**. Oxygen via nasal cannula @2 - 4 LPM to maintain the pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. **Initiate High Quality CPR if patient in cardiac arrest (as soon as patient is safely removed from electrical current).**
4. Remove smoldering clothes and assess for trauma. Look for entrance and exit wounds.
5. Treat burns per **Burn Protocol 2.10.8**
6. Initiate Trauma Alert if applicable and meets criteria
7. Correct any open/sucking chest wound
8. **Control hemorrhage**
9. Cover burns with dry sterile dressing.
10. Attach cardiac monitor and pulse oximeter
11. Complete bandaging, splinting, packaging PRN. Immobilize injured extremities, making note of pulses, sensation, motor function, and color of distal extremities.
12. Try to determine amps, volts, and duration of contact, if possible

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If cardiac arrest or dysrhythmias, standard ALS measures (see appropriate protocol 2.3). NOTE: A patient in cardiac arrest from a severe electrocution (i.e. lightning strike) may have a return of their heartbeat before a return of their respirations. Be prepared to treat asystole (immediately after the strike), respiratory arrest only (period when intrinsic heartbeat returns but diaphragm still paralyzed), or v-fib (from secondary arrest as described above).

2. Initiate IV lactated Ringer’s or Normal Saline at 125ml/hr. If patient hypotensive (systolic < 90 mm Hg) and/or tachycardic (HR > 110) bolus with 1-2 liters of IV fluid in 250ml increments until systolic BP > 90 mm Hg (20 ml/kg for children). Recheck vital signs and lung exam in-between each increment. Discontinue bolus if signs of pulmonary edema or development of respiratory distress.

3. Correct any massive flail segment that causes respiratory compromise. Intubate if necessary.
4. Correct any tension pneumothorax (see needle decompression protocol)
5. If altered mental status, determine serum glucose level with Glucometer or DextroStix:
   a. If sugar 60 mg/dl - 80 mg/dl; give; 100 ml **10% Dextrose** IV or **Glucagon 1mg** IM or Sublingual glucose paste, May repeat x 1 if after 15 minutes recheck fingerstick glucose < 80 mg/dl
   b. If Blood sugar < 60 mg/dl; 100 – 250 ml **10% Dextrose** IV (titrate to effect) or **Glucagon 1 mg** IM
   c. If glucose > 80 mg/dl and < 200 mg/dl, provide supportive care, keep NPO
   d. If glucose > 200 mg/dl, go to **Hyperglycemia Protocol 2.8.2**.

6. If patient is in severe pain with no evidence of a head injury, chest or abdominal trauma, give one of the following:
   a. **Morphine Sulfate** 2 – 6 mg IV or IM
   b. **Fentanyl** 50 – 100 mcg IV/IO/ IM/IN
   c. **Ketamine** 0.1 – 0.5 mg/kg IV/IO or 0.5 mg/kg IN or 5 mg/kg IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director if any concerns or any questions.

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2.10
Adult Trauma Emergencies
2.10 Adult Trauma Protocols

These protocols cover specific types of injuries and their treatment. The initial assessment of the trauma patient should include determination of trauma alert criteria (see General Protocol 1.10, Trauma Transport). When the situation demands it (e.g., when Trauma Alert criteria are met), scene time should be limited as much as possible (e.g., 10 minutes) and the patient should be expeditiously transported to a trauma center. Do not delay transport to establish vascular access or bandage and splint every injury. Priority should be given to airway management and rapid preparation for transport (e.g., full immobilization on a backboard) and control of gross hemorrhage.

If a vascular access is obtained and hypovolemia is suspected (e.g., the patient shows signs and symptoms of shock, such as systolic BP less than 90 mm Hg), a fluid challenge of 1-2 L (20 mL/kg) may be administered until a systolic BP of 90 mm Hg is maintained. If the patient is still in shock after receiving 2 L of fluid, an additional 1 L of fluid may be administered (maximum total fluid administration = 3 L). However, administration of large volumes of IV fluids has been found to be deleterious to the survival of patients with uncontrolled hemorrhage, internally or externally. Studies (NEJM, 1994) have shown that maximal fluid resuscitation may increase the bleeding, thereby preventing the formation of a protective thrombus or dislodging it once the intraluminal pressure exceeds the tamponading pressure of the thrombus. For this reason, consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g., less than 20 minutes).

A female in her second or third trimester (greater than 20 weeks) of pregnancy should be placed on her left side for transport. If the injuries require the use of a backboard, following full immobilization to the backboard, the backboard should be tilted to the left. Failure to follow this practice may cause hypotension due to decreased venous return.

If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the patient’s head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization. Cases involving hangings that do not meet Trauma Alert criteria are not considered Trauma Alert patients (e.g., a “suffocation type” patient without c-spine deformity).
2.10.1 Head and Spine Injuries / Trauma

Purpose: This protocol is for patients who are suspected of having a head and/or spinal injury. If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization. Hangings without Trauma Alert Criteria ARE NOT Trauma Alert Patients (e.g. “suffocation type”, patient without C-spine deformity). NOTE: protocol 4.35 Spinal Motion Restriction Clearance should be used on a completely alert and cooperative patient at low risk for c-spine injury to determine if spinal motion restriction is needed.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC

1. Initial Patient Assessment Protocol 2.1.1.
2. Airway Assessment/Management Protocol 2.1.2. Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Determine if C-spine immobilization is needed via Spinal Motion Restriction Clearance Protocol.
4. Attach cardiac monitor and pulse oximeter
5. If isolated head injury, elevate head of backboard 30 degrees (12 – 18 inches).
6. Determine level of consciousness (AVPU).
7. Assess for and document the Glasgow Coma Scale
8. Complete motor examination (paralysis, weakness, posturing), if possible.
10. Complete sensory examination, if possible.
11. Open wounds, which expose the brain tissue, should be covered with saline-soaked gauze.
12. If combative, check airway, ensure oxygen delivery, and restrain as needed.

ALS LEVEL 1: PARAMEDIC ONLY

1. Intubation and ventilation with 100% oxygen for markedly decreased LOC, inability to maintain a patient airway, or for GCS <= 8.
2. If signs of brainstem herniation exist (e.g. pupillary dilatation, asymmetric pupillary reaction, or motor posturing), ventilate patient to achieve optimal ETCO₂ of 35 – 40 mm Hg.
3. If unresponsive or pulseless, apneic:
   a. Intubate with neck in neutral position (stabilized with traction by second EMT).
   b. Ventilate with 100% oxygen.
   c. CPR if pulseless.
4. If BP <90 mm Hg systolic, or signs of shock:
   a. IV Lactated Ringer's en route. Bolus with 250 cc increments of IV fluid p.r.n. x 2 liters. Recheck vitals after each bolus
5. If patient has seizures give one of the following:
   a. Valium 2 - 10 mg IVP
   or
   b. Versed 2 – 4 mg IVP/IO/IM/IN for seizures and agitation.
   c. Ativan 2 – 4 mg IV/IO/IN
6. Consider need or RSI to control airway. See procedure 4.31 RSI

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director if any concerns or any questions.

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General Guidelines for Tx Pt
2.10.2  Eye Injuries
Adult Medical Protocol

**Purpose:** This protocol covers a variety of injuries to the eye. If other injuries to the body exist, priority of care should be given as appropriate.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Patient Assessment Protocol 2.1.1]
2. [Airway Assessment/Management Protocol 2.1.2]. Oxygen if applicable via nasal cannula @2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO2 < 90%).
3. Attach cardiac monitor and pulse oximeter as indicated.
4. Remove or ask patient to remove contact lens, if still in affected eye(s).
5. **If Penetrating Trauma:**
   a. Stabilize penetrating object(s) and cover affected eye with an ocular shield or similar rigid device. Cover both eyes to minimize eye movement. Avoid direct pressure on eye or penetrating object.
   b. DO NOT delay transport.
6. **If Blunt Trauma:**
   a. Cover both eyes
   b. Do Not delay transport
7. If eyeball has been forced out of the socket, cover the entire eye area with a rigid container, such as a disposable drinking cup. Avoid contact with the exposed globe. If bleeding, control by direct pressure with a sterile dry dressing.
8. **If Loss of Vision:** (If sudden painless and non-traumatic loss of vision, consider Retinal Artery Occlusion);
   a. Apply cardiac monitor and assess for changes
   b. Apply vigorous pressure using heel of hand to affected eye for 3-5 seconds, then release. (Patient may perform this procedure)
   c. Do Not delay transport
9. **If Chemical Injury:**
   a. Flush immediately with sterile normal saline and continue flushing en route.
   b. Bring chemical container or name of chemical with patient to the emergency department.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If chemical injury or foreign body sensation;
   a. Instill (if available) 2 drops **Tetracaine ophthalmic drops** (0.5% solution) in affected eye if patient not allergic to Tetracaine or the "caine" class of local anesthetics. Contraindicated in penetrating eye injuries or laceration of the cornea or globe.
2. Initiate IV lactated Ringer’s or Normal Saline at KVO PRN if injury seems serious.
ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control or medical director if any concerns or any questions.

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2.10.3 Chest Trauma: Blunt and Penetrating
Adult Medical Protocol

**Purpose:** This protocol covers both blunt and penetrating chest trauma and should be part of initial resuscitation if breathing is compromised. Chest pain due to blunt trauma may be an indication of underlying injury. Blunt injuries such as a pulmonary contusion and cardiac contusion may cause respiratory insufficiency and/or myocardial infarction.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol. 2.1.1**
2. **Airway Assessment/Management Protocol. 2.1.2**  Oxygen via nasal cannula @ 4 LPM to maintain pulse ox ≥ 94% (use non-rebreather @15 LPM if SpO₂ < 90%)
3. Attach cardiac monitor and pulse oximeter.
4. If penetrating or sucking chest or upper back wound (look for bubbles, listen for air leaks):
5. Place occlusive dressing (or commercially available covering) during exhalation (tape on 3 sides) or apply Asherman Chest Seal or similar device. Once occluded, monitor for tension pneumothorax.
6. Impaled objects should be stabilized in place. If impaled object is very large or unwieldy, attempt to cut object to no less than six inches from chest.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Start two large bore IVs or IOs of lactated Ringer's or normal saline TKO. Bolus as needed with two liters of IV fluid in 250 – 500 ml increments to maintain systolic BP > 90 mm Hg. Check vital signs frequently.
2. Call Trauma Alert if patient meets criteria (see Trauma Alert Criteria)
3. If flail chest (unstable segment that does not expand with the remainder of the chest on inspiration):
   a. If conscious, stabilize flail segment with gauze pad, IV bag, or place the patient’s ipsilateral arm in a sling and swathe
   b. If unconscious, immobilize neck and intubate. Ventilate with 100% oxygen by BVM.
4. If tension pneumothorax develops, (unilateral absent breath sounds with or without tracheal deviation or bilaterally absent breath sounds:
   e. Perform needle decompression per protocol.
5. If continued inadequate ventilations and decreasing LOC:
   a. Rapid secondary survey for additional injuries.
   b. Immobilize neck.
   c. Control hemorrhage.
   d. Intubate with cervical stabilization.
   e. Ventilate with 100% oxygen via BVM.
   f. Cardiac compressions if pulseless.
6. Treat any dysrhythmias per cardiac dysrhythmia protocols.
7. If patient being transferred to another facility with chest tube(s) already in place:
   a. Keep chest tubes tubing from kinking.
   b. Check dressing over chest tube site to assure adequately adhered.
   c. Keep pleuravac upright at all times.
   d. Monitor if on suction for intermittent bubbling.
   e. If patient with chest tube begins to experience severe respiratory distress:
      1) Rapidly assess ABCs.
      2) Assist ventilations as needed.
      3) Check chest tube tubing for kinks or leaky connections or blood in tube. If so, unkink, seal leak, or milk tubing.
      4) If patient is on board air ambulance, immediately ascertain the cabin altitude pressure. If greater than sea level, have the pilot descend the aircraft to achieve cabin altitude of sea level.

ALS LEVEL 2: MEDICAL CONTROL
1. Medical control or medical director for further orders as needed.
2. Pain management for chest trauma ONLY by medical control orders
2.10.4 Abdominal / Pelvic Trauma
Adult Medical Protocol

**Purpose:** This protocol covers blunt and penetrating abdomino-pelvic trauma. Penetrating injuries may also include the chest. Patients who may initially appear normal can rapidly deteriorate and therefore should be closely monitored and have serial exams.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Attach cardiac monitor and pulse oximeter.
4. If patient pregnant and back boarded, tilt board 30 degrees left
5. Impaled objects should be stabilized in place.
6. Eviscerations should be covered with saline-soaked gauze. Do not attempt to push the organs back into the abdomen.
7. For penetrating injuries cover with an occlusive dressing (e.g. Vaseline gauze).
8. Do not log roll patient with a suspected pelvic fracture (may use scoop stretcher)
9. If pelvic fracture suspected, wrap in sheet splint or commercially available pelvic splint

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Establish two large bore IVs of lactated Ringer’s to maintain systolic pressure > 90 mm Hg. Run in two liters of IV fluid. Monitor vital signs and lung sounds after each 250cc bolus. Discontinue if signs of pulmonary edema. If systolic pressure still < 90 contact medical control for further IV orders. IF IV access is unavailable, insert one or two EZ-I0s in the appropriate extremities
2. Call a trauma alert on all patients that meet criteria (see trauma alert protocol).

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for any questions or problems.
2. Pain management for abdominal pain ONLY by medical control orders

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2.10.5 Extremity Injuries
Adult Medical Protocol

Purpose: This protocol will cover extremity injuries including fractures, crush, lacerations, and amputations. Time is critical if there is any chance of re-implanting the amputated part. Lacerations should be repaired as soon as possible (ideally wounds should be repaired within 6 hours), as the risk of infection increases with each passing hour before repair. Urgently transport any injury with vascular compromise.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2
3. Control bleeding
4. Rinse any grossly contaminated wound with saline and cover with sterile dressing.
5. Attach cardiac monitor and pulse oximeter as indicated for seriously injured patient (may not be necessary for an isolated distal extremity wound or fracture).
6. Trauma Alert patients who meet criteria (see Trauma Alert Criteria)
7. Transport to designated facility.
8. If severe life threatening hemorrhage cannot be controlled by direct pressure or other simple measures, apply a CAT tourniquet as per Tourniquet Protocol or refer to 2.10.11 Prehospital Bleeding/External Hemorrhage Control protocol

**FRACTURES**
1. Any fracture or suspected fracture should be splinted appropriately and if possible, apply ice pack to area.
2. Remove and secure all jewelry on the affected extremity. Have your partner witness the disposition of the jewelry, i.e. given to patient or family member, and document disposition in the chart.
3. Check pulse, sensation, and movement before and after splinting.
4. Closed angulated fractures without distal pulse should be aligned using proximal and distal traction during splinting, except fractures that involve a joint, which should be splinted in position found.
5. Traction splints should be used in cases of closed femur fractures, unless a pelvic fracture is suspected. Hip fractures or pelvic fractures can be treated with sheet splint. Femur fractures can also be treated with HARE Traction Splint or Sager Traction Splint.

**AMPUTATIONS**
1. The amputated stump should be dressed with bulky dressing
2. Rinse the amputated part with saline to remove loose debris.
3. Wrap amputated part in gauze moistened with saline
4. Placed wrapped part in plastic bag and seal. Label with name, date and time.
5. Place plastic bag on ice for transport.
1. One or two large bore IV(s) of lactated Ringer’s solution at appropriate rate to maintain systolic > 90 mm Hg. If intraosseous IV is started, do not use injured extremity. If BP < 90, bolus with 250 ml increments of IV fluid up to 2 liters with vital sign rechecks between each bolus.

2. Treat for shock, if indicated.

3. If patient’s blood pressure is stable AND isolated extremity wounds AND patient has no allergies to specific pain medication give one of the following:
   a. **Morphine** IV in 2mg increments, titrate to pain up to 10mg
   b. **Fentanyl** 50 – 100 mcg IV/IM/IO/IN
   c. **Ketamine** 0.1 – 0.5 mg/kg IV/IO, or 0.5 mg/kg IN, or 5 mg/kg IM

4. If nauseated, give one of the following:
   a. **Zofran** 4-8mg IV
   b. **Benadryl** 25 mg IV or IM.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any questions or problems.
2. For IV fluid orders beyond 2 liters if patient remains hypotensive and tachycardic
3. For further pain medication orders beyond the amount allowed in ALS LEVEL 1
2.10.6 Burns
Adult Medical Protocol

**Purpose:** Burns can be caused by solar, thermal, chemical, and electrical sources. First-degree burns (reddened skin, only the epidermal layer), and second-degree burns (red skin with blisters, extends into the dermis) are painful. Third degree burns (full thickness, charred appearance, All epidermal and dermal structures are destroyed) are painless and leathery. Many burns are associated with inhalation injury. The signs and symptoms of inhalation injury include: nasal and oropharyngeal burns, charring of the tongue or teeth, sooty (blackened) sputum, singed nasal and facial hair, abnormal breath sounds (e.g. stridor, rhonchi, wheezing, etc.), and respiratory distress. In cases of inhalation injury, attention should be given to the patency of the airway. Acute swelling can cause an airway obstruction. The paramedic should consider the need for early intubation to avoid a complete airway obstruction that requires a Cricothyroidotomy.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1.
3. Attach cardiac monitor and pulse oximeter.
4. Extinguish any flames on patient; remove smoldering clothing (leather), and any constricting jewelry. Do not remove or peel off skin or tissue.
5. Stop the burning process:
   - THERMAL BURNS; Lavage the burned area with tepid water (sterile, if possible) to cool the skin. Do not attempt to wipe off semisolids (grease, tar, wax, etc)
   - CHEMICAL: Flush with water or normal saline. Brush off dry chemicals. Refer to hazmat protocols as indicated.
   - ELECTRICAL: Remove from contact with current source if equipped to do so. (Note any secondary fractures and Exit wounds caused by current.)
6. Assess the extent of the burn using the Rule of Nines and the degree of burn severity. Call trauma alert if patient meets criteria (2° or 3° burns > 20% BSA): (SEE TRAUMA ALERT CRITERIA) (See Burn Rule of Nine Appendix) (see Burn Severity Categories)
7. Apply dry sterile dressings to burn areas
8. Prevent hypothermia, keep patient warm and insure that all outer layers of dressings are dry
9. If altered LOC and/or signs of head injury (consider carbon monoxide and/or cyanide poisoning if closed space burn):
10. Transport to designated hospital.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. 1 or 2 large bore IVs (in non burned area if possible) with Lactated Ringer’s or Normal Saline. Rate should be based on Parkland Formula: 4cc x kg x %TBS area burned. ½ of this amount will be given over the first 8
hours, so divide the total amount by 2 then again by 8 and this is the cc/hr needed. Example: 70 kg patient with 60% burns to his body.

\[
4\text{cc} \times 70\text{kg} \times 60 \text{%burned} = 16,800
\]

\[
16,800 \div 2 = 8,400 \text{ (amount of fluid need in 8 hours)}
\]

\[
8,400 \div 8 = 1050 \text{ (amount of IV fluid /hour)}
\]

2. If respiratory distress, or airway burns exist, prepare to intubate or support/assist ventilations.

3. If pulseless or apneic, go to Cardiac Arrest Protocol.

4. If additional injuries, go to specific protocol.

5. If patient has isolated burn injuries and no evidence of head injury, altered mental status, chest trauma or abdominal trauma and normal vital signs, CHECK ALLERGIES, give one of the following pain meds for major burns;

   - **Morphine** 2mg increments IV and titrate to pain up to 10mg
   - **Fentanyl** 50 – 100 mcg IV/IM/IO/IN
   - **Ketamine** 0.1 – 0.5 mg/kg IV/IO, or 0.5 mg/kg IN, or 5 mg/kg IM
   - For minor burns, give **Toradol** 30mg IV or 60mg IM.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control for additional pain medication orders as needed.

2. Consider escharotomy per med control if circumferential burns of the neck, chest, or extremities are interfering with effective ventilations or circulation.

3. Contact medical control or medical director for any questions or problems

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<table>
<thead>
<tr>
<th>Burn Classification</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>Minor burn injury</td>
<td>◆ 1° burn</td>
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<tr>
<td></td>
<td>◆ 2° burn &lt; 15% BSA in adults</td>
</tr>
<tr>
<td></td>
<td>◆ 2° burn &lt; 5% BSA in children/aged</td>
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<td></td>
<td>◆ 3° burn &lt; 2% BSA</td>
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<tr>
<td>Moderate burn injury</td>
<td>◆ 2° burn 16-25% BSA in adults</td>
</tr>
<tr>
<td></td>
<td>◆ 2° burn 5-20% BSA in children/aged</td>
</tr>
<tr>
<td></td>
<td>◆ 3° burn 2-10% BSA</td>
</tr>
<tr>
<td>Major burn injury</td>
<td>◆ 2° burn &gt; 25% BSA in adults</td>
</tr>
<tr>
<td></td>
<td>◆ 2° burn &gt; 20% BSA in children/aged</td>
</tr>
<tr>
<td></td>
<td>◆ 3° burn &gt; 10% BSA</td>
</tr>
<tr>
<td></td>
<td>◆ Burns involving the hands, face, eyes, ear feet, or perineum</td>
</tr>
<tr>
<td></td>
<td>◆ Most patient with inhalation injury, electric injury, concomitant major trauma,</td>
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<td></td>
<td>or significant pre-existing diseases</td>
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</table>
The Rule of Nines.
2.10.7 Dental Trauma /Avulsed Tooth/Teeth
Adult Medical Protocol

**Purpose:** This protocol can be used for patients who sustained dental trauma. Broken teeth, dentures or partial plates can potentially cause airway obstruction, have high index of suspicion if patient is having any respiratory distress following dental trauma. These should be removed to clear the airway. If a tooth is completely knocked out and is not a primary (baby) tooth, make all possible attempts to locate the tooth. If the tooth can be located, AND the root is not broken (completely intact) follow this protocol to manage the situation.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol 2.1.2** (oxygen PRN)
3. Attach cardiac monitor and pulse oximeter PRN.
4. Transport to designated hospital.
5. If the avulsed tooth (teeth) can be located, pick it up by the crown and avoid touching the root. Inspect the tooth to make sure it is completely intact (not broken and the entire root of the tooth is intact).
6. Rinse in normal saline (DO NOT rub or scrub) and placed in moistened gauze, but there is no need to cool or ice. Transport with patient to the hospital. As an alternative, if re-implantation is NOT feasible and the patient is a fully conscious adult, then the best procedure is to place the tooth in the mouth, either under the tongue or in the buccal vestibule. This is not recommended for children.
7. Re-implantation is recommended if possible at the scene as time is of the essence. The sooner an avulsed tooth can be re-inserted into its original socket, the greater the chance the tooth will survive. The following guidelines pertain to re-implantation at the scene:
   a. Applicable only for permanent teeth (i.e., with patients over 6.5 years of age)
   b. Applicable when only one or two teeth are cleanly avulsed and the entire root is present
   c. Applicable only to anterior teeth (front 6, upper and lower)
   d. The patient must be conscious, cooperative, and not under the influence of alcohol or drugs.
   e. Should be attempted within the first 30 minutes; the sooner, the greater success rate
   f. Have the patient rinse his/her mouth with saline and spit. Do this several times to rinse the oral cavity.
   g. Rinse the tooth with saline (do not scrub), gently reposition it into the original socket and in as best anatomical position as possible (as even with the adjacent teeth as possible).
   h. Do not force reimplantation. Gentle insertion is all that is necessary. Slight incorrect positioning can be corrected later.
i. Roll a piece of gauze and place between the patient’s teeth. Ask the patient to lightly bite down to hold the re-positioned tooth in place with the rolled gauze.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Chances are this patient will not need IV fluids. Pain meds can be given IM however at paramedic’s discretion, IV access can be established.

2. If this is isolated dental trauma with no signs of head injury, c-spine injury, or airway compromise, you may give one of the following:
   a. **Morphine** 2mg increments IV up to 10 mg or **Morphine** 5mg IM
   b. **Fentanyl** 50 – 100 mcg IV/IM/IO/IN
   c. **Ketamine** 0.1 – 0.5 mg/kg IV/IO, or 0.5 mg/kg IN, or 5 mg/kg IM

**ALS LEVEL 2: MEDICAL CONTROL**

1. Notify medical control or medical director if any problems and/or questions

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2.10.8 Sexual Assault
Adult Medical Protocol

Purpose: This protocol is to be used for patients who are alleged victims of sexual assault. Treat patient with dignity. Be careful what and how you document. Avoid comments that may be construed as fact by an attorney but for which you have no proof. For example don’t write; “patient sustained a large wound on her leg that occurred during the rape”. Unless you were there and witnessed the incident, you cannot say for a fact that the wound occurred as the result of the rape. This also implies that you know for a fact that a rape occurred. It is better to use statements such as “the alleged rape” or “the patient states she was raped”. Attorneys will back you into a corner and discredit your whole testimony if you make such statements.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Reassure patient and provide emotional support.
5. Perform secondary survey.
6. Treat all injuries appropriately, preferably with a relative present.
7. Protect the scene and preserve evidence. Do not allow the patient to bathe, change clothes, go to the bathroom, or douche. Do not allow patient to place any potential evidence in plastic bags.
8. Notify police if not already informed.
9. Transport to hospital that is equipped to perform sexual assault examinations.

ALS LEVEL 1: PARAMEDIC ONLY
1. Unless patient has serious injuries and/or is hemodynamically unstable, no ALS Level 1 needed
2. Initiate IV only if indicated by seriousness of injury

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for any questions or problems.
2.10.9  Taser / Stun Device Protocol
Adult Medical Protocol

Purpose: This protocol if for patients who have been injured by a taser, stun gun, or similar incapacitating device.

DEFINITIONS:
- **Taser Device** - means any device which is powered by electrical charging units, such as batteries, and which fires one or several barbs attached to a length of wire and which, upon hitting a human, can send out a current capable of disrupting a person's nervous system in such a manner as to render him/her incapable of normal functioning.

- **Stun Device** – means any weapon or other device (except taser devices), which emits an electric or current, intended to temporarily disable a person.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Assessment Protocol 2.1.1
2. Approach scene/patient only when scene is secure per law enforcement
3. Be sure wires are snipped from barb before evaluating/treating patient.
4. Airway Assessment Protocol 2.1.2. (Assess/treat the ABC's as per any medical/trauma call). C-spine precautions if indicated
5. Evaluate and treat the patient for any trauma that may have resulted from a fall due to the taser/stun gun incident.
6. If patient has a specific complaint, evaluate/treat the area of concern according to protocol, (i.e. chest pain, shortness of breath, etc).
7. Management of the barbs:
   a. Any penetrating barb in the skin above the clavicles or in the genitalia will be stabilized and transported to the hospital for removal.
   b. Barbs penetrating the skin other than above the clavicles or the genitalia can be removed at the scene if the paramedic or EMT is comfortable doing so, otherwise, stabilized for removal at the hospital. To remove barbs, simply stabilize the skin on either side of the barb and pull straight out. Cleanse area with alcohol or Betadine afterwards.
8. Decision to transport to hospital:
   a. Any patient who sustained obvious trauma from the incident will be transported.
   b. Any patient with any medical complaint following incident will be transported (i.e. chest pain, shortness of breath, nausea, headache, muscle cramps, etc.)
   c. Any patient with an altered mental status resulting from the taser/stun gun incident or perhaps under the influence of any mind
altering substance (which may have led to the incident) will be transported.

d. Any patient who request transport for evaluation for any reason, will be transported.

e. Any patient who refuses to be transported to the hospital for further evaluation must meet the dry run/refusal criteria.

9. Law enforcement personnel should accompany paramedic for high risk (violent, dangerous) patients.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. None unless significant trauma then refer to appropriate protocol.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any concerns or questions.
2.10.10 General Crush Injury
Adult Medical Protocol

Purpose:
This protocol should be considered when the patient has been entrapped at the scene for more than one hour, one or more full extremities trapped by an object capable of causing a crush injury, including machinery, dirt, rock, and rubble or there is entrapment of patient with history of previous cardiac or renal disease or dialysis treatment. The damaged muscle tissue produces and releases many toxins that can have detrimental effects on the body. The longer the victim is trapped, the longer the toxins are given to build up distal to the crush site. The crushing force acts as a dam that prevents these toxins from being released into the rest of the body. Once the force is removed, the toxins are allowed to run freely throughout the body, causing a myriad of problems.

Crush Syndrome should be suspected in patients with entrapment/compression of greater than one hour, especially when a large muscle mass/group is involved. The initial injury is at the site of the muscle crushed by the mechanical force of an object. The muscle cells die as the result of the following. First, the force of the crushing object ruptures muscle cells. Second, the direct pressure of the object on the limb causes muscle cells to become ischemic. The combination of mechanical force and ischemia can cause muscle death within an hour. Third, the force of the crush injury compresses large vessels, resulting in the loss of blood supply to muscle tissue. Muscles can normally survive circulatory ischemia for up to four hours before the cell death. After four hours, the cells begin to die as a result of the circulatory compromise.

Treatment of the patient at risk for Crush Syndrome should begin before the patient is removed when practical. After the skeletal muscle injury occurs and the crushing object is removed, the accumulation of cellular toxins (myoglobin) and electrolytes (potassium) are released into the circulation and may cause lethal cardiac arrhythmias, acute renal failure and sudden death. The systemic effects of Acute Crush Syndrome only occur after the object is removed and the injured extremity is re-perfused. Removal of the object causes a massive fluid shift into the injured muscle, resulting in acute hypovolemia and hypotension.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment Protocol 2.1.2: Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%) (environmental considerations, dust)
3. Spinal Motion Restriction if applicable
4. Confirm entrapment of 1 or more extremities
5. Complete trauma assessment to evaluate for other injuries and treat immediate life threats immediately
6. Hemorrhage control, may require Tourniquet (see Tourniquet Protocol 4.42) or refer to 2.10.11 Prehospital Bleeding/External Hemorrhage Control protocol
7. Place on Cardiac Monitor and pulse oximeter. Take vitals
8. If the extremity is reachable, check for decreased sensation, motor function, skin color changes and diminished distal pulses
9. Rapid transport once extricated

**ALS LEVEL 1: PARAMEDIC ONLY**

**PRE-EXTRICATION;**
1. Establish two large bore IVs of NS (or LR). 2 liters NS bolus, followed by 500 ml/hr (limit fluid bolus for pediatric (20 ml/kg) and patients with history of cardiac or renal dysfunction
2. Pain control per Pain Protocol 2.1.5. Fentanyl is preferred to Morphine.
   a. Fentanyl 50 – 100 mcg IV/IM/IO/IN
   b. Morphine 4 mg initial then 2 mg increments prn up to 10 mg
   c. Ketamine 0.1 – 0.5 mg/kg IV/IO; or 0.5 mg/kg IN; or 5 mg/kg IM
3. IMMEDIATELY PRIOR TO EXTRICATION; Give Sodium Bicarbonate 1 mEq/kg up to 100 mEq IVP
4. Extrication

**POST-EXTRICATION**
5. Continue cardiac monitoring and assess for hyperkalemia; i.e. widening of QRS (>0.12 seconds) and peak T waves, hypotension
6. If hyperkalemic changes on monitor, give: Calcium Chloride 1 gm IV slow (over 5 minutes)
7. Give an Albuterol (only) Neb 2.5 mg
8. Dress/splint wound/extremity
9. Call Trauma Alert if criteria are met

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director for any questions or problems.

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2.10.11 Prehospital Bleeding/External Hemorrhage Control

Prehospital Bleeding/External Hemorrhage Control Protocol

Apply direct pressure/pressure dressing to injury

- Direct pressure effective (Bleeding controlled)

- Direct pressure ineffective or impractical (Hemorrhage NOT controlled)

  - Wound amenable to tourniquet placement (e.g. extremity injury)

  - Wound not amenable to tourniquet placement (e.g. junctional injury)

- Apply tourniquet at least 3 inches above wound, not over a joint. In an unstable scene, or if the extent of the wound cannot be fully assessed in the field, tourniquet should be placed as proximal on limb as possible “high and tight”

- Apply second tourniquet if hemorrhage is not controlled – adjacent to initial tourniquet

- Assure airway and breathing are adequate

- Assess for hypotension. If hypotension is present, bolus with IV NS (refer to Hypotension Protocol 2.4.4). Consider TXA if traumatic cause and approved in your operation

- Transport to the closest appropriate facility (Trauma Center). Maintain the patient’s skin to warm or normothermic condition. Record all patient care information, including patient’s medical history and all treatment provided in the ePCR
Purpose: This protocol is to be considered for any patient with symptoms of hemorrhagic shock (sustained BP of < 90 mm Hg, sustained HR > 110/min secondary to blood loss) of less than 3 hours duration who may be in need of massive transfusion (> 10 units PRBCs) upon arrival at the hospital. Hemorrhage could be the result of blunt force or penetrating trauma. Hemorrhage may be internal or external.

NOTE: Do not delay transport to prepare and administer TXA.

Protocol:

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol. 2.1.1
2. Airway Assessment/Management Protocol. 2.1.2. Oxygen via nasal cannula @ 4 LPM to maintain pulse ox > 94% (use non-rebreather @15 LPM if SpO2 < 90%)
3. Attach cardiac monitor and pulse oximeter.
4. If penetrating or sucking chest or upper back wound (look for bubbles, listen for air leaks):
5. Place occlusive dressing (or commercially available covering) during exhalation (tape on 3 sides) or apply Asherman Chest Seal. Once occluded, monitor for tension pneumothorax.
6. Impaled objects should be stabilized in place. If impaled object is very large or unwieldy, attempt to cut object to no less than six inches from chest.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Start two large bore IVs of lactated Ringer's or normal saline TKO. Bolus as needed with one to two liters of IV fluid in 250 – 500 ml increments to maintain systolic BP > 90 mm Hg. Check vital signs frequently.
2. Control obvious source of external hemorrhage with direct pressure, pressure dressing and/or tourniquet.
3. Manage other traumatic injuries as per the specific protocol.
4. Criteria for starting TXA:
   i. Hemorrhagic shock < 3 hrs old with suspected need for massive transfusion
   ii. Sustained heart rate of 110 beats per minute or greater
   iii. Sustained hypotension (systolic BP less than 90 mmHg) secondary to blood loss
5. Mix 1 gram Tranexamic acid (TXA) in 100 – 250 ml NS and infuse over 10 minutes. If transport time will exceed 1 hour: Begin a maintenance infusion after the initial bolus.
   iv. **Bolus Dose:**
      Adult: 1 gm tranexamic acid over 10 minutes
v. **Maintenance:**
   - Adult: 1 gram mixed in 1 liter (1000 ml) of NS is to be infused at 125 ml/hr IV.
   - Peds: 20 mg/kg to be infused over 8 hours. Not to exceed 1000mg over 8 hours.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Medical control or medical director for further orders as needed.
2.11 Adults With Special Health Care Needs
2.11 Adults with Special Healthcare Needs
Adult Medical Protocol

**Overview:** These protocols cover specific types of special healthcare needs in adult patients. Adults with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typical adults.

The general approach to adults with special healthcare needs includes the following:

1. Priority is given to ABCs.
2. Do not be overwhelmed by the machines.
3. Listen to the caregiver.
4. If a nurse is present, rely on their judgment.
5. Remember…the patient’s cognitive level of function may be altered.
6. Assume that the patient can understand exactly what you say.
7. Bring all medications and equipment to the hospital.

Obtaining a history includes asking the parent/caregiver the following:

1. Patient’s normal vital signs
2. Patient’s actual weight.
3. Developmental level of the patient.
4. Patient’s allergies- include latex.
5. Pertinent medications/therapies.
2.11.1 Home Mechanical Ventilators
Adult Medical Protocol

**Purpose:** This protocol is for patients who are on home ventilators. Home mechanical ventilators may be indicated for chronically ill adult with abnormal respiratory drive, severe chronic lung disease, or severe neuromuscular weakness. Some patients require continuous mechanical ventilation, while others only require intermittent support during sleep or acute illness. Home ventilators may either be volume limited or pressure limited. All are equipped with alarms. Types of ventilator alarms:

- **Low pressure or apnea:** May be caused by a loose or disconnected circuit or an air leak in the circuit or at the tracheostoma, resulting in inadequate ventilation.
- **Low power:** caused by a depleted battery.
- **High pressure:** can be caused by a plugged or obstructed airway or circuit tubing, by coughing, or by bronchospasm.
- **Setting error:** is caused by ventilator setting outside the capacity of the equipment.
- **Power switchover:** occurs when the unit switches from alternating-current power to the internal battery.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Patient Assessment Protocol 2.1.1](#)
2. Patient (if able) or family should be available to assist with operating the patient’s home ventilator during transport.
3. Confirm vent setting are correct with patient and/or family.
4. [Airway Assessment/Management Protocol 2.1.2](#), If ventilator-dependant patient is in respiratory distress and the cause is not easily ascertained and corrected, remove the ventilator and provide assisted manual ventilations with a bag-valve device.
5. Suction PRN
6. Attach cardiac monitor and pulse oximeter if indicated
7. Consider need for other protocols

**ALS LEVEL 1: PARAMEDIC ONLY**

1. None

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any problems or concerns.

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2.11.2 Tracheostomy
Adult Medical Protocol

**Purpose:** Tracheostomies are indicated for long-term ventilatory support, to bypass an upper airway obstruction, and to aid in the removal of secretions. Tracheostomies come in a variety of sizes and can be either single lumen or double lumen. Special attachments include: tracheostomy nose (filtration device), tracheostomy collar (for oxygen or humidification), and Passy-Muir valve (speaker valve).

Signs of tracheostomy tube obstruction:
- Excess secretions.
- No chest wall movement.
- Cyanosis.
- Accessory muscle use.
- No chest wall rise with bag-valve ventilations.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If obstruction is present, inject 1-3 ml of normal saline into the tracheostomy tube and suction PRN.
3. If unable to clear obstruction by suctioning, remove tracheostomy tube and insert new tube (same size or one size smaller). DO NOT FORCE TUBE.
4. If unable to insert new tracheostomy tube or if unavailable, insert endotracheal tube of similar size into stoma and ventilate with bag-valve-device PRN.
5. If unable to insert endotracheal tube, ventilate with bag-valve-mask over stoma or over patient’s mouth while covering stoma PRN.
6. Attach cardiac monitor and pulse oximeter if indicated.
7. Consider need for other protocols.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. None

**ALS LEVEL 2: MEDICAL CONTROL**

1. Contact medical control or medical director for any problems or concerns

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2.11.3 Central Venous Lines
Adult Medical Protocol

Purpose: Central venous lines are indicated for administration of medications, delivery of chemotherapy, nutritional support, infusion of blood products, and blood draws. Types of central venous lines include: Broviac/Hickman, Port-a-cath/Med-a-port, and percutaneous intravenous catheters (PIC). Central venous line emergencies include: catheter coming completely out, bleeding at the site, catheter broken in half, blood embolus, thrombus, air embolus, and internal bleeding. Use of SQ ports require special training and should not be used for IV access.

Signs of blood embolus, thrombus, air embolus and internal bleeding:

- Chest pain
- Cyanosis
- Dyspnea
- Shock

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Patient Assessment Protocol 2.1.1
2. Airway Assessment/Management Protocol 2.1.2. If indicated Oxygen via nasal cannula @ 2 - 4 LPM to maintain pulse ox at ≥ equal to 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. If catheter is completely out, apply direct pressure.
5. If there is bleeding at the site, apply direct pressure.
6. If catheter is broken in half, clamp end of remaining tube.
7. If suspect blood embolus, thrombus, or internal bleeding: clamp line.
8. If suspected air embolism, clamp line and place patient on left side.
9. Consider need for other protocols

ALS LEVEL 1: PARAMEDIC ONLY
1. CVP and PIC lines may be used for emergency IV access under sterile conditions
2. If central ports need accessing for emergencies, refer to protocol 4.42 Indwelling Vascular Catheter

ALS LEVEL 2: MEDICAL CONTROL
1. Contact medical control or medical director for any problems or concerns

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2.11.4 Feeding Tubes
Adult Medical Protocol

**Purpose:** Feeding tubes are indicated for administration of nutritional supplements and in patients that have an inability to swallow. Types of feeding tubes include: nasogastric tube (temporary) and gastrostomy tubes (G tube). Types of G tubes include those that are surgically placed, percutaneous endoscopic gastrostomy tubes, PEG tubes, and jejunal tubes (J-tube). Complications include: leaks, bleeding around the site, and displacement of the tube.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Medical Supportive Care 2.1.3
2. If catheter is completely out, cover site with Vaseline gauze and apply direct pressure to site.
3. If there is bleeding at the site, apply direct pressure.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or the medical director for any questions or concerns.

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3.0

PEDIATRIC
PROTOCOLS
Pediatric Protocols Overview

3.1 Pediatric Initial Assessment and Management

Introduction:

Protocols in Section 3.1 are designed to guide the EMT or paramedic in his or her initial approach to assessment and management of pediatric patients. The Basic Level care is specified as EMT and Paramedic (BLS) and Level 1 is Paramedic only (ALS). ALS Level 2 designates medical control orders.

Protocol 3.1.1 Initial Assessment should be used on all pediatric patients for initial assessment. During this assessment, if the paramedic determines that there is a need for airway management, Protocol 3.1.2 Airway Management should be used for the management of the pediatric airway. These protocols are frequently referred to by other protocols, which may or may not override them in recommending more specific therapy.

Protocol 3.1.3 Medical Supportive Care presents the basic components of preparation for transport of medical patients. Due to the significant differences in priorities and packaging in the pre-hospital care of trauma and hypovolemia cases, a separate Trauma Supportive Care protocol has been developed. After following Protocol 3.1.1 Initial Assessment, this Medical Supportive Care protocol may be the only protocol used in medical emergency situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

Protocol 3.1.4 Trauma Supportive Care presents the basic components of preparation for transport of trauma patients. Due to the significant differences in priorities and packaging in the pre-hospital care of medical cases, a separate Medical Supportive Care protocol has been developed. After following Protocol 3.1.1, this Trauma Supportive Care protocol may be the only protocol used in trauma or hypovolemia situations where a specific diagnostic impression and choice of additional protocol(s) cannot be made. Judgment must be used in determining whether patients require ALS or BLS level care. This protocol is frequently referred to by other protocols, which may or may not override it in recommending more specific therapy.

**Paramedics should use protocol 3.1.5. for pain management**
Overview of Evaluating and Managing Pediatric Emergencies:

1. Remember that children are not small adults. Treatments vary as do drug dosages and fluid administration rates.
2. Cardiac arrest in children is not a sudden event. It is almost always due to a respiratory problem, which leads to hypoxia, bradycardia, and eventually asystole. Ventricular fibrillation is a rare event in children. Initial treatment should be directed at establishment of an airway, administration of supplemental oxygen, and mechanical ventilation.
3. Extra-glottic devices are available for pediatric patients. The preferred method of airway management is endotracheal intubation. Demand valves should not be used in children because of the tendency to cause barotrauma.
4. The intraosseous route of fluid and medication administration is available in children less than 6 years of age.
5. Blood pressure is a late sign of shock in children. Instead, you should evaluate end-organ perfusion.

Anticipating Cardiopulmonary Arrest

All sick children should undergo a rapid cardiopulmonary assessment. The goal is to answer the question, "Does this child have pulmonary or circulatory failure that may lead to cardiopulmonary arrest?" Recognition of the physiologically unstable infant is made by physical examination alone. Children who should receive the rapid cardiopulmonary assessment include those with the following conditions.

- Respiratory rate greater than 60
- Heart rate greater than 180 or less than 80 (under 5 years)
- Heart rate greater than 180 or less than 60 (over 5 years)
- Respiratory distress
- Trauma
- Burns
- Cyanosis
- Altered level of consciousness
- Seizures
- Fever with petechiae (small skin hemorrhages)

Rapid Cardiopulmonary Assessment
The rapid cardiopulmonary assessment is designed to assist you in recognizing respiratory failure and shock, thus anticipating cardiopulmonary arrest. The rapid cardiopulmonary assessment follows the new basic ABCs (or CAB) of CPR.

**Airway Patency**

Inspect the airway and ask yourself the following questions.

- Is the airway patent?
- Is it maintainable with head positioning, suctioning, or airway adjuncts?
- Is the airway unmaintainable? If so, what action is required?

(Endotracheal intubation, removal of a foreign body, and so on)

**Breathing**

Evaluation of breathing includes assessment of the following conditions.

- Respiratory rate. Tachypnea is often the first manifestation of respiratory distress in infants. An infant breathing at a rapid rate will eventually tire. Thus, a decreasing respiratory rate is not necessarily a sign of improvement. A slow respiratory rate in an acutely ill infant or child is an ominous sign.
- Air entry. Observing for chest rise, breath sounds, stridor, or wheezing can assess the quality of air entry.
- Respiratory mechanics. Nasal flaring and use of the accessory respiratory muscles is evidence of increased work of breathing in the infant and child.
- Color. Cyanosis is a fairly late sign of respiratory failure and is most frequently seen in the mucous membranes of the mouth and the nail beds. Cyanosis of the extremities alone is more likely due to circulatory failure (shock) than respiratory failure.

**Circulation**

The cardiovascular assessment consists of the following procedures.

- Heart rate. Infants develop sinus tachycardia in response to stress. Thus, any tachycardia in an infant or child requires further evaluation to determine the cause. Bradycardia in a distressed infant or child may indicate hypoxia and is an ominous sign of impending cardiac arrest.
- Blood pressure. Hypotension is a late and often sudden sign of cardiovascular decompensation. Even mild hypotension should be taken
seriously and treated quickly and vigorously, since cardiopulmonary arrest is imminent.

- Peripheral circulation. The presence of pulses is a good indicator of the adequacy of end-organ perfusion. The pulse pressure (the difference between the systolic and diastolic blood pressure) narrows as shock develops. Loss of central pulses is an ominous sign.

- End-organ perfusion. The end-organ perfusion is most evident in the skin, kidneys, and brain. Decreased perfusion of the skin is an early sign of shock. A capillary refill time of greater than 2 seconds is indicative of low cardiac output. Impairment of brain perfusion is usually evidenced by a change in mental status. The child may become confused or lethargic. Seizures may occur. Failure of the child to recognize the parents' faces is often an ominous sign. Urine output is directly related to kidney perfusion. Normal urine output is 1-2 ml/kg/hr. urine flow of less than 1 ml/kg/hr is an indicator of poor renal perfusion.

The rapid cardiopulmonary assessment should be repeated throughout initial assessment and patient transport. This will help you determine whether the patient's condition is deteriorating or improving. Any decompensation or change in the patient's status should be immediately treated.
3.1.1 Initial Assessment
Pediatric Protocol

**Purpose:** The initial assessment of the pediatric patient will vary with the age of the patient. However, there are some initial components of assessment that are consistent with all patients, regardless of age. The paramedic or EMT should follow the appropriate approach to patient assessment with respect to the patient's age. In addition to the patient, the parents or caregiver may be needed to gain information needed for a complete assessment of the patient.

A five-step, systematic approach should be used when assessing the child:
1. Scene size-up
2. General assessment (pediatric assessment triangle [PAT]).
   a. Appearance
   b. Work of breathing
   c. Circulation
3. Primary assessment
   a. ABCDE
   b. Cardiopulmonary function
   c. Neurological function
   d. Vital signs
4. Secondary assessment
   a. SAMPLE
   b. Head-to-toe survey
5. Ongoing assessment

**Procedure:**

**Basic Level: EMT and PARAMEDIC**

1. **Scene Size-up.**
   A. Review of Dispatch Information.
   B. Assess Need for Body Substance Isolation.
   C. Assessment of Scene Safety.
   D. Determine Mechanism of Injury.
   E. Determine Number and Location of Patients.
   F. Determine Need for Additional Resources.
   G. Observe Environment of Pediatric Patient.

2. **Pediatric Assessment Triangle - Rapid Cardiopulmonary Assessment.**
   A. Appearance. *(Peds Assessment Triangle chart)*
      1. Alertness.
      2. Distractibility.
      3. Consolability.
      4. Eye Contact.
5. Speech/Cry.
7. Color.

B. Work of Breathing. *(Peds Assessment Triangle chart)*
1. Appearance (as above).
2. Use of accessory muscles.
   a. Intercostal and/or supraclavicular retractions.
   b. Diaphragmatic breathing (see-saw type breathing).
3. Respiratory rate.
4. Tidal volume (chest expansion).
5. Other signs of respiratory distress.
   a. Nasal flaring.
   b. Grunting.
   c. Cyanosis.

C. Circulation to Skin. *(Peds Assessment Triangle chart)*
1. Strength of pulses (central vs. peripheral).
2. Color and temperature of extremities (central vs. peripheral).
3. Capillary refill time.
4. Pulse rate.
5. Blood pressure (may be difficult to assess in infants).

3. Initial Assessment.
   A. Assess Airway, C-Spine and Initial Level of Consciousness (AVPU).
   B. Assess Breathing.
   C. Assess Circulation and Presence of Hemorrhage.
   D. Assess Disability - Movement of Extremities.
   E. Expose and Examine Head, Neck, Chest, Abdomen, and Pelvis (check back when patient is rolled on side).
   F. Identify Priority Patients.
   G. Assess the vital signs
      1. Blood Pressure (Capillary Refill)
      2. ECG
      3. SpO2

4. Initial Management (see *Pediatric Protocol 3.1.3 - Medical Supportive Care* or *3.1.4 -Trauma Supportive Care*).
   A. Life-threatening (urgent)
   B. Non-Life-threatening (not urgent)

5. Secondary Assessment.
   A. Conduct a Toe-to-Head Survey.
   B. Neurological Assessment.
      1. Pupillary Response.
      2. Pediatric Glasgow Coma Score.
C. Repeat Assessment Triangle - Rapid Cardiopulmonary Assessment (as above).
D. Obtain a Medical History.
   4. P - Past Medical History.
   5. L - Last Oral Intake.
   6. E - Events Leading to Illness or Injury.
6. **Ongoing Assessment.** Reassess the patient every fifteen (15) minutes, or for critical patients every five (5) minutes.
   A. Continually monitor:
      1. Respiratory effort
      2. Skin color
      3. Mental status
      4. Temperature
      5. Pulse oximetry
   B. Reevaluate vital signs and compare with baseline vital signs.

7. **Other Assessment Techniques.**
   A. Cardiac Monitoring.
   B. Glucose Determination
   C. Pulse Oximetry
   D. Dealing with the autistic patient (3.10.5 Autistic patients)

Return to:  Contents at top    Pediatric Protocols    Peds Initial Assessment and Management
The PAT functions as a rapid, initial assessment to determine “sick” or “not sick,” and should be immediately followed by/not delay the ABCDEs. It can be utilized for serial assessment of patients to track response to therapy.

### Appearance: The “Tickles” (TICLS) Mnemonic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Normal features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone</td>
<td>Move spontaneously, resists examination, sits or stands (age appropriate)</td>
</tr>
<tr>
<td>Interactiveness</td>
<td>Appears alert/engaged with clinician or caregiver, interacts well with people/environment, reaches for objects</td>
</tr>
<tr>
<td>Consolability</td>
<td>Stops crying with holding/comforting by caregiver, has differential response to caregiver vs. examiner</td>
</tr>
<tr>
<td>Look/gaze</td>
<td>Makes eye contact with clinician, tracks visually</td>
</tr>
<tr>
<td>Speech/cry</td>
<td>Uses age-appropriate speech</td>
</tr>
</tbody>
</table>

### Work of breathing

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Abnormal features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal airway sounds</td>
<td>Snoring, muffled/hoarse speech, stridor, grunting, wheezing</td>
</tr>
<tr>
<td>Abnormal positioning</td>
<td>Sniffing position, tripoding, prefers seated posture</td>
</tr>
<tr>
<td>Retractions</td>
<td>Supraclavicular, intercostal, or substernal, head bobbing (infants)</td>
</tr>
<tr>
<td>Flaring</td>
<td>Flaring of the nares on inspiration</td>
</tr>
</tbody>
</table>

### Circulation to skin

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Abnormal features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pallor</td>
<td>White/pale skin or mucous membranes</td>
</tr>
<tr>
<td>Mottling</td>
<td>Patchy skin discoloration due to variable vasoconstriction</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>Bluish discoloration of skin/mucous membranes</td>
</tr>
</tbody>
</table>
## Components of the PAT and the General Impression

<table>
<thead>
<tr>
<th>Component</th>
<th>Stable</th>
<th>Resp Distress</th>
<th>Resp Failure</th>
<th>Shock</th>
<th>CNS/Metabolic</th>
<th>Cardiopul Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Normal</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Normal/abnormal</td>
<td>Abnormal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Work of Breathing</td>
<td>Normal</td>
<td>Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
<tr>
<td>Circulation of the skin</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal/Abnormal</td>
<td>Abnormal</td>
<td>Normal</td>
<td>Abnormal</td>
</tr>
</tbody>
</table>

[Return to Peds Initial Assessment]
3.1.2 Airway Management
Pediatric Protocol

Purpose: Airway assessment and management is the most important and first order of business when patient contact is made (immediate removal from unsafe scene may on occasion trump airway management). An algorithm for general airway assessment/management provides a general overview and road map for the EMT/Paramedic to follow if needed. This algorithm will in turn direct the EMT/Paramedic to either a Non-breathing Airway Protocol or a Breathing Patient Airway Protocol. Once the airway is controlled/secured, attention can be given to the other medical/trauma problems and care directed according to the appropriate protocol.

Procedure:

**Basic Level: EMT and PARAMEDIC**

1. Initial Pediatric Assessment Protocol 3.1.1
2. If spontaneous breathing is present without compromise:
   A. Monitor breathing during transport.
   B. Administer oxygen PRN (Oxygen should only be administered and titrated to the patient that shows signs of respiratory compromise and/or is unable to maintain SpO₂ ≥ 94%). Avoid over oxygenation; wean oxygen concentration as tolerated.
   1. Infants via infant mask @ 2-4 L/min.
   2. Small child (1-8 years) via pediatric nasal cannula @ 2 – 4 L/min or pediatric face mask @ 6-8 L/min.
   3. Older child (9-15 years) via nasal cannula @ 2 – 4 L/min, simple mask @4-6 L/min or non-rebreather mask @ 10-15 L/min.
   4. If mask is not tolerated administer via blow-by method.
3. If spontaneous breathing is present with compromise:
   A. Maintain airway (e.g. modified jaw thrust)
   B. Suction PRN.
   C. Administer oxygen and titrate to pulse ox of > 94%.
   1. Infants via infant mask @ 2-4 L/min.
   2. Small child (1-8 years) via pediatric nasal cannula @ 2 – 4 L/min or pediatric mask @ 6-8 L/min.
   3. Older child (9-15 years) via nasal cannula @ 2 – 4 L/min, simple mask @4-6 L/min or non-rebreather mask @ 10-15 L/min.
   4. If mask is not tolerated administer via blow-by method.
   D. If unable to maintain airway, insert oropharyngeal or nasopharyngeal airway PRN. May consider extra glottic device if available for size of child.
E. Assist ventilations with BVM PRN.
F. Pulse oximeter, as soon as possible.

4. If spontaneous breathing is absent or markedly compromised: (a)(b)
   A. Maintain airway (e.g. modified jaw thrust).
   B. Suction PRN.
   C. If unable to maintain airway, insert oropharyngeal or nasopharyngeal airway. May consider extra glottic device if available for size of child.
   D. Ventilate with BVM @ 12 – 20 BPM for perfusing rhythm or 8 – 10 BPM when CPR is being performed.
   E. Monitor pulse oximetry and capnography or ETCO₂ monitoring device, as soon as possible.

ALS Level 1: PARAMEDIC ONLY
A. Perform endotracheal intubation PRN and document the following (The BVM should be initially used for ventilatory support. Endotracheal intubation should only be used when the BVM is ineffective or prolonged ventilatory support is necessary).
   (1) Confirm ETT placement (see confirmation protocol). Document at least three.
      a. Negative epigastric sounds
      b. Positive bilateral breath sounds
      c. Condensation in the ET tube
      d. Chest rise and fall
   (2) Secure ETT with tape and bite block or commercial device.
      a. Full spinal immobilization is recommended
   (3) Attach end-tidal CO₂ monitoring device.
   (4) Monitor SpO₂ with pulse oximeter.
B. If unable to intubate and patient cannot be adequately ventilated by other means, perform needle cricothyroidotomy and transport rapidly to the hospital.

ALS LEVEL 2: MEDICAL CONTROL
A. Insert Nasogastric tube (only if trained) and decompress stomach PRN (when gross gastric distension is noted, an NG tube should be inserted to relieve gastric distension that may be compromising ventilatory effort).

(a) Ineffective ventilations may be evident by poor chest rise, poor lung sounds, and capnography readings failing to improve with ventilations.
(b) Follow the Universal Airway Algorithm on all advanced airways

Return to:  Contents at top  Pediatric Protocols  Pediatric Initial Assessment and Management  Peds Carbon Monoxide Poisoning
3.1.3 MEDICAL SUPPORTIVE CARE
Pediatric Protocol

Purpose: This protocol is used in conjunction with the Initial patient Assessment Protocol.

Procedure:

**Basic Level: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
3. Attach cardiac monitor and pulse oximeter if indicated
4. Keep patient warm (except if treating heat stroke, cool patient).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Monitor ECG PRN.
2. Establish IV (or EZ-IO if critical condition and in need of urgent fluids and/or drugs) of Normal Saline with regular infusion set PRN (a)(b)(c)(d), unless overridden by other specific protocol.
3. Establish hospital contact for notification of incoming patient and obtaining consultation for level 2 orders.

**ALS Level 2: MEDICAL CONTROL**
1. Contact medical control or medical director if any concerns or any questions.

Note:
(a) Authorized IV routes include all peripheral venous sites. Intraossious IV site is the alternative to poor or no peripheral access. A large bore intracath should be used for unstable patients; avoid sites below the diaphragm.
(b) A Buretrol, Volutrol, or Soluset should be used in lieu of a minidrip when starting an IV on patients that are eight years old or less, if available.
(c) An IV lock or medication access point (MAP) may be used in lieu of an IV bag in some patients with intravenous lines, when appropriate 
(d) An EMT that has been authorized by their Medical Director may establish and IV.
(e) When unable to establish an IV in the pediatric patient that needs to be resuscitated, an intraosseous line may be used by the paramedic only.

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3.1.4 TRAUMA SUPPORTIVE CARE
Pediatric Protocol

Purpose: This protocol is used in conjunction with the Initial Assessment Protocol.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1. Initiate trauma alert, if applicable.
3. Correct any open wound/sucking chest wound (occlusive dressing).
4. Control hemorrhage
5. Spinal Motion Restriction of C-spine and secure patient to backboard or Pediatric Immobilizer PRN (a)
6. Attach cardiac monitor and pulse oximeter if indicated
7. Expedite transport
8. The following steps should not delay transport:
   a. Complete bandaging, splinting and packaging PRN
   b. Establish hospital contact for notification of incoming patient and for the Paramedic to obtain consultation for level 2 orders

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Correct any massive flail segment that causes respiratory compromise (intubate)
2. Correct any tension pneumothorax with needle decompression as per protocol
3. Establish IV (or EZ-IQ if critical condition and in need of urgent fluids and/or drugs) of Normal Saline with regular infusion set PRN (b)(c)(d), unless overridden by other specific protocol.
4. Monitor ECG PRN.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director if any concerns or questions.

Note:
(a) Infants and small children in car seats may be immobilized without removing them from the car seat, as long as it will not interfere with patient assessment and other needed procedures and car seat is intact. If patient is not in car seat on arrival, do not put patient back into car seat to immobilize; use backboard or pediatric immobilizer.
(b) Authorized IV routes include all peripheral venous sites. Two IVs using large bore intracath should be used for unstable patients, avoid sites below the diaphragm. Rapid transport should not be delayed to establish an IV. Intraossious access is alternative to poor or no peripheral access.
(c) A Buretrol, Volutrol, or Soluset should be used in lieu of a regular infusion set when starting an IV on patients that are less than eight years old. In not available, use a microdrip set.
(d) When unable to establish an IV in the pediatric patient that needs to be resuscitated, an intraosseous line may be used by the paramedic only.

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3.1.5 PAIN MANAGEMENT
Pediatric Protocol

**Purpose:** This protocol is to be used for managing pain in pediatric patients with the following conditions:
- Isolated Extremity Fracture
- Acute back strain
- Soft tissue injuries, burns, bites and stings.
- Discomfort related to attached devices or inserted tubes such as a foley catheter, NG tube, chest tube, etc. This will apply to intra-facility transfers.

Do not use this protocol if there is multisystem trauma or hemodynamic instability. For mechanisms or incidents involving a high transfer of energy (i.e. MVA, long falls, etc.), contact medical control prior to administration of pain medication. Keep in mind that severe back pain can sometimes be indicative of a condition that may require emergency surgery such as appendicitis, ruptured or dissecting aneurysm, ruptured ectopic pregnancy, etc. Be sure you do a good abdominal exam on patients complaining of back pain. If any abdominal tenderness is found, do not give pain med until advised by medical control or medical director. If patient has severe enough back pain that you are considering giving pain medication for, be sure the history is consistent with back strain, e.g. lifting heavy material and felt a pull. **DO NOT USE TORADOL ON ANY PATIENT THAT MAY REMOTELY BE GOING TO SURGERY**, e.g. fractured extremities, serious soft tissue injuries. If you’re not sure, call med control for advice. Kidney stone patients may report a history of kidney stones and may or may not have hematuria (blood in urine). Always monitor respiratory status and pulse ox after administration of a narcotic. Intervene as needed to keep pulse ox \( \geq 95\% \)

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Patient Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3

**Isolated Extremity Fracture**

The purpose of this procedure is to manage pain associated with isolated extremity fractures not associated with multisystem trauma or hemodynamic instability. Injuries from a high mechanism of injury, such as an MVA or long fall should be discussed with med control prior to giving pain meds.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Patients should be asked to quantify their pain on an analog pain scale (0=least severe to 10=most severe) or **Wong-Baker Faces Scale** or Infant
Behavior Score (a)(b). This should be documented and used to measure the effectiveness of analgesia.

2. Distal circulation, sensation and movement should be noted and recorded in the injured extremity.

3. The extremity should be immobilized as described in Adult Protocol Extremity Injuries.

4. Extremity fractures should be elevated, if possible, and cold applied.

**ALS LEVEL 2: MEDICAL CONTROL**

1. If pain persists and systolic BP is adequate (see Appendix - Pediatric Vital Signs), choose one of the following:
   a. **Morphine Sulfate** may be given intravenously in increments every 3 – 5 minutes, titrated to pain to a maximum of 5 mg. Administer at a rate not to exceed 1 mg/min. Pediatric dose:
      - **< 6 months;** 0.05 – 0.2 mg/kg SQ/IM/IV (avoid IM route if possible)
      - **6 months- 12 yrs;** 0.1-0.2 mg/kg IV/IM/SQ.

   b. **Fentanyl (Sublimaze)**
      1-3 yrs old: 1 - 2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      3 – 12 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      >12 yrs old: 0.5 – 1 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)

   c. **Ketamine: 0.1 – 0.5 mg/kg IV/IO.**
      5 mg/kg IM dose
      0.5 mg/kg IN dose: via atomizer
      - If hypersalivation/coupius brochial secretions, give Atropine 0.02 mg/kg IV/IO.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
<th>10kg purple</th>
<th>12kg yellow</th>
<th>15kg white</th>
<th>19kg blue</th>
<th>24kg orange</th>
<th>30kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine IV/IO/IM/SQ</td>
<td>0.04 mg</td>
<td>0.06 mg</td>
<td>0.08 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Fentanyl IV/IO</td>
<td>4 mcg</td>
<td>6 mcg</td>
<td>8 mcg</td>
<td>10 mcg</td>
<td>12 mcg</td>
<td>15 mcg</td>
<td>19 mcg</td>
<td>24 mcg</td>
<td>30 mcg</td>
</tr>
<tr>
<td>Fentanyl IN</td>
<td>6 mcg</td>
<td>9 mcg</td>
<td>12 mcg</td>
<td>15 mcg</td>
<td>16 mcg</td>
<td>22.5 mcg</td>
<td>28.5 mcg</td>
<td>36 mcg</td>
<td>45 mcg</td>
</tr>
<tr>
<td>Ketamine IV/IO/IN</td>
<td>2 mg</td>
<td>3 mg</td>
<td>4 mg</td>
<td>5 mg</td>
<td>6 mg</td>
<td>7.5 mg</td>
<td>9.5 mg</td>
<td>12 mg</td>
<td>15 mg</td>
</tr>
<tr>
<td>Ketorolac (Toradol)</td>
<td>If &gt; 2 years of age, Ketorolac Tromethamine (Toradol) may be given 0.5 mg/kg (maximum 15mg) IV or 1 mg/kg (maximum 30 mg) IM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Atropine</td>
<td>0.08 mg</td>
<td>0.12 mg</td>
<td>0.16 mg</td>
<td>0.2 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
<td>0.38 mg</td>
<td>0.48 mg</td>
<td>0.6 mg</td>
</tr>
</tbody>
</table>
**Naloxone (Narcan)**
- 0.4 mg
- 0.6 mg
- 0.8 mg
- 1 mg
- 1.2 mg
- 1.5 mg
- 1.9 mg
- 2 mg
- 2 mg

**Ondansetron (Zofran)**
- Contact med control
- 1 mg
- 1 mg
- 1 mg
- 2 mg
- 2 mg
- 3 mg

---

**Acute Back Strain, Soft Tissue Injuries, Burns, Bites and Stings**

This procedure is used for pain associated with acute back strains, soft tissue injuries, burns, bites and stings not associated with multisystem trauma or hemodynamic instability.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Patients should be asked to quantify their pain on an analog pain scale (0=least severe to 10=most severe). This number should be documented and used to measure the effectiveness of analgesia.

**ALS Level 2: MEDICAL CONTROL**
1. If pain persists and systolic BP is adequate (see Appendix Pediatric Vital Signs), give one of the following:
   a. **Morphine Sulfate** may be given intravenously in increments every 3 – 5 minutes, titrated to pain to a maximum of 10 mg. Administer at a rate not to exceed 1 mg/min. 
      Pediatric dose:
      - **< 6 months;** 0.05 – 0.2 mg/kg SQ/IM/IV (avoid IM route if possible)
      - **6 months- 12 yrs;** 0.1-0.2 mg/kg IV/IM/SQ.
   b. **Fentanyl (Sublimaze)** Pediatric dose:
      - 1-3 yrs old: 1 - 2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      - 3 – 12 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      - >12 yrs old: 0.5 – 1 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
   c. If > 2 years of age, **Ketorolac Tromethamine (Toradol)** may be given 0.5 mg/kg (maximum 15mg) IV or 1 mg/kg (maximum 30 mg) IM
   d. **Ketamine:**
      - IV/IO dose: 0.1 – 0.5 mg/kg
      - IM dose: 5 mg/kg
      - IN dose: 0.5 mg/kg (via atomizer)
NOTE: If hypersalivation/coupsious brochial secretions, give **Atropine** 0.02 mg/kg IV/IO.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
<th>10kg purple</th>
<th>12kg yellow</th>
<th>15kg white</th>
<th>19kg blue</th>
<th>24kg orange</th>
<th>30kg green</th>
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</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>0.04 mg</td>
<td>0.06mg</td>
<td>0.08 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>8 mcg</td>
<td>12 mcg</td>
<td>16 mcg</td>
<td>20 mcg</td>
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<td>38 mcg</td>
<td>48 mcg</td>
<td>60 mcg</td>
</tr>
<tr>
<td>Ketamine IV/IO/IN</td>
<td>2 mg</td>
<td>3 mg</td>
<td>4 mg</td>
<td>5 mg</td>
<td>6 mg</td>
<td>7.5 mg</td>
<td>9.5 mg</td>
<td>12 mg</td>
<td>15 mg</td>
</tr>
<tr>
<td><strong>Ketorolac (Toradol)</strong></td>
<td>0.08 mg</td>
<td>0.12 mg</td>
<td>0.16 mg</td>
<td>0.2 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
<td>0.38 mg</td>
<td>0.48 mg</td>
<td>0.6 mg</td>
</tr>
<tr>
<td>Naloxone (Narcan)</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2 mg</td>
<td>2 mg</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>Contact med control</td>
<td>1 mg</td>
<td>1 mg</td>
<td>1 mg</td>
<td>2 mg</td>
<td>2 mg</td>
<td>3 mg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

(a) **Wong-Baker Facial Scale:**

![Wong-Baker Facial Scale](image)

(b) **Infant Behavior Score**

Assessment of Behavior Score:

0  “Relaxed” – Infant comfortable, not distressed
1-2 Some transitory distress caused; returns immediately to “relaxed”.
3-4 Transitory distress, likely to respond to consolation
5  Infant experiences pain; if no response to consolation, may require analgesia.
6  “Anguished” and “exaggerated” – infant experiencing acute pain; is unlikely to respond to consolation, will probably benefit from analgesia.
6-8 “Inert” - (no response to traumatic procedure) infant is habituated to pain; will not respond to consolation; systematic pain control by analgesia should be considered.

Infant Behavior Score:
Facial Expression

0 “relaxed” Smooth muscled; relaxed expression; either in deep sleep or quietly alert.
1 “anxious” Anxious expressions; frown; REM behind closed lids; wandering gaze; eyes narrowed; lips parted; pursed lip as if “oo” is pronounced.
2 “anguished” Anguished expression/crumped face; brow bulge; eye-squeeze; nasolabial furrow pronounced; square-stretched mouth; cupped tongue; “silent cry”
3 “inert” (Only during or immediately after traumatic procedure) no response to trauma; no crying; rigidity; gaze avoidance; fixed/staring gaze; apathy; diminished alertness

Body Movement

0 “relaxed” Relaxed trunk and limbs; body in tucked position; hands in cupped position or willing to grasp a finger
1 “restless” Moro reflexes; startles; jerky or uncoordinated movement of limbs; flexion/extension of limbs; attempt to withdraw limb from site of injury.
2 “exaggerated” Abnormal position of limbs; limb/neck extension; splaying of fingers and/or toes; flailing or thrashing of limbs; arching of back; side swiping/guarding site of injury
3 “inert” (Only during or immediately after traumatic procedure) no response to trauma; inertia; limpness/rigidity; immobility

Color

0 Normal skin color (depending on skin type)
1 Redness; congestion
2 Pallor; mottling; grey

(c) Extreme caution should be used with administering Morphine to a patient with an SpO2 < 95%

(d) Toradol is contraindicated in the following patients:
1. Potential surgical candidate (e.g. trauma patient)
2. Know allergies to nonsteroidal anti-inflammatory drugs (e.g. aspirin, ibuprofen)
3. History of nasal polyps
4. Angioedema
5. Bronchospastic reactivity (e.g. asthma)
6. Kidney dysfunction
Peds Burn Injuries, Documentation
3.2
PEDIATRIC RESPIRATORY EMERGENCIES
3.2 PEDIATRIC RESPIRATORY EMERGENCIES

Pediatric Protocol

**Overview:** Most children requiring urgent intervention have primary respiratory problems. 80-90% of all pediatric cardiac arrests originate in the respiratory system. When the child in respiratory distress can no longer compensate, respiratory failure will be followed by cardiac failure. It is crucial to recognize respiratory distress and dysfunction early, so that cardiopulmonary failure may be prevented. Note that the respiratory system is also used to compensate for the hypoxia and acidosis found in primary circulatory failure. Assessment of the pediatric respiratory system should focus not on clinical status, as reflected by general appearance (adequacy of cerebral oxygenation and ventilation) and work of breathing.

**Components of Appearance**

1. **Alertness:** How responsive and interactive is the child with a stranger or other changes in the environment? Is the patient restless, agitated or lethargic?
2. **Distractibility:** How readily does a person, object, or sound draw the child's interest or attention? Will the patient play with a toy or new object?
3. **Consolability:** Can the patient be comforted by the caregiver or by the paramedic?
4. **Eye Contact:** Does the child maintain eye contact with objects or people? Will the patient fix his/her gaze on a face?
5. **Speech/Cry:** Is the speech/cry strong and spontaneous? Weak and muffled? Hoarse?
6. **Spontaneous Motor Activity:** Is the patient moving and resisting vigorously and spontaneously? Is there good muscle tone and responsiveness?
7. **Color:** Is the patient pink? Or is the patient pale, ashen, blue or mottled? Does the skin coloring of the trunk differ from that of the extremities?

**Signs of Work of Breathing**

1. **Use of Accessory Muscles:** Pediatric patients will use accessory muscles early to compensate for deficiencies in perfusion. Intercostal and supraclavicular retractions, as well as diaphragmatic breathing (see-saw) may be very apparent.
2. **Respiratory Rate:** Significant finding if >60/min. or <10-20/min.
3. **Tidal Volume** Inspection of chest wall movement may not be adequate for assessment of tidal volume. It is imperative to auscultate bilateral lung sounds to determine adequacy of tidal volume.

4. **Nasal Flaring** Flaring of the external nares indicates respiratory distress.

5. **Grunting** Grunting is an ominous sign associated with severe distress. It is caused by a premature closure of the glottis on exhalation due to atelectasis. The patient is attempting to maintain a positive end expiratory pressure (PEEP) to allow for better lung inflation.

6. **Cyanosis** Cyanosis is usually a late finding and will initially be visible around the mouth and gums (perioral) and nail beds.

7. **Pulse Oximeter** \(\text{SpO}_2 < 90\%\) is suggestive of respiratory insufficiency.

8. **Lung Sounds** Auscultation of bilateral lungs sounds not only assesses tidal volume but may uncover abnormal sounds (eg. wheezing, stridor, rales).

Specific treatments for the different causes of respiratory distress are outlined in the following protocols. When the paramedic is unsure as to which protocol to follow, he or she should follow the protocols in Section 3.1 and contact medical control for further direction.


3.2.1 AIRWAY OBSTRUCTION

Pediatric Protocol

**Purpose:** Causes of upper airway obstruction include the tongue, foreign bodies, swelling of the upper airway due to angio-neurotic edema (see Pediatric Protocol - Allergic Reactions/Anaphylaxis), trauma to the airway, and infections (see Pediatric Protocol - Upper Airway (Stridor - Croup/Epiglottitis)). Differentiation of the cause of upper airway obstruction is essential to determining the proper treatment.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Pediatric Assessment Protocol 3.1.1](#)
2. [Medical Supportive Care Protocol 3.1.3](#)
3. If air exchange is inadequate and there is a reasonable suspicion of foreign body airway obstruction (FBAO), apply abdominal thrust (a). For an infant apply chest compressions and back blows (a)
   
   a. **Child:**
      i. If conscious, ask, “Are you choking?”
      ii. If patient unable to speak and/or shakes head yes, give abdominal thrust
      iii. Repeat abdominal thrust until effective or patient become unconscious.
      iv. If patient becomes unconscious, perform a tongue-jaw lift, visualize object and perform a finger sweep to remove object. Do not perform blind finger sweep.
      v. Open airway and attempt to ventilate. If still obstructed, reposition airway and try to ventilate again.
      vi. Give 5 abdominal thrusts
      vii. Repeat steps iv through vi twice.
      viii. If still unrelieved, go to ALS Level 1 Treatment.
   
   b. **Infant:**
      i. If conscious, determine airway patency
      ii. If patient is unable to move air or has poor air exchange, give 5 back blows between the shoulder blades and then 5 chest thrusts with patient in a head dependent position
      iii. Repeat back blows and chest thrusts until effective or patient becomes unconscious
      iv. If patient becomes unconscious, perform a tongue-jaw lift and look in the mouth for the object. If object can be seen, remove the object.
      v. Open airway and attempt to ventilate; if still obstructed, reposition airway and try to ventilate again.
vi. Give 5 back blows and 5 chest thrusts, with patient in a head dependent position.

vii. Repeat steps iv. through vi. twice.

viii. If still unrelieved, go to ALS Level 1 treatment

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If unable to relieve FBAO, visualize with laryngoscope and extract foreign body with Magill forceps.
2. If obstruction is due to trauma and/or edema, or if uncontrollable bleeding into the airway causes life-threatening ventilatory impairment, perform endotracheal intubation/advanced airway.
3. If unable to intubate and patient cannot be adequately ventilated by other means, perform needle cricothyroidotomy.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director if any concerns or questions.

**Note:**

(a) If air exchange is adequate with a partial airway obstruction, do not interfere and encourage patient to cough up obstruction. Continue to monitor for adequacy of air exchange. If air exchange becomes inadequate continue with protocol.
3.2.2 UPPER AIRWAY (STRIDOR / CROUP / EPIGLOTTITIS)

Pediatric Protocol

**Purpose:** Stridor is a high pitched "crowing" sounds caused by restriction of the upper airway. In addition to FBAO (see Pediatric Protocol Airway Obstruction), stridor can be caused by croup and epiglottitis.

Croup (laryngotracheobronchitis) is a viral infection of the upper airway, which causes edema/ inflammation below the larynx and glottis with a resultant narrowing of the lumen of the airway. Croup most often occurs in children 6 months to 4 years of age. The child with croup will have stridor, as well as, a distinctive barking cough and cold symptoms (low-grade fever (100-101 degrees F), with a gradual onset of respiratory distress.

Epiglottitis is an acute infection and inflammation of the epiglottis that potentially is life threatening. Since the availability of Hemophilus influenza, type B (Hib) vaccine, epiglottitis has markedly decreased, yet it may still occur from other bacterial pathogens. Epiglottitis usually occurs in children 4 years of age and older. The child with epiglottitis will present with stridor, as well as, acute respiratory distress, sore throat, pain upon swallowing which causes the distinctive drooling, high grade fever (102-104 degrees F), and may assume the classic tripod position.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Pediatric Assessment Protocol 3.1.1**
2. **Medical Supportive Care Protocol 3.1.3**, including pulse oximeter (avoid IVs in these patients) (a).
3. Avoid agitating the child with suspected epiglottitis. Never examine the epiglottis (a).
4. Administer humidified oxygen. If humidified oxygen is unavailable, use nebulized saline (do not force oxygen mask on pediatric patient - use blow-by technique if necessary) (a).

**ALS LEVEL 1: PARAMEDIC ONLY**

1. 3 – 5 ml of aerosolized Epinephrine, 1:1000 (no dilution) for CROUP PATIENTS ONLY.

* Aerosolized Epinephrine is contraindicated for epiglottitis

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director if any concerns or questions.

**Note:**

(a) Avoid any procedure that will agitate patient.

Return to: Contents at top Pediatric Protocols Pediatric Respiratory Emergency
Peds Airway Obstruction

3.2.3 LOWER AIRWAY (WHEEZING ASTHMA / BRONCHIOLITIS)
Pediatric Protocol

Purpose: This protocol for pediatric patients with wheezing. Wheezing is a whistling type breath sound associated with narrowing or spasm of the smaller airways. Wheezing in the child under one year of age is usually the result of bronchiolitis, a viral infection of the bronchioles which causes prominent expiratory wheezing, clinically resembling asthma. Asthma is a chronic inflammatory disease that is triggered by many different factors (e.g. environmental allergens, cold air, exercise, foods, irritants, and certain medications). Asthma has a two-phase response. The first phase is associated with a histamine release, which causes bronchoconstriction and bronchial edema. Early treatment with bronchodilators may reverse the bronchospasm. The second phase consists of inflammation of the bronchioles and additional edema. The second phase will usually not respond to bronchodilators. An anti-inflammatory medication (e.g. corticosteroid) is typically required. Assessment of the asthma patient usually includes a history of asthma with associated medications. The patient will be tachypneic and may have an unproductive cough. Use of accessory muscles is evident and wheezing may be heard, most commonly on expiration. In a severe asthma attack, the patient may not wheeze at all due to a lack of air flow.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3, including pulse oximeter.

ALS LEVEL 1: PARAMEDIC ONLY
Lower are
1. Albuterol (Ventolin) 1 nebulizer treatment. May repeat twice PRN (a).
   a. If <1 year or <10 kg, mix 1.25 mg in 1.5 ml of Normal Saline (0.083%)
   b. If >1 year or >10 kg, mix 2.5 mg in 3 ml of Normal Saline (0.083%).
2. Add Ipratropium Bromide (Atrovent); to each albuterol neb tx and flow O₂ at 6-8 L/min.
   a. If < 8 years, add 0.25 mg (1.25 ml);
   b. If > 8 years, add 0.5 mg (2.5 ml)
3. Consider need for assisted ventilation and intubation
4. If respiratory distress is severe, Epinephrine (1:1000) 0.01mg/kg IM (up to maximum dose of 0.3mg). May be repeated to maximum of 3 doses.
5. If respiratory distress is persistent and severe after several albuterol nebs, give **Methylprednisolone Sodium Succinate (Solu-Medrol)** 2mg/kg IV or IM (Maximum dose 60 mg).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
<th>10kg purple</th>
<th>12kg yellow</th>
<th>15kg white</th>
<th>19kg blue</th>
<th>24kg orange</th>
<th>30kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol</td>
<td>&lt; 1 yr or &lt; 10 kg mix 1.25 mg in 1.5 ml NS</td>
<td>&gt; 1 yr or &gt; 10 kg mix 2.5 mg in 3 ml NS</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atrvent</td>
<td>&lt; 8 yrs old mix 0.25 mg (1.25 ml) to 1st Albuterol</td>
<td>If &gt; 8 yrs old mix 0.5 mg (2.5 ml) to first Albuterol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylprednisolone (Solu-Medrol)</td>
<td>8 mg</td>
<td>12 mg</td>
<td>16 mg</td>
<td>20 mg</td>
<td>24 mg</td>
<td>30 mg</td>
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<tr>
<td>Epinephrine 1:1000 IM</td>
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<td>0.06 mg</td>
<td>0.08 mg</td>
<td>0.10 mg</td>
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<td>0.15 mg</td>
<td>0.19 mg</td>
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<td>0.3 mg</td>
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<tr>
<td>Magnesium</td>
<td>160 mg</td>
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<td>400 mg</td>
<td>480 mg</td>
<td>600 mg</td>
<td>760 mg</td>
<td>960 mg</td>
<td>1200 mg</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**

1. Repeat **Epinephrine** (1:1000) 0.01 mg/kg IM (if < 8 years, 0.15 mg up to maximum dose of 0.3 mg; if > 8 years, maximum dose is 0.3 – 0.5 mg).
2. Call medical control or medical director if any concerns or questions.
3. For severe dyspnea, consider giving **Magnesium Sulfate**: 40 mg/kg (maximum 2gm) IV (mixed in 50 ml of D5W given over 30 minutes).

Return to: [Contents at top](#)  [Pediatric Protocols](#)  [Pediatric Respiratory Emergencies](#)
3.3

PEDIATRIC CARDIAC DYSRHYTHMIAS
3.3 PEDIATRIC CARDIAC DYSRHYTHMIAS
Pediatric Protocol

Overview:
Cardiac dysrhythmias in pediatric patients are uncommon and are usually due to noncardiac problems, unless the patient is known to have congenital or acquired cardiac disease. Cardiac arrest is usually the end result of hypoxemia and acidosis resulting from respiratory insufficiency or shock. Therefore, attention should be given initially to support of the respiratory system. Pediatric dysrhythmias can be divided into three categories: slow rhythms, fast rhythms, or no rhythm. The most common dysrhythmia is bradycardia, which is the result of hypoxia or acidosis. Tachycardias can be a compensatory mechanism or a result of a reentry mechanism. Ventricular fibrillation, although rare in pediatrics, is usually the result of hypoxia. Asystole is a terminal event, following prolonged, untreated bradycardia.

Automated external defibrillators (AEDs) may be used for children 1 to 8 years of age who have no signs of circulation. Ideally the device should deliver a pediatric dose. The arrhythmia detection algorithm used in the device should demonstrate high specificity for pediatric shockable rhythms, i.e., it will not recommend delivery of a shock for nonshockable rhythms (Class IIb).” These protocols follow the AHA/PALS guidelines. The paramedic should use these protocols to guide him/her through the treatment of cardiac patients with specific dysrhythmias and accompanying signs and symptoms. After stabilization of the patient, the paramedic may need to refer to additional protocols for continued treatment (e.g. other cardiac protocols). Remember to consider the “H’s and T’s” when assessing for a possible cause.
3.3.1 ASYSTOLE/PEA (Peds Cardiac Arrest Algorithm)

Pediatric Protocol

**Purpose:** This protocol is for pediatric patients found to be in asystole.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Peds Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3, including pulse oximeter.
3. Determine the patient’s unresponsiveness and check for CABs.
4. Oxygenate with 15 – 25 L per minute via bag-valve-mask with an appropriate airway adjunct device at 8 – 10 breaths per minute.
5. Begin immediate chest compressions at a rate of 100 - 120/min for 2 minutes while the monitor is being attached.
6. Do not interrupt CPR to check the heart rhythm. Continuous uninterrupted compressions are paramount to patient survival.
7. Resume 2 minutes of continuous compressions at 100 - 120/min; check the heart rhythm.
8. Consider the H’s and T’s

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Intubate with ET tube or use other airway adjunct.
2. Confirm airway adjunct placement with electronic EtCO2 and waveform on scene, during transport, and during transfer at the hospital.
3. Establish IV or IO access; give normal saline wide open for fluid challenge at 20ml/kg or 10ml/kg for neonates (infants less than 1 month).
4. **Epinephrine**
   - Epi 1:10,000 0.01 mg/kg (0.1 ml/kg) IV/IO (max single dose 1 mg).
   - Repeat every 3-5 minutes.
   - If unable to establish an IV/IO, administer Epinephrine (1:1,000) 0.1 mg/kg (0.1 ml/kg) via ET. Repeat every 3-5 minutes for duration of pulselessness.

5. Give 2 minutes of chest compressions; check the heart rhythm.
6. Perform glucose test with finger stick. If glucose is below 60 mg/dL, administer:
   a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   a. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg) you are
   b. Children: **10% Dextrose**: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms) (a).

7. If a pulse is present, begin post-resuscitative care.

8. If narcotic possibly involved, administer **Narcan** 0.1 mg/kg, IVP may repeat once.

9. Consider the H’s and T’s.

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Ventilate/oxygenate</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Ventilation; Sodium Bicarb 1 mEq/kg IV/IO</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>D10W</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Calcium Chloride 10% 20mg/kg (0.2 ml/kg) IV/IO (max 1 gm) Sodium Bicarb 1 mEq/kg IV/IO with 20 ml NS flush between.</td>
</tr>
<tr>
<td>Hyper/Hypothermia</td>
<td>Cool/Warm the patient</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Needle decompression</td>
</tr>
<tr>
<td>Trauma</td>
<td>Load and go, appropriate protocol</td>
</tr>
<tr>
<td>Toxins</td>
<td>Appropriate protocol</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
<td>Load and go</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Load and go</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director if any concerns or questions.

**Note**
(a) Provide a 15:2 compression to ventilation ratio. Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) If EtCO2 is less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO2=12 - 25mm Hg: Goal during resuscitation.
   If EtCO2=35 - 45mm Hg: Check for ROSC
(c) If ROSC achieved, wean down oxygen to maintain a SpO2 at greater than or equal to 94%.
(d) To avoid infiltration and resultant tissue necrosis, Dextrose 10% should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.

Return to: [Contents at top](#)  [Pediatric Protocols](#)  [Pediatric Cardiac Dysrhythmias](#)
Pediatric Cardiac Arrest Algorithm—2015 Update

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Rhythm shockable?
   - Yes
   - VF/pVT
   - Shock
   - CPR 2 min
     - IO/IV access

3. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway

4. Rhythm shockable?
   - No
   - CPR 2 min
     - Epinephrine every 3-5 min
     - Consider advanced airway

5. Shock

6. CPR 2 min
   - Epinephrine every 3-5 min
   - Consider advanced airway

7. Shock

8. CPR 2 min
   - Amiodarone or lidocaine
   - Treat reversible causes

9. Asystole/PEA

10. CPR 2 min
    - IO/IV access
    - Epinephrine every 3-5 min
    - Consider advanced airway

11. CPR 2 min
    - Treat reversible causes

12. Asystole/PEA → 10 or 11
    - Organized rhythm → check pulse
    - Pulse present (ROSC) → post-cardiac arrest care

Go to 5 or 7

CPR Quality
- Push hard (2/3 of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 15:2 compression-ventilation ratio.

Shock Energy for Defibrillation
- First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy
- Epinephrine IO/IV dose: 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes.
  - If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- Amiodarone IO/IV dose: 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.
- Lidocaine IO/IV dose:
  - Initial: 1 mg/kg loading dose.
  - Maintenance: 20-50 mg/kg per minute infusion (repeat bolus dose if infusion initiated >15 minutes after initial bolus therapy).

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
Return to: Peds Asystole   Peds Pulseless Electrical Activity   Wide complex tachy w/o pulse, v-fib
Peds Cardiac Dysrhythmias
3.3.2 BRADYCARDIA (Peds Bradycardia Algorithm)
Pediatric Protocol

**Purpose:** Use this protocol for pediatric patients with bradycardia. Causes of symptomatic bradycardia include hypoxemia, hypothermia, head injury, heart block, heart transplant (special situation), and toxin/poison/drug overdose.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3, including pulse oximeter.
3. Assure adequate ventilation and oxygenation.
4. If heart rate is <60/min. in infant or child associated with poor systemic perfusion, start chest compressions
5. Consider the H’s and T’s

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Start IV/IO, administer a fluid challenge of NS 20 ml/kg IV (10 ml/kg neonate)
2. **Epinephrine** (1:10,000) 0.01 mg/kg (0.1 ml/kg) IV/IO (max dose 1 mg) q 3-5 min. If unable to establish IV/IO, administer **Epinephrine** (1:1,000) 0.1 mg/kg ET. Repeat every 3-5 minutes at same dose (a).
3. **Atropine** 0.02 mg/kg IV/IO (Minimum single dose 0.1 mg)(a)(b) Maximum single dose: (child 0.5 mg) (adolescent 1.0 mg) Maximum total dose: (child 1.0 mg) (adolescent 2.0 mg)
   If unable to establish IV/IO, administer **Atropine** 0.04 mg/kg ET (same minimum dose as IV/IO). May repeat Atropine once (a).
4. Identify and treat possible causes.
5. If patient remains hypotensive and bradycardic and is conscious and aware of the situation consider pacing and sedation. Consider sedation with one of the following benzodiazepines. Midazolam (Versed) is the preferred benzodiazepine:
   a. **Midazolam (Versed)** 0.1 mg/kg, max single dose 4 mg IV, IO, IM; or 0.2 mg/kg IN (use 10 mg/2ml concentration), max single dose 5 mg; may repeat once if necessary. Max total dose of 10 mg
   b. **Diazepam (Valium)** 0.2 mg/kg (max single dose 5 mg) IV/IO may repeat once to max dose of 10 mg
   c. **Lorazepam (Ativan)** 0.05 mg/kg IV/IO//IN; may repeat once, to maximum dose of 4 mg
6. **External pacemaker** (see Medical Procedure 4.13).
ALS LEVEL 2: MEDICAL CONTROL

1. Call medical control or medical director if any concerns or questions.

Notes
(a) Administer Atropine before Epinephrine for bradycardia due to suspected increased vagal tone or primary AV block.
(b) Small doses of Atropine less than 0.1 mg may produce paradoxical bradycardia.

Return to: Contents at top  Pediatric Protocols  Pediatric Cardiac Dysrhythrias

Peds Bradycardia Alogrithm on next page!
Pediatric Bradycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don't delay therapy

2. Cardiopulmonary compromise?
   - Hypotension
   - Acutely altered mental status
   - Signs of shock

   No

3. CPR if HR <60/min with poor perfusion despite oxygenation and ventilation

4a. Support ABCs
   - Give oxygen
   - Observe
   - Consider expert consultation

4. Bradycardia persists?
   No

5. Epinephrine
   - Atropine for increased vagal tone or primary AV block
   - Consider transthoracic pacing/transvenous pacing
   - Treat underlying causes

6. If pulseless arrest develops, go to Cardiac Arrest Algorithm

Doses/Details

Epinephrine IO/IV dose:
0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If IO/IV access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of 1:1000).

Atropine IO/IV dose:
0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.

Return: Peds Bradycardia  Peds Cardiac Arrest Algorithm
3.3.3 NARROW COMPLEX TACHYCARDIA (Peds Tachycardia Algorithm)
Pediatric Protocol

**Purpose:** Pediatric patients suffering from tachycardia may or may not exhibit symptoms. Narrow complex tachycardia (QRS < 0.08 seconds) is either sinus tachycardia or supraventricular tachycardia. The following rates should be considered:

- **Sinus tachycardia** is greater than normal (see Appendix; Pediatric Vital Signs 7.10) and usually for a child: >180/minute and infant: >220/minute. Rate may vary with sinus tachycardia.

- **Supraventricular tachycardia** is usually >220/minute for infants. If >2 years of age, SVT may be slower (e.g. 180-220/minute). Rate will not vary with SVT.

Wide complex SVTs are rare in children and, therefore, should initially be considered as ventricular in origin, unless proven otherwise (e.g. documented QRS morphology consistent with pre-existing BBB or WPW).

Possible causes of pediatric tachycardia include:

<table>
<thead>
<tr>
<th>H’s</th>
<th>T’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxemia</td>
<td>Tamponade</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
<td>Toxins</td>
</tr>
<tr>
<td>Hyper/Hypokalemia</td>
<td>Thromboembolism</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Trauma</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Tablets</td>
</tr>
</tbody>
</table>

3.3.3a SINUS TACHYCARDIA with DIMINISHED PERFUSION (Peds Tachycardia Algorithm)

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. Determine the patient’s hemodynamic stability and symptoms
4. Apply SpO2 monitor and administer oxygen to maintain SpO2 at ≥ 94%

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Fluid challenge Normal Saline 20 ml/kg IV (10 ml/kg neonate). May repeat X 1.
2. Obtain 12 lead EKG
3. Consider other cause (e.g. H’s & T’s).

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Ventilate/oxygenate</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Ventilation; Sodium Bicarb 1 mEq/kg IV/IO</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>D10W</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Calcium Chloride 10% 20mg/kg (0.2 ml/kg) IV/IO (max 1 gm) Sodium Bicarb 1 mEq/kg IV/IO with 20 ml NS flush between.</td>
</tr>
<tr>
<td>Hyper/Hypothermia</td>
<td>Cool/Warm the patient</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Needle decompression</td>
</tr>
<tr>
<td>Trauma</td>
<td>Load and go, appropriate protocol</td>
</tr>
<tr>
<td>Toxins</td>
<td>Appropriate protocol</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
<td>Load and go</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Load and go</td>
</tr>
</tbody>
</table>

ALS LEVEL 2: MEDICAL CONTROL
1. Call medical control or medical director if any concerns or questions.

3.3.3b STABLE SVT (Normal perfusion) (Peds Tachycardia Algorithm)

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Peds Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. Determine the patient’s hemodynamic stability and symptoms
4. Apply SpO2 monitor and administer oxygen to maintain SpO2 at ≥ 94%

ALS LEVEL 1: PARAMEDIC ONLY
1. Perform 12 lead ECG (see Medical Procedure 4.38).
2. Consider cause (e.g. H’s & T’s).
3. Establish IV access; give NS wide open for fluid challenge 20 ml/kg or 10 ml/kg for neonates (infants less than month)

ALS LEVEL 2: MEDICAL CONTROL
1. Vagal maneuvers; begin with ice water (see Medical Procedure Vagal maneuvers 4.27.2)
2. Adenosine Triphosphate (Adenocard) 0.1 mg/kg (6 mg max.) rapid IVP followed by 10 ml NS flush.
3. Repeat in 2 minutes, Adenosine Triphosphate (Adenocard) 0.2 mg/kg (12 mg max.) rapid IVP followed by 10 ml NS flush.
3.3.3c UNSTABLE SVT (Diminished perfusion) (Peds Tachycardia Algorithm)

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Peds Assessment 3.1.1**
2. **Medical Supportive Care Protocol** 3.1.3.
3. Determine the patient’s hemodynamic stability and symptoms
4. Apply SpO2 monitor and administer oxygen to maintain SpO2 at ≥ 94%

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Consider sinus tachycardia as the underlying rhythm, not SVT
2. Consider cause (eg. H’s & T’s).
3. Obtain 12 lead EKG and record rhythm strip
4. If patient is responsive, **Adenosine Triphosphate (Adenocard)** 0.1 mg/kg (6 mg max.) rapid IVP or IOP followed by 10 ml NS flush (a). If not resolved, repeat in 2 minutes, **Adenosine Triphosphate (Adenocard)** 0.2 mg/kg (12 mg max.) rapid IVP followed by 10 ml NS flush (a).
5. If decision to cardiovert and patient is conscious and aware of situation, consider sedation with one of the following benzodiazepines (versed is the preferred benzodiazepine):
   a. **Midazolam (Versed)** 0.1 mg/kg, max single dose 4 mg IV, IO, IM; or 0.2 mg/kg IN (use 10 mg/2ml concentration), max single dose 5 mg; may repeat once if necessary. Max total dose of 10 mg. (c)
   b. **Diazepam (Valium)** 0.2 mg/kg (max single dose 5 mg) IV/IO may repeat once to max dose of 10 mg (c).
   c. **Lorazepam (Ativan)** 0.05 mg/kg IV/IO/IN; may repeat once, to maximum dose of 4 mg (c)
6. If patient is poorly responsive, **synchronized cardioversion**
   a. @ 0.5 joule/kg. (or equivalent biphasic energy level) if no response (b)
   b. Synchronized cardioversion @ 1 joule/kg (or equivalent biphasic energy level). If no response (b)
   c. Synchronized cardioversion @ 2 joules/kg (or equivalent biphasic energy level). (b)
<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg Red</th>
<th>10 kg Purple</th>
<th>12 kg Yellow</th>
<th>15 kg White</th>
<th>19 kg Blue</th>
<th>24 kg Orange</th>
<th>30 kg Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine 0.1 mg/kg – 1st dose</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Adenosine 0.2 mg/kg – 2nd dose</td>
<td>0.8 mg</td>
<td>1.2 mg</td>
<td>1.6 mg</td>
<td>2 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.8 mg</td>
<td>4.8 mg</td>
<td>6 mg</td>
</tr>
<tr>
<td>Midazolam (Versed) IV/IO/IM</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1.0 kg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Midazolam (Versed) IN</td>
<td>0.8 mg</td>
<td>1.2 mg</td>
<td>1.6 mg</td>
<td>2 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.8 mg</td>
<td>4.8 mg</td>
<td>5 mg (max)</td>
</tr>
<tr>
<td>Diazepam (Valium) IV/IO</td>
<td>0.8 mg</td>
<td>1.2 mg</td>
<td>1.6 mg</td>
<td>2 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.8 mg</td>
<td>4.8 mg</td>
<td>6 mg</td>
</tr>
<tr>
<td>Lorazepam (Ativan) IV/IO/IN</td>
<td>0.2 mg</td>
<td>0.3 mg</td>
<td>0.4 mg</td>
<td>0.5 mg</td>
<td>0.6 mg</td>
<td>0.75 mg</td>
<td>0.95 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**

1. **Amiodarone** 5 mg/kg IV/IO over 20 minutes.

Return to: [Contents at top](#)  [Pediatric Protocols](#)  [Pediatric Cardiac Dysrhythmias](#)

(a) Record the patient’s heart rhythm while attempting to convert the rhythm so as to capture conversion data.
(b) Do not delay synchronized cardioversion to establish an IV for sedation purposes.
(c) Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.

**Peds Tachycardia Algorithm on next page.**
Pediatric Tachycardia With a Pulse and Poor Perfusion Algorithm

1. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IO/IV access
   - 12-Lead ECG if available; don’t delay therapy

2. Evaluate QRS duration
   - Narrow (<0.09 sec)
   - Wide (>0.09 sec)

3. Evaluate rhythm with 12-lead ECG or monitor
   - Probable sinus tachycardia
     • Compatible history consistent with known cause
     • P waves present/normal
     • Variable R-R; constant PR
     • Infants: rate usually <220/min
     • Children: rate usually <180/min
   - Probable supraventricular tachycardia
     • Compatible history (vague, nonspecific); history of abrupt rate changes
     • P waves absent/abnormal
     • HR not variable
     • Infants: rate usually ≥220/min
     • Children: rate usually ≥180/min

4. Search for and treat cause

5. Consider vagal maneuvers (No delays)

6. Synchronized cardioversion

7. Consider adenosine if rhythm regular and QRS monomorphic

8. If IO/IV access present, give adenosine or
   - If IO/IV access not available, or if adenosine ineffective, synchronized cardioversion

9. Possible ventricular tachycardia
   - Cardiopulmonary compromise?
     • Hypotension
     • Acutely altered mental status
     • Signs of shock

10. Yes

11. Synchronized cardioversion

12. No

13. Expert consultation advised
   - Amiodarone
   - Procainamide

Doses/Details

Synchronized Cardioversion
   Begin with 0.5-1 J/kg; if not effective, increase to 2 J/kg. Sedate if needed, but don’t delay cardioversion.

Drug Therapy

Adenosine IO/IV dose:
   First dose: 0.1 mg/kg rapid bolus (maximum: 6 mg).
   Second dose: 0.2 mg/kg rapid bolus (maximum second dose: 12 mg).

Amiodarone IO/IV dose:
   5 mg/kg over 20-60 minutes or Procainamide IO/IV dose:
   15 mg/kg over 30-60 minutes
   Do not routinely administer amiodarone and procainamide together.

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Return to: Peds Narrow Complex Tachycardia    Wide Complex Tachy-Stable
            Wide Complex Tachy-Unstable

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
3.3.4 PULSELESS ELECTRICAL ACTIVITY (PEA) (Peds Cardiac Arrest Algorithm)  
Pediatric Protocol

**Purpose:** This protocol is used for: electromechanical dissociation (EMD), pseudo-EMD, idioventricular rhythms, bradyasystolic rhythms, post-defibrillation idioventricular rhythms.

Possible causes of pediatric PEA include:

<table>
<thead>
<tr>
<th>H’s</th>
<th>T’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxemia</td>
<td>Tamponade</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
<td>Toxins</td>
</tr>
<tr>
<td>Hyper/Hypokalemia</td>
<td>Thromboembolism</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Trauma</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Tablets</td>
</tr>
</tbody>
</table>

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Peds Assessment 3.1.1**
2. **Medical Supportive Care Protocol 3.1.3**, including pulse oximeter.
3. Determine the patient’s unresponsiveness and check for CABs.
4. Oxygenate with 15 – 25 L per minute via bag-valve-mask with an appropriate airway adjunct device at 8 – 10 breaths per minute.
5. Begin immediate chest compressions at a rate of 100 - 120/min for 2 minutes while the monitor is being attached.
6. Do not interrupt CPR to check the heart rhythm. Continuous uninterrupted compressions are paramount to patient survival.
7. Check the heart rhythm; confirm PEA rhythm.
8. Resume 2 minutes of continuous compressions at 100 - 120/min; check the heart rhythm.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Intubate with ETT or use other airway adjunct and ventilate pt.
2. Confirm airway adjunct placement with electronic EtCO2 and waveform on scene, during transport, and during transfer at the hospital.
3. Establish IV or IO access; give normal saline wide open for fluid challenge at 20ml/kg or 10ml/kg for neonates (infants less than 1 month).
4. **Epinephrine**  
   **Epi 1:10,000** 0.01 mg/kg (0.1 ml/kg) IV/IO (max single dose 1 mg).  
   Repeat every 3-5 minutes for duration of pulselessness.
If unable to establish an IV/IO, administer **Epinephrine** (1:1,000) 0.1 mg/kg (0.1 ml/kg) via ET. Repeat every 3-5 minutes for duration of pulselessness.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg grey</th>
<th>6 kg pink</th>
<th>8 kg red</th>
<th>10 kg purple</th>
<th>12 kg yellow</th>
<th>15 kg white</th>
<th>19 kg blue</th>
<th>24 kg orange</th>
<th>30 kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000 0.01 mg/kg IV/IO</td>
<td>0.04 mg</td>
<td>0.06 mg</td>
<td>0.08 mg</td>
<td>0.1 mg</td>
<td>0.12 mg</td>
<td>0.15 mg</td>
<td>0.19 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
</tr>
<tr>
<td>Epinephrine 1:1,000 0.1 mg/kg ET</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
</tbody>
</table>

5. Give 2 minutes of chest compressions; check the heart rhythm.
6. Perform glucose test with finger stick. If glucose is below 60 mg/dL, administer:
   a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg)
   b. Children: **10% Dextrose**: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms) (d).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg grey</th>
<th>6 kg pink</th>
<th>8 kg red</th>
<th>10 kg purple</th>
<th>12 kg yellow</th>
<th>15 kg white</th>
<th>19 kg blue</th>
<th>24 kg orange</th>
<th>30 kg green</th>
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</thead>
<tbody>
<tr>
<td>D10W</td>
<td>20 ml</td>
<td>30 ml</td>
<td>40 ml</td>
<td>50 ml</td>
<td>60 ml</td>
<td>75 ml</td>
<td>95 ml</td>
<td>120 ml</td>
<td>150 ml</td>
</tr>
</tbody>
</table>

7. If the patient is taking calcium channel blockers or if there a high suspicion for hyperkalemia, administer Calcium Chloride 20 mg/kg IV/IO slowly
8. If a pulse is present, begin post-resuscitative care.
9. If narcotic possibly involved, administer **Narcan** 0.1 mg/kg, IVP may repeat once.
10. Consider the H’s and T’s

<table>
<thead>
<tr>
<th>Possible Cause:</th>
<th>Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Ventilate/Oxygenate</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn</td>
</tr>
<tr>
<td>Hydrogen ion (Acidosis)</td>
<td>Ventilation; Sodium Bicarb 1 mEq/kg IV/IO</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>D10W</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Calcium Chloride 10% 20mg/kg (0.2 ml/kg) IV/IO (max 1 gm) Sodium Bicarb 1 mEq/kg IV/IO with 20 ml NS flush between.</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
<td>Warm/Cool the patient</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Needle decompression</td>
</tr>
<tr>
<td>Trauma</td>
<td>Load and go, appropriate protocol</td>
</tr>
<tr>
<td>Toxins</td>
<td>Appropriate protocol</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
<td>Load and go</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Load and go</td>
</tr>
</tbody>
</table>
ALS LEVEL 2: MEDICAL CONTROL
1. Call medical control or medical director if any concerns or questions.

Note
(a) Provide a 15:2 compression to ventilation ratio. Once an advanced airway is in place, provide 1 breath every 6 seconds.
(b) If EtCO2 is less than 10mmHg: Attempt to improve CPR (compressions vs. ventilation).
   If EtCO2=12 - 25mm Hg: Goal during resuscitation.
   If EtCO2=35 - 45mm Hg: Check for ROSC
(c) If ROSC achieved, wean down oxygen to maintain a SpO2 at greater than or equal to 94%.
   (d) To avoid infiltration and resultant tissue necrosis, Dextrose 10% should be given via slow IV with intermittent aspiration of the IV line to confirm IV patency, followed by saline flush.
3.3.5 WIDE COMPLEX TACHYCARDIA WITH A PULSE (VENTRICULAR TACHYCARDIA) (Peds Tachycardia Algorithm)
Pediatric Protocol

STABLE (normal perfusion)

**Purpose:** This protocol is used in wide complex tachycardia (QRS > 0.08 seconds) with a rate > 150/minute.

Possible causes of pediatric tachycardia include:

<table>
<thead>
<tr>
<th>H’s</th>
<th>T’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxemia</td>
<td>Tamponade</td>
</tr>
<tr>
<td>Hyponolemia</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypothermia/Hyperthermia</td>
<td>Toxins</td>
</tr>
<tr>
<td>Hyper/Hypokalemia</td>
<td>Thromboembolism</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Trauma</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Tablets</td>
</tr>
</tbody>
</table>

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Determine the patient’s hemodynamic stability and symptoms
4. Apply SpO2 monitor and administer oxygen to maintain SpO2 at ≥ 94%

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Administer one of the following antiarrhythmics:
   a. **Amiodarone** 5 mg/kg IV/IO in 50 – 100 ml of D5W over 20 minutes.[FIRST LINE]
   b. **Lidocaine** 1% 1 mg/kg IV/IO. Repeat every 5 minutes to a maximum total dose of 3 mg/kg (a)(c). Use if Amiodarone is unavailable.
   c. **Procainamide** 15 mg/kg IV/IO over 30 minutes.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg Red</th>
<th>10 kg Purple</th>
<th>12 kg Yellow</th>
<th>15 kg White</th>
<th>19 kg Blue</th>
<th>24 kg Orange</th>
<th>30 kg Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lidocaine</td>
<td>4 mg</td>
<td>6 mg</td>
<td>8 mg</td>
<td>10 mg</td>
<td>12 mg</td>
<td>15 mg</td>
<td>19 mg</td>
<td>24 mg</td>
<td>30 mg</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>20 mg</td>
<td>30 mg</td>
<td>40 mg</td>
<td>50 mg</td>
<td>60 mg</td>
<td>75 mg</td>
<td>95 mg</td>
<td>120 mg</td>
<td>150 mg</td>
</tr>
<tr>
<td>Procainamide</td>
<td>60 mg</td>
<td>90 mg</td>
<td>120 mg</td>
<td>150 mg</td>
<td>180 mg</td>
<td>225 mg</td>
<td>285 mg</td>
<td>360 mg</td>
<td>450 mg</td>
</tr>
</tbody>
</table>

2. Consider cause (e.g. H’s & T’s).
**Possible Cause:**

<table>
<thead>
<tr>
<th>Possible Cause</th>
<th>Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Ventilate/Oxygenate</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Ventilation; Sodium Bicarb 1 mEq/kg IV/IO</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>D10W</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Calcium Chloride 10% 20mg/kg (0.2 ml/kg) IV/IO (max 1 gm) Sodium Bicarb 1 mEq/kg IV/IO with 20 ml NS flush between.</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
<td>Warm/Cool the patient</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Needle decompression</td>
</tr>
<tr>
<td>Trauma</td>
<td>Load and go, appropriate protocol</td>
</tr>
<tr>
<td>Toxins</td>
<td>Appropriate protocol</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
<td>Load and go</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Load and go</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**

1. Use only one antiarrhythmic medication. If rhythm does not convert with maximum dose, treat as unstable (synchronized cardiovert).
2. Call medical control or medical director if any concerns or questions.

**Notes**

(a) Dilute Lidocaine 2% 1:1 with Normal Saline to make 1%.
(b) If unable to establish IV/IO, administer Lidocaine 3 mg/kg ET. May repeat every 5 minutes up to 6 mg/kg ET.
(c) If Lidocaine suppresses ectopy, start Lidocaine maintenance infusion: Mix 120 mg in 100 ml of D5W (or 60 mg in 50 ml of D5W) and flow at 20-50 mcg/kg/min.
(d) If patient converts rhythm, give Lidocaine 1% 1 mg/kg IV/IO, refer to (a)(b)(c).

Return to: Contents at top Pediatric Protocols Pediatric Cardiac Dysrhythmias Peds V-Tach w/pulse Stable

**UNSTABLE (diminished perfusion)**

**Purpose:** This protocol is used in wide complex tachycardia (QRS > 0.08 seconds) with a rate > 150/minute.

Possible causes of pediatric tachycardia include:

<table>
<thead>
<tr>
<th>H’s</th>
<th>T’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxemia</td>
<td>Tamponade</td>
</tr>
</tbody>
</table>
Hypovolemia | Tension pneumothorax
Hypo/Hyperthermia | Toxins
Hyper/Hypokalemia | Thromboembolism
Hydrogen Ion (Acidosis) | Trauma
Hypoglycemia | Tablets

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Peds Assessment 3.1.1**
2. **Medical Supportive Care Protocol 3.1.3.**
3. Determine the patient’s hemodynamic stability and symptoms
4. Apply SpO2 monitor and administer oxygen to maintain SpO2 at ≥ 94%

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If considering cardioversion and patient is conscious and aware of situation, consider sedation with one of the following benzodiazepines:
   a. **Midazolam (Versed)** 0.1 mg/kg, max single dose 4 mg IV, IO, IM; or 0.2 mg/kg IN (use 10 mg/2ml concentration), max single dose 5 mg; may repeat once if necessary. Max total dose of 10 mg.
   b. **Diazepam (Valium)** 0.2 mg/kg (max single dose 5 mg) IV/IO may repeat once to max dose of 10 mg.
   c. **Lorazepam (Ativan)** 0.05 mg/kg IV/IO/IN; may repeat once, to maximum dose of 4 mg.
2. Synchronized cardioversion @ 0.5 joule/kg (or equivalent biphasic energy).
3. Synchronized cardioversion @ 1 joules/kg (or equivalent biphasic energy).
4. Administer one of the following antiarrhythmics:
   a. **Amiodarone** 5 mg/kg IV/IO in 50-100 ml of D5W over 20 minutes.
   b. **Lidocaine** 1% 1 mg/kg IV/IO. Repeat every 5 minutes to a maximum total dose of 3 mg/kg.
   c. **Procainamide** 15 mg/kg IV/IO over 30 minutes.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg Red</th>
<th>10 kg Purple</th>
<th>12 kg Yellow</th>
<th>15 kg White</th>
<th>19 kg Blue</th>
<th>24 kg Orange</th>
<th>30 kg Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam (Versed) IV/IO/IM</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1.0 kg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
</tr>
<tr>
<td>Midazolam (Versed) IN</td>
<td>0.8 mg</td>
<td>1.2 mg</td>
<td>1.6 mg</td>
<td>2 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.8 mg</td>
<td>4.8 mg</td>
<td>5 mg (max)</td>
</tr>
</tbody>
</table>
### Diazepam (Valium)

<table>
<thead>
<tr>
<th>IV/IO</th>
<th>0.8 mg</th>
<th>1.2 mg</th>
<th>1.6 mg</th>
<th>2 mg</th>
<th>2.4 mg</th>
<th>3 mg</th>
<th>3.8 mg</th>
<th>4.8 mg</th>
<th>6 mg</th>
</tr>
</thead>
</table>

### Lorazepam (Ativan)

<table>
<thead>
<tr>
<th>IV/IO/IN</th>
<th>0.2 mg</th>
<th>0.3 mg</th>
<th>0.4 mg</th>
<th>0.5 mg</th>
<th>0.6 mg</th>
<th>0.75 mg</th>
<th>0.95 mg</th>
<th>1.2 mg</th>
<th>1.5 mg</th>
</tr>
</thead>
</table>

### Lidocaine

<table>
<thead>
<tr>
<th>4 mg</th>
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<th>8 mg</th>
<th>10 mg</th>
<th>12 mg</th>
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<th>19 mg</th>
<th>24 mg</th>
<th>30 mg</th>
</tr>
</thead>
</table>

### Amiodarone

<table>
<thead>
<tr>
<th>20 mg</th>
<th>30 mg</th>
<th>40 mg</th>
<th>50 mg</th>
<th>60 mg</th>
<th>75 mg</th>
<th>95 mg</th>
<th>120 mg</th>
<th>150 mg</th>
</tr>
</thead>
</table>

### Procainamide

<table>
<thead>
<tr>
<th>60 mg</th>
<th>90 mg</th>
<th>120 mg</th>
<th>150 mg</th>
<th>180 mg</th>
<th>225 mg</th>
<th>285 mg</th>
<th>360 mg</th>
<th>450 mg</th>
</tr>
</thead>
</table>

#### 5. Synchronized cardioversion @ 2 joules/kg (or equivalent biphasic energy) (c).

#### 6. Synchronized cardioversion @ 4 joules/kg (or equivalent biphasic energy).

#### 7. Consider cause (e.g. H’s, & T’s).

### Possible Cause:

<table>
<thead>
<tr>
<th>Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypovolemia</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
</tr>
<tr>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Hyperkalemia</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Trauma</td>
</tr>
<tr>
<td>Toxins</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
</tr>
<tr>
<td>Thrombosis</td>
</tr>
</tbody>
</table>

### ALS LEVEL 2: MEDICAL CONTROL

**Notes**

(a) Dilute Lidocaine 2% 1:1 with Normal Saline to make 1%.

(b) If unable to establish IV/IO, administer Lidocaine 3 mg/kg ET. May repeat every 5 minutes up to 6 mg/kg ET.

(c) If Lidocaine suppresses ectopy, start **Lidocaine maintenance infusion**: Mix 120 mg in 100 ml of D5W (or 60 mg in 50 ml of D5W) and flow at 20-50 mcg/kg/min.

(d) If patient converts rhythm, give **Lidocaine** 1% 1 mg/kg IV/IO, refer to (a)(b)(c).

(e) Record the patient’s heart rhythm while attempting to convert the rhythm so as to capture conversion data.

(f) Do not delay synchronized cardioversion to establish an IV for sedation purposes.
(g) Administer Benzodiazepines slowly, titrate to effect, and be aware of associated hypotension.

Return to:  
Contents at top  Pediatric Protocols  Pediatric Cardiac Dysrhythmias
3.3.6 WIDE COMPLEX TACHYCARDIA WITHOUT A PULSE AND VENTRICULAR FIBRILLATION (Peds Cardiac Arrest Algorithm)

Pediatric Protocol

**Purpose:** This protocol if for pediatric patients in V-Fib and V-tach without a pulse.

**Consider and Treat Possible Causes**

<table>
<thead>
<tr>
<th>6 Hs</th>
<th>6 Ts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Tablets</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>Tamponade</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Toxins – poisons, drugs</td>
</tr>
<tr>
<td>Hypo/hyperkalemia</td>
<td>Thrombosis – coronary (AMI) – pulmonary (PE)</td>
</tr>
<tr>
<td>Hydrogen ion (acidosis)</td>
<td>Trauma</td>
</tr>
</tbody>
</table>

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Peds Assessment 3.1.1**
2. **Medical Supportive Care Protocol 3.1.3.**
3. Determine the patient’s unresponsiveness and check for CABs.
4. Oxygenate with 15 – 25 L per minute via bag-valve-mask with an appropriate airway adjunct device at 8 – 10 breaths per minute.
5. Begin immediate chest compressions at a rate of 100 - 120/min for 2 minutes while the monitor is being attached.
6. Perform chest compressions at a ratio of 15:2 unless an advanced airway has been established (supraglottic or ETT)
7. Do not interrupt CPR to check the heart rhythm. Continuous uninterrupted compressions are paramount to patient survival.
8. Check the heart rhythm.
9. Resume 2 minutes of continuous compressions at 100 - 120/min; check the heart rhythm.

**ALS LEVEL 1: PARAMEDIC ONLY (AEMTs if trained)**

1. Insert advanced airway adjunct when feasible.
2. Defibrillate @ 2 joules/kg x1, followed by 5 cycles (or two minutes) of CPR then check rhythm. If arrhythmia still persists, resume CPR while charging defibrillator.
3. Check blood glucose: Below 60 mg/dL, administer:
   a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg)
c. Children: **10% Dextrose**: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg</th>
<th>6 kg</th>
<th>8 kg</th>
<th>10 kg</th>
<th>12 kg</th>
<th>15 kg</th>
<th>19 kg</th>
<th>24 kg</th>
<th>30 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grey</td>
<td>Pink</td>
<td>red</td>
<td>purple</td>
<td>yellow</td>
<td>white</td>
<td>blue</td>
<td>orange</td>
<td>green</td>
</tr>
<tr>
<td>D10W</td>
<td>20 ml</td>
<td>30 ml</td>
<td>40 ml</td>
<td>50 ml</td>
<td>60 ml</td>
<td>75 ml</td>
<td>95 ml</td>
<td>120 ml</td>
<td>150 ml</td>
</tr>
</tbody>
</table>

4. Defibrillate @ 4 joules/kg x1, followed by 5 cycles (or two minutes) of CPR then check rhythm. If arrhythmia still persists, resume CPR while charging defibrillator.

5. **Epinephrine**
   - **Epi 1:10,000** 0.01 mg/kg (0.1 ml/kg) IV/IO. Repeat every 3-5 minutes.
   - If unable to establish an IV/IO, administer **Epinephrine** (1:1,000) 0.1 mg/kg (0.1 ml/kg) via ET. Repeat every 3-5 minutes for duration of pulselessness. (a)

6. Defibrillate @ 4 joules/kg x1, followed by 5 cycles (or two minutes) of CPR then check rhythm. If arrhythmia still persists, resume CPR while charging defibrillator. Subsequent energy levels should be at least 4 J/kg, and higher energy levels may be considered, not to exceed 10 J/kg or the adult maximum dose (AHA Class IIb, LOE C).

5. CPR while the defibrillator is charging

6. Administer one of the following antiarrhythmics:
   - **Amiodarone** 5mg/kg IV/IO (a)
   - **Lidocaine** 1 mg/kg IV/IO (if Amiodarone is unavailable), followed by 5 cycles of CPR if no conversion. Repeat **Lidocaine** 1 mg/kg IV/IO every 3-5 minutes (max. 3 mg/kg). (a)(b)(c)(d)
   - If Torsades de Pointes, **Magnesium Sulfate** 25 – 40 mg/kg (maximum 2gm) IV/IO (mixed in 50 ml of D5W given over 10 – 20 minutes). (a)

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7. Consider and treat possible causes: 6H’s and 6T’s.

<table>
<thead>
<tr>
<th>Possible Cause:</th>
<th>Treatment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
<td>Ventilate/Oxygenate</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn</td>
</tr>
<tr>
<td>Hydrogen Ion (Acidosis)</td>
<td>Ventilation; Sodium Bicarb 1 mEq/kg IV/IO</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>D10W</td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td>Calcium Chloride 10% 20mg/kg (0.2 ml/kg) IV/IO (max 1 gm) Sodium Bicarb 1 mEq/kg IV/IO with 20 ml NS flush between.</td>
</tr>
<tr>
<td>Hypo/Hyperthermia</td>
<td>Warm/Cool the patient</td>
</tr>
<tr>
<td>Tension pneumothorax</td>
<td>Needle decompression</td>
</tr>
<tr>
<td>Trauma</td>
<td>Load and go, appropriate protocol</td>
</tr>
<tr>
<td>Toxins</td>
<td>Appropriate protocol</td>
</tr>
<tr>
<td>Tamponade (cardiac)</td>
<td>Load and go</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Load and go</td>
</tr>
</tbody>
</table>

8. Repeat steps 3 thru 7 for duration of pulselessness.

**ALS Level 2: MEDICAL CONTROL**
1. Consider termination of resuscitation attempt.
2. Call medical control or medical director if any concerns or questions.

**Notes:**
(a) Defibrillate @ 4 joules/kg after every drug is circulated for 30 seconds.
(b) Dilute Lidocaine 2% 1:1 with Normal Saline to make 1%.
(c) If unable to establish IV/IO, administer Lidocaine 3 mg/kg ET. May repeat every 5 minutes up to 9 mg/kg.
(d) If Lidocaine converts rhythm, start Lidocaine maintenance infusion @ 20-50 mcg/kg/min.

Return to: Contents at top Pediatric Protocols Pediatric Cardiac Dysrhythmias
3.4
NEWBORN / INFANT
CARDIOPULMONARY ARREST
3.4 NEWBORN / INFANT CARDIOPULMONARY ARREST
Pediatric Protocol

Overview:

Infant and newborn cardiopulmonary arrest is usually a result of prolonged poor oxygenation and/or severe circulatory collapse. Newborns should be resuscitated using Pediatric Protocol 3.4.1. Unless there are obvious signs of death (see Administrative Protocol; DNR / RESUSCITATION CONSIDERATIONS / DOA) the infant in cardiopulmonary arrest should be resuscitated using the protocols in Pediatric Protocol 3.3. Some infants may not appear to be salvageable, where the Paramedic determines a resuscitation attempt is warranted for psychological reasons (e.g. parent's peace of mind). Consideration should also be given to SIDS (see Pediatric Protocol 3.4.2).
3.4.1 NEWBORN RESUSCITATION  (Neonatal Resuscitation Algorithm)
Pediatric Protocol

**Purpose:** This protocol is to be used for newborns (immediately following delivery) that are in need of resuscitation (all other neonates should be treated as infants, with the exception of Atropine).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Dry and keep baby warm (cover with thermal blanket or dry towel and cover scalp with stocking cap).
2. Position patient to open airway (a).
3. Clear airway - suction mouth and nose with bulb syringe PRN.
4. Paramedic Only: If newborn has signs of thick meconium, after suctioning with bulb syringe, and the newborn is not vigorous and crying, intubate and suction trachea using the meconium aspirator (see below) (b).
5. Stimulate baby (rub baby's back).
6. Never “milk” the cord, after infant delivery wait at least 30 seconds up to 3 minutes or until the cord stops pulsating to clamp/cut the cord.
7. Clamp and cut cord, if not already done. Apply 2 umbilical clamps, 2 inches apart and at least 8 inches from the navel and cut between clamps.
8. Assess skin color, respirations, and heart rate.
9. Administer 100% oxygen via blow-by method to newborns that are breathing but have central cyanosis or have no improvement in respiratory, circulatory, or neurological status within 90 seconds of initial assessment.
10. Ventilate @ 40-60 breaths/minute with 100% oxygen under the following conditions:
   a. Apnea.
   b. Heart rate <100 beats/minute.
   c. Persistent central cyanosis after high-flow oxygen.
11. Newborns who require CPR in the prehospital setting, should receive CPR according to infant guidelines: 2 rescuers provide continuous chest compressions with asynchronous ventilations if an advanced airway is in place and a 15:2 ventilation-to compression ratio if no advanced airway is in place (Class IIb, LOE C).
12. Perform chest compressions at 120/minute using two thumbs side by side (or superimposed one on top of the other) over the mid-sternum just below the nipple line with the fingers encircling the chest and supporting the back, under the following conditions:
a. Heart rate < 60 beats/minute and not rapidly increasing despite adequate ventilation with 100% oxygen for approximately 30 seconds.

ALS LEVEL 1: PARAMEDIC ONLY

1. Intubate under the following conditions:
   a. Bag-valve-mask ventilation is ineffective after 2 minutes.
   b. Tracheal suctioning is required, especially for thick meconium (b).
   c. Prolonged positive pressure ventilation is needed.

2. **Epinephrine** (1:10,000) 0.01-0.03 mg/kg IV/IO/ET under the following conditions:
   a. Asystole.
   b. Heart rate <60 beats/minute despite adequate ventilation with 100% oxygen and chest compressions.
   c. Repeat every 3-5 minutes, PRN.

3. Fluid challenge Normal Saline 10 ml/kg IV under the following conditions:
   a. Pallor that persists after adequate oxygenation.
   b. Faint pulses with a good heart rate.
   c. Poor response to resuscitation with adequate ventilations.

4. Check blood glucose level on all resuscitations that do not respond to initial therapy. Use heel stick.
   a. If blood glucose is <40 mg/dL, administer D10 5 ml/kg IV/IO (dilate D50 1:4 with Sterile Water or Normal Saline = D10).

5. Perform Pediatric Assessment Triangle - Rapid Cardiopulmonary Assessment (see Pediatric 3.1.1 - Initial Assessment) frequently.

ALS LEVEL 2: MEDICAL CONTROL

1. If neonate continues to have altered mental status with depressed respirations, consider **Narcan** 0.1 mg/kg (1 mg/ml concentration) IV/IO/IM/IN (c).
Notes

(a) The neonate should be placed on his or her back or side with the neck in a neutral position. To help maintain correct position, a rolled blanket or towel may be placed under the back and shoulders of the supine neonate, to elevate the torso 3/4 or 1 inch off the mattress to extend the neck slightly. If copious secretions are present, the neonate should be placed on his or her side with the neck slightly extended to allow secretions to collect in the mouth rather than in the posterior pharynx.

(b) Tracheal suctioning for thick meconium should be done via the endotracheal tube using a meconium aspirator attached to the 15 mm adaptor of the ETT. The suction unit is then attached and placed on low (no more than 100 mm Hg). Suctioning should be performed until the ETT is clear (maximum 5 seconds). It may be necessary to repeat the intubation and continue suctioning until clear (maximum 3 times).

(c) Avoid the use of Narcan if the mother has a history of drug use/abuse, as Narcan may precipitate seizures in the newborn due to acute withdrawal.
Neonatal Resuscitation Algorithm — 2015 Update

Antenatal counseling
Team briefing and equipment check

Birth

Term gestation? Good tone? Breathing or crying?

Yes

Term gestation? Good tone? Breathing or crying?

No

Warm and maintain normal temperature, position airway, clear secretions if needed, dry. Ongoing evaluation

Apnea or gasping? HR below 100/min?

No

Labored breathing or persistent cyanosis?

Yes

ppv
SpO₂, monitor
Consider ECG monitor

Position and clear airway
SpO₂ monitor
Supplementary O₂ as needed
Consider CPAP

HR below 100/min?

Yes

Check chest movement
Ventilation corrective steps if needed
ETT or laryngeal mask if needed

No

HR below 60/min?

Yes

Intubate if not already done
Chest compressions
Coordinate with PPV
100% O₂
ECG monitor
Consider emergency UVC

No

HR below 60/min?

Yes

IV epinephrine
If HR persistently below 60/min
Consider hypovolemia
Consider pneumothorax

Postresuscitation care
Team debriefing

Targeted Preductal SpO₂
After Birth

<table>
<thead>
<tr>
<th>Time</th>
<th>Targeted SpO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 min</td>
<td>60%-65%</td>
</tr>
<tr>
<td>2 min</td>
<td>65%-70%</td>
</tr>
<tr>
<td>3 min</td>
<td>70%-75%</td>
</tr>
<tr>
<td>4 min</td>
<td>75%-80%</td>
</tr>
<tr>
<td>5 min</td>
<td>80%-85%</td>
</tr>
<tr>
<td>10 min</td>
<td>85%-95%</td>
</tr>
</tbody>
</table>

Return: Newborn Resuscitation
3.4.2 SUDDEN INFANT DEATH SYNDROME (SIDS)
Pediatric Protocol

Purpose:
Sudden unexpected infant deaths (SUID) are defined as deaths in infants less than 1 year of age that occur suddenly and unexpectedly, and whose cause of death are not immediately obvious prior to investigation. Each year in the United States, about 4,000 infants die suddenly of no immediately obvious cause. About half of these SUIDs are due to Sudden Infant Death Syndrome (SIDS), the leading cause of SUID and of all deaths among infants aged 1–12 months. The three most frequently reported causes are SIDS, cause unknown, and accidental suffocation and strangulation in bed. Additional information and training material is available at www.cdc.gov/SIDS/

Sudden Infant Death Syndrome, or "crib death," is the sudden and unexpected death of an apparently healthy infant, usually under one year of age, which remains unexplained after a complete medical history, death scene investigation and postmortem examination. SIDS almost always occurs when the infant is asleep or thought to be asleep. See Appendix Sudden Infant Death Syndrome

The majority of SIDS deaths (90%) occur in infants less than six months of age. SIDS is more common in males (60%) then females (40%). SIDS almost always occurs when the infant is asleep or thought to be asleep. SIDS is more prevalent in winter months and in infants with low birth weights. SIDS occurs in all socio-economic, racial and ethnic groups. Occasionally, a mild upper respiratory infection may be present prior to death.

Physical examination of a SIDS infant may reveal lividity or settling of blood, which produces mottled, blue or gray skin. The lividity may give the appearance of "bruising." There may also be froth, blood tinged mucus draining from the infant's mouth and nostrils. In addition, cooling and rigor mortis may be present. The SIDS infant usually appears well developed and does not exhibit any signs of external injury.

SIDS should not be confused with child abuse (see Appendix - Signs of Child Abuse 7.13). Initially it is difficult to distinguish a SIDS death from other causes of death in infants. SIDS is the leading cause of death between one week and one year of age in the United States.

Although there may be obvious signs of death, the Paramedic may attempt resuscitation of the infant for psychological reasons (e.g. parents peace of mind). There may also be some infants in which the Paramedic determines that a resuscitation attempt is not warranted (see Administrative Protocol - DNR/DOA 1.2.5). In either event, the Paramedic should be prepared for a myriad of grief reactions from the parents and/or caregiver.

It should also be noted, that some SIDS deaths are mistaken for child abuse. If there are possible signs of abuse (see Appendix - Signs of Child Abuse 7.13), the Paramedic should continue as if it were a SIDS death, to avoid any unnecessary grief on the part of the parents and/or caregiver. The Paramedic should not attempt to determine whether or not child abuse has taken place. The scene should be treated as any other death scene, with attention to preservation of potential evidence. Remember, it is more common for an unexpected death of an infant to be SIDS.
Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. In most instances, resuscitation should be attempted (see appropriate Pediatric Protocols).
2. Assign a crewmember to assist the parents and/or caregiver and to explain the procedures.
3. If time permits, elicit a brief history and perform an environmental check. Document all findings on the EMS run report.
4. Once resuscitation is started, do not stop until directed to do so in the hospital by a physician.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. As per appropriate protocol

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

Return to:  [Contents at top](#)  Pediatric Protocols  Newborn/Infant Cardiopulmonary Arrest
3.5
PEDIATRIC
NEUROLOGIC EMERGENCIES
3.5 PEDIATRIC NEUROLOGIC EMERGENCIES
Pediatric Protocol

Overview:
This section covers the most common pediatric neurologic emergencies, altered mental status and seizures. It is important for the paramedic to understand appropriate behavior for the child/infant's age in order to properly assess level of consciousness (see Appendix - Glasgow Coma Score for pediatric patients). Attention should be given to how the child interacts with parents and the environment and whether or not the patient can make good eye contact. Parents may be invaluable for a baseline comparison of level of consciousness. The parents may simply state that the patient is not acting right. Causes of pediatric altered mental status include: hypoxia, head trauma, intoxication, infection, and hypoglycemia.

Approximately 4-6% of all children will have at least one seizure. Seizures may be due to an underlying disease (e.g. epilepsy) or may simply be a result of fever. Other causes of pediatric seizures include: hypoxia, brain hemorrhage, infection of brain and spinal cord (e.g. meningitis), hypoglycemia, and ingestion/poisoning.
3.5.1 ALTERED LEVEL OF CONSCIOUSNESS
(ALTERED MENTAL STATUS)
Pediatric Protocol

**Purpose**: Use this protocol for pediatric patients with altered mental status. Common signs of altered mental status in pediatric patients include: combative behavior, decreased responsiveness, lethargy, weak cry, moaning, hypotonia, ataxia, and changes in personality. Initial approach should be based on the assumption that the patient is suffering from hypoxia, ischemia, hypoglycemia or dehydration. Secondary considerations should include medications, illicit drugs, plants, trauma, etc.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Pediatric Assessment Protocol** 3.1.1
2. **Medical Supportive Care Protocol** 3.1.3, consider need for spinal immobilization.
3. Consider need for ventilatory assistance.
4. Assess for and document the [Glasgow Coma Scale](#).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If child remains unresponsive and prolonged ventilatory assistance is needed, consider need for advanced airway (a).
2. Perform glucose test with finger stick. If glucose is below 60 mg/dL (<40 mg/dl for newborns), administer:
   - a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   - b. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg)
   - c. Children: **10% Dextrose**: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms)
3. If unable to obtain IV/IO access, give **Glucagon** IM as follows:
   - a. If ≤ 20 kgs give 0.5 mg IM
   - b. If > 20 kgs give 1 mg IM
4. If mental status is depressed and signs of dehydration exist, administer fluid challenge of Normal Saline @ 20 ml/kg IV (10 ml/kg for neonates).
5. If mental status and respiratory effort is depressed, administer **Narcan** 0.1 mg/kg (maximum 2 mg) IV/IO/IM/IN. May repeat every 5 minutes PRN.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg Red</th>
<th>10 kg Purple</th>
<th>12 kg Yellow</th>
<th>15 kg White</th>
<th>19 kg Blue</th>
<th>24 kg Orange</th>
<th>30 kg Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10W</td>
<td>20 ml</td>
<td>30 ml</td>
<td>40 ml</td>
<td>50 ml</td>
<td>60 ml</td>
<td>75 ml</td>
<td>95 ml</td>
<td>120 ml</td>
<td>150 ml</td>
</tr>
<tr>
<td>Narcan</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2 mg</td>
<td>2 mg</td>
</tr>
</tbody>
</table>
6. If toxicology (poisoning) is suspected,

**Contact Poison Information Center (1-800-222-1222)**

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

**Notes:**
(a) Use appropriate discretion regarding immediate intubation of pediatric patients who may quickly regain consciousness, such as hypoglycemics after D10 or opiate overdose cases after Narcan.
(b) To avoid infiltration and resultant tissue necrosis, Dextrose 10% should be given slow IV with intermittent aspiration of IV/IO line to confirm IV/IO patency followed by saline flush.

Return to Pediatric Protocols  Return to:  Contents at top  Pediatric Protocols  Pediatric Neurological Emergencies
3.5.2 SEIZURE DISORDERS

Pediatric Protocol

**Purpose:** This protocol should be used when the patient has witnessed continuous convulsions or repeating episodes without regaining consciousness or sufficient respiratory compensation. Consider underlying etiology, such as: fever, hypoxia, head trauma, infection of brain and spinal cord (e.g. meningitis), hypoglycemia, and intoxication.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Apply gentle support of the patient's head to avoid trauma and loosen tight fitting clothing.
4. Assess for and document the Glasgow Coma Scale.

**ALS LEVEL 1: PARAMEDIC ONLY**

2. Perform glucose test with finger stick. If glucose is below 60 mg/dL, administer:
   a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg)
   c. Children: **10% Dextrose**: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms) (a)(b).
3. If unable to obtain IV/IO access, give **Glucagon** IM as follows:
   a. If ≤ 20 kgs give 0.5 mg IM
   b. If > 20 kgs give 1 mg IM
4. If seizure continues, administer one of the following benzodiazepines:
   a. **Midazolam (Versed)** 2 mo – 12 yrs; 
      IV/IO: start 0.15 mg/kg x1(Max 4 mg),
      IM: 0.2 mg/kg. Maximum 10 mg
      IN (intranasal): 0.2 mg/kg. Maximum 10 mg (c)
   b. **Diazepam (Valium)**
      IV/IO: [1 mo – 5 yr] 0.1 - 0.3 mg/kg IV/IO q 5-10 min. Max 5 mg total.
      [5 yr – 12 yr] 0.1- 0.3 mg/kg IV/IO q 5-10 min. Max 10 mg total.
      [> 12 yr] 5 – 10 mg IV/IO q 10 – 15 min. Max 30 mg total.
      Rectal: Verify dose with Broselow tape
      [up to 5 yrs] 0.5 mg/kg PR x 1
      [6 – 11 yrs] 0.3 mg/kg PR x1
      [> 11 yrs] 0.2 mg/kg PR x 1
c. **Lorazepam**: *(Not available in all service areas)*

- IV/IO: 0.05 – 0.1 mg/kg IV over 2 – 5 minutes; not to exceed 4 mg/dose; repeat 0.05 mg/kg prn q 10 – 15 min
- IN (intranasal via atomizer): 0.1 mg/kg (max 5 mg)

### ALS LEVEL 2: MEDICAL CONTROL

1. If seizure continues for 5 minutes, administer one of the following benzodiazepines:
   a. **Diazepam (Valium)**,
      - IV/IO: 0.2 mg/kg IV/IO
      - Rectal: 0.5 mg/kg (maximum 20 mg) rectally. (d)(e)
   b. **Midazolam (Versed)** 0.1 mg/kg (maximum 4 mg) IV or 0.2 mg/kg intranasal (maximum 10mg) (c)
   c. **Lorazepam (Ativan)**: 0.05 – 0.1 mg/kg IV over 2 – 5 minutes; not to exceed 4 mg/dose; repeat 0.05 mg/kg prn q 10 – 15 min

2. Call medical control or medical director for any questions or concerns.

### Notes:

(a) For newborns and infants, perform heel stick. In newborns, if blood glucose is <40 mg/dL, administer D10 5 ml/kg IV/IO (dilute D50 1:4 with Normal Saline = D10).

(b) To avoid infiltration and resultant tissue necrosis, Dextrose 10%, should be given slow IV with intermittent aspiration of IV/IO line to confirm IV/IO patency followed by saline flush.

(c) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device (same as IV dose).

(d) Use a lubricated tuberculin or 3-5 ml syringe **without the needle**. Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm into the rectum. Inject Valium, remove syringe and tape buttocks closed.
(e) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.
3.6
PEDIATRIC
TOXICOLOGIC EMERGENCIES
3.6 PEDIATRIC TOXICOLOGIC EMERGENCIES
Pediatric Protocol

**Overview:**
This protocol is to be used for those patients suspected of exposure to toxic substances via any route of exposure (e.g. drug overdose, snake bite, etc.). The protocols will give specific considerations for each type of exposure, as well as general treatment guidelines. Additional assistance may be necessary in certain cases (e.g. hazardous materials team for toxic exposure, police for scene control, including violent and/or impaired patient - see Pediatric Protocol 3.7.5).

A history of the events leading to the illness or injury should be obtained from the patient and bystanders to include:

1. What drugs, poisons, or other substances was the patient exposed to? Consider multiple substances, especially on overdoses. Also consider plants and herbal remedies.
2. When and how much?
3. Duration of symptoms?
5. Accidental? Nature of accident?
6. Duration of exposure (if applicable).

Collect all pill bottles, empty or full, and check for "suicide notes" (if applicable). Transport any/all information or items that may assist in the treatment of the patient to the emergency department.

**Contact the Poison Information Center (1-800-222-1222)** for consultation regarding specific therapy and then contact on-line medical control for confirmation of Level 2 orders.
3.6.1 PEDIATRIC INGESTION (OVERDOSE)
Pediatric Protocol

**Purpose:** This protocol should be used on most types of ingestion (e.g. acetaminophen, benzodiazepines, narcotics, tricyclic antidepressants, vitamins with iron, etc.). Symptoms vary with the substance involved (also see Pediatric Protocol 3.6.4 - Organophosphate Poisoning).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. [Initial Pediatric Assessment Protocol 3.1.1]
2. [Medical Supportive Care Protocol 3.1.3]
3. Consider need for ventilatory support
4. Assess for and document the [Glasgow Coma Scale]

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Consider need for intubation
2. Perform glucose test with finger stick. If glucose is below 60 mg/dL (< 40 mg/dl newborn), administer:
   a. Neonates: [10% Dextrose] 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: [10% Dextrose] 5 ml/kg (0.5 g/kg)
   c. Children: [10% Dextrose] 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms)
3. If hypoglycemic and unable to start IV/IO, and patient is:
   a. < 20 kg give [Glucagon] 0.5 mg SC/IM
   b. > 20 kg give [Glucagon] 1 mg SQ/IM.

<table>
<thead>
<tr>
<th>Weight</th>
<th>D10W</th>
<th>Glucagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 kg</td>
<td>Grey</td>
<td>20 ml</td>
</tr>
<tr>
<td>6 kg</td>
<td>Pink</td>
<td>30 ml</td>
</tr>
<tr>
<td>8 kg</td>
<td>Red</td>
<td>40 ml</td>
</tr>
<tr>
<td>10 kg</td>
<td>Purple</td>
<td>50 ml</td>
</tr>
<tr>
<td>12 kg</td>
<td>Yellow</td>
<td>60 ml</td>
</tr>
<tr>
<td>15 kg</td>
<td>White</td>
<td>75 ml</td>
</tr>
<tr>
<td>19 kg</td>
<td>Blue</td>
<td>95 ml</td>
</tr>
<tr>
<td>24 kg</td>
<td>Orange</td>
<td>120 ml</td>
</tr>
<tr>
<td>30 kg</td>
<td>Green</td>
<td>150 ml</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If &lt; 20 kg give 0.5 mg IM</td>
</tr>
</tbody>
</table>

4. If any questions, contact [Poison Information Center (1-800-282-3171)].
5. If suspected narcotic overdose in non-neonate, administer [Narcan] 0.1 mg/kg (maximum 2 mg) IV/IO/IM/Intranasal. May repeat every 5 minutes PRN. (c)

<table>
<thead>
<tr>
<th>Weight</th>
<th>Narcan</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 kg</td>
<td>Grey</td>
</tr>
<tr>
<td>6 kg</td>
<td>Pink</td>
</tr>
<tr>
<td>8 kg</td>
<td>Red</td>
</tr>
<tr>
<td>10 kg</td>
<td>Purple</td>
</tr>
<tr>
<td>12 kg</td>
<td>Yellow</td>
</tr>
<tr>
<td>15 kg</td>
<td>White</td>
</tr>
<tr>
<td>19 kg</td>
<td>Blue</td>
</tr>
<tr>
<td>24 kg</td>
<td>Orange</td>
</tr>
<tr>
<td>30 kg</td>
<td>Green</td>
</tr>
</tbody>
</table>

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
6. If suspected tricyclic antidepressant overdose (QRS > 0.10), administer Sodium Bicarbonate 1 mEq/kg IV/IO (d).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg red</th>
<th>10 kg purple</th>
<th>12 kg yellow</th>
<th>15 kg white</th>
<th>19 kg blue</th>
<th>24 kg orange</th>
<th>30 kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Charcoal PO</td>
<td>4 gm</td>
<td>6 gm</td>
<td>8 gm</td>
<td>10 gm</td>
<td>12 gm</td>
<td>15gm</td>
<td>19 gm</td>
<td>24 gm</td>
<td>30 gm</td>
</tr>
<tr>
<td>Naloxone IV/IO/IM/IN</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2 mg</td>
<td>2 mg</td>
</tr>
<tr>
<td>Sodium Bicarbonate IV/IO</td>
<td>4 mEq</td>
<td>6 mEq</td>
<td>8 mEq</td>
<td>10 mEq</td>
<td>12 mEq</td>
<td>15 mEq</td>
<td>19 mEq</td>
<td>24 mEq</td>
<td>30 mEq</td>
</tr>
<tr>
<td>Calcium Chloride IV/IO</td>
<td>40 mg</td>
<td>60 mg</td>
<td>80 mg</td>
<td>100 mg</td>
<td>120 mg</td>
<td>150 mg</td>
<td>190 mg</td>
<td>240 mg</td>
<td>300 mg</td>
</tr>
<tr>
<td>Glucagon IV/IO/IM</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
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<tr>
<td>Atropine IV/IO</td>
<td>0.08 mg</td>
<td>0.12 mg</td>
<td>0.16 mg</td>
<td>0.2 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
<td>0.38 mg</td>
<td>0.48 mg</td>
<td>0.5 mg (Max)</td>
</tr>
<tr>
<td>Midazolam (Versed) IV/IO</td>
<td>0.6 mg</td>
<td>0.9 mg</td>
<td>1.2 mg</td>
<td>1.5 kg</td>
<td>1.8 mg</td>
<td>2.25 mg</td>
<td>2.85 mg</td>
<td>3.6 mg</td>
<td>4 mg</td>
</tr>
<tr>
<td>Midazolam (Versed) IN/IM</td>
<td>0.8 mg</td>
<td>1.2 mg</td>
<td>1.6 mg</td>
<td>2 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.8 mg</td>
<td>4.8 mg</td>
<td>6 mg</td>
</tr>
<tr>
<td>Diazepam (Valium) IV/IO</td>
<td>1.2 mg</td>
<td>1.8 mg</td>
<td>2.4 mg</td>
<td>3 mg</td>
<td>3.6 mg</td>
<td>4.5 mg</td>
<td>5 mg</td>
<td>5 mg</td>
<td>5 mg</td>
</tr>
<tr>
<td>Valium Rectal</td>
<td>2 mg</td>
<td>3 mg</td>
<td>4 mg</td>
<td>5 mg</td>
<td>6 mg</td>
<td>7.5 mg</td>
<td>9.5 mg</td>
<td>12 mg</td>
<td>15 mg</td>
</tr>
<tr>
<td>Lorazepam (Ativan) IV/IO/IN</td>
<td>0.4 mg</td>
<td>0.6 mg</td>
<td>0.8 mg</td>
<td>1 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
<td>1.9 mg</td>
<td>2.4 mg</td>
<td>3.0 mg</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

**Notes:**
(a) For newborns and infants, perform heel stick. In newborn, if blood glucose is <40 mg/dL, administer D10 5 ml/kg IV/IO (dilute D50 1:4 with Normal Saline = D10).
(b) To avoid infiltration and resultant tissue necrosis, Dextrose 10% should be given slow IV with intermittent aspiration of IV/IO line to confirm IV/IO patency followed by saline flush.
(c) Intranasal administration of Naloxone requires the use of a mucosal atomization device (same as IV dose).
(d) If patient is seizing, also see Pediatric Protocol Seizures 3.5.2).

Return to: Contents at top Pediatric Protocols Pediatric Toxocologic Emergencies Drug Refer
3.6.2 BITES AND STINGS

Pediatric Protocol

Purpose: This protocol includes the treatment for snake and spider bites, dog and cat bites, insect stings, marine animal envenomations and stings. All bites should be transported to the hospital. For questions or concerns, contact Poison Information Center (1-800-222-1222).

Procedure:

Snake Bites

BASIC LEVEL: EMT and PARAMEDIC

1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. Consider need for Pediatric Protocol 3.7.1 – Allergic Reactions/Anaphylaxis.
4. Splint affected area, place patient supine with extremities at a neutral level, keep patient quiet, remove and secure all jewelry.
5. Wash area of bite with copious amounts of water.
6. Attempt to identify snake, if safe to do so.
7. Check temperature and pulse distal to bite on extremity and mark level of swelling and time with pen every 15 minutes.

ALS LEVEL 1: PARAMEDIC ONLY

1. Refer to Pediatric Pain Protocol 3.1.5 for pain management.

ALS LEVEL 2: MEDICAL CONTROL

1. Call medical control or medical director for any questions or concerns.

Dog and Cat and Wild Animal Bites

BASIC LEVEL:

1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Trauma Supportive Care Protocol 3.1.4 if indicated
4. Wound care - BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat).
5. Advise dispatch to contact animal control and PD for identification and quarantine of animal.

ALS LEVEL 1: PARAMEDIC ONLY

1. Refer to Pediatric Pain Protocol 3.1.5 for pain management.
**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

**Insect Stings (including: Centipedes, Scorpions and Spiders)**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Pediatric Assessment Protocol](#) 3.1.1
2. [Medical Support Protocol](#) 3.1.3
3. [Trauma Supportive Care Protocol](#) 3.1.4, if indicated
4. Consider need for [Pediatric Protocol 3.7.1 - Allergic Reactions/Anaphylaxis](#).
5. Remove stinger by scraping skin with edge of flat surface (e.g. credit card). Do not attempt to pull stinger out, as this may release more venom.
6. Clean area with soap and water.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Refer to [Pediatric Pain Protocol](#) 3.1.5 for pain management.

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

**Marine Animal Envenomations -Stingray, Scorpionfish (Lionfish, Zebrafish, Stonefish), Catfish, Weeverfish, Starfish, and Sea Urchin**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Pediatric Assessment Protocol](#) 3.1.1
2. [Medical Supportive Care Protocol](#) 3.1.3
3. [Trauma Supportive Care Protocol](#) 3.1.4, if indicated
4. Consider need for [Pediatric Protocol 3.7.1 - Allergic Reactions/Anaphylaxis](#).
5. Immerse the punctures in nonscalding hot water to tolerance (110-113 degrees F) to achieve pain relief (30-90 minutes). Transport should not be delayed, immersion in nonscalding hot water may be continued during transport.
6. Remove any visible pieces of the spine(s) or sheath. Gently wash wound with soap and water, then irrigate vigorously with fresh water (avoid scrubbing).

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Refer to [Pediatric Pain Protocol](#) 3.1.5 for pain management.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

Marine Animal Stings -Jellyfish, Man-of-War, Sea Nettle, Irukandji, Anemone, Hydroid, Fire Coral

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1  
2. Medical Supportive Care Protocol 3.1.3  
3. Trauma Supportive Care Protocol 3.1.4, if indicated  
   Consider need for Pediatric Protocol 3.7.1 - Allergic Reactions/Anaphylaxis.  
4. Rinse the skin with seawater (Do not use fresh water, do not apply ice, do not rub the skin).  
5. Apply soaks of acetic acid 5% (vinegar) until pain is relieved.  
6. Remove large tentacle fragments using forceps (use gloves to avoid contact with bare hands).  
7. Apply a lather of shaving cream (if available) and shave the affected area with edge of flat surface (e.g. credit card).  
8. Apply heat pack to area.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Refer to Pediatric Pain Protocol 3.1.5 for pain management.

**A LS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

Human Bites

**BASIC LEVEL: EMT and PARAMEDIC**
8. Initial Pediatric Assessment Protocol 3.1.1  
9. Medical Supportive Care Protocol 3.1.3  
10. Trauma Supportive Care Protocol 3.1.4 if indicated  
11. Wound care - BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean area with soap and water.  
12. Advise dispatch to contact PD for possible domestic violence.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Refer to Pediatric Pain Protocol 3.1.5 for pain management.

**A LS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
**3.6.3 CARBON MONOXIDE POISONING**

**Pediatric Protocol**

**Purpose:** Carbon Monoxide poisoning should be suspected when the patient has been exposed to the products of combustion (e.g. smoke, automobile exhaust, exhaust fumes from fuel powered machinery, etc.) and are experiencing symptoms. These symptoms may vary with the level of carbon monoxide exposure. See [Hazardous Exposure Chemical Treatment Guideline](#) for more details.

Mild CO exposure signs and symptoms include: headache, nausea/vomiting, poor concentration, irritability, agitation, and anxiety.

Moderate to severe CO exposure signs and symptoms include: altered mental status, chest pain, cardiac dysrhythmias, pale skin, cyanosis, seizures, and rarely cherry red skin.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

13. [Initial Pediatric Assessment Protocol 3.1.1](#)
14. [Medical Supportive Care Protocol 3.1.3](#)
15. Remove patient from hazardous area.
16. Administer high-flow oxygen (100%). Ventilatory support as needed/indicated (see [Peds Airway Management Protocol](#))

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Consider need to intubate.
2. Treat specific dysrhythmias (see [Pediatric Cardiac Dysrhythmia Protocol 3.3](#)).
3. Treat seizures according to seizure protocol (see [Pediatric Seizure Protocol](#))

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

Return to: [Contents at top](#)  [Pediatric Protocols](#)  [Pediatric Toxocologic Emergencies](#)
3.6.4 ORGANOPHOSPHATE POISONING
Pediatric Protocol

Purpose: Organophosphate compounds are used as insecticides in residential as well as commercial agriculture. Organophosphates affect both the parasympathetic (muscarinic effects) and the sympathetic (nicotinic effects) nervous systems. Signs and symptoms are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). The patient may have constricted pupils (miosis). Bradycardia is also common; however stimulation of nicotinic receptors will produce tachycardia. Also see Chem Exposure Guideline Green for additional information and management guidelines.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Pediatric Assessment Protocol 3.1.1
2. Avoid exposure to patient's sweat, vomit, stool, and vapor emitting from soaked clothes (a).
3. If patient was exposed externally, remove clothing and decontaminate skin.
4. Medical Supportive Care Protocol 3.1.3
6. Contact Poison Information Center (1-800-282-3171) if any questions or concerns.

ALS LEVEL 1: PARAMEDIC ONLY
1. If patient is symptomatic, administer Atropine
   < 2 yr old: 0.05 mg/kg (max. 3 mg) IM or 0.02 mg/kg IV/IO, repeat q 5-10 minutes until atropinization occurs. (If nerve agent, Start 0.05 mg/kg IM x 1 for mild/moderate sx. Start 0.1 mg/kg IM for severe sx).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
<th>8 kg red</th>
<th>10 kg purple</th>
<th>12 kg yellow</th>
<th>15 kg white</th>
<th>19 kg blue</th>
<th>24 kg orange</th>
<th>30 kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atropine IM</td>
<td>0.2 mg</td>
<td>0.3 mg</td>
<td>0.4 mg</td>
<td>0.5 mg</td>
<td>0.6 mg</td>
<td>0.75 mg</td>
<td>0.95 mg</td>
<td>1.2 mg</td>
<td>1.5 mg</td>
</tr>
<tr>
<td>Atropine IV/IO</td>
<td>0.08 mg</td>
<td>0.12 mg</td>
<td>0.16 mg</td>
<td>0.2 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
<td>0.38 mg</td>
<td>0.48 mg</td>
<td>0.6 mg</td>
</tr>
</tbody>
</table>

2 – 10 yrs: 1 – 2 mg IM/IV/IO q 10 – 30 min prn; Start 1 mg IM/IV x 1. (If nerve agent, Start 1 mg/kg IM x 1 for mild/moderate sx. Start 2 mg/kg IM for severe sx).
> 10 yrs: 1-2 mg IM/IV/IO q 10 – 30 min prn; Start 2 mg IM/IV x 1. (If nerve agent, Start 2 mg/kg IM x 1 for mild/moderate sx. Start 4 mg/kg IM for severe sx).
2. If seizing, see Pediatric Seizure Protocol 3.5.2.
3. Alert emergency department to prepare for contaminated patient.
4. Do not induce vomiting.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Repeat Atropine 0.05 mg/kg IV/IO (maximum 3 mg) every 5-10 minutes until secretions are inhibited.

**Note:**
(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate HAZMAT PPE protocol, as the risk of secondary contamination is very high.
3.7
OTHER PEDIATRIC MEDICAL EMERGENCIES
3.7 OTHER PEDIATRIC MEDICAL EMERGENCIES
Pediatric Protocol

Overview:
The paramedic should use these protocols to guide him/her through the treatment of patients with other medical emergencies that are exhibiting signs and symptoms. In addition to these protocols, the paramedic may need to refer to additional protocols for continued treatment.

Return to: Contents at top  Pediatric Protocols  Pediatric Other Medical Emergencies
3.7.1 ALLERGIC REACTIONS/ ANAPHYLAXIS
Pediatric Protocol

**Purpose:** This protocol should be used for patients exhibiting signs and symptoms consistent with allergic reaction as follows:
- **Skin** - flushing, itching, hives, swelling, cyanosis.
- **Respiratory** - dyspnea, sneezing, coughing, wheezing, stridor, laryngeal edema, laryngospasm, bronchospasm.
- **Cardiovascular** - vasodilation, increased heart rate, decreased blood pressure.
- **Gastrointestinal** - nausea/vomiting, abdominal cramping, diarrhea.
- **CNS** - dizziness, headache, convulsions, tearing.

Treatment is outlined according to the severity of the allergic reaction (mild, moderate, and severe or anaphylaxis).

**Procedure:**

**Mild Reactions** - *(redness and/or itching, normal perfusion without dyspnea)*

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Trauma Supportive Care Protocol 3.1.4 if indicated

**ALS LEVEL 1: PARAMEDIC ONLY**
1. For severe itching, administer Diphenhydramine *(Benadryl)* 1-2 mg/kg IM/IV (max. 50 mg IM or 25 mg IV). If administering Benadryl IV dilute amount in 9 ml of normal saline.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg Grey</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Diphenhydramine <em>(Benadryl)</em></td>
<td>4 mg</td>
<td>6 mg</td>
<td>8 mg</td>
<td>10 mg</td>
<td>12 mg</td>
<td>15 mg</td>
<td>19 mg</td>
<td>24 mg</td>
<td>30 mg</td>
</tr>
</tbody>
</table>

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

**Moderate Reactions** - *(edema, hives, dyspnea, wheezing, and normal perfusion)*

**BASIC LEVEL: EMT and PARAMEDIC**
1. Medical Supportive Care Protocol 3.1.3
2. Trauma Supportive Care Protocol 3.1.4 if indicated

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Establish IV/IO. Monitor BP carefully and prepare to bolus with IV fluid if patient becomes hypotensive.

2. **Diphenhydramine (Benadryl)** 1-2 mg/kg (maximum 50 mg IM or 25 mg IV) IM/IV. If administering Benadryl IV dilute amount in 9 ml of normal saline.

3. **Zantac (Ranitidine)** 2-5 mg/kg po if child able to swallow pills.

4. **Methylprednisolone Sodium Succinate (Solu-Medrol)** 2 mg/kg IV/IM (maximum dose 125 mg) x 1.

5. **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.3 mg) IM/SQ (a).

6. If patient has signs of respiratory distress, administer **Albuterol (Ventolin)** 1 nebulizer treatment;
   a. If <1 year or <10 kg, mix 1.25 mg in 1.5 ml of Normal Saline (0.083%)
   b. If >1 year or >10 kg, mix 2.5 mg in 3 ml of Normal Saline (0.083%)
   c. May repeat twice (a)

7. If bronchodilator is administered, add **Ipratropium Bromide (Atrovent)** 0.5mg (0.5 ml) to each nebulize treatment.

8. May repeat **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.15) SQ (a).

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<thead>
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<th>Weight</th>
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<td>30 mg</td>
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<tr>
<td>Zantac</td>
<td>Child must be able to swallow. Older children can be given 2 – 5 mg/kg po. ~75 mg – 150 mg</td>
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<tr>
<td>Methylprednisolone (Solu-Medrol)</td>
<td>8 mg</td>
<td>12 mg</td>
<td>16 mg</td>
<td>20 mg</td>
<td>24 mg</td>
<td>30 mg</td>
<td>38 mg</td>
<td>48 mg</td>
<td>60 mg</td>
</tr>
<tr>
<td>Epinephrine 1:1000 IM</td>
<td>0.04 mg</td>
<td>0.06 mg</td>
<td>0.08 mg</td>
<td>0.10 mg</td>
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</tr>
<tr>
<td>Albuterol</td>
<td>&lt; 1 yr or &lt; 10 kg mix 1.25 mg in 1.5 mL NS</td>
<td>&gt; 1 yr or &gt; 10 kg mix 2.5 mg in 3 mL NS</td>
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<td></td>
</tr>
<tr>
<td>Atrovent</td>
<td>&lt; 8 yrs old mix 0.25 mg (1.25 mL) with Albuterol</td>
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**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

Severe Reactions - (edema, hives, severe dyspnea and wheezing, poor perfusion/hypotension, and possible cyanosis and laryngeal edema)

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Medical Supportive Care Protocol** 3.1.3
2. **Trauma Supportive Care Protocol** 3.1.4 if indicated

**ALS LEVEL 1: PARAMEDIC ONLY**
Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
1. Establish IV/IO. If patient is hypotensive, bolus with IV NS at 20 ml/kg (10 ml/kg for neonates). May repeat bolus x 1 then contact med control if still hypotensive.

2. **Diphenhydramine (Benadryl)** 1mg/kg (maximum 50 mg IM or 25 mg IV) IM/IV. If administering Benadryl IV dilute amount in 9 ml of normal saline.

3. **Zantac (Ranitadine)** 2mg/kg po if child able to swallow pills.

4. **Methylprednisolone Sodium Succinate (Solu-Medrol)** 2 mg/kg IV/IM (maximum dose 125 mg) x 1.

5. **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.15 mg) SQ (a).

6. If patient shows signs of respiratory distress, administer **Albuterol (Ventolin)** 1 nebulizer treatment:
   a. If <1 year or <10 kg, mix 1.25 mg in 1.5 ml of Normal Saline (0.083%)
   b. If >1 year or >10 kg, mix 2.5 mg in 3 ml of Normal Saline (0.083%)
   c. May repeat twice (a)

7. If bronchodilator is administered, add **Ipratropium Bromide (Atrovent)** 0.5mg (0.5 ml) with nebulized treatment.

8. May repeat **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.15) SQ (a).

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<td>0.3 mg</td>
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<td>&lt; 1 yr or &lt; 10 kg mix 1.25 mg in 1.5 ml NS</td>
<td>&gt; 1 yr or &gt; 10 kg mix 2.5 mg in 3 ml NS</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atrovent</td>
<td>&lt; 8 yrs old mix 0.25 mg (1.25 ml) with Albuterol</td>
<td>If &gt; 8 yrs old mix 0.5 mg (2.5 ml) with Albuterol</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>IV NS bolus</td>
<td>80 ml</td>
<td>120 ml</td>
<td>160 ml</td>
<td>200 ml</td>
<td>240 ml</td>
<td>300 ml</td>
<td>380 ml</td>
<td>480 ml</td>
<td>600 ml</td>
</tr>
</tbody>
</table>
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**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

**Note**

(a) The EPI-Jr.® may be used if other means of Epinephrine administration are not available.

Return to: **Contents at top**  Pediatric Protocols  Peds Respiratory Emergencies
Peds Airway Obstruction  Peds Other Medical Emerg  Peds Bites and Stings
3.7.2 DIABETIC EMERGENCIES
Pediatric Protocol

**Purpose:** This protocol is to be used for those patients whose blood glucose is below 60 mg/dL (see Pediatric Protocol 3.4.1 for newborn). Consider medication errors, overdoses, accidental ingestions, and other factors related to etiology. Look for pill bottles.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. If patient is conscious with an intact gag reflex, assist with self-administration of oral glucose, if possible.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Perform glucose test with finger stick (heel stick for newborn). If glucose is below 60mg/dL (< 40 mg/dl for newborns), administer:
   a. Neonates: **10% Dextrose**: 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: **10% Dextrose**: 5 ml/kg (0.5 g/kg)
   c. Children: **10% Dextrose**: 5ml/kg (0.5 g/kg) not to exceed 250 ml.
2. Repeat glucose test after 15 minutes with finger stick (heel stick for newborn). If glucose is still below 60 mg/dL (< 40 mg/dl in newborn), repeat dosing as above.
3. If unable to start IV/IO administer **Glucagon** if patient is:
   - [< 20kg] 0.5mg SQ/IV/IM x 1, max dose 1mg/dose
   - [>20 kg] 1 mg SQ/IV/IM x 1, max dose 1mg/dose
Following Glucagon, once patient is alert enough to swallow, give oral glucose. Glucagon efficacy may be limited in glycogen-depleted patients (chronic alcoholics, malnourished, starvation).

<table>
<thead>
<tr>
<th>Weight</th>
<th>4 kg</th>
<th>6 kg</th>
<th>8 kg</th>
<th>10 kg</th>
<th>12 kg</th>
<th>15 kg</th>
<th>19 kg</th>
<th>24 kg</th>
<th>30 kg</th>
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</thead>
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<tr>
<td></td>
<td>Grey</td>
<td>Pink</td>
<td>Red</td>
<td>Purple</td>
<td>Yellow</td>
<td>White</td>
<td>Blue</td>
<td>Orange</td>
<td>Green</td>
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<tr>
<td>D10W</td>
<td>20 ml</td>
<td>30 ml</td>
<td>40 ml</td>
<td>50 ml</td>
<td>60 ml</td>
<td>75 ml</td>
<td>95 ml</td>
<td>120 ml</td>
<td>150 ml</td>
</tr>
<tr>
<td>Glucagon</td>
<td>If &lt; 20 kg give 0.5 mg IM</td>
<td>&gt; 20 kg give 1 mg IM</td>
<td></td>
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</tr>
</tbody>
</table>

4. If blood glucose is >300 mg/dL with signs of dehydration, administer Normal Saline 20 ml/kg IV, unless contraindicated.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
Note:
(a) To avoid infiltration and resultant tissue necrosis, Dextrose 10% should be given slow IV with intermittent aspiration of IV line to confirm IV patency followed by saline flush.
3.7.3 NAUSEA AND VOMITING
Pediatric Protocol

**Purpose:** Use this protocol for patients who are nauseated and vomiting due to their illness, pain, side effect of medications, etc. If the patient’s nausea and vomiting is associated with an altered mental status or a seriously ill appearance, consider the cause to be a decompensation of their medical problem such as DKA (if diabetic)

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. **Initial Patient Assessment Protocol**
2. **Airway Assessment/Management Protocol.** If indicated, Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO₂ < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Provide appropriate comfort measures (i.e. cool cloth to forehead).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If child is very ill appearing with nausea and vomiting, initiate IV lactated Ringer’s or Normal Saline and bolus with 20 ml/kg for children (10 ml/kg neonates).
2. Administer Zofran (Ondansetron) as follows:
   a. **Oral dissolvable tablets** (if available). LESS THAN 20 KG: DO NOTADMINISTER
      i. 20 kg - 39 kg (5-11 year): 4 mg oral disintegrating tablet (ODT) placed under the tongue. Dose may not be repeated
      ii. 40 kg or more (12 year or older): 4 mg oral disintegrating tablet (ODT) placed under the tongue. May repeat at 10-15 minutes with maximum dose of 8 mg
   b. **Injection**
      i. Less than 40 kg: 0.1 mg/kg SLOW IV push over 2-3 minutes or IM. Do not repeat.
      l. 40 kg or more: 4 mg SLOW IV push over 2-3 minutes or IM. May be repeated once if no improvement within 30 minutes. Do not exceed 8 mg total dosage.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Contact medical control or medical director if any concerns or any questions.

Return to: [Contents at top](#) [Pediatric Protocols](#) [Peds Other Medical Emerg](#) [Peds Cold Related Emerg](#)
3.7.4 NON-TRAUMATIC ABDOMINAL PAIN

Pediatric Protocol

**Purpose:** This protocol should be used for patients that complain of abdominal pain without a history of trauma (refer to Appendix – Signs of Child Abuse).

Assessment should include specific questions pertaining to the GI/GU systems.

Abdominal physical assessment includes:
- Ask patient to point to area of pain (palpate this area last).
- Gently palpate for tenderness, rebound tenderness, distension, rigidity, guarding, and pulsatile masses. Also palpate flank for CVA (costovertebral) tenderness.

Abdominal history includes:
- Hx of pain (OPQRST).
- Hx of nausea/vomiting (color, bloody, coffee grounds).
- Hx of bowel movement (last BM, diarrhea, bloody, tarry).
- Hx of urine output (painful, dark, bloody).
- Hx of abdominal surgery.
- Hx of medication ingestions
- SAMPLE (attention to last meal).

Additional questions should be asked of the female adolescent patient regarding OB/GYN history (see Adult OB/GYN Emergencies).

An acute abdomen can be caused by: appendicitis, diabetic ketoacidosis, incarcerated hernia, intussusception, cholecystitis, cystitis -UTI (bladder inflammation), duodenal ulcer, diverticulitis, abdominal aortic aneurysm, kidney infection - UTI (urinary tract infection), kidney stone, pelvic inflammatory disease - PID (female), pancreatitis (see Appendix - Abdominal Pain Differential 7.1).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care protocol 3.1.3
3. Trauma Supportive Care Protocol 3.1.4, if indicated

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If decreased perfusion (see Appendix 7.10 - Pediatric Vital signs), administer fluid challenge of Normal Saline 20 ml/kg IV (10 ml/kg for neonates).
ALS LEVEL 2: MEDICAL CONTROL

1. Consider pain control (see Pediatric Pain Protocol 3.1.5 for pain scale and medication dosage—same as isolated extremity fracture pain protocol).
2. Call medical control or medical director for any questions or concerns.

<table>
<thead>
<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
<th>10kg purple</th>
<th>12kg yellow</th>
<th>15kg white</th>
<th>19kg blue</th>
<th>24kg orange</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Morphine IV/IO/IM/SQ</td>
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<tr>
<td>Fentanyl IV/IO</td>
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<tr>
<td>Fentanyl IN</td>
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<tr>
<td>Ketamine IV/IO/IN</td>
<td>2 mg</td>
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<td>4 mg</td>
<td>5 mg</td>
<td>6 mg</td>
<td>7.5 mg</td>
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<td>15 mg</td>
</tr>
<tr>
<td>Ketorolac (Toradol)</td>
<td>If &gt; 2 years of age, Ketorolac Tromethamine (Toradol) may be given 0.5 mg/kg (maximum 15 mg) IV or 1 mg/kg (maximum 30 mg) IM</td>
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<tr>
<td>Atropine</td>
<td>0.08 mg</td>
<td>0.12 mg</td>
<td>0.16 mg</td>
<td>0.2 mg</td>
<td>0.24 mg</td>
<td>0.3 mg</td>
<td>0.38 mg</td>
<td>0.48 mg</td>
<td>0.6 mg</td>
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<tr>
<td>Naloxone (Narcan)</td>
<td>0.4 mg</td>
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<td>1 mg</td>
<td>1.2 mg</td>
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<tr>
<td>Ondansetron (Zofran)</td>
<td>Contact med control</td>
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<td>2 mg</td>
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3.7.5 NON-TRAUMATIC CHEST PAIN UNDIFFERENTIATED
Pediatric Protocol

Purpose: Causes of non-traumatic chest pain in the pediatric patient include: wheezing associated illness, spontaneous pneumothorax, pleurisy, costochondritis, pulmonary embolism, pneumonia, peptic ulcer, drug usage (e.g. stimulants - cocaine), dissecting aortic aneurysm, pericarditis, hiatal hernia, esophageal spasm, cholecystitis, pancreatitis, cervical disk problem, and rarely cardiac problems (see Appendix Chest Pain Differential). Also refer to Appendix – Signs of Child Abuse 7.13.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. Airway Management Protocol 3.1.2
4. Consider need for other protocols (e.g. Pediatric Protocol 3.2 - Pediatric Respiratory Emergencies).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**
1. Consider pain control (see Pediatric Pain Protocol 3.1.5 for pain scale and medication dosage-same as isolated extremity fracture pain protocol).
2. Call medical control or medical director for any questions or concerns.

<table>
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<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg Red</th>
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<tr>
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<td>Fentanyl IV/IO</td>
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<tr>
<td>Ketamine IV/IO/IN</td>
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<td>2 mg</td>
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3.7.6 VIOLENT AND/OR IMPAIRED PATIENT

Pediatric Protocol

Purpose: This treatment protocol is used in conjunction with Adult Medical Protocol - Behavioral Violent Psychiatric Emergencies. If patient is violent and an immediate threat to the patient, EMS crew or bystander safety exists, restraint should be used to prevent patient from harming him or herself or others. If patient is not violent, be observant for possibility of violence and avoid provoking patient. Particular caution should be exercised when any “non-lethal” law enforcement device (e.g. pepper spray, taser, etc.) has been employed.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Have patient placed under Baker Act (or equivalent commitment form) when appropriate and refer to Impaired/Incapacitated Persons Act
3. Medical Supportive Care 3.1.3.
4. Airway Management 3.1.2
5. Rule out causes other than psychiatric (e.g. drug overdose, ETOH, head trauma, hypoxia, hypoglycemia).
6. Physically restrain patient when appropriate (see Medical Procedure Physical Restraints 4.28).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Perform glucose test with finger stick. If glucose is below 60 mg/dL (< 40mg/dl for newborns), administer:
   a. Neonates: 10% Dextrose: 2-5 ml/kg (0.2-0.5 g/kg)
   b. Infants: 10% Dextrose: 5 ml/kg (0.5 g/kg)
   c. Children: 10% Dextrose: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms)
2. If unable to obtain IV/IO access, give Glucagon IM as follows:
   a. If ≤ 20 kgs give 0.5 mg IM
   b. If > 20 kgs give 1 mg IM
3. Administer one of the following benzodiazepines(< 12 yr old contact med control first):
   a. **Diazepam (Valium)** 0.2 mg/kg (maximum 5 mg) IM/IV, may repeat once PRN (up to max. 10 mg).
   b. **Midazolam (Versed)** 0.1mg/kg (maximum 2mg) IM/IV or Intranasal. May repeat once PRN (up to max. 4 mg) (b).
   c. **Lorazepam (Ativan)** 0.05 mg/kg IV/IO//IN; may repeat once, to maximum dose of 4 mg (b).
4. Diphenhydramine HCL (Benadryl) 1 mg/kg (maximum 50 mg IM or 25 mg IV) IM or IV (a).
### ALS LEVEL 2: MEDICAL CONTROL

1. Call medical control or medical director for any questions or concerns.

**Notes:**
(a) In some instances, IV administration may present a safety concern; therefore IM or intranasal administration of sedatives may be the more desirable route.
(b) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device (same as IV dose).

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3.7.7 SUSPECTED CHILD ABUSE

Pediatric Protocol

**Purpose:** This protocol should be used when the paramedic suspects that child abuse may have occurred. See Appendix - Signs of Child Abuse 7.13 and Report of Abuse 7.12. Child abuse is when a person intentionally inflicts, or allows to be inflicted, physical or psychological injury to a child, which causes or results in risk of death, disfigurement, or distress. Child neglect is when a child's physical, mental, or emotional condition is impaired or in danger because of failure of the legal guardian to supply basic necessities, including: adequate food, clothing, shelter, education, or medical care.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
3. Trauma Supportive Care Protocol 3.1.4 if indicated.
4. Advise Police that child abuse is suspected.
5. Protect child from further abuse.
6. Obtain information in a non-judgmental manner.
7. Do not confront caregiver and/or parent.
8. Transport patient to the hospital for evaluation and possible treatment (a).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

**Note**
(a) If Parent's refuse to have patient transported to hospital, request police assistance.
(b) Reporting of suspected child abuse is required by law.

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3.7.8  **SICKLE CELL ANEMIA**

**Pediatric Protocol**

**Purpose:** Sickle cell anemia is a chronic hemolytic anemia occurring almost exclusively in African Americans and is characterized by sickle-shaped red blood cells. Sickle cell crisis results from the occlusion of a blood vessel by masses of sickle-shaped red blood cells. Pain is the principle manifestation, and this represents the most common type of crisis. Typical pain occurs in the joints and back. Hepatic, pulmonary, or central nervous system involvement can occur, each with its own group of symptoms. Keep in mind that patients with sickle cell disorder have a high incidence of life-threatening disorders at a very young age.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Provide emotional support

**ALS LEVEL 1: PARAMEDIC ONLY**
1. IV/IO of normal saline. Give fluid challenge of 20 ml/kg, and then maintain IV at KVO.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. If pain persist and systolic BP is adequate (see Appendix – Pediatric Vital Signs 7.10), choose one of the following pain meds:
   
   a. **Morphine Sulfate** may be given intravenously in increments every 3 – 5 minutes, titrated to pain to a maximum of 5 mg. Administer at a rate not to exceed 1 mg/min. Pediatric dose:
      
      - < 6 months; 0.05 – 0.2 mg/kg SQ/IM/IV (avoid IM route if possible)
      - 6 months– 12 yrs; 0.1-0.2 mg/kg IV/IM/SQ.

   b. **Fentanyl (Sublimaze)**
      Pediatric dosage: 1-3 yrs old: 1-2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      3 – 12 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)
      >12 yrs old: 0.5 – 1 mcg/kg IV slow or 1.5 mcg/kg IN (via atomizer)

   c. **Ketamine:** 0.1 – 0.5 mg/kg IV/IO. (IM dose 5 mg/kg)
i. If hypersalivation/coupious brochial secretions, give **Atropine** 0.02 mg/kg IV/IO.

d. If > 2 years of age, **Ketorolac Tromethamine (Toradol)** may be given 0.5 mg/kg (maximum 15mg) IV or 1 mg/kg (maximum 30 mg) IM

<table>
<thead>
<tr>
<th>Weight</th>
<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
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<tbody>
<tr>
<td>Morphine IV/IO/IM</td>
<td>0.4 mg</td>
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<tr>
<td>Fentanyl IV/IO</td>
<td>4 mcg</td>
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<td>22.5 mcg</td>
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<td>36 mcg</td>
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<tr>
<td>Ketamine IV/IO/IN</td>
<td>2 mg</td>
<td>3 mg</td>
<td>4 mg</td>
<td>5 mg</td>
<td>6 mg</td>
<td>7.5 mg</td>
<td>9.5 mg</td>
<td>12 mg</td>
<td>15 mg</td>
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</table>

**Ketorolac (Toradol)**

| IV/IO/IM | If > 2 years of age, Ketorolac Tromethamine (Toradol) may be given 0.5 mg/kg (maximum 15mg) IV or 1 mg/kg (maximum 30 mg) IM |

| Atropine IV/IO | 0.08 mg | 0.12 mg | 0.16 mg | 0.2 mg | 0.24 mg | 0.3 mg | 0.38 mg | 0.48 mg | 0.6 mg |

**Note:**
(a) Extreme caution should be used with administering narcotic analgesics to a patient with a SpO₂ ≤ 95%

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3.7.9 PEDIATRIC FEVER
Pediatric Protocol

**Purpose:** Use this protocol for pediatric patients who are feverish. Child should be awake and able to swallow with no difficulty. You may allow/assist the parent with administration of any medication. Fever in an infant less than 30 days old is potentially very serious. Child should be transported to an emergency department for a possible septic work up. Should parent or legal guardian decline transport, contact supervisor or medical control prior to accepting a refusal.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
17. [Initial Pediatric Assessment Protocol](#) 3.1.1
18. [Medical Supportive Care Protocol](#) 3.1.3
19. Obtain a temperature. If the child is less than two years of age this should be done rectally (or with newer thermo-sensing skin thermometers). Inquire if Tylenol has been given in previous four hours. If so, do **NOT** administer more Tylenol.

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<thead>
<tr>
<th>Weight</th>
<th>4 kg</th>
<th>6 kg</th>
<th>8 kg</th>
<th>10 kg</th>
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<th>19 kg</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>60 mg</td>
<td>90 mg</td>
<td>120 mg</td>
<td>150 mg</td>
<td>180 mg</td>
<td>225 mg</td>
<td>285 mg</td>
<td>360 mg</td>
<td>450 mg</td>
</tr>
</tbody>
</table>

20. For a child less than twelve years old who has a temperature greater than 101.5 degrees F. and unimpaired ability to swallow TYLENOL 15mg/kg P0. may be administered once. (The same dose may be administered rectally if parents have suppositories at home.)
21. Consider cooling the child with tepid water applied with a wet cloth to head, axillary, and groin regions.
22. If transport time is greater than thirty minutes a follow-up temperature should be taken.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Should patient experience a febrile seizure, treat according to [Pediatric Seizure Protocol](#).

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

**Note:**
Due to the inability to determine the origin of the fever in the field; this Patient Order Set can only be used when the patient is transported to an Emergency Department.
### 3.7.10 Pediatric Hyperkalemia

**Pediatric Protocol**

**Purpose:** This protocol is to be used on pediatric patients found to be in a state of hyperkalemia. Hyperkalemia is a serum potassium level of > 5.5 mEq/L. Hyperkalemia in children can be caused by renal failure, rhabdomyolysis, the use of potassium-sparing diuretics, and adrenal cortical insufficiency. Metabolic acidosis can result in hyperkalemia due to the hydrogen-potassium shift. In the pre-hospital setting, hyperkalemia may be an unintentional adverse consequence of rapid sequence intubation using Succinylcholine. It is important for the paramedic to recognize the developing EKG signs of hyperkalemia following RSI of child in order to initiate immediate therapy. EKG evidence of hyperkalemia includes sudden change in the appearance of the EKG from a NSR to sudden peaked T-waves followed by prolongation of the PR interval as well as widening of the QRS complex. Eventually, the P wave drops, the QRS becomes very wide and blends in with the peaked T wave giving the appearance of a sinusoid wave.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Patient Assessment Protocol 3.1.1
2. Pediatric Airway Management 3.1.2
3. Medical Supportive Care Protocol 3.1.3
4. Attach cardiac monitor and pulse oximeter if indicated
5. Keep patient warm (except if treating heat stroke, cool patient).

**ALS LEVEL 1: PARAMEDIC ONLY**

1. Establish IV with NS at KVO
2. Perform 12 lead EKG and confirm changes in EKG from baseline, suggestive of hyperkalemia
   a. Peaked T-wave
   b. Prolonged PR interval
   c. Widening of QRS
3. If iSTAT available, run potassium level on sample of blood. If K+ found to be > 5.5 mEq/Liter AND EKG changes as above, proceed with treatment below.
4. If there is strong evidence to suggest hyperkalemia (elevated K+ level and/or definite EKG changes) and you are unable to start an IV, place an IO in patient.
5. Give Albuterol 0.5% solution; give 2.5mg via nebulizer (DO NOT use Atrovent with the Albuterol when treating hyperkalemia).
6. Give **Sodium Bicarb**: 1 mEq/kg initially IV/IO (1ml/kg of 8.4% solution). In neonates and infants, dilute the 8.4% solution 1:1 with sterile water (not saline) making a 4.2% solution to reduce the hyperosmolarity of the solution.

7. **Calcium Chloride** 20 mg/kg IV/IO q 10 min prn

8. Notify hospital staff ASAP as child will need additional Rx upon arrival (Regular Insulin, Kayexcelate)

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<tr>
<th>Weight</th>
<th>4 kg Grey</th>
<th>6 kg Pink</th>
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<th>19 kg blue</th>
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<th>30 kg green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol</td>
<td>&lt; 1 yr or &lt; 10 kg mix 1.25 mg in 1.5 ml NS</td>
<td>&gt; 1 yr or &gt; 10 kg mix 2.5 mg in 3 ml NS</td>
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<tr>
<td>Sodium Bicarb</td>
<td>4 mEq</td>
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<td>480 mg</td>
<td>600 mg</td>
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**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

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3.7.11 Peds Adrenal Insufficiency
Pediatric Protocols

Purpose
This protocol is used for pediatric patients with a known history of Adrenal Insufficiency (Primary Adrenal Insufficiency aka Addison’s disease, Secondary Adrenal Insufficiency, Congenital Adrenal Hyperplasia aka CAH) who have or are currently experiencing an episode of high stress such as trauma, infection, or recent surgery. This protocol is to be used to prevent such stressful episodes from possibly causing a life-threatening condition known as an Adrenal Crisis, of which these patients are at extreme risk.

• Adrenal insufficiency or Addison’s disease is an endocrine disorder that occurs when the adrenal glands do not produce sufficient amounts of cortisol and other glucocorticoid hormones needed to respond to stress and inflammatory reactions.
• Early signs and symptoms of patients in crisis include pallor, dizziness, headache, weakness/lethargy, abdominal pain, nausea/vomiting and hypoglycemia.

Procedure:

BASIC LEVEL: EMT AND PARAMEDIC
4. Initial Patient Assessment Protocol
5. Airway Assessment/Management Protocol. Oxygen via nasal cannula @ 2-4 LPM to maintain pulse ox ≥ 94%
6. Attach cardiac monitor and pulse oximeter

ALS LEVEL 1: PARAMEDIC ONLY
7. If the patient/care-taker is able to provide or is found with his/her own supply of prescribed Solu-Cortef, assist the patient/care-taker to administer the medication.
8. If the patient/care-taker is not able to administer the patient’s prescribed Solu-Cortef, administer the medication IM according to the dosage instructions provided with the Solu-Cortef (Peds dosing 2mg/kg IV/IM/IO) or contact Medical Control.
9. Initiate IV of lactated Ringer’s or normal saline at TKO. If patient is tachycardia and/or hypotensive, administer a fluid challenge of normal saline 20 ml/kg (10 ml/kg for neonates) IV or IO to maintain SBP of > 90 mmHg, repeat as needed x 2
10. If the patient has a known history of Adrenal Insufficiency but does not have his/her own Solu-Cortef, and the possibility of adrenal crisis exists, contact Medical Control for consideration of administering Solu-Medrol 1 mg/kg IM/IO/IV (Max dose 125 mg)
11. If the patient has persistent hypotension, start Dopamine 5 – 10 mcg/kg/min (1600 mcg/mL infusion concentration = 15 – 60 gtt/min). Mix 400 mg in 250 ml D5W
   • Titrate to maintain a minimum systolic BP of 90 mm Hg and maximum BP of 120 mm Hg (maximum dose 20 mcg/kg/min).
12. Determine serum glucose level with Glucometer. If patient is hyperglycemic or hypoglycemic, treat according to Diabetic Emergencies protocol.

ALS LEVEL 2: MEDICAL CONTROL
1. Contact Medical Control or Medical Director for any questions or problems.

NOTE:
(d) Adrenal Crisis leading to death usually results from hypotension or cardiac dysrhythmias due to hyperkalemia. Remember that an ECG can provide evidence of hyperkalemia.
(e) In addition to treating with Solu-Cortef, treatment should be based on the clinical presentation and findings.
(f) Be alert for vomiting and have suction ready.

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3.8 PEDIATRIC ENVIRONMENTAL EMERGENCIES
3.8 PEDIATRIC ENVIRONMENTAL EMERGENCIES
Pediatric Protocol

**Overview:** The following protocols cover a range of problems due to the environment, including: trauma due to changes in atmospheric pressure, exposure to heat and cold extremes, water submersion, and exposure to electricity. Initial efforts should focus on removing the patient from the harmful environment.

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3.8.1 NEAR DROWNING
Pediatric Protocol

**Purpose:** Near drowning patients are those that have been submerged in fresh or salt water and may or may not be conscious. If the patient is still in open water on arrival of EMS, a Dive Rescue Team should be utilized to remove the patient from the water whenever possible. Additional protocols may be needed for treatment decisions (e.g. Pediatric Barotrauma Protocol 3.8.4 -).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4 (protect C-spine).
3. Determine pertinent history (duration of submersion, depth, water temperature, possible seizure, drug and/or alcohol use, possible trauma).
4. Maintain body temperature, dry and warm patient.
5. All near drowning patients should be transported to the hospital, regardless of how well they may seem to have recovered. Delayed death or complications due to pulmonary edema or aspiration pneumonia are not uncommon. The most devastating injury is due to asphyxia.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Treat dysrhythmias per specific protocol (see Pediatric Dysrhythmia Protocol 3.3).

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Consider Nasogastric Tube (see Medical Procedure NG Insertion 4.4.6) (b)

**Notes**

(a) The routine use of abdominal thrusts for near-drowning victims is not recommended. This maneuver should only be used in cases of FBAO (see Medical Procedure 4.15 – Foreign Body Obstructed Airway).
(b) Any near-drowning patient with a decreased ability to protect their airway, with gross abdominal distension, or who requires ventilatory assistance needs an NG tube.
3.8.2 HEAT RELATED EMERGENCIES
Pediatric Protocol

Purpose: Hyperthermia occurs when the patient is exposed to increased environmental temperature and can manifest as heat cramps, heat exhaustion, or heat stroke. Certain drugs may cause an increase in temperature (e.g. cocaine, ecstasy, etc.)

Some tympanic thermometers (Braun Thermoscan™ Pro-1 and Pro 3000) will register from 68 – 108 degrees F (tympanic thermometers should not be used in infants (<1yr)).

Heat Cramps  Signs and symptoms include: muscle cramps of the fingers, arms, legs, or abdomen, hot sweaty skin, weakness, dizziness, tachycardia, normal BP, and normal temperature.

Heat Exhaustion  Signs and symptoms include: cold and clammy skin, profuse sweating, nausea/vomiting, diarrhea, tachycardia, weakness, dizziness, transient syncope, muscle cramps, headache, positive orthostatic vital signs, normal or slightly elevated temperature.

Heat Stroke  Signs and symptoms include: hot dry skin (sweating may be present), confusion and disorientation, rapid bounding pulse followed by slow weak pulse, hypotension with low or absent diastolic reading, rapid and shallow respirations (which may later slow), seizures, coma, elevated temperature above 105 degrees F.

Procedure:

Heat Cramps and Heat Exhaustion

BASIC LEVEL: EMT and PARAMEDIC
1. Initial Pediatric Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3
3. Trauma Supportive Care Protocol 3.1.4 if indicated.
4. Remove from warm environment and cool patient.
5. Monitor temperature.
6. For mild to moderate heat cramps and heat exhaustion, if patient is conscious, encourage patient to drink salt containing fluids (e.g. half-strength Gatorade® or 10K®).

ALS LEVEL 1: PARAMEDIC ONLY
1. If heat cramps are severe or patient's level of consciousness is diminished, administer fluid challenge of Normal Saline 20 ml/kg IV (10 ml/kg for neonates). Repeat x1 prn with vital sign check and reassess lung sounds between each bolus.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

**Heat Stroke**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol [3.1.1]
2. Medical Supportive Care Protocol [3.1.3]
3. Trauma Supportive Care Protocol [3.1.4] if indicated
4. Remove from warm environment and aggressively cool patient. Remove patient's clothing and cover patient with wet sheets. Also, turn A/C and fans on high and apply ice packs to head, neck, chest and groin.
5. Monitor temperature. Cool patient to 102 degrees F, then remove wet sheets, ice packs, and turn off fans (avoid lowering temperature too much).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Treat hypotension with a bolus of IV/IO fluid at 20 mg/kg (10 mg/ml in neonates). May repeat x 1. **Avoid using vasopressors and anticholinergic drugs** (may potentiate heat stroke by inhibiting sweating).
2. Treat seizures as per Pediatric Seizure Protocol

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

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3.8.3 COLD RELATED EMERGENCIES
Pediatric Protocol

**Purpose:** Factors that predispose and/or cause a patient to develop hypothermia include: geriatric and pediatric patients, poor nutrition, diabetes, hypothyroidism, brain tumors or head trauma, sepsis, use of alcohol and certain drugs, and prolonged exposure to water or low atmospheric temperature. Hypothermia patients can be divided into three categories:

- Mild (temperature 94-97 degrees F),
- Moderate (temperature 86-94 degrees F),
- Severe (temperature <86 degrees F).

It should be noted that most oral thermometers will not register below 96 degrees F. However, some tympanic thermometers (Braun Thermoscan™ Pro-1 and Pro 3000) will register from 68 – 108 degrees F (tympanic thermometers should not be used in infants).

Mild to Moderate hypothermia

Patients will generally present with shivering, lethargy, and stiff, uncoordinated muscles.

Severe hypothermia

Patients may have altered mental status, ranging from confusion to lethargy or coma. Shivering will usually stop and physical activity will be uncoordinated. In addition, severe hypothermia will frequently produce an Osborn wave or J wave on the ECG, as well as dysrhythmias (bradycardia, ventricular fibrillation).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. [Initial Pediatric Assessment Protocol](#) 3.1.1
2. [Medical Supportive Care Protocol](#) 3.1.3 (d)
3. [Trauma Supportive Care Protocol](#) 3.1.4 if indicated (a).
4. Remove all wet clothes and dry patient.
5. Protect from heat loss and wind chill.
7. Avoid rough movement and excess activity (careful gentle handling) (b) (c) (d).
8. Monitor temperature.
9. Add heat to patient's head, neck, chest, and groin.
10. For severe hypothermia, warm IV fluids, if possible.

**For Severe Hypothermic Cardiac Arrest:**

11. Start CPR(c).
ALS LEVEL 1: PARAMEDIC ONLY
1. For VF or pulseless VT, defibrillate x 1 @ 2 J/kg and immediately resume CPR for 5 cycles (or two minutes) before checking rhythm (e).
2. Intubate and ventilate with warm humidified oxygen, if possible.
3. Establish IV with warm Normal Saline.
4. Determine blood glucose and treat as per Peds Hypoglycemic Protocol.

If temperature is above 86 degrees F:
4. If patient’s core temperature $\geq 30^\circ C$ (86°F), follow appropriate dysrhythmia treatment (see Pediatric Cardiac Dysrhythmia Protocol 3.3) (d) (e).

If temperature is below 86 degrees F:
5. Continue CPR and transport immediately. Do not treat dysrhythmias in severe hypothermia (warm patient prior to treatment) (e).

ALS LEVEL 2: MEDICAL CONTROL
1. Call medical control or medical director for any questions or concerns.

Note:
(a) Cases of frostbite should be bandaged with dry sterile dressings and transported without attempting rewarming in the prehospital setting.
(b) Manipulation can precipitate ventricular fibrillation in the irritable hypothermic myocardium
(c) To avoid inappropriate chest compressions, a patient who is unmonitored or in a “non-arrested rhythm” (a rhythm other than ventricular fibrillation or asystole, such as sinus bradycardia or atrial fibrillation) should be examined carefully for respiratory activity and pulses. 30 to 45 seconds should be spent attempting to do detect respiratory activity and palpate a pulse. If none detected, CPR should be initiated.
(d) Although dysrhythmias in hypothermic patient may represent an immediate threat to life, most rhythm disturbances (e.g., Sinus bradycardia, atrial fibrillation or flutter) require no therapy and revert spontaneously with rewarming.
(e) Ventricular fibrillation may be refractory to therapy until the patient is rewarmed. The hypothermic heart is relatively resistant to atropine, pacing, and counter shock. The American Heart Association suggests a single defibrillation attempt. If this is unsuccessful, CPR should be instituted and rapidly rewarming begun. Defibrillation should be reattempted when the core temperature reaches 30°C (86°F).

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3.8.4 BAROTRAUMA / DECOMPRESSION ILLNESS - DIVE INJURIES

Pediatric Protocol

**Purpose:** Barotrauma and decompression illness is caused by changes in the surrounding atmospheric pressure beyond the body's capacity to compensate for excess gas load. These injuries are most commonly associated with the use of SCUBA (Self-Contained Underwater Breathing Apparatus). SCUBA diving emergencies can occur at any depth with the most serious injuries manifesting symptoms after a dive. It should be understood that if a patient took a breath underwater, from any source of compressed gas (e.g. submerged vehicle, SCUBA, etc) while greater than three (3) feet in depth then ascended to the surface, the patient may be a victim of barotrauma. Barotrauma may cause several injuries to occur including: arterial gas embolism (AGE), pneumothorax, pneumomediastinum, subcutaneous emphysema, and the "squeeze". Decompression illnesses may also include decompression sickness ("Bends").

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Pediatric Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4,
3. High-flow O₂.
4. Place patient supine. Vomiting patients should be placed in the left lateral decubitus position to prevent aspiration. (c).
5. Complete the Dive Ac Adent Signs and Symptoms Checklist (see Forms Section).
6. Start Dive History Profile (see Forms Section), if possible (the patient's dive buddy maybe helpful in answering many of these questions).
7. Start Rapid Neuro Field Exam Record (see Forms Section).
8. Whenever possible, have the legal authority in charge (e.g. police, Florida Marine Patrol, U.S. Coast Guard, etc.) secure all of the victims dive gear with proper chain of custody for testing, analysis, etc.
9. Manage patient according to appropriate protocol(s).
10. Transport to closest Emergency Department or Trauma Center.
11. If using air transport for diving accident patient; cabin altitude must be below 1000 feet.
12. Contact Diver’s Alert Network (DAN) at Duke University Medical Center collect at (919) 684-4326 or (919) 648-8111 for further assistance (a).

**ALS LEVEL 1: PARAMEDIC ONLY**

1. None .
ALS LEVEL 2: MEDICAL CONTROL
1. Call medical control or medical director for any questions or concerns.

NOTE:
(a) DAN may be contacted while on scene or after arrival at the hospital. If at hospital, give name of ED physician and ED phone number.
(b) The two most serious dive related accidents are Air Embolism (arterial gas embolism), and Decompression Sickness (venous gas embolism).
(c) According to the U.S. Navy Diving Manual, dive accident victims should be transported lying flat. Although most of the diving community teaches that victims should be transported with the victim on his left side, head lower than the rest of the body. When placing a victim in the Dive Accident Management Position lay him flat on a backboard. The only time a victim should be placed on his side is if a pneumothorax exists, or there is a possibility of regurgitation. If the patient has a pneumothorax, place him on the affected side otherwise, left lateral decubitus if vomiting.

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3.8.5 ELECTRICAL EMERGENCIES
Pediatric Protocol

**Purpose:** A wide range of injuries can be caused from a lightning strike or contact with electricity. Electrical injury can occur from direct contact, an arc, or a flash of the electricity and a direct hit or a splash from lightning. The movement of electrical current through the body can cause violent muscle contractions that can lead to fractures, and therefore, the C-spine should be protected. The thermal energy can cause external burns, but in many cases the majority of thermal damage is internal, with few external signs of injury. Dysrhythmias are also common (e.g. ventricular fibrillation). The rescuer should be sure that the patient is no longer in contact with the electrical current before initiating treatment.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Pediatric Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4 (protect C-spine).
3. Treat burns per Pediatric Burn Protocol 3.9.7.
4. Consider need to transport to a trauma center
5. Try to determine the amps, volts, and duration of contact with the electricity, if possible. (500 volts or more should be categorized as high voltage)

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Treat dysrhythmias per specific protocol (see Pediatric Cardiac Dysrhythmia Protocol 3.3).

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

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3.9

PEDIATRIC

TRAUMA EMERGENCIES
3.9 PEDIATRIC TRAUMA EMERGENCIES

Overview: These protocols cover specific types of injuries and their treatment. The initial assessment of the trauma patient should include determination of trauma alert criteria (see appendix for trauma alert criteria). When the situation demands (e.g. trauma alert criteria is met), scene time should be limited as much as possible (e.g. 10 minutes) and the patient should be expeditiously transported to a trauma center. Do not delay transport to establish vascular access or bandage and splint every injury. Priority should be given to airway management, rapid preparation for transport (e.g. full immobilization on a backboard) and control of gross hemorrhage.

If a vascular access is obtained and hypovolemia is suspected (e.g. signs and symptoms of shock), a fluid challenge of 20 ml/kg should be administered. If the patient is still in shock, repeat fluid challenge at 20 ml/kg until a maximum of 60 ml/kg is administered. However, administration of large volumes of IV fluids has been found to be deleterious to the survival of patients with uncontrolled hemorrhage, internally or externally. In recent studies (NEJM 1994), it has been shown that maximal fluid resuscitation may increase the bleeding, preventing the formation of a protective thrombus or dislodging it once the intraluminal pressure exceeds the tamponading pressure of the thrombus. Therefore, consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g. < 20 minutes).

Avoid the use of vasopressors agents (e.g. Dopamine) in trauma patients that are hypotensive (see appendix- pediatric vital signs)

The pregnant adolescent female in her third trimester should be placed on her left side for transport. If the injuries require the use of a backboard, following full immobilization to the backboard, said board should be tilted to the left. Failure to follow this practice may cause hypotension due to decreased venous return.
3.9.1 HEAD AND SPINE INJURIES
Pediatric Protocol

**Purpose:** If history, symptoms, or signs of head or spinal injuries are present, manually immobilize the head and neck while maintaining a patent airway using a modified jaw-thrust method. Immobilization of the entire spine is indicated following initial stabilization.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4. with appropriate C-Spine precautions
3. If not hypotensive (see Appendix 7.10 - Pediatric Vital Signs), elevate head of backboard 30 degrees (12-18 inches).
4. If child is asleep upon arrival, gently arouse him/her to assess the level of consciousness or irritability. If the child is upset, allow some time for the child to settle down before continuing with the exam.
5. Perform a through head-to-toe assessment for trauma, including an age-appropriate neurologic exam and musculoskeletal exam.
6. Assess for and document a Glasgow Coma Scale
7. Apply a hemostatic gauze on severe wounds to the head, neck, face, axilla, or buttocks that cannot be controlled by other means (direct pressure)

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If signs of brainstem herniation exist (e.g. pupillary dilation, asymmetric pupillary reactivity, or motor posturing), consider intubation and ventilate @ 20/minute for child and 30/minute for infant. Keep the end tidal CO2 between 35 and 40.
2. If patient is seizing, see Pediatric Seizure Protocol 3.5.2 (avoid glucose containing solutions and medications).

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

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3.9.2 EYE INJURIES
Pediatric Protocol

**Purpose:** This protocol covers a variety of injuries to the eye. If other injuries to the body exist, priority of care should be given as appropriate.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4 (establish IV PRN).
3. Remove or ask to the patient to remove contact lenses, if still in the affected eye(s).
4. For penetrating object, stabilize object and cover affected eye with an ocular shield or similar rigid device. Cover both eyes to minimize eye movement. Avoid direct pressure on eye or penetrating object.
5. If eyeball has been forced out of the socket, cover the entire eye area with a rigid container, such as a disposable drinking cup. Avoid contact with the exposed globe. If bleeding, control by direct pressure with a sterile dry dressing.
6. If there are signs and symptoms or suspicion of ocular exposure to chemicals or foreign body, without obvious or suspected penetrating injury or laceration of the cornea or globe, irrigate with Normal Saline IV solution.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. none

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Contact med control for pain medication order if needed.

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3.9.3 CHEST INJURIES
Pediatric Protocol

**Purpose:** This protocol covers both blunt and penetrating chest trauma and should be part of initial resuscitation if breathing is compromised.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4.
3. Penetrating injuries to the chest or upper back should be covered immediately with an occlusive dressing (e.g. Vaseline gauze).
4. Do not attempt to remove an impaled object (stabilize with bulky dressing, etc.). If impaled object is very large or unwieldy, attempt to cut object to no less than six inches from chest.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Do not delay transport to establish vascular access or bandage and splint every injury
2. For tension-pneumothorax, with evidence of respiratory and circulatory compromise, decompress chest on affected side (see Medical Procedure Needle Decompression 4.26).
3. For massive flail chest with severe respiratory compromise, intubate and ventilate @ 20/minute for child and 30/minute for infant. If flail chest does not cause severe respiratory compromise, stabilize externally using ipsilateral arm in sling and swathe.
4. For crush injury, establish two large bore IVs. If crushing object is still on patient, infuse a minimum of 20 ml/kg of fluid before attempting to lift object off of patient.
5. For traumatic asphyxia with entrapment > 20 minutes, Sodium Bicarbonate (8.4%) 1 mEq/kg IV (a).
6. For hypovolemia is suspected (e.g. signs and symptoms of shock), a fluid challenge of 20 ml/kg should be administered. If the patient is still in shock, repeat fluid challenge at 20 ml/kg until a maximum of 60 ml/kg is administered.
7. Avoid the use of vasopressors agents (e.g. Dopamine) in trauma patients that are hypotensive.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g. < 20 minutes).

**Note:**
(a) **Sodium Bicarbonate** (4.2%) 1 mEq/kg IV/IO should be administered to infants (dilute 8.4% 1:1 with Normal Saline to make 4.2%).

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3.9.4 ABDOMINO-PELVIC INJURIES
Pediatric Protocol

**Purpose:** This protocol covers blunt and penetrating abdomino-pelvic trauma. Penetrating injuries may also include the chest (see Pediatric Protocol 3.9.3 - Chest Injuries). Also refer to Appendix – Signs of Child Abuse.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4. (CALL TRAUMA ALERT IF APPROPRIATE)
3. For penetrating injuries, cover with an occlusive dressing (e.g. Vaseline gauze).
4. For evisceration, cover organs with saline soaked sterile dressing and then cover with an occlusive dressing (e.g. foil). Do not attempt to put organs back into abdomen.
5. Do not log roll patient with suspected pelvic fracture (may use scoop stretcher if appropriate to patient size).

**ALS LEVEL 1: PARAMEDIC ONLY**
1. Do not delay transport to establish vascular access or bandage and splint every injury
2. If a vascular access is obtained and hypovolemia is suspected (e.g. signs and symptoms of shock), a fluid challenge of 20 ml/kg should be administered. If the patient is still in shock, repeat fluid challenge at 20 ml/kg until a maximum of 60 ml/kg is administered.
3. Avoid the use of vasopressors agents (e.g. Dopamine) in trauma patients that are hypotensive

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g. < 20 minutes).
3.9.5 EXTREMITY INJURIES
Pediatric Protocol

**Purpose:** This protocol covers open and closed injuries to the extremities, including amputation.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. [Initial Peds Assessment Protocol](#) 3.1.1
2. [Trauma Supportive Care Protocol](#) 3.1.4 (establish IV PRN).
3. Any fracture or suspected fracture should be splinted appropriately with ice to area. Remove and secure all jewelry. Check and document distal neurovascular status pre and post splinting.
4. Angulated fractures should be aligned using proximal and distal traction during splinting, except in fractures that involve a joint, which should be splinted in the position found.
5. [Traction splints](#) should be used in cases of femur fractures, unless a pelvic fracture is suspected. Sheet splint suspected pelvic fractures.
6. Amputations should be dressed with bulky dressings and amputated part should be wrapped in moistened sterile gauze and placed in plastic bag and then the bag placed on ice for transportation to the hospital.
7. Do not delay transport to establish vascular access or bandage and splint every injury.
8. Apply direct pressure for hemorrhage control. If direct pressure does not stop the hemorrhage apply a trauma [tourniquet](#).
9. Apply a [hemostatic gauze](#) on severe wounds (head, neck, face, axilla or buttocks) that cannot be controlled by other means (direct pressure/tourniquet)

**ALS LEVEL 1: PARAMEDIC ONLY**
1. See [Pediatric Pain Protocol](#) 3.1.5 for pain management.
2. If a vascular access is obtained and hypovolemia is suspected (e.g. signs and symptoms of shock), a fluid challenge of 20 ml/kg should be administered. If the patient is still in shock, repeat fluid challenge at 20 ml/kg until a maximum of 60 ml/kg is administered.

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
2. Consult with the physician should be made prior to the administration of large volumes of IV fluids when the transport time is relatively short (e.g. < 20 minutes).
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<th>4kg Grey</th>
<th>6kg Pink</th>
<th>8kg red</th>
<th>10kg purple</th>
<th>12kg yellow</th>
<th>15kg white</th>
<th>19kg blue</th>
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3.9.6 TRAUMATIC ARREST
Pediatric Protocol

**Purpose:** The decision to attempt resuscitation of a traumatic arrest should be based on the paramedic's judgment as to the possibility of survival and/or the possibility of organ harvest. There are instances where resuscitation of a traumatic arrest is not warranted (see Administrative Guidelines-1.2.5 DNR/Resuscitation Considerations/DOA).

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Trauma Supportive Care Protocol 3.1.4.
3. Rapidly prepare patient for transport and then expeditiously transport patient to the trauma center.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. If IV(s) or IO(s) can be established, infuse Normal Saline 20 ml/kg up to 60 ml/kg IV/IO.
2. Avoid use of vasopressors in cases of suspected hypovolemia.
3. Call Trauma Alert if applicable

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
3.9.7 BURN INJURIES
Pediatric Protocol

Purpose: Burns can be caused by thermal, chemical, and electrical sources. If an electrical burn is suspected, also see Pediatric Protocol 3.8.5 - Electrical Emergencies. Remember that burn patients are volume depleted. However, burns do not bleed; therefore, look for other sources of bleeding. Assume that any patient with compromised perfusion has other injuries and treat accordingly. Many burn injuries are associated with inhalation injury. The signs and symptoms of inhalation injury include: nasal and oropharyngeal burns, charring of the tongue or teeth, sooty (blackened), sputum, singed nasal and facial hair, abnormal breath sounds (e.g. stridor, rhonchi, wheezing, etc.), and respiratory distress. In cases of inhalation injury, attention should be given to the patency of the airway. Acute swelling can cause an airway obstruction. The Paramedic should consider the need for early intubation to avoid a complete airway obstruction that requires a cricothyroidotomy.

Procedure:

**BASIC LEVEL: EMT and PARAMEDIC**

1. **Initial Peds Assessment Protocol** 3.1.1
2. **Trauma Supportive Care Protocol** 3.1.4.
3. Stop the burning process, if necessary (do not cause hypothermia):

   **Thermal Burns:** Lavage the burned area with tepid water (sterile, if possible) to cool skin. Do not attempt to wipe off semisolids (grease, tar, wax, etc.).

   **Dry Chemical Burns:** Brush off dry powder, then lavage with copious amounts of tepid water (sterile, if possible) for 15 minutes.

   **Liquid Chemical Burns:** Lavage the burned area with copious amounts of tepid water (sterile, if possible) for 15 minutes. (When Phenol has caused the burn, flush with copious amounts of tepid water and then apply vegetable oil to area, if available. Isopropyl alcohol may be used for very small areas.)

3. Remove clothing from around burned area, but do not remove/peel off skin or tissue.
4. Remove and secure all jewelry and tight fitting clothing.
6. Assess the extent of the burn using the Modified Rule of Nines and the degree of burn severity (see Appendix - Burn Severity Categorization).
and Appendix - Rule of Nines). An additional method is to use the palmar surface of the patient as 1% BSA.

7. Apply dressing to burn area as follows:
   a. If there is ≥ 20% 2nd degree or 5% 3rd degree burns, cover burned areas with dry sterile dressings.
   b. If there is < 20% 2nd degree and 5% 3rd degree burns, apply wet sterile dressings to burned areas for 15 minutes to aid in pain control.

8. Prevent hypothermia, keep patient warm and insure that all outer layers of dressings are dry.

**ALS LEVEL 1: PARAMEDIC ONLY**

1. If respiratory distress, or airway burns exist, prepare to intubate (RSI if indicated) or support/assist ventilations.
2. Establish IV (may start IO for severe burns) of Lactated Ringers or Normal Saline. IV fluid administration based on the
   a. Parkland formula: % body surface burned x wt (in kg) x 4 cc/kg. One half of this total is given in the first 8 hours from time of burn (if burn occurred 2 hours before you start treatment, then the first half of the amount needs to be given over the next 6 hours).
3. If pulseless or apneic, go to Cardiac Arrest Protocol 3.3.6.
4. If additional injuries, go to specific protocol.
5. For pain management, (see Pediatric Pain Management Protocol 3.1.5).

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

<table>
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Leon County EMS & Tallahassee Fire Department **Medical Protocols**
Revised April 2018 – Version 1.0 – Live May 15th, 2018
### Burn Classification

<table>
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<tr>
<th>Classification</th>
<th>Characteristics</th>
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<tbody>
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<td>Minor burn injury</td>
<td>◆ 1° burn&lt;br&gt;◆ 2° burn &lt; 15% BSA in adults&lt;br&gt;◆ 2° burn &lt; 5% BSA in children/aged&lt;br&gt;◆ 3° burn &lt; 2% BSA</td>
</tr>
<tr>
<td>Moderate burn injury</td>
<td>◆ 2° burn 16-25% BSA in adults&lt;br&gt;◆ 2° burn 5-20% BSA in children/aged&lt;br&gt;◆ 3° burn 2-10% BSA</td>
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<tr>
<td>Major burn injury</td>
<td>◆ 2° burn &gt; 25% BSA in adults&lt;br&gt;◆ 2° burn &gt; 20% BSA in children/aged&lt;br&gt;◆ 3° burn &gt; 10% BSA&lt;br&gt;◆ Burns involving the hands, face, eyes, ear, feet, or perineum&lt;br&gt;◆ Most patient with inhalation injury, electric injury, concomitant major trauma, or significant pre-existing diseases</td>
</tr>
</tbody>
</table>
The Rule of Nines.

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
3.9.8 Peds Crush Injury/Compartment Syndrome  
Pediatric Protocol

**Purpose:** Crush injuries are rarely seen in pre-hospital medicine but are common in times of disaster, both natural and manmade. Early and aggressive treatment of victims suspected of having a crush injury is paramount. Without aggressive pre-hospital treatment, the victim may die during extrication or weeks later from complications of the injury.

In the crush injury syndrome, the initial injury is at the site of the muscle crushed by the mechanical force of an object. The muscle cells die as the result of the following. First, the force of the crushing object ruptures muscle cells. Second, the direct pressure of the object on the limb causes muscle cells to become ischemic. The combination of mechanical force and ischemia can cause muscle death within an hour. Third, the force of the crush injury compresses large vessels, resulting in the loss of blood supply to muscle tissue. Muscles can normally survive circulatory ischemia for up to four hours before the cell death. After four hours, the cells begin to die as a result of the circulatory compromise.

The damaged muscle tissue produces and releases many toxins that can have detrimental effects on the body. The longer the victim is trapped, the longer the toxins are given to build up distal to the crush site. The crushing force acts as a dam that prevents these toxins from being released into the rest of the body. Once the force is removed, the toxins are allowed to run freely throughout the body, causing a myriad of problems. Along with the release of toxins after extrication, the victim can become severely hypovolemic from the third spacing of fluid, and the rapid swelling of the injured area can cause acute compartment syndrome.

<table>
<thead>
<tr>
<th>Toxin</th>
<th>Effect</th>
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<tbody>
<tr>
<td>Histamine</td>
<td>Vasodilatation and Bronchoconstriction</td>
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<td>Lactic Acid</td>
<td>Acidosis and dysrhythmias</td>
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<td>Nitric Oxide</td>
<td>Vasodilatation</td>
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<tr>
<td>Potassium</td>
<td>Hyperkalemia</td>
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<tr>
<td>Thromboplastin</td>
<td>DIC</td>
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</table>

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

5. Initial Peds Assessment Protocol 3.1.1
6. Trauma Supportive Care Protocol 3.1.4.
7. Spinal motion restriction if indicated
8. Apply cardiac monitor: Document rhythm
9. Administer oxygen according to following criteria:
   - SpO2 94% or above do not administer O2.
   - SpO2 less than 94% administer O2 by nasal cannula at 2 L/min.

10. Rapidly prepare patient for transport and then expeditiously transport patient to the trauma center.

**ALS LEVEL 1: PARAMEDIC ONLY**

**CRUSH INJURY or COMPARTMENT SYNDROME**

3. Establish IV access; give Normal Saline 1 Liter.
4. Pain management: If patient is normotensive (systolic BP greater than 90 mm Hg), administer
   d. **Morphine Sulfate** may be given intravenously in increments every 3 – 5 minutes, titrated to pain to a maximum of 5 mg. Administer at a rate not to exceed 1 mg/min. Pediatric dose:
      - < 6 months; 0.05 – 0.2 mg/kg SQ/IM/IV (avoid IM route if possible)
      - 6 months – 12 yrs; 0.1-0.2 mg/kg IV/IM/SQ.
   e. **Fentanyl (Sublimaze)**
      1-3 yrs old: 1 - 2 mcg/kg IV slow or
      1.5 mcg/kg IN (via atomizer)
      3 – 12 yrs old: 1 – 2 mcg/kg IV slow or
      1.5 mcg/kg IN (via atomizer)
      >12 yrs old: 0.5 – 1 mcg/kg IV slow or
      1.5 mcg/kg IN (via atomizer)
   f. **Ketamine**: 0.1 – 0.5 mg/kg IV/IO.
      5 mg/kg IM dose
      0.5 mg/kg IN dose: via atomizer
      - If hypersalivation or copious bronchial secretions, give **Atropine** 0.02 mg/kg IV/IO.

5. For crush injury release compression and extricate patient

**CRUSH SYNDROME**; if unable to release compression and situation progresses to CRUSH SYNDROME, that is, entrapment with compression lasting longer than 4 hours OR on the thorax for 20 minutes.

6. If suspicion of hyperkalemia (Peaked T-waves, absent P waves or widened QRS).
a. Establish IV access, 2 large bore IVs recommended in order to separate CaCl and Bicarb;
b. Pain management as noted in #2 above
c. **Calcium Chloride** 20mg/kg into 50 mL bag of normal saline and administer SLOW IV over 10 minutes (follow with minimum of 20 mL flush).
d. **Sodium Bicarbonate** and Normal Saline—Add Sodium Bicarbonate 50 mEq to 1 L of Normal Saline (or alternatively sodium bicarbonate 25 mEq added into 500 ML of normal saline). Infuse via IV wide-open just prior to extrication. May repeat x 1 for prolonged extrication.

7. Recommended in second line.
   a. Continue IV fluids at 500 mL/hr
8. Administer Albuterol (Ventolin): one nebulizer treatment containing 2.5 mg of Albuterol premixed with 2.5 mL normal saline
9. Call **Trauma Alert** if applicable

### ALS LEVEL 2: MEDICAL CONTROL

2. Call medical control or medical director for any questions or concerns.

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Return to:  **Contents at top**  **Peds Protocols**  **Peds Trauma Emerg**  **Peds Electrical Injuries**
3.10 CHILDREN WITH SPECIAL HEALTHCARE NEEDS
3.10 CHILDREN WITH SPECIAL HEALTHCARE NEEDS:  
Pediatric Protocols

**Overview:** These protocols cover specific types of special healthcare needs in pediatric patients. “Children with special healthcare needs are those who have or are at risk for chronic physical, developmental, behavioral, and emotional conditions that necessitate use of health and related services of a type or amount not usually required by typically developing children.”

The general approach to children with special healthcare needs includes the following:

1. Priority is given to the ABCs.
2. Do not be overwhelmed by the machines.
3. Listen to the caregiver.
4. If a nurse is present, rely on their judgment.
5. Remember…the child’s cognitive level of function may be altered.
6. Assume that the child can understand exactly what you say.
7. Bring all medications and equipment to the hospital.

Obtaining a history includes asking the parent/caregiver the following:

1. Child’s normal vital signs.
2. Child’s actual weight.
3. Developmental level of the child.
4. Child’s allergies – include latex.
5. Pertinent medications/therapies.
3.10.1 HOME MECHANICAL VENTILATORS
Pediatric Protocol

**Purpose:** Home mechanical ventilators may be indicated for chronically ill children with abnormal respiratory drive, severe chronic lung disease, or severe neuromuscular weakness. Some children require continuous mechanical ventilation, while others only require intermittent support during sleep or acute illness. Home ventilators may either be volume limited or pressure limited. All are equipped with alarms.

Types of ventilator alarms:

1. **Low pressure or apnea** – may be caused by a loose or disconnected circuit or an air leak in the circuit or at the tracheostoma, resulting in inadequate ventilation.
2. **Low power** – caused by a depleted battery.
3. **High pressure** – can be caused by a plugged or obstructed airway or circuit tubing, by coughing, or by bronchospasm.
4. **Setting error** – is caused by ventilator settings outside the capacity of the equipment.
5. **Power switchover** – occurs when the unit switches from alternating-current power to the internal battery.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Peds Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. Patient (if able) or family should be available to assist with operating the patient’s home ventilator during transport.
4. Confirm vent setting are correct with patient and/or family.
5. If ventilator-dependant child is in respiratory distress and the cause is not easily ascertained and corrected, remove the ventilator and provide assisted manual ventilations with a bag-valve device.
6. Consider need for other protocols (e.g. Pediatric Protocol 3.2 - Pediatric Respiratory Emergencies).
7. Don’t hesitate to ask the parents or caregiver for help managing the home ventilator since they are likely well versed on its use.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.

Return to: [Contents at top](#)  [Peds Protocols](#)  [Peds Special Healthcare Needs](#)
3.10.2 TRACHEOSTOMY
Pediatric Protocol

**Purpose:** Tracheostomies are indicated for long-term ventilatory support, to bypass an upper airway obstruction, and to aid in the removal of secretions. Tracheostomies come in neonatal, pediatric, and adult sizes and can be either single lumen or double lumen. Special attachments include: tracheostomy nose (filtration device), tracheostomy collar (for oxygen or humidification), and Passymuir valve (speaker valve).

Signs of tracheostomy tube obstruction:

1. Excess secretions.
2. No chest wall movement.
3. Cyanosis.
4. Accessory muscle use.
5. No chest wall rise with bag-valve ventilations.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**

1. Initial Peds Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. If obstruction is present, inject 1-3 ml of Normal Saline into the tracheostomy tube and suction PRN (set suction at 100 mm Hg or less).
4. If unable to clear obstruction by suctioning, remove tracheostomy tube and insert new tube (same size or one size smaller). DO NOT FORCE TUBE. If long term trach patient, parent and/or caregiver usually familiar with this procedure so allow them to assist if they offer.
5. If unable to insert new tracheostomy tube or if unavailable, insert endotracheal tube of similar size into stoma and ventilate with bag-valve-device PRN.
6. If unable to insert endotracheal tube, ventilate with bag-valve-mask over stoma or over patient’s mouth while covering stoma PRN.
7. Consider need for other protocols (e.g. Pediatric Protocol 3.2 - Pediatric Respiratory Emergencies).

**ALS Level 1: PARAMEDIC ONLY**

1. None

**ALS LEVEL 2: MEDICAL CONTROL**

1. Call medical control or medical director for any questions or concerns.
3.10.3 CENTRAL VENOUS LINES
Pediatric Protocol

**Purpose:** Central venous lines are indicated for administration of medications, delivery of chemotherapy, nutritional support, infusion of blood products, and blood draws. Types of central venous lines include: Broviac/Hickman, Port-a-cath/Med-a-port, and percutaneous intravenous catheters (PIC). Central venous line emergencies include: catheter coming completely out, bleeding at the site, catheter broken in half, blood embolus, thrombus, air embolus, and internal bleeding. The uses of SQ ports require special training and should not be used for IV access unless you have been trained and signed off to do so by medical director.

Signs of blood embolus, thrombus, air embolus, and internal bleeding:

2. Cyanosis.
3. Dyspnea.
4. Shock.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. If catheter is completely out, apply direct pressure to site.
4. If there is bleeding at the site, apply direct pressure.
5. If catheter is broken in half, clamp end of remaining tube.
6. If suspected blood embolus, thrombus, or internal bleeding: clamp line.
7. If suspected air embolism, clamp line and place patient on left side.
8. Consider need for other protocols (e.g. Pediatric Protocol 3.2 - Pediatric Respiratory Emergencies).

**ALS Level 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.

Return to Peds Protocols
Return to Peds Special Healthcare Needs
3.10.4 FEEDING TUBES
Pediatric Protocol

**Purpose:** Feeding tubes are indicated for administration of nutritional supplements and in patients that have an inability to swallow. Types of feeding tubes include: nasogastric tube (temporary) and gastrostomy tubes (G tube). Types of G tubes include those that are surgically placed, percutaneous endoscopic gastrostomy tubes, PEG tubes, and jejunal tubes (J-tube). Complications include: leaks, bleeding around the site, and displacement of the tube.

**Procedure:**

**BASIC LEVEL: EMT and PARAMEDIC**
1. Initial Peds Assessment Protocol 3.1.1
2. Medical Supportive Care Protocol 3.1.3.
3. If catheter is completely out, apply direct pressure to site.
4. If there is bleeding at the site, apply direct pressure.

**ALS LEVEL 1: PARAMEDIC ONLY**
1. None

**ALS LEVEL 2: MEDICAL CONTROL**
1. Call medical control or medical director for any questions or concerns.
3.10.5 Autistic Patient
Pediatric protocols

PURPOSE: This protocol is intended to assist emergency personnel in dealing with the special challenges that they face when encountering an autistic patient.

Signs of Autism

Many parents are in denial or do not realize the possibility that their child is autistic. It is for this reason that careful consideration should be made before inquiring whether a child is autistic. Doing so may prompt the parent to “shut down” or become defensive, which could hamper the process of acquiring patient information.

Signs of autism that the emergency care provider may recognize include these:

- Has not “babbled” or “cooed” by the age of 1 year.
- Has not gestured, pointed, or waved by 1 year.
- Has not spoken a single word by 16 months.
- Has not spoken a two-word phrase by 2 years.

Special Considerations

When dealing with an autistic patient, special accommodations must be made during the encounter to achieve a positive outcome. Conditions that may affect the encounter include these:

- Autistic patients may respond aggressively to an unwanted touch.
- Autistic patients may appear to have a hearing impairment.
  - This may affect your assessment of the patient’s level of consciousness and the Glasgow Coma Scale score.
  - It may also prevent the patient from coming to you if called, such as in motor vehicle accidents, fires, and evacuations (a).
- During stressful times, autistic persons may “bolt” or run away from the situation even if they are hurt. These patients will not respond to someone calling their name to stop! This behavior may result in the person running into traffic or other hazardous areas (b).
- Autistic patients cannot tell or describe what is hurt or what they want (c).
- Autistic patients will likely not follow any directions. This will present a great challenge during the patient assessment (e).
- Autistic children do not play with toys appropriately.
- Autistic patients have poor eye contact, which may affect the evaluation of pupils.
  - The autistic patient usually directs his/her eyes up, down, or away. This factor should be considered when head injuries are suspected.
- Autistic patients appear to be in their own world. This could pose a concern if a patient is in danger and is not aware of it.
• Autistic patients have odd movement patterns.
  o These movements may include hand flapping, hand washing motions, spinning motions, head slapping, and covering of the ears or eyes
• Autistic patients exhibit an unusual attachment to toys or other objects.
  o To gain the trust of an autistic patient, provide him/her with a favorite object, which may not necessarily be a toy. Ask the parent/caregiver to assist you.
• Autistic patients often demonstrate repetitive behaviors.
  o Autistic persons feel compelled to complete certain tasks, such as lining up their toys.
  o Before allowing an intrusion, such as emergency workers examining them, autistic patients may feel compelled to complete a certain task such as lining up toys, opening a door, or going through a certain routine.
• Autistic patients do not adjust well to a change in their surroundings or routines.
  o These patients are usually set in a certain routine and are extremely comfortable in their known surroundings. Any changes could result in an aggressive response.
• Autistic patients may walk on “tippy toes.”
• Autistic patients may have an increased level of pain tolerance.
  o This may be a major consideration during the physical exam. A thorough physical exam is required, especially with suspected abdominal pain, fractures/sprains, and head/neck injuries.
• Autistic patients have an extreme sensitivity to touches and textures (i.e., smooth, rough, sticky, hot/cold, wet/dry).
  o Consideration should be given to this factor when applying dressings and bandages. The simplest of procedures, such as applying a Band-Aid or irrigating a wound, could result in a “meltdown.”
• Autistic patients are extremely sensitive to having things on their heads or around their necks.
  o This factor should be considered when applying dressings to head injuries, as well as when utilizing a sling to secure an extremity.

“Meltdowns and Refocus Periods”

Children with autism can have frequent “meltdowns” (tantrums) due to any one of the factors mentioned in the “Special Considerations” section of this protocol. These meltdowns may also occur for no apparent reason and may result in aggressive behavior. After a meltdown, autistic children will likely go through what is known as a “refocus” period. They will suddenly become quiet; they may crouch down and cover their ears or eyes. Typically they will look for a quiet, darkened, “sheltered” area. During this period, patients are trying to “refocus” their world; this is their time. The refocus period can last a
few minutes to possibly 30 minutes or longer. If there is an attempt to rush this period, another meltdown may occur, to be followed by another refocus period; this process could become a vicious cycle.

If you encounter a parent/caregiver who is aware of the autism, ask him/her for advice on how to handle the patient. Parents of autistic children are usually very actively involved with their children and understand their “quirks.” Their help should enhance your treatment and be a major factor in lessening the stress level in an already stressful situation.

Note: Clues that may indicate that you are dealing with an autistic patient may include car magnet “puzzle piece” ribbons on vehicles involved in motor vehicle accidents as well as window stickers on homes indicating the presence of a special needs person.

(a) Autistic patients are not aware of any present dangers. To safely secure the patient, reduce the risk of danger before encountering the patient. Ask the parent/caregiver to assist you during your interview.

(b) If possible, ask the parent/caregiver to assist with “refocusing” the patient. If such a person is not available, try clapping your hands to get the patient’s attention if the situation is urgent.

(c) Be aware of a possibly aggressive response to an unwanted touch.

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Initial Peds Assessment
4. PROCEDURAL PROTOCOLS
4.1.1. Automated External Defibrillator (AED)

Level of training: EMT-(B-I-A), EMT-P, First Responders

Introduction:

1. AED Use General Considerations:
   A) Take body substance isolation precautions en route to the scene
   B) Initiate immediate ALS backup as appropriate
   C) Preparation for transport of patient should begin immediately as staffing allows.
   D) The patient should be transported when one of the following has occurred:
      1. The patient regains a pulse
      2. Two (2) shocks have been delivered by EMS staff
      3. Per medical control recommendation
   E) All contact with the patient must be avoided during analysis of rhythm and delivery of shock(s)
   F) **Do not apply AED in children under 1 year of age.** Begin CPR and transport. Contact medical control for further instructions.
   G) A pediatric capable AED is preferred for age 1-8 years. However, a standard AED may be used if it is the only one available.
   H) 2005 AHA guidelines do not restrict AED use in a moving vehicle.
   I) It is acceptable to continue using the public access defibrillator (PAD) if it has already been applied so as not to interrupt CPR to apply EMS AED.

Indications:

1. For the patient in non-traumatic cardiac arrest when a defibrillator is not immediately available. Keep in mind; many public buildings now have AED stations. Also, many law enforcement agencies carry AEDs in their patrol vehicles.

Contraindications: None

Procedure: *(FOLLOW THE VERBAL DIRECTIONS AS PER THE AED DEVICE)*

1. In general there are **four general steps** to operate the A.E.D.
   a. **Push the “power” button** and turn on the AED
   b. **Attach the defibrillator pads** to the patient
c. **Push the “analyze” button** (this may be automatically done when the power is turned on)

d. **Push the “shock” button** to deliver shock, if indicated and safe (this is automatically done by a fully automatic AED

2. AED Application by age

a. Age 1 through 8 years
   i. Perform CPR for 5 cycles (about 2 minutes) before undertaking other actions
   ii. Apply AED, using a pediatric capable AED if available
      1. If PAD is the only pediatric capable AED available, continue using it
      2. If only standard AED available, it may be applied. It is recommended to place the patches in anterior-posterior positions to avoid arcing.

b. Age > 8 years
   i. Apply standard AED

3. Resuscitation (EMS Provider)

a. Arrive on scene and perform initial assessment
b. Stop CPR if in progress for as minimal a period as possible
c. Verify pulselessness and apnea
d. If no CPR (or poor quality CPR) performed prior to your arrival and response interval from time of collapse is:
   i. Less than 5 minutes, the immediate priority is defibrillation
   ii. More than 5 minutes, perform two (2) minutes of CPR prior to defibrillation.
e. If three or more shocks have been given by PAD and patient remains pulseless, consider one additional shock if indicated and begin immediate transport.
f. AED Activation and Use
   i. Attach and activate defibrillator
   ii. Stop CPR
   iii. Clear patient
   iv. Initiate analysis of rhythm
      1. If AED advises shock:
         a. Deliver shock
         b. Immediately begin CPR and prepare for immediate transport
            i. After 2 minutes, stop CPR assess ABC’s
            ii. If no return of carotid pulse, allow AED to re-analyze
            iii. If shock advised, deliver shock and perform two minutes of CPR
iv. The sequence of two (2) minutes of CPR followed by one shock may be repeated a maximum of three times.

v. After two shocks no delay should be made remaining on the scene. This may require the third shock being performed in the ambulance.

c. If after shock patient exhibits signs of life (spontaneous respirations, purposeful motor activity) stop CPR and assess ABC’s.
   i. If breathing adequately, give high concentration oxygen by non re-breather mask and transport promptly
   ii. If not breathing adequately, artificially ventilate with high concentration oxygen, transport promptly (consider insertion of advanced airway here).

2. If AED advises no shock:
   a. Resume CPR and begin immediate transport
   b. After two minutes of CPR allow re-analysis
      i. If shock advised, deliver shock.
      ii. If no shock advised for the second time, resume CPR and begin immediate transport.

v. Consider insertion of an advanced airway when appropriate
   1. Airway should be inserted while chest compressions continue
   2. Once airway is in place, ventilations should be made at the rate of 8-10 per minute and CPR should be performed for two minutes between re-analyzing or pulse check.

vi. If at any time during transport pulses are lost, restart protocol.

vii. Medical Control should be contacted as soon as possible to discuss further treatment option including termination of resuscitation.

viii. If ambulance not at scene continue the sequence of two minutes CPR followed by analysis for as long as shockable rhythm persists or until transport becomes possible.

**Document**

- Clinical assessment
- Whether arrest was witnessed or un-witnessed
- Presence of by-stander CPR
- Defibrillator use including PAD
- Resuscitative measures and response
- Communication with medical control
4.1.2. Cardiopulmonary Resuscitation (CPR)

Level: First Responder, EMT- (B-I-A), EMT-P

**Adult**
1. Establish unresponsiveness (call for backup as needed).
2. C: Assess circulation via carotid pulse (5-10 seconds). If a pulse is absent, start chest compressions (push hard, push fast). Administer compressions at a rate of 100 - 120 per minute (place the heel of hand on the sternum between the nipples and compress to a depth of 2 inches but not greater than 2.4 inches). The goal is to achieve a (CCF) Chest Compression Fraction of 60 – 80%
3. A: Open the airway using an appropriate method.
4. B: Assess breathing (5-10 seconds). If breathing is absent, give two breaths.
5. Administer 30 compressions and then 2 ventilations
6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.
7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.

**Child**
1. Establish unresponsiveness (call for backup as needed).
2. C: Assess circulation via carotid pulse (5-10 seconds). If a pulse is absent, start chest compressions. Administer compressions at a rate of 100 -120 per minute (place the heel of hand on the mid sternum and compress at a depth of 2 inches but no greater than 2.4 inches). The goal is to achieve a (CCF) Chest Compression Fraction of 60 – 80%
3. A: Open the airway using an appropriate method.
4. B: Assess breathing (5-10 seconds). If breathing is absent, give two breaths to make the chest rise.
5. For one rescuer, administer 30 compressions and then 2 ventilations; for two rescuers, administer 15 compressions and then 2 ventilations.
6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.
7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.

**Infant**
1. Establish unresponsiveness (call for backup as needed).
2. C: Assess circulation via brachial pulse (5-10 seconds).
   - For one rescuer, use two fingers on the sternum, one finger width below the nipple line; administer at least 100- 120 compressions per minute, at one-third the depth of the chest.
• For two rescuers, use two thumbs side by side at the center of breast bone just below the nipple line. Squeeze the infant’s posterior chest with the encircled fingers, and administer at least 100 - 120 compressions per minute at a depth of 1 1/2 inches of the chest.

3. A: Open the airway using an appropriate method.
4. B: Assess breathing (5-10 seconds). If breathing is absent, give two breaths to make the chest rise.

5. For one rescuer, administer 30 compressions and then 2 ventilations, for two rescuers, administer 15 compressions and then 2 ventilations.

6. If an advanced airway is in place and there are two rescuers, administer continuous compressions and unsynchronized ventilations at a rate of 1 breath every 6 seconds or 1 breath every 10 compressions.

7. Continue compressions and ventilations until the return of a pulse is noted. Intermittently check for the return of a spontaneous pulse.
4.1.3. Head Tilt – Chin Lift

1. Place one hand on the patient’s forehead and push with your palm to tilt the head back.
2. Place the fingers of the other hand under the bony part of the patient’s lower jaw near the chin. Do not press deeply into the soft tissue under the chin because it might obstruct the airway.
3. Lift the jaw to bring the chin forward.

4.1.4. Jaw Thrust

1. Place a hand on each side of the patient’s face.
2. Grasp the angles of the patient’s mandible and lift upward.
3. If there are not enough responders to maintain the jaw thrust or if the jaw thrust is not successful in opening the airway, proceed to the head tilt-chin lift maneuver.
4.1.5. Rescue Breathing w/ Bag-Valve-Mask

Level of training: EMT-(B, I, A), EMT-P,

Procedure:
1. Attach high flow oxygen to the bag
2. Have suction available since vomiting may occur
3. Use an appropriate size airway adjunct with BVM
4. Use an appropriate size mask to avoid pressure over the eyes (pediatric patient), which may cause vagal stimulation.

One Person
1. Position yourself directly above the patient’s head.
2. Place the mask on the patient’s face, using the bridge of the nose as a guide for correct positioning. Dentures left in place will help the mask make a better seal.
3. Use the E-C clamp technique to hold the mask in place while you lift the patient’s jaw to hold the airway open.
   - Perform a head tilt.
   - Use the thumb and index finger of one hand to make a “C,” pressing the edges of the mask to the face.
   - Use the remaining fingers to lift the angles of the jaw (three fingers form an “E”) and open the airway.
4. Squeeze the bag to achieve chest rise. The delivery of breaths is the same whether you do or do not use supplementary oxygen.
   For perfusing rhythm:
   - Adult: 10-12 breaths/min.
   - Pediatric: 12-20 breaths/min.
   When CPR is being performed or if an Advanced Airway is in place:
   - Adult and pediatric: 8-10 breaths/min (1 breath every 6 seconds).
5. Insert an oral or nasal airway.

Two Persons
1. Rescuer one:
   - Take a position directly above the patient’s head.
   - Place the mask on the patient’s face, using the bridge of the nose as a guide for correct positioning.
   - Use the E-C clamp technique to hold the mask in place with both hands.
   - Use the thumb and index finger of one hand to make a “C,” pressing the edges of the mask to the face.
   - Use the remaining three fingers to form an “E” to lift the angles of the jaw.
2. Rescuer two:
   - Squeeze the bag for 1 second, while watching for chest rise.
   - Apply continuous cricoid pressure.
3. Squeeze the bag to achieve chest rise. The delivery of breaths is the same whether you do or do not use supplementary oxygen. For perfusing rhythm:
   - Adult: 10-12 breaths/min.
   - Pediatric: 12-20 breaths/min.
When CPR is being performed or if an advanced airway is in place:
   - Adult and pediatric: 8-10 breaths/min. (1 breath every 6 seconds).
4. Insert an oral or nasal airway

Note:  
   a) Avoid aggressive squeezing of the bag. It takes 25 cm of water pressure to open the esophagus.
   b) If patient does not have adequate chest rise and breath sounds with BVM, consider the following interventions:
      - Reposition the head
      - Check for airway obstruction
      - Suction the airway
      - Disable the pressure pop-off valve to increase the delivery of air into the patient
      - Use a larger bag to increase the volume of air delivered into the patient

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4.1.6. Suspected Foreign Body Airway Obstruction (FBAO)

**Adult**
1. If the patient is conscious, ask, “Are you choking?”
2. If the patient is unable to speak and/or nods his/her head “yes,” give abdominal thrusts, or chest thrusts if the patient is pregnant or obese.
3. Repeat the abdominal thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:

4. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
5. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
7. Repeat Steps 4 through 6 until the FBAO is relieved.

**Child**
1. If the patient is conscious, ask, “Are you choking?”
2. If the patient is unable to speak and/or nods his/her head “yes,” give abdominal thrusts.
3. Repeat the abdominal thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:

1. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
2. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
3. Give 30 chest compressions.
4. Repeat Steps 4 through 6 until the FBAO is relieved.

**Infant**
1. If the patient is conscious, determine airway patency.
2. If the patient is unable to move air or has poor air exchange, give 5 back slaps between the shoulder blades and then 5 chest thrusts with the patient in a head-dependent position.
3. Repeat the back slaps and chest thrusts until they are effective or the patient becomes unconscious.

If the patient becomes unconscious, continue with the following steps:
1. Open the airway. If able to visualize the obstruction, perform a finger sweep to remove the object.
2. Attempt to ventilate; if the airway is still obstructed, reposition the airway and try to ventilate again.
3. Give 30 chest compressions.
4. Repeat Steps 4 through 6 until the FBAO is relieved.

**Indications for using the Magill Forceps:**
1. Upper airway obstruction due to a foreign body that has not resolved with 5 abdominal thrust
2. Patient must be unconscious
3. Patient must be placed supine

**Contraindications:** None

**Adverse Effects/Complications:** Trauma to the oropharynx, vocal cords, esophagus, or trachea.

**Precautions:** It is important to distinguish the foreign body from the portions of the patient’s anatomy.

**Procedure:** Use the Magill Forceps to grasp objects while using the laryngoscope to visualize the cords and upper airway.
4.2. Airway Adjuncts

4.2.1. Nasopharyngeal Airway Insertion (NPA)

This procedure should not be performed in the presence of frontal head or midfacial trauma where the cribriform plate may be fractured.

1. Determine the proper size of tube (measure from the nostril to the earlobe).
2. Lubricate with a water-soluble lubricant (optional: lidocaine gel).
3. Position the patient’s head in a neutral position, inspect the nose, and select the larger nostril.
4. Insert the nasopharyngeal tube with the bevel facing the nasal septum.
5. Gently insert the tube until the flange rests against the nostril.
   - If resistance is met, insert with a twisting motion.
   - If there continues to be resistance, attempt insertion in the other nostril.
6. Ventilation with a bag-valve device.

4.2.2. Oropharyngeal Airway Insertion (OPA)

1. Determine the proper size of tube (measure from the corner of the mouth to the earlobe).
2. Open the patient’s mouth by tongue/jaw-lift maneuver.
3. Insert the oropharyngeal tube with the tip toward the side of the mouth.
   - Prior to complete insertion; start to rotate the tube 90 degrees so that the flange rests on e lips.
   - If the patient has an intact gag reflex, perform a nasopharyngeal insertion.
4. Ventilate with a bag-valve device.
4.3. Airway Suctioning

4.3.1. Flexible Suctioning

1. Wear protective eyewear, gloves, and face mask.
2. Preoxygenate the patient.
3. Turn on the suction unit.
4. Insert the catheter to an appropriate depth, place your thumb over the suction control orifice, and rotate the catheter between your fingertips while withdrawing catheter. (Caution: Do not suction for more than 10 seconds.)
5. Monitor the patient’s heart rate, pulse, oxygen saturation, and clinical appearance during suctioning. If bradycardia occurs or the clinical appearance deteriorates, administer high-flow oxygen until the rate and clinical appearance return to normal.
6. Maintain ventilatory support with 100% oxygen.

4.3.2. Rigid Suctioning

1. Wear protective eyewear, gloves, and face mask.
2. Preoxygenate the patient.
3. Turn on the suction unit.
4. Measure the depth of catheter insertion from the patient’s earlobe to the corner of the mouth.
5. Insert the catheter to an appropriate depth, place your thumb over the suction control orifice, and suction the oropharynx. (Caution: Do not suction for more than 10 seconds.)
6. Monitor the patient’s heart rate, pulse, oxygen saturation, and clinical appearance during suctioning. If bradycardia occurs or the clinical appearance deteriorates, administer high-flow oxygen until the rate and clinical appearance return to normal.
7. Maintain ventilatory support with 100% oxygen.
4.4. Advanced Airways

For all advanced airways/supraglottic airway devices (SGA)

- Assure a patent airway and ventilate with 100% O2 before attempting placement of the any advanced airway. Do not hyperventilate the patient
- Monitor SpO2 with a pulse oximeter and provide 100% O2 via a BVM
- Select the proper size tube
- Assemble and check the necessary equipment
- Confirm the SGA placement with an end-tidal CO2 monitoring device and additional confirmation methods such as negative epigastric sounds and positive bilateral breath sounds.
- Secure the SGA with tape or a commercially available device.
- Continually monitor the pulse oximeter and the end-tidal CO2 levels. Provide ventilations at a rate to keep the ETCO2 between 35-45.

4.4.1. Combitube
Level: EMT-(B-I-A), EMT-P,

Introduction:
The Combitube is designed to provide a patent airway for arrested patients when visualization of the airway and endotracheal intubation are not possible. It is designed to be inserted blindly. The double lumen design allows effective ventilations to be provided regardless of whether esophageal or tracheal placement is accomplished. The pharyngeal balloon fills the space between the tongue and soft
palate, eliminating the need for a mask and the associated face mask seal problems. If the Combitube is placed in the esophagus, the distal cuff will occlude the esophagus. Ventilations are then provided through perforations at the pharyngeal site. If the device is placed in the trachea, it functions as an endotracheal tube, with the distal cuff preventing aspiration.

**Indications:**

Where orotracheal and nasotracheal intubation have failed or contraindicated, and the need for airway control persist due to the following:

- Risk of failure of oxygenation or ventilation
- Risk of failure of airway maintenance or protection
- Risk of worsening clinical course

**Contraindications:**

1. Responsive patients with an intact gag reflex
2. Patients under 5 feet tall or 16 years of age
3. Known esophageal disease or ingestion of a caustic substance
4. Allergy or sensitivity to latex (The pharyngeal balloon contains latex.)

**Precautions:**

1. Take appropriate universal precautions, including facial protection, as expulsion of stomach contents can occur through the #2 tube if the initial placement is in the esophagus.
2. May be used in trauma, but take care to prevent neck movement.
3. In the arrested patient needing defibrillation, initial defibrillation (up to 3) should not be delayed for Combitube insertion.
4. Pulse oximetry, in states of low perfusion such as cardiac arrest, may be unreliable.

**Procedure:**

1. Assure patent airway and provide hyperventilation with 100% oxygen before attempting placement of the Combitube
2. Test cuffs and lubricate with a water-soluble jelly
   - Maintain cervical spinal motion restriction
3. (if indicated) and lift tongue and jaw upward with one hand. (Caution: When facial trauma has resulted in sharp, broken teeth or dentures, remove dentures and exercise extreme caution when passing the Combitube into the mouth to prevent the cuff from tearing.)
4. Insert Combitube into the mouth and advance gently until the printed ring is aligned with the teeth, which is the indicated depth; (Caution: Do not force the
Combitube. If the tube does not advance easily, redirect it or withdraw and reinsert.)

5. Inflate line 1, (the blue pilot balloon leading to the pharyngeal balloon) with 100cc of air using the 140cc syringe. (This may cause the Combitube to move slightly from the patient’s mouth.).

6. Inflate line 2 (the white pilot balloon leading to the distal cuff) with approximately 15cc of air using the 20cc syringe.

7. Ventilate through primary tube #1 and evaluate lung ventilation (breath sounds, gastric sounds, chest rise, end tidal CO2, oxygen saturation)

8. If lung ventilation is absent, immediately ventilate through secondary tube (#2) and re-evaluate (breath sounds, gastric sounds, chest rise, end tidal CO2, oxygen saturation).

9. If no lung ventilation, then deflate cuff #1, withdraw Combitube 2 – 3 cm, re-inflate cuff, and re-evaluate ventilation through tube #1 (as in #6 & #7 of this section).

10. Once effective ventilation is confirmed, continue to monitor oxygen saturation

11. If unable to achieve adequate ventilation using combitube, remove device, reinsert, and attempt again. If unable to ventilate, re-attempt bag valve mask ventilation, consider obstructed airway maneuvers, (if not yet performed), and return to the Breathing Airway Control Protocol.

Removal procedure:
1. The Combitube should not be removed unless:
   A. Tube placement cannot be determined.
   B. The patient no longer tolerates the tube (begins to gag).
   C. The patient vomits past either the distal or pharyngeal balloon.
   D. There is a palpable pulse and the patient begins breathing on his or her own.
   E. ALS personnel or a physician are present to place an ET tube.

2. Have suction equipment ready.
3. Log roll the patient to the side.
4. Deflate pharyngeal cuff using #1 pilot balloon. Pilot balloon should completely collapse.
5. Deflate distal cuff using #2 pilot balloon. Pilot balloon should completely collapse.
6. Gently remove the Combitube while suctioning the airway.

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
Special notes:
1. May be performed by all EMS personnel. (First Responder through ALS)
2. There may be occasions following the insertion of the Combitube where auscultation of breath sounds is negative AND gastric insufflation is negative. This may result from advancing the Combitube too deep into the airway, causing the pharyngeal balloon to push the epiglottis over the tracheal opening. This essentially creates a partial airway obstruction, making ventilation difficult. If this occurs, deflate the No. 1 pilot (pharyngeal) balloon, pull the Combitube approximately 2 - 3 cm out of the patient’s mouth and reinflate the pharyngeal balloon. This will reseat the pharyngeal balloon higher in the airway. If auscultation of breath sounds is now positive, and auscultation of gastric sounds is negative, continue ventilating. It is normal for the Combitube to rise slightly out of the mouth as the pharyngeal balloon is being inflated. Do not attempt to prevent the Combitube from rising while that balloon is being inflated. Remove any Combitube if you cannot determine which port is appropriate or if ventilation becomes more difficult after insertion.
3. The Combitube should be stored in its original container. This assures that all necessary components are present, protects the distal and pharyngeal cuffs, and provides proper pre-filled syringe volumes.
4. The Combitube may be used with an oxygen-powered resuscitator, a bag-valve-mask, or an automatic transport ventilator.
5. If air leaks around the pharyngeal balloon, up to 20 cc of air (10 cc for Combitube SA) may be added to it (#1 pilot balloon). Do not add additional air to the distal cuff (#2 pilot balloon).
6. The Combitube must be left in place when a patient is pronounced in the field.
7. The Combitube is a single use device and should be discarded after use.
8. Upon arrival at the medical facility, the large syringe should be brought into the ER to facilitate the decompression of the pharyngeal balloon for ET intubation.
9. In the unintubated patient, EMT’s should attempt endotracheal intubation (X 2) first. A Combitube should not be placed if the patient has been successfully endotracheal intubated.
10. If the Combitube has been placed in the esophagus, EMT’s should make one attempt at ET intubation when they arrive at the scene. With suction ready, deflate the pharyngeal balloon, move the device to the left, and visualize vocal cords with laryngoscope. Intubate in usual manner. If successful, leave the Combitube in place as removal may dislodge ET tube.
11. If the Combitube is in the trachea and a physician wishes to replace it with an endotracheal tube, a tube exchanger may be passed down the shorter, white (#2) tube.
4.4.2. Laryngeal Mask Airway (LMA)

1. Tightly deflate the cuff so that it forms a smooth “spoon shape.” Lubricate the posterior surface of the mask with a water-soluble lubricant.
2. Hyperextend the patient’s neck (unless cervical spine injury is suspected).
3. Carefully flatten the laryngeal mask tip against the hard palate.
4. Advance the mask until definite resistance is felt at the base of the hypopharynx.
5. Without holding the tube, inflate the cuff to the recommended volume of air for the tube size.
4.4.3. KingLT Airway
Level of training: EMT-(B-I-A), EMT-P

Select the correct KING LT-D size based on patient height. The size is printed on the package and on the tube. Just remember “4 5-6” means size 4 for 5 to 6 feet. “5-6” means size 5 for 6 feet plus. Other sizes are available and may be used in the future.
Test cuff and inflation system for leaks by injecting the maximum recommended volume of air into the cuffs (size 4 - 80 ml; size 5 - 90 ml). Remove all air from both cuffs prior to insertion. The inflation volume is printed on the tube.

Apply lubricant to the beveled distal tip and posterior aspect of the tube, be careful that you don’t get lubricant into the ventilation openings.

**Pre-oxygenate as you would for a normal intubation.**
The ideal head position for insertion of the KING LT-D is the “sniffing position”. However, the angle and shortness of the tube also allows it to be inserted with the head in a neutral position.

Hold the KING LT-D at the connector with your dominant hand. Hold mouth open and apply chin lift with your other hand.

Rotate the King Airway laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Introduce the tip into mouth and advance the airway behind the base of the tongue.
As tube tip passes under the tongue, rotate the tube back to midline (blue orientation line facing chin).

Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.

Using the syringe provided, inflate the cuffs of the KING LT-D with the appropriate volume: Size 4 70 ml, Size 5 80 ml. Inflation volume is printed on the tube.
Attach BVM to the KING LT-D. While gently bagging the patient to assess ventilation, simultaneously withdraw the KING LT-D until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).

Depth markings are provided at the lip indicate the distance from the distal ventilatory openings. When properly placed, with the distal tip and cuff in the upper esophagus, and the ventilatory openings aligned with the opening to the larynx, the depth markings give an indication of the distance, in centimeters, from the vocal cords to the teeth.

Confirm proper position by auscultation, chest movement and verification with colormetric CO2 detector.
Re-adjust cuff inflation to "just sealed" volume (inflation amount needed to seal the airway at the peak bagging pressure employed).

Secure KING LT-D to patient using tape or other accepted means. A bite block can also be used, if desired.

The KING LT-D is not an ET tube and can’t be used as a med route. The end of the KING airway should be in the esophagus, not the trachea; it therefore will not deliver meds into the lungs! NO MEDS DOWN THIS TUBE!

The LT-D model of the King Airway has a “ramp” at the distal end of the ventilation tube. This ramp is designed for the placement of a guidewire down the tube and into the trachea. The ramp points the guide wire into the trachea. When the guide wire is placed, the King can be removed, leaving the guide wire in place and an ET tube inserted over the wire into the trachea. Initially we won’t be using the
4.4.4. I-gel Airway

1. Lubricate the back, sides and front of the cuff with a thin layer of water-soluble lubricant (do not use silicone based lubricants).
2. Grasp the i-gel firmly along the integral bite block. Position the device so that the i–gel cuff outlet is facing towards the chin of the patient.
3. The patient should be in the sniffing position with head extended and neck flexed. The chin should be gently pressed down before proceeding to insert the i-gel.
4. Introduce the leading soft tip into the mouth of the patient in a direction towards the hard palate.
5. Glide the tube downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
6. At this point the tip of the airway should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework.
7. The incisors should be resting on the integral bite-block.
4.4.5. Oral Tracheal Intubation by Direct Laryngoscopy
Level: EMT-P (credentialed AEMT or EMT-I)

Indications:
1. Risk of failure of oxygenation or ventilation
2. Airway maintenance or protection.
3. Worsening clinical course expected.

Contraindications: Upper airway obstruction due to foreign objects

Adverse Effects/Complications:
1. Hypoxia during prolonged attempts at intubation
2. Intubation of the esophagus
3. Trauma to the oropharynx, vocal cords, esophagus, or trachea
4. Right mainstem bronchus intubation
5. Vomiting
6. Increased intracranial pressure as a result of increased vagal stimulation
7. Pneumothorax or a tension pneumothorax from high-pressure ventilation or underlying pre-existing trauma.

Procedure: 8 Ps
1. Prepare
   a. Suction
   b. Intubation kit
   c. Bag valve mask
   d. Extra-glottic Device (Combitube or King Airway)
   e. Cricothyroidotomy equipment
   f. CO₂ detection devices (or if available, Esophageal Detection Device)
2. Predict difficult airway (LEMONS, MOANS, RODS, SHORT/SMART)
   a. Obesity or very small patient
   b. Short muscular neck
   c. Buck teeth
   d. Receding jaw
   e. Burns
   f. Facial trauma
   g. S/S of anaphylaxis
   h. Strider
   i. Evaluate the 3-3-2 rule
      1. Mouth opening < 3 fingers
      2. Hyoid-chin distance < 3 fingers
      3. Thyroid cartilage-mouth floor distance < 2 fingers
   j. Obstruction pathology
      1. Peri-tonsillar abscess
      2. Epiglottitis
      3. Retro-pharyngeal abscess
3. Preoxygenate with 100% oxygen x 3 minutes
   a. Assist with BVM as needed or 8 full tidal breaths
4. Pre-medicate
   a. **Lidocaine** 1.5 mg/kg IV over 30 – 60 seconds if head trauma suspected or severe asthmatic/reactive airway disease
   b. **Fentanyl** 3 mcg/kg (~200 mcg for average 70 kg adult) for head injury or need to block sympathetic response
   c. **Atropine**: 0.02 mg/kg IVP for age < 12 months to prevent bradycardia secondary to airway maneuvers
5. Position
   a. Sniff position aligns the axes of the oropharynx, pharynx, and larynx (Contraindicated in suspected spinal injuries). Do not elevate the head of children
   b. If suspected cervical spine injury, apply manual in-line cervical spine stabilization by second caregiver.
6. Placement: Perform Intubation (5 step)
   a. Open the mouth: with the thumb and middle finger of the right hand, use the scissor technique to open the patient’s mouth.
   b. Control the tongue: holding the laryngoscope in the left hand and the ETT in the right, insert the blade into the right side of the mouth and sweep the tongue to the left.
   c. Recognize landmarks: Use the blade to lift the tongue and recognize the epiglottis and pharyngeal landmarks. Do not use the patient’s teeth as a fulcrum.
   d. Control the epiglottis: Expose the glottic opening: posterior cartilages of the larynx, inter-arytenoid notch, and the true vocal cords.
   e. Placement of the endotracheal tube: insert the tube down the right side (midline obscures the view) just anterior to the inter-arytenoid notch and through the vocal cords to the 21cm (23 cm for males) mark at the incisors for females. Remove the stylet and inflate the cuff with 5 – 10 cc of air (until no cuff leak).
7. Placement: Confirm Intubation: Document at least three
   a. Visualization of the ETT passing through the vocal cords. Advance the tube through the glottic opening until the proximal end of the cuff disappears past the vocal cords.
   b. **End tidal CO₂ detection**/change
   c. Condensation on inside of ET tube during ventilation
   d. Auscultation on inside of ET tube during ventilation
   e. Bilateral, symmetrical expansion of the thorax.
   f. If available; Esophageal detection device- EDD (tube check)
8. Post-intubation Management
   a. Secure tube
b. Document: tube size, tube depth at lips, tube confirmation methods, post intubation pulse ox.
c. Reconfirm tube placement:
   1. Once the patient is prepared for transport
   2. Anytime the patient is moved
   3. Anytime dislodgement of the tube is suspected
   4. Any change in the patient’s condition
   5. When responsibility for care is transferred to another provider.
d. Contact medical control for any problems and for orders to sedate patients if needed.
e. Attach and monitor end-tidal CO2
f. Monitor vital signs and pulse ox

**Pediatric orotracheal intubation considerations:**

1. The endotracheal tube can be sized by several methods, to include the Broselow Tape or Hantevy System or size of the nares or pinky finger, or the formula 4+ (age in years/4 for uncuffed tube and age in years/3 for cuffed tube). Once the proper size is determined, that ET tube as well as the next size smaller and next size larger (0.5 mm) should be made available for the Paramedic performing the intubation. (This is especially important in smaller children when the uncuffed tube is utilized, which relies on an anatomical seal.)

2. The anatomy of the airway is different than the adult patient and very apparent vocal cords may not be seen. Due to the over-abundance of tissue in the posterior pharynx, in infants, the tracheal opening may simply present as the anterior opening found in the subglottic region.

3. Anytime the pediatric patient is intubated, or prolonged bag-valve-mask ventilation (>3 minutes) occurs, a nasogastric (5 - 8 fr.) tube should be inserted (see NG Tube Procedure). (This procedure will insure that gastric distention is relieved and maximum ventilatory support is achieved.)

4. The endotracheal tube (ETT) will be secured as soon as correct placement is assured by auscultation of lung sounds. Do not let go of the ET during this process! Tape should be applied to the maxillary region of the face only! (Tape applied to the mandibular region may cause extubation if the mouth opens during transport, etc.) A properly sized ETT lock device may also be used.

5. The most experienced crew members should be charged with airway control. In addition, great care should be exercised when moving the patient from one surface to another, to assure that accidental extubation does not occur.

6. Continuous monitoring of ETT placement should be based on the following:
   a. Auscultation for positive bilateral breath sounds and negative epigastric sounds.
   b. Positive CO₂ reading (color change) on End-Tidal CO₂ Detector or continuous monitoring of ETCO₂ with a reading between 35 -45 mm Hg on monitor (see Medical Procedure 4.10).
c. Improving and/or normal SaO₂ level on Pulse Oximeter
   (See Pulse Oximeter Procedure).
d. Improvement in patient's status.

7. When assessing the child for intubation complications (bradycardia, cyanosis, etc.) remember to assess in order of the following causes:
   a. Equipment failure (O₂ supply, BVM reservoir, etc.)
   b. Blocked ET (kinked, secretions in the tube, etc.)
   c. Displaced ET (right mainstem, esophagus, etc.)
   d. Pneumothorax (spontaneous, trauma, etc.)

4.4.5.1. Airway Intubation with Eschmann Catheter, Tracheal Tube Introducer or Gum Elastic Bougie

Technique
1. Perform direct laryngoscopy after thorough pre-oxygenation.
2. Insert bougie under direct visualization (grade II) or semi blind (grade III) using epiglottis as a guide. Maintain midline bent end facing anteriorly.
3. With the tip directed anteriorly guide the bougie toward the epiglottis.
4. Advance the bougie posterior to the epiglottis and into the glottic opening.
5. Cricoid pressure may facilitate correct placement (when the tip of the introducer passes the cricoid cartilage and enters the trachea it also may be palpable at the anatomic location).
6. The operator may be able to feel the bougie “click” or “bump” over the anterior tracheal rings (“wash boarding or railroading”)
7. Use the laryngoscope to elevate the pharyngeal soft tissue.
8. Subtle maneuvering may be required to traverse the vocal cords.
9. Advance to the carina (resistance to passage) to verify placement (approximately 45 cm). Once advanced to the carina, further insertion causes the bougie to rotate on entrance into a bronchus as an additional criterion to confirm correct placement. Failure to meet resistance after inserting nearly the full length of the bougie indicates esophageal placement. Withdraw and align the black “lip-line marker” with the lips (1 cm band located 40 cm (4 stripes) from proximal end).
10. Pass endotracheal tube (larger than 6.0 mm) over the bougie.
11. If the endotracheal tube catches on the arytenoid or aryepiglottic folds, withdraw the tube slightly and rotate it 90° counterclockwise and advance it forward (allows beveled end to pass).
12. For optimal passage of the tube over the bougie into the trachea, the laryngoscope may be left in place as the endotracheal tube is advanced with the bevel facing posteriorly.
13. Secure the tube (remove bougie) and verify tube placement.
4.4.6. Nasogastric (NG) tube

Level of training: EMT-P

Purpose: Nasogastric Tube insertion is indicated to relieve gastric distention in the ventilated patient who meet the following criteria:

1. The adult patient with noticeable gastric distention that interferes with ventilatory support.
2. Any pediatric patient that is intubated or receives long term (>3 minutes) ventilation by Bag Valve Mask.

Cautions:

1. This procedure should not be performed in the presence of frontal head or mid-facial trauma where the cribiform plate may be fractured.
2. DO NOT FORCE THE NG TUBE. If resistance is felt, withdraw slightly and gently reinsert using a twisting motion to avoid the turbinates in the nose.
3. The NG tube should be passed in a horizontal position.

Procedure:

1. Ready the proper size tube (adult 16 French/pediatric as per the Broselow Tape 6 - 16 French), 60 cc syringe, water soluble lubricant, and tape.
2. Measure the tube by placing over the stomach region and extend to the ear and then to the nose. (Note tube mark at this time.)
3. Coil the tip of the tube around your index finger and stretch the tube to create a curvature at the tip. This will assist in navigating the posterior nasopharynx.
4. Lubricate the end of the tube with Lidocaine gel and insert into the largest nares, advancing until the tube mark noted above is at the nares opening. (The conscious patient can assist while swallowing during insertion.)
5. Verify placement by auscultating epigastric sounds while inserting 20-30 cc's of air.
6. Tape in place and note depth of tube on the run report.
## 4.4.7. Rapid Sequence Intubation (RSI)

**PURPOSE:**

**Indications:**
- Any medical, traumatic, or neurologic condition, acute or chronic in which there is failure to protect the airway.
- Significant altered mental status (GCS ≤ 8) with airway compromise.
- Risk for impending/actual airway compromise is suspected or anticipated, such as acute burn injury or acute severe angioedema of the airway.
- Any condition where there is failure to oxygenate and/or failure to ventilate and patient has an intact gag reflex.

**Relative Contraindications:**
- Concern for difficult intubation until assessed via LEMON, MOANS, RODS, SHORT/SMART
- Hypersensitivity to any of the drugs involved.
- Unfamiliar with medications used and or the procedure itself.
- Contraindications to succinylcholine (consider using Rocuronium or Vecuronium instead).
  - Patients with or at risk for hyperkalemia
    - History of **neuromuscular disease** (ALS, MS, muscular dystrophy, myasthenia gravis)
    - **Renal Failure** patient with evidence of hyperkalemia on EKG
    - Known **Hyperkalemia** (potassium > 5.5 mEq/liter)
    - **Burn** patient – between 5 days old until healed
    - **Crush injury** patients – between 5 days old until healed
    - **Stroke** patients and **spinal cord injury** patients – between 5 days until approximately six months
    - **Intra-Abdominal sepsis** – between 5 days unto resolved
  - Malignant Hyperthermia
  - Unstable Fractures

**Complications:**
- Increased intragastric pressure (emesis).
- Bradycardia/asystole (especially in children less than 1 yr not pre-medicated with Atropine.)
- Malignant hyperthermia.
- Prolonged apnea.
- Inability to intubate/ventilate after paralytic administration.
- Hypotension.
- Aspiration.
- Increased intraocular pressure.
- Dysrhythmias.
- Fasciculations.
- Histamine flush
- Tachycardia.
- Hyperkalemia.
- Inability to recognize decreased neurologic status.
- Bronchospasm

**PROCEDURE:**

**Preparation:**
- During your preparation, refer to the **UNIVERSAL AIRWAY ALGORITHM** below
- If patient is found to be in cardia or respiratory arrest or has agonal breathing, **GO TO THE CRASH AIRWAY ALGORITHM BELOW**
  - Assign or begin BLS airway measures including use of BVM
  - If after three attempts to intubate, you are unable to intubate the patient, go to **FAILED AIRWAY ALGORITHM** below
- Assemble necessary equipment and personnel (suction, B-V-M with correct sized mask, **working suction equipment**, appropriate sized ET tubes, working laryngoscope, gum bougie, appropriate drugs drawn up in syringes, pulse oximeter, end-tidal CO₂, cardiac monitor, extra-glottic airway and/or cricothyroidotomy equipment)
- One or two patent IVs
- Prepare to position patient in sniffing position or use in-line stabilization if indicated.
- Connect patient to cardiac monitor and pulse oximeter.
- Assign specific duties to personnel on scene (i.e., assistance with bagging, pushing of medications, ETC.)
- Assess patient for possible difficult intubation via LEMON, MOANS, RODS, and SHORT/SMART.
  - Check and document Mallampati
  - Test the 3-3-2 rule
  - If patient is found to be a potential difficult airway case, **GO TO THE DIFFICULT AIRWAY ALGORITHM BELOW**
    - Anesthetize with Aqueous Lidocaine 5 cc of 1, 2, or 4% via atomizer
    - Sedate patient with one of the following
      - Etomidate – ½ the induction dose
      - Ketamine – 1 – 2 mg/kg IV
      - Versed 2- 4 mg IV then titrate 1 mg increments prn till adequate sedation
    - If unable to intubate the patient, go to **FAILED AIRWAY ALGORITHM** below
If patient is neither a CRASH AIRWAY nor a DIFFICULT AIRWAY, proceed below with RSI

Pre-Oxygenation:

- The goal of rapid sequence induction is to facilitate a controlled intubation. (An adequately pre-oxygenated patient can remain apneic for 2 to 3 minutes without serious hypoxia).
- It is ideal to allow the patient to spontaneously breathe 100% oxygen for 4 - 5 minutes to “wash out” the nitrogen reservoir and establish an oxygen reservoir.
- If the patient is not breathing adequately, give 100% oxygen via B-V-M for 3 minutes.
- In addition to above, place patient on continuous oxygen via nasal cannula at 6 L per minute. Once the patient is sedated and/or paralyzed, increase the flow rate to 15 lpm via nasal cannula. Continue nasal oxygen throughout your intubation attempt while patient is paralyzed. Once intubated, discontinue the nasal oxygen.

Pre-Treatment:

- If head injury or evidence of increased ICP:
  - Give Lidocaine 1.5 mg/kg IV
  - Give Fentanyl 3 mcg/kg IV (not for patients less than 10 years of age)
- If reactive airway disease
  - Give Lidocaine 1.5 mg/kg IV
- If need to block cardiac sympathetic response
  - Give Fentanyl 3 mcg/kg IV
- If patient is less than 12 months of age and you are using Succinylcholine
  - Give Atropine 0.02mg/kg (1mg max)

Paralysis with induction: (virtual simultaneous administration)

- Induction agents (use one)
  - Etomidate 0.3mg/kg
  - Ketamine 1.5 mg/kg (preferred for hypotensive, septic, hypovolemic, reactive airway)
- Paralytic
  - Succinylcholine 1.5 mg/kg – depolarizing agent
  - Rocuronium 1 mg/kg – non-depolarizing agent

Protection and position

- Watch for apnea and have suction ready if needed
- Maintain head in sniffing position

Placement and Proof

- Pass ET tube and confirm placement
  - ETCO2
  - Breath sounds
  - Misting in tube
  - Chest rise and fall
  - Absent breath sounds over epigastrium
- If unable to pass tube;
  - Go to FAILED AIRWAY ALGORITHM. See below
• Attempt King Airway or other extra-glottic device
• Attempt to ventilate with BVM to maintain pulse ox > 91%
• Consider Cricothyroidotomy or needle cric as last resort

Post intubation management:
• Secure tube with tube tamer or other measures
• Apply C-collar
• Monitor end tidal CO2
• Recheck vital signs
• Sedation as needed (may use any one of the following. OK to combine a narcotic with a benzo. Ketamine works as a stand-alone drug)
  o Versed 2.5 – 5 mg IV then 1 mg increments prn (watch BP and administer bolus if it drops)
  o Valium 2 – 4 mg IV then 1 mg increments prn
  o Morphine 2 - 5 mg IV then 1 mg increments prn
  o Fentanyl 50 mcg IV then 25 mcg increments IV prn
  o Ketamine 0.25 – 0.5 mg/kg IV every 5 – 10 min (Med control may order a Ketamine infusion: 2 – 4 mg/kg/hr continuous infusion)
  o Continue paralysis with Rocuronium, only per med control

KEY POINTS/PEARLS:
1. Note: the benefit of obtaining airway control must always be weighed against the risk of complications in these patients
2. Maintain spinal motion retriction if indicated.
3. HAVE SUCTION EQUIPMENT READY TO USE
4. Perform baseline neurological exam prior to paralyzing patient.
5. Assess and record vital signs, cardiac rhythm, and pupillary exam at least every 5 minutes.
6. Remain in constant attendance with the patient at all times.
7. Provide emotional support and orientation to the environment.
8. Document all medications and reactions (i.e. paralysis achieved.) also, document reasons for repeat doses (i.e. increased difficulty ventilating or increased movement).
9. Notify medical control if after you administered Succinylcholine, you patient develops changes on the EKG suggestive of hyperkalemia (Peaked T waves, prolonged PR, prolonged QRS). Initiate the Hyperkalemia treatment

Airway Algorithms
Universal Airway Algorithm

Needs Intubation

Agonal or Arrest?

yes
Crash Airway Algorithm

no

Does the patient have a difficult airway?

yes
Difficult Airway Algorithm

no

no

Rapid Sequence Intubation

Fails

Fails

Fails

Failed Airway Algorithm

Fails

Needs Intubation

Return to:  Contents at top        Admin Guidelines      Procedure Protocol List
Adult Med Protocols        Peds Med Protocols Airway Management
Oral Tracheal Intubation    RSI
Crash Airway Algorithm

Attempt to Intubate

Successful?

Post-Intubation Management

No

Succinylcholine 2 mg/kg IVP (unless contraindicated)

Can you bag ventilate patient?

No

Failed Airway Algorithm

Yes

Is Patient completely Relaxed/ Flaccid?

No

Repeat Attempts to Intubate

No

Successful?

Yes

Post-Intubation Management

Yes

> 2 Attempts by the Most experienced Paramedic?

No

Repeat Attempts to Intubate

No

Successful?

Yes

Post-Intubation Management

Yes


Leon County EMS & Tallahassee Fire Department Medical Protocols Revised April 2018 – Version 1.0 – Live May 15th, 2018
Failed Airway Algorithm

Failed Airway Criteria → Call for Assistance

Failure to maintain oxygenation? → Yes → Cricothyrotomy

ET via AirTraq, EGD, i.e. King Airway → Contraindicated

Airway tube placed? → Yes → Post-intubation Management

Able to maintain SpO2 > 91%? → No → Cricothyrotomy

Yes → Transport for Definitive Airway

Pediatric Rapid Sequence Intubation

Universal Patient Care Protocol

- Preoxygenate with 100% FiO2 for 5 min.
  Avoid bag mask ventilation if possible

- Obtain IV/IO access

- Consider
  Atropine 0.02 mg/kg

**If septic consider
Ketamine 1.5 mg/kg IV
Or
Fentanyl 2 mcg/kg And
Midazolam 0.1 mg/kg

**If no concern for sepsis consider
Etomidate 0.3 mg/kg

Shock?

- Consider
  Lidocaine 1 mg/kg

Ketamine 1.5 mg/kg IV
Or
Etomidate 0.3 mg/kg

- Apply cricoid pressure

Suspected intracranial hypertension?

- Ketamine 1.5 mg/kg IV
  Or
  Fentanyl 2 mcg/kg And
  Midazolam 0.1 mg/kg

- Apply cricoid pressure

Any personal or family history of malignant hyperthermia, known or suspected mitochondrial or skeletal myopathy, glaucoma, penetrating eye injury?

Rocuronium 1 mg/kg OR Vecuronium 0.1 mg/kg

Orotracheal Intubation Pg. 88

Succinylcholine 2 mg/kg OR Rocuronium 1 mg/kg

M Contact Medical Control M

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Level: Specially trained EMT-P, RN
4.4.7.1. SMART AIRWAY MANAGEMENT

**Purpose:** The SMART Airway Management approach should be used on all patients requiring advanced airway management. The Universal Airway Algorithm outlines the basis for using this procedure.

**Universal Airway Algorithm**

1. **Needs Intubation**
   - **Agonal or Arrest?**
     - yes → **Crash Airway Algorithm**
     - no → **Does the patient have a difficult airway?**
       - yes → **Difficult Airway Algorithm**
       - no → **Rapid Sequence Intubation**
2. **Failed Airway Algorithm**

Procedure:

**Crash Airway Algorithm**

This algorithm is intended for use when faced with a need for a rapid airway in the setting of an uncomplicated clinical condition. Examples include cardiac arrest, respiratory arrest and unconscious patients with agonal respirations in need of active airway assistance.

1. Assess the patient for a probable difficult airway. Use LEMONS, MOANS, RODS, and SHORT. Examples include:
   a. Thick beard
   b. Overjet (Buck teeth)
   c. Mallampati of 3 or 4
   d. Less than 2 fingerbreadths space between the patient’s teeth
   e. Thryromental distance less the 3 fingerbreadths
   f. Decreased neck mobility
   g. Decreased jaw mobility
   h. Wired jaw

2. Ensure the patient is appropriately ventilated with 100% oxygen via a bag-valve-mask or similar device. An OPA or NPA should be in place.

3. Attempt to orotracheally intubate the patient (see medical procedure 4.27)

4. If successful, perform post-intubation management procedures including:
   a. Verification of proper placement via at least three independent measures (see Adult Medical Protocol 2.1.2)
   b. Note the centimeter marking of the ET tube adjacent to the teeth
   c. Secure the ET tube with a commercial device
   d. Place a cervical collar to prevent accidental dislodgement

5. If unsuccessful, maintain the SpO₂ > 91% via bag-valve-mask or similar device. If you feel the reason you were unsuccessful was due to lack of sufficient muscle relaxation of the jaw, administer one time dose of **Succinylicholine 2 mg/kg**. Attempt to intubate two more times by most experienced medic. If these interventions fail, proceed to the failed airway algorithm/protocol.

SEE Diagram Below
Crash Airway Algorithm

Attempt to Intubate

Successful?

Yes → Post-Intubation Management

No → Can you bag ventilate patient?

Yes → Is Patient completely Relaxed/ Flaccid

Yes → > 2 Attempts by the Most experienced Paramedic?

No → Repeat Attempts to Intubate

Successful?

Yes → Post-Intubation Management

No

Succinylcholine 2 mg/kg IVP (unless contraindicated)

Can you bag ventilate patient?

Yes

No

Is Patient completely Relaxed/ Flaccid

Yes

No

Failed Airway Algorithm

Return to: Contents at top Admin Guideline Adult Med Protocols

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
Difficult Airway Algorithm

1. When faced with a predicted or known difficult airway, call for assistance.
2. Assess per:
   A. LEMONS,
      a. Look externally (gastalt)
      b. Evaluate 3-3-2 rule
      c. Mallampati
      d. Obstruction/Obesity
      e. Neck mobility
   B. MOANS,
      a. Mask Seal
      b. Obese
      c. Aged (> 55 years old)
      d. No teeth
      e. Stiff (increased ventilatory pressures, e.g. asthma, COPD, ARDS, term pregnancy)
   C. RODS,
      a. Restricted mouth opening
      b. Obese
      c. Distorted airway
      d. Stiff (as for MOANS)
   D. SHORT
      a. Surgery
      b. Hematoma or infection
      c. Obese
      d. Radiation
      e. Tumor
3. Maintain the SpO₂ > 91% via non-rebreather mask, bag-valve-mask or similar device. If difficulty is encountered, assign a second rescuer to assist with ventilations and insert additional basic airway devices (2 NPA’s and 1 OPA should be in place). If these interventions fail, proceed to the failed airway algorithm/protocol.

4. If SpO₂ remains > 91%, and patient spontaneously breathing, consider nasotracheal intubation. If successful, perform post-intubation management procedures including:
   a. Verification of proper placement via at least three independent measures (See Adult Medical Protocol 2.1.2)
   b. Note the centimeter marking of the ET tube adjacent to the teeth
   c. Secure the ET tube with a commercial device
   d. Place a cervical collar to prevent accidental dislodgement

5. If nasotracheal intubation is unsuccessful or not attempted, decide if bag-valve-mask ventilations or using an extra-glottic airway will be successful. If yes, decide if endotracheal intubation is predicted to be successful. If yes, providers may consider employing the RSI algorithm/protocol but should do so with extreme caution.

6. If bag-valve-mask ventilations or using an extra-glottic airway is predicted to successful but it is questionable if endotracheal intubation will be successful, proceed with a sedation look.
   a. Apply 1 – 4% Lidocaine local anesthesia with atomizer to posterior pharynx (5 – 6 ml)
   b. Sedate patient with one of the following:
      1. Start with½ the induction dose of Etomidate (induction dose is 0.3 mg/kg) then titrate the remaining induction dose till adequate sedation achieved
      2. Start with 2 – 4 mg of Versed then if needed, titrate 1 mg increments till adequate sedation is achieved.

7. Attempt to visualize the vocal cords with laryngoscope, AirTraq or video laryngoscope. Look for grade 1 or 2 on Cormak-Lehane classification scale. See illustration below.
8. If you can visualize the cords easily, two choices
   A. Proceed with passing the endotracheal tube while you have the cords in good view, or
   B. Back out and proceed with RSI
      a. Give the remaining dose of **Etomidate** followed by the paralytic (**Succinylcholine 1.5mg/kg**)

9. If successful, proceed to post intubation management
   A. Secure tube
   B. Sedate patient as needed
a. **Versed** 2 – 4 mg IV initial then titrate 1 mg increments prn
b. **Morphine 2-5 mg** IV then titrate 2 mg increments prn
c. **Fentanyl** 50 mcg IV then 25 mcg increments IV prn

d. **Ketamine** 0.25 – 0.5 mg/kg IV every 5 – 10 min (Med control may order a Ketamine infusion: 2 – 4 mg/kg/hr continuous infusion)
e. Continue paralysis with **Rocuronium** only per med control

C. Apply C-collar
D. Monitor end tidal CO2

10. If unsuccessful, proceed to failed airway algorithm
4.4.8. Nasotracheal Intubation
Levels: EMT-P, RN

Purpose: Nasal intubation is the technique of passing an endotracheal tube through the nose and pharynx into the trachea. This is done without using a laryngoscope to visualize the vocal cords (blind technique).

The procedure is limited to breathing patients in whom oral intubation is difficult.

Indications:
1. Risk of failure of oxygenation or ventilation; airway maintenance or protection; or risk of worsening clinical course
2. Respiratory failure with decreasing level of consciousness, signs of hypoxia, or deep coma.
3. Respiratory failure with trismus (clenched jaws)
4. Trauma patients without significant midfacial trauma or instability

Contraindication:
1. Apnea
2. Patient receiving anticoagulants, such as Coumadin (Warfarin)
3. Patients with upper airway hemorrhage, significant mid-facial trauma, or laryngeal trauma.
4. Patients with cerebral spinal fluid leakage or evidence of basilar skull fracture
5. Patients less than 14 years of age

Adverse Effects/Complications:
1. Epistaxis
2. Intubation of the esophagus
3. Trauma of the oral pharynx, vocal cords, esophagus, or trachea
4. Right mainstem bronchus intubation
5. Vomiting
6. Increased intracranial pressure, as result of increased vagal stimulation.
7. Pneumothorax, tension pneumothorax from high pressure ventilation or underlying pre-existing trauma
8. Intracranial tube placement through the basal skull fracture

Procedure:
1. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage
2. Pre-oxygenate the patient. Lubricate the distal end of the tube.
3. Remove the nasal airway and gently insert endotracheal tube keeping the bevel of the tube toward the septum (Do Not Force the ET tube).
4. Continue to pass the tube listening for air movement and looking for vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.

5. Gently advance the tube through the glottic opening on the inspiration.

6. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.

7. Confirm placement via: (document at least three of the following)
   a. Visualization of the ETT passing through the vocal cords
   b. End tidal CO₂ detection/change
   c. Condensation on inside of ET tube during ventilation
   d. Auscultation of all lung fields to confirm breath sounds (and over the epigastrium for absence of gurgling sounds)
   e. Bilateral, symmetrical expansion of the thorax.
   f. If available; Esophageal detection device- EDD

8. Once confirmed, continue monitoring ETCO₂ (maintain between 35 – 45 mm Hg (if available), pulse ox, chest rise and fall and breath sounds.

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4.4.9. Post Intubation Management

A. Secure tube
B. Apply C-Collar
C. Recheck vital signs frequently
   a. Heart rate
   b. Blood pressure
   c. Pulse oximetry
D. Monitor End-Tidal CO₂
E. Keep patient sedated with any one of the following, or a combination of a benzodiazepine (a or b) and narcotic (c or d).
   a. Versed 2 – 4 mg IV initial then titrate 1 mg increments prn
   b. Valium 2 – 5 mg IV initial then 1 - 2 mg increments prn
   c. Morphine 2-5 mg IV then titrate 2 mg increments prn
   d. Fentanyl 50 – 100 mcg IV slow. May repeat every 15 minutes up to 200 mcg
   e. Continue paralysis with Rocuronium only per med control
F. Reassess for proper tube position (follow end tidal CO₂ and other confirmation protocols) each time patient is moved.
4.5. Surgical and Non-Surgical Airways

4.5.1. Needle Cricothyroidotomy for Pediatrics

Level: EMT-P

Indications:
1. A patient in respiratory arrest or near arrest in whom an airway cannot be secured with intubation.
2. Situations in which standard endotracheal intubations cannot be done such as:
   a. Excessive oropharyngeal hemorrhage.
   b. Massive traumatic or congenital deformities.
   c. Complete airway obstruction precluding ET tube placement.
3. Cervical spine fracture with respiratory embarrassment in patients who cannot be endotracheally intubated.
4. Unsuccessful attempts by EMT-P or RN at endotracheal intubation in situations where delays would result in hypoxic injury.

Procedure:
1. Prepare the necessary equipment:
   - 14-gauge, over-the-catheter needle
   - 10-cc syringe
   - 15-mm adaptor from 3.0 or 3.5 intubation tube
2. Have suction supplies available and ready
3. Place the patient in the supine position.
4. Palpate the cricothyroid membrane between the thyroid and cricoid cartilages. For children < 10 yrs old the cricothyroid membrane is not sufficiently developed, just cannulate the trachea like you would a vein.
5. Prep the area.
6. Attach a #14 gauge 2inch IV needle to a 10cc syringe.
7. Puncture the skin midline, directly over the cricothyroid membrane.
8. Direct the needle at a 45° degree angle caudally. When the needle penetrates the trachea, a “pop” will be felt.
9. Carefully insert the needle through the lower half of the membrane, aspirating as the needle is advanced.
10. Aspiration of air signified entry into the tracheal lumen.
11. Advance the catheter over the needle into the trachea.
12. Attach catheter needle hub to a 3.0 mm pediatric endotracheal tube adapter and oxygenate with 100% oxygen via a B-V-M.
13. Ventilate for 1 second and allow 2 seconds for exhalation.
15. Secure apparatus to neck.
17. Monitor pulse ox.
IF a “PERTRACH” KIT is available:

Steps 1 through 4 is as above

a. Use the Pertrach needle and syringe, insert the needle through the cricothyroid membrane at a 45 - 60 degree caudal angle  
b. Aspirate for air with the syringe throughout the procedure  
c. Once air returns easily, stop advancing the device  
d. Remove the syringe and insert the dilating, threaded catheter into the needle  
e. Break the needle apart and remove.
f. Push the catheter into the trachea (may require a small skin incision at the puncture site), and remove the threading device.
g. Assess breath sounds.

Steps 12 through 16 as above.

**Complications:**
1. Exsanguinating hematoma.
2. Subcutaneous and/or mediastinal emphysema.
3. Inadequate ventilations resulting in hypoxia and death.

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4.5.2. Surgical Airway (Cricothyroidotomy)

Level: Specially trained EMT-P

**Procedure:**

1. Place patient in the supine position with the neck in a neutral position. Palpate the cricothyroid membrane between the thyroid and cricoid membranes for orientation.
2. Prep the area.
3. Stabilize the thyroid cartilage with non-dominant hand.
4. With #15 scalpel blade, make a vertical skin incision.
5. Bluntly dissect down to the cricothyroid membrane (use the back end of the scalpel or pair of hemostats).
6. Make a horizontal incision through the membrane. Carry the incision in each direction until the total length is approximately 1.5 to 2.0 cm. NOTE: hold the scalpel between the thumb and index finger so that only the tip of the blade can enter the trachea during the initial stab incision.
7. **DO NOT REMOVE THE BLADE FROM THE OPENING IN THE TRACHEA UNTIL A HEMOSTAT OR STYLET OR BOUGIE HAS BEEN PLACED IN THE TRACHEA PRIOR TO REMOVING THE SCALPEL BLADE.**
8. Insert the scalpel handle and rotate 90° to the incision, use a curved hemostat, or your index finger to open the airway.
9. Insert an appropriately sized (preferably 5 - 7 mm) cuffed ET tube or tracheostomy tube into the airway, directing the tube distally into the trachea.
10. Inflate cuff and ventilate the patient.
11. Observe lung inflations and auscultate chest for adequate ventilation.
12. Secure tube to prevent inadvertent dislodging.
14. This procedure is not recommended in children under age 12.

**Complications:**

2. Hemorrhage or hematoma formation.
3. Laceration of the esophagus.
### 4.6. Autistic Patient

This protocol is intended to assist emergency personnel in dealing with the special challenges that they face when encountering an autistic patient.

#### Signs of Autism

Many parents are in denial or do not realize the possibility that their child is autistic. It is for this reason that careful consideration should be made before inquiring whether a child is autistic.

Doing so may prompt the parent to “shut down” or become defensive, which could hamper the process of acquiring patient information. Signs of autism that the emergency care provider may recognize include these:

- Has not “babbled” or “cooed” by the age of 1 year.
- Has not gestured, pointed, or waved by 1 year.
- Has not spoken a single word by 16 months.
- Has not spoken a two-word phrase by 2 years.

#### Special Considerations

When dealing with an autistic patient, special accommodations must be made during the encounter to achieve a positive outcome. Conditions that may affect the encounter include these:

- Autistic patients may respond aggressively to an unwanted touch.
- Autistic patients may appear to have a hearing impairment.
  - This may affect your assessment of the patient’s level of consciousness and the Glasgow Coma Scale score.
  - It may also prevent the patient from coming to you if called, such as in motor vehicle accidents, fires, and evacuations (a).
- During stressful times, autistic persons may “bolt” or run away from the situation even if they are hurt. These patients will not respond to someone calling their name to stop! This behavior may result in the person running into traffic or other hazardous areas (b).
- Autistic patients cannot tell or describe what is hurt or what they want (c).
- Autistic patients will likely not follow any directions. This will present a great challenge during the patient assessment (c).
- Autistic children do not play with toys appropriately.
• Autistic patients have poor eye contact, which may affect the evaluation of pupils.
  o The autistic patient usually directs his/her eyes up, down, or away. This factor should be considered when head injuries are suspected.
• Autistic patients appear to be in their own world. This could pose a concern if a patient is in danger and is not aware of it (d).
• Autistic patients have odd movement patterns.
  o These movements may include hand flapping, hand washing motions, spinning motions, head slapping, and covering of the ears or eyes
• Autistic patients exhibit an unusual attachment to toys or other objects.
  o To gain the trust of an autistic patient, provide him/her with a favorite object, which may not necessarily be a toy. Ask the parent/caregiver to assist you.
• Autistic patients often demonstrate repetitive behaviors.
  o Autistic persons feel compelled to complete certain tasks, such as lining up their toys.
  o Before allowing an intrusion, such as emergency workers examining them, autistic patients may feel compelled to complete a certain task such as lining up toys, opening a door, or going through a certain routine.
• Autistic patients do not adjust well to a change in their surroundings or routines.
  o These patients are usually set in a certain routine and are extremely comfortable in their known surroundings. Any changes could result in an aggressive response.
• Autistic patients may walk on “tippy toes.”
• Autistic patients may have an increased level of pain tolerance.
  o This may be a major consideration during the physical exam. A thorough physical exam is required, especially with suspected abdominal pain, fractures/sprains, and head/neck injuries.
• Autistic patients have an extreme sensitivity to touches and textures (i.e., smooth, rough, sticky, hot/cold, wet/dry).
  o Consideration should be given to this factor when applying dressings and bandages. The simplest of procedures, such as applying a Band-Aid or irrigating a wound, could result in a “meltdown.”
• Autistic patients are extremely sensitive to having things on their heads or around their necks.
  o This factor should be considered when applying dressings to head injuries, as well as when utilizing a sling to secure an extremity.
“Meltdowns and Refocus Periods”

Children with autism can have frequent “meltdowns” (tantrums) due to any one of the factors mentioned in the “Special Considerations” section of this protocol. These meltdowns may also occur for no apparent reason and may result in aggressive behavior. After a meltdown, autistic children will likely go through what is known as a “refocus” period. They will suddenly become quiet; they may crouch down and cover their ears or eyes. Typically they will look for a quiet, darkened, “sheltered” area. During this period, patients are trying to “refocus” their world; this is their time. The refocus period can last a few minutes to possibly 30 minutes or longer. If there is an attempt to rush this period, another meltdown may occur, to be followed by another refocus period; this process could become a vicious cycle.

If you encounter a parent/caregiver who is aware of the autism, ask him/her for advice on how to handle the patient. Parents of autistic children are usually very actively involved with their children and understand their “quirks.” Their help should enhance your treatment and be a major factor in lessening the stress level in an already stressful situation.

**Note:** Clues that may indicate that you are dealing with an autistic patient may include car magnet “puzzle piece” ribbons on vehicles involved in motor vehicle accidents as well as window stickers on homes indicating the presence of a special needs person.

(a) Autistic patients are not aware of any present dangers. To safely secure the patient, reduce the risk of danger before encountering the patient. Ask the parent/caregiver to assist you during your interview.

(b) If possible, ask the parent/caregiver to assist with “refocusing” the patient. If such a person is not available, try clapping your hands to get the patient’s attention if the situation is urgent.

(c) Be aware of a possibly aggressive response to an unwanted touch.
4.7. Blood Alcohol Sampling

Level of training: EMT-P

Indications: This protocol is for paramedics who may be called upon by law enforcement personnel to obtain a sample of blood on an individual who may be suspected of operating a vehicle under the influence. In Florida, Florida Statues, Chapter 16.1932(2) (f) (2) states…”Only a physician, certified paramedic,...acting at the request of a law enforcement officer, may withdraw blood for the purpose of determining the blood alcohol content thereof or the presence of chemical substances or controlled substances therein…”

DRAWING A BLOOD ALCOHOL SAMPLE SHOULD NOT DELAY TRANSPORT OF THE CRITICAL PATIENT.

Procedure:

1. The EMS run report shall contain the following information:
   a. A blood alcohol kit was used.
   b. Betadine (povidone-iodine) solution (or hydrogen peroxide/acetone if allergic to iodine) was used for the skin preparation.
   c. Name of law enforcement officer requesting blood sample
   d. Time of draw.
   e. If paramedic drawing sample is different from the one signing the report, that paramedic will sign under the above information.

2. All blood samples taken shall be surrendered to the requesting law enforcement officer.

3. The paramedic:
   a. May be required to obtain multiple samples
   b. Shall obtain a minimum of two samples per person/per draw.
   c. Shall render emergency medical service or treatment as necessary prior to the drawing of the blood and alcohol samples.
   d. Shall obtain blood alcohol samples only at the request of a law enforcement officer, either in the field or upon arrival in the Emergency Department.

4. Blood specimen collection instructions:
   a. The blood specimen must be drawn by a paramedic. The blood draw must be at the request of a law enforcement officer, and observed by that officer.
   b. The officer will remove the parts of the kit and hand them to the paramedic drawing the blood as needed. Two vials from the kit will be filled with blood. NOTE: The tube marked CONTROL will remain in the kit at all times. It will not be used for the collection of blood.
   c. The paramedic drawing the blood should use the pad provided in the kit to clean the area where the needle is going to be inserted. If the provided pad is not used, make sure that a non-alcoholic solution is used. The foil envelope that the swab came in should be placed back in the Biological Specimens box. The swab may be disposed of by the paramedic drawing the blood.
d. The paramedic drawing the blood should hand the vials back to the officer as they are filled. The officer should gently rock the vials (at least 10 times) to mix the anticoagulant with the blood. Do not shake them vigorously!

e. The paramedic drawing the blood may now dispose of the needle and holder along with any other contaminated parts not needed as evidence.

f. The paramedic that drew the blood must sign the Blood Collection Form (section three: Certification of Blood Withdrawal).

g. The officer is responsible to complete steps 7 – 10 noted on the instruction form noted on the kit.
4.8. Chest Compression Devices

4.8.1. AUTOPULSE

Level of training: EMT-(B-I-A), EMT-P,

**Purpose:** The AutoPulse will be used for all patients 18 years of age and older in non-traumatic cardiac arrest, where CPR would otherwise be used. In case of mechanical malfunction of the AutoPulse the EMS responder will resort back to manual CPR for patient care.

**Contraindications:**
- Traumatic cardiac arrest
- Patients under the age of 18
- Persons whose weight is >300 lbs or 136 kg

**Precautions**
- Always minimize any interruptions to compressions when using the AutoPulse.
- Deployment of AutoPulse should not postpone initiation of manual compressions.
- Do not place or position the patient on the AutoPulse in either a face down orientation or on the patient’s side.
- Check that the patient is correctly aligned on the AutoPulse platform and that the LifeBand Load-distributing Band (LDB) is correctly positioned at the patient’s armpit; otherwise injury may result. Check alignment prior to turning on the device, periodically during use, after moving the patient to a different surface, and frequently during transport.
- Press the STOP/CANCEL button prior to realigning the patient.
- Do not place any straps or restraints across (or otherwise constrain) the LifeBand during active operation.
- Do not use the AutoPulse platform alone to carry a patient. Instead use the AutoPulse platform in conjunction with the Reeves stretcher or secure AutoPulse platform to the top of a backboard or stretcher used to carry or transport the patient.
- If a System Error occurs during active operation, immediately revert to manual CPR.
- Do not touch the patient while the AutoPulse Platform is analyzing the patient’s size.
- Check vents during operation to ensure that they are not obstructed by sheets or patient clothes.
- Do not place hands under the LifeBand while the AutoPulse is analyzing the patient’s size or during active operation.
- Use of the AutoPulse for a prolonged period of time may result in minor skin irritation to the patient. With large patients, check the skin at the sides under the LifeBand.
- Do not use a LifeBand if it has any apparent cuts or tears.
• Ensure that the battery is securely latched (snaps into place) before moving the AutoPulse or initiating chest compressions.
• When inserting the battery into the AutoPulse platform or the charger, do not slam it into position but rather slide carefully so the connectors are not damaged; ensure that the battery locks into place.
• Do not remove a battery from the Battery Charger during the Test Cycle.

Complications:
• Care should be used when moving patients with a large abdomen (shifting of excess flesh may cause the LifeBand to move or break)
• If disruption or malfunction of the LifeBand occurs Revert Back to Manual CPR.

Technique / Procedure:

1. Initiate CPR.
2. Maintain high-quality compressions.
3. Power up the AutoPulse by pressing the ON/OFF button at the top of the device.
4. Remove the clothing on the patient’s torso:
   • Sit the patient up and perform a single cut down the back of the patient’s clothing. Then slide the Auto-Pulse platform into position behind the sitting patient, and have the patient lie down on the platform.
   or
   • Log-roll the patient to one side and perform a single cut down the back of the patient’s clothing. Then log-roll the patient onto the Auto-Pulse platform.
5. Align the patient on the platform. The patient’s armpit should be positioned on the “yellow” indicator line on the Auto-Pulse platform.
6. Close the LifeBand over the patient’s chest.
   • Therapy electrodes or defibrillation pads should be in place before applying the LifeBand.
   • Make sure the LifeBand is not twisted.
   • The LifeBand is secure when the mating slot is placed over the alignment tab and the bands are pressed together to engage the Velcro.
   • Center the LifeBand on the patient’s chest.
7. Begin compressions by pressing the green Start/Continue button once. The Auto-Pulse device will automatically adjust the bands on the chest.
8. The Auto-Pulse unit will pause for 3 seconds to allow for a check of proper alignment.
   • If patient is not aligned correctly, push the orange Stop/Cancel button.
   • Realign the LifeBand and press the green Start/Continue button.
9. Select the desired mode of compressions by pushing the gray Menu/Mode button.
   • 30:2 mode: 30 compressions and a pause for 2 ventilations.
   or
• Continuous mode: uninterrupted compressions.

10. Complete the process of securing the patient for transport.
• Clip the straps for the shoulder restraint to the Auto-Pulse platform and tighten them.
• Secure the patient’s head to the Auto-Pulse platform with the manufacturer’s head immobilizer or tape applied across the patient’s forehead.

11. After successful resuscitation or termination of activities, press the orange Stop/Cancel button.

**Documentation:**
• Document the use of AutoPulse on PPCR and steps performed.
• Time AutoPulse was turned on.
• Time AutoPulse was turned off.
• Initial rhythm at time of onset.
• Whether the arrest was witnessed or not.
• Whether bystander CPR was performed.
• Total compressions, active time, and pause time from AutoPulse.
• Problems with device operation.
• Patient complications related to use of the device.
• Deficiencies in provider competency when using the device.
• Document femoral pulses every two minutes.
AutoPulse® Quick Reference Guide

For Adult (≥18 years) Non-Traumatic Cardiac Arrest
Maximum Patient Weight 300 lbs.

1. Power up AutoPulse
2. Close chest bands
3. Press CONTINUE (green button)
4. Press START (green button) to begin compressions
   To pause or stop operation press STOP (orange button)

Troubleshooting

For Fault/User Advisory
- Lift up and fully extend both chest bands.
- Check both lateral and vertical patient alignment.
- Verify that chest bands are not twisted, are 90 degrees to the Platform and are free of obstructions.
- Press RESTART (green button) and follow on-screen instructions to begin compressions.

If you cannot rectify problem immediately open chest bands and revert to manual CPR.

LifeBand® instructions on other side

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
4.8.2. **Lucas Chest Compression System**

Level of training; EMT-(B-I-A), EMT-P

Confirm cardiac arrest and start manual CPR with a minimum of interruptions until LUCAS is applied and ready.

1. **Activate (A)**
   - Push ON/OFF for 1 second to start self-test and power up LUCAS

2. **Back Plate (B)**
   - Pause manual CPR
   - Carefully put Back Plate under the patient, below armpits
   - Resume manual CPR

3. **Compressor (C)**
   - Pull release rings once; claw locks open. Then let go of the release rings
   - Attach to Back Plate; listen for "click"
   - Pull up once to ensure attachment

4. **Position the Suction Cup**
   - Center the Suction Cup over the chest
   - The lower edge of Suction Cup should be immediately above the end of the sternum

5. **Push down the Suction Cup**
   - Push the Suction Cup down with two fingers (make sure it is in the ADJUST mode)
   - Pressure pad inside Suction Cup should touch patient’s chest. If the pad does not touch or fit properly, continue manual compressions
   - Push PAUSE to lock Start Position – then remove your fingers from the Suction Cup

6. **Start compressions**
   - Check for proper position. Adjust if necessary
   - Push ACTIVE (continuous) or ACTIVE (30:2)
   - LUCAS provides compressions with a rate of 100 per minute and 1.5 to 2 inches depth

7. **LUCAS Stabilization Strap**
   - Attach the LUCAS Stabilization Strap

Always follow local and/or international guidelines for CPR when you use LUCAS.
Lucas Chest Compression System:
1. Initiate CPR, Maintain high-quality compressions.
2. Open the LUCAS carrying bag to expose the unit.
3. Make certain the On/Off knob is in the “adjust” position.
4. Connect the high-pressure airline to the regulator on the air source.
5. Take the back plate out of the bag. With one rescuer on each side of patient, grab the patient’s arm to lift the upper body. One person should lift the patient and support the head, and the other person should lift the patient and slide the back plate below the armpits.
7. Take the upper part of the LUCAS unit out of the bag. Hold the LUCAS device by the handles on the support legs and make sure the support legs have reached their outer position.
8. Pull up once on the release rings to check that the claw locks are open.
9. Interrupt manual chest compressions and place the upper part of the LUCAS unit over the patient’s chest. The claw locks at the end of each support leg should be aligned with the back plate to lock the components together.
10. Check by pulling upward that both support legs are locked into the back plate.
11. Lower the suction cup with the height adjustment handles until the pressure pad inside the suction cup touches the patient’s chest without compressing the chest.
12. Turn the ON/OFF knob to activate the chest compressions.
13. Attach the neck pad by raising the patient’s head slightly. Clip the pad into each buckle attached to the support arms. Pull the excess slack out of each strap by pulling gently and simultaneously until the pad positions itself into place.
14. Attach the wrist straps to each of the patient’s wrists to assist with securing the arms during movement/transportation. Use caution to determine that the intravenous site is not compromised due to a slight bend that will occur in the patient’s arm. If this does occur, release the arm and secure the unit by other means.
15. After successful resuscitation or termination of activities, turn the ON/OFF knob to the “Off” position.

LUCAS 2 Chest Compression System
1. Initiate CPR, Maintain high-quality compressions.
2. Pull red handle on bag to open
3. To activate, push ON/OFF button for one second to start self-test and power up
4. The green LED adjacent to ADJUST illuminates
5. Take the back plate out of the bag. Pause manual CPR. With one rescuer on each side of patient, grab the patient’s arm to lift the upper body. One person should lift the patient and support the head, and the other person should lift the patient and slide the back plate below the armpits.
7. Take the upper part of the LUCAS 2 unit out of the bag. Hold the LUCAS 2 device by the handles on the support legs and make sure the support legs have reached their outer position.
8. Check that the release rings on claw locks are open.
9. Interrupt manual chest compressions and place the upper part of the LUCAS 2 unit over the patient’s chest. The claw locks at the end of each support leg should be aligned with the back plate to lock the components together. Listen for the CLICK when attached.

4.8.3. Lifeline ARM Device
4.8.4. The CardioPump ACD-CPR Device

Protocol pending implementation and Acquisition of device

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4.9. Chest Decompression
Level: EMT-P

Indications:
1. Tension pneumothorax.
2. Trauma CPR patients may require bilateral chest decompression.

Procedure:
1. Assess the patient to make sure that his/her condition is due to a tension pneumothorax:
   - Mechanism of injury
   - Absent or decreased breath sounds on the affected side.
   - Poor ventilation despite an open airway.
   - Tracheal deviation away from the side of the injury (may not always be present).
   - Neck vein distention (may not be present if there is associated severe hemorrhage).
   - Tympani (hyper-resonance) to percussion on the affected side.
   - Shock.
   - Decreased SpO2/end-tidal CO2.
2. Assess chest and respiratory excursion.
3. Apply oxygen per nonrebreather mask or with 100% with B-V-M.
4. Identify second intercostal space, midclavicular line on the affected side.
5. Prep the area. (Locally anesthetize the area if patient conscious or if time permits).
6. Snugly attach a 14 or 16 gauge, 3 – 3 ½-inch, over the needle IV catheter to a 10 ml syringe (or use arrow kit) or use a decompression device (ThoraQuik).
7. If no Heimlich Valve is available, construct a flutter valve using the finger of a latex glove. Push the needle through the inside of the latex finger such that the needle comes out through the tip. Advance till the hub of the needle comes to rest inside the tip of the finger.
8. Insert the needle into the skin and over the rib into the 2nd or 3rd intercostal space in mid-clavicular line.
9. Puncture the parietal pleura.
10. Aspirate air as necessary to relieve patient's symptoms.
11. Leave the plastic catheter remaining but remove the needle.
12. Secure the catheter to the chest.
13. Connect the catheter to a one-way valve such as a Heimlich Valve or use the Asherman Chest Seal or equivalent.
14. Reassess ventilatory status, jugular veins, tracheal position, pulse, and blood pressure.
Complications:

1. Pneumothorax.
4.9.1. **ThoraQuick Chest Decompression Device**
(Device Pending)

Unscrew needle from hub with counter clockwise action and remove adhesive backing tapes from underneath the hub.
Incorporated one-way valve
Enables fluid and air to pass out of the catheter with no risk of air being able to enter the pleural cavity

Ergonomic hub
Reduces the risk of catheter dislodgement

Adhesive underside
Secures the device to the patient, minimising the risk of catheter dislodgement

Large gauge cannula
Minimises the risk of occlusion

Long length cannula with three lateral eyes
10cm catheter reaches the pleural space even in larger patients and minimises the risk of catheter occlusion

Atraumatic needle tip
Minimises the risk of trauma on insertion
1. After locating the proper landmark (second intercostal space, mid clavicular line)
2. Prep the skin with betadine or equivalent skin cleanser
3. Attach a 10 cc syringe to the hub of the ThoraQuik device
4. Within the 2nd intercostal space, identify the superior margin of the third rib. Make a small skin incision with the blade from the ThoraQuik kit.
5. Remove the adhesive from the bottom of the ThoraQuik chest plate
6. Insert the needle through the incision and keep it perpendicular to the chest wall
7. Aspirate back on the syringe as you advance the ThoraQuik needle into the chest cavity. As soon as you aspirate air into the syringe, indicating you are in the pleural space, stop advancing the needle.
8. After entering the pleural cavity with the ThoraQuik needle, hold the syringe steady and in place with one hand, advance the ThoraQuik catheter and base plate off the needle and continue until the base plate is flush against the chest wall.
9. You can now withdraw the needle.
10. The one-way valve on the top of the hub enables fluid and air to pass out of the chest cavity with no risk of air being able to enter the pleural cavity.
4.10. CO2 monitoring devices

4.10.1. Electronic Waveform CO2 Detection

**Electronic End-Tidal CO2 (ETCO₂) Monitor Definition:** The End-Tidal CO₂ (ETCO₂) Monitor electronically measures the amount of carbon dioxide (CO₂) in the airway at the end of each breath. ETCO₂ monitors display this information in the manner (depending on the make and manufacturer):

1. Capnometer = number (ETCO₂)
2. Capnogram = tracing (Waveform)
3. Capnograph = Number and tracing

**Electronic ETCO₂ Monitor Applications:** Capnography is an objective monitoring tool for patients in respiratory distress and patients undergoing procedural sedation. It may be used to confirm, monitor and document ET tube intubation. A nasal-oral cannula is used to assess, monitor and document the respiratory status of the non-intubated patient.

**Application on Intubated Patients:**

1. Verification of ET tube placement
2. Monitoring and detection of ET tube dislodgement
3. Loss of circulatory function
4. Determination of adequate CPR compression
5. Confirmation of return of spontaneous circulation (ROSC)

**Application on NON-Intubated Patients**

1. Assessment of asthma and COPD
2. As a marker for sepsis
3. Documented monitoring during procedural sedation
4. Detection of apnea or inadequate breathing
5. Measurement of hypoventilation
6. Evaluation of hyperventilation
Return to: Contents at top | Admin Guidelines | Adult Medical Protocols | Airway Management | Oral Tracheal Intubation | Return of Spontaneous Circulation

**HYPERVENTILATION**: Rapid RR; shortened waveform; high 
end tidal CO2.

**PATIENT BREATHING AROUND ET TUBE**: Angled.

**DISLODGED ET/ESOPHAGEAL INTUBATION**:

- **SHARKFIN** waveform:akens dysphagia.
- **RISING BASELINE**: Patient is rebreathing CO2.

**MANAGEMENT**:
- **BASELINE**: CO2 = 35 mmHg.
- **ETCO2 = 0**: Management: Replace ET T.
- **ETCO2 = 35 mmHg**: Management: Monitor.

**OHMEOG:

- **A**: End of inspiration.
- **B**: Beginning of expiration.
- **C**: Exhalation of alveolar gas.
- **D**: End of expiration and point of maximal or highest CO2 concentration.

**NORMAL**: 

- **ETCO2 waveform**: baseline CO2 = 0.
- **ETCO2 waveform**: baseline CO2 = 35 mmHg.
4.10.2. Color Metric End-Tidal CO2 Detection

Level of training: EMT-P,

**Color Metric End-Tidal CO2 Detector Definition:** The End-Tidal CO₂ detector attaches to the endotracheal tube and a breathing device (e.g. BVM/Demand Valve) to detect approximate ranges of End-Tidal CO₂ by color comparison for up to two hours.

**Color Metric ETCO₂ Indications**

1. To assist verification of endotracheal tube placement after intubation and during transport
2. To detect approximate ranges of End-Tidal CO₂ when clinically significant.

**Color Metric ETCO₂ Cautions:**

1. Interpreting results before administering six breaths can yield false results (initial detector color may yield a false positive)
2. Results are not conclusive; the endotracheal tube should be immediately removed unless correct anatomic placement can be confirmed with certainty by other means (e.g. direct laryngoscopy).
3. This device should not be used in conjunction with a heated humidifier or nebulizer. Excessive humidity will affect accuracy.
4. In cardiac standstill, re-establishment of cardiac output and pulmonary perfusion by adequate cardiopulmonary resuscitation is necessary to increase End-Tidal CO₂ levels detectable by the CO₂ detector.
5. The chemical indicator may become mottled or irreversibly yellow after epinephrine is instilled into the ET tube and/or after any liquid (gastric contents, pulmonary edema) passes through the barrier. Remove the device and replace with a new device if this occurs.
6. This device cannot be used to detect oropharyngeal tube placement. Standard clinical assessment should be used.
7. Use an appropriate CO₂ indicator based on patient weight.

**Procedure:**

**For EASY CAP End-Tidal CO₂ Detector:**

1. Remove from package and match initial color of the indicator to the purple color labeled CHECK on the product dome. The color should be the same or darker. If lighter, **DO NOT USE**.
2. After endotracheal tube is inserted and cuff is inflated, firmly attach EASY CAP detector between the endotracheal tube and the breathing device.
3. Ventilate the patient with SIX BREATHS of moderate tidal volume. Interpreting results with less than six breaths can yield false results.
4. Compare color of indicator on full end-expiration to color chart on the product dome
   a. If color of indicator is Tan, ventilate six more times and recheck.
   b. If the color indicator is “yellow,” the ETT is in the trachea
5. If patient is in cardiac arrest and the color indicator is Purple, recheck ETT placement with direct laryngoscopy to confirm placement.
6. Check centimeter marking on ETT at teeth. If ETT is too shallow (in hypopharynx), reading may be inaccurate.
4.11. CPAP

**Overview:** Continuous Positive Airway Pressure (CPAP) is a non-invasive mechanically assisted delivery system designed to administer oxygenation of several respirational pathologies. CPAP is not a replacement for any medication or procedure, but a tool which can provide a high level of ventilatory support without the need for RSI or intubation. CPAP is approved for patients 18 years of age and older, with moderate to severe respiratory distress.

**Indications:**
1. Severe dyspnea/hypoxia secondary to CHF and Acute Cardiogenic Pulmonary Edema.
2. Severe dyspnea/hypoxia associated with COPD (asthma, bronchitis, emphysema), pneumonia.
3. Patient MUST be:
   a. Spontaneously breathing
   b. Is awake, oriented and able to cooperate
   c. Has ability to maintain an open airway (GCS >10)
   d. Has a systolic BP > 90 mm Hg

**Contraindications:**
1. Respiratory arrest
2. Agonal breathing
3. Patient is suspected of having a pneumothorax
4. Patient has a tracheostomy
5. Unconscious or severely impaired level of consciousness
6. Shock/Hypotension (BP < 90)
7. Penetrating chest trauma
8. Persistent nausea and vomiting
9. Facial anomalies/trauma
10. Active upper GI bleeding
11. History of recent gastric surgery

**Procedure:**
1. Make sure patient does not have a pneumothorax
2. Explain the procedure to the patient
3. Have suction equipment available and ready to use
4. Have advanced airway equipment available for any unexpected problem/deterioration
5. Place patient in a sitting position (fowlers or semi-fowlers)
6. Assess vital signs and SpO2 q 5 min
7. Attach heart monitor and pulse oximeter
8. If BP < 100 systolic, contact medical control prior to beginning CPAP
9. Frequently reassure your patient as they may become very anxious
10. Ensure adequate oxygen supply to ventilate device, Be sure oxygen is turned on
11. Place the mask over the mouth and nose (It may help relieve anxiety if you allow the patient to help hold the mask in place while you apply the retaining straps)
12. Secure Mask
13. Start CPAP at ambient pressure (‘O’ cmH₂O) or the lowest pressure setting available.
14. Instruct patient to breathe in through nose slowly and exhale through their mouth as long as possible
15. If Patient is having exacerbation of asthma, have in-line nebulized treatment attached and ready to use on the first breath.
16. Explain to patient that you will begin to slowly increase the pressure and to continue exhaling out against the pressure as long as possible before inhaling
17. Slowly titrate the pressure (adjust the flow meter until desired pressure is obtain.
   Flow of 12 – 14 L per minute is required to reach CPAP pressure of 8.5 – 10 cm of H₂O) to one of the following levels:
   a. CHF/ACPE 10 cm H₂O (some patients will improve with a slightly lower pressure, titrate to effect)
   b. All other SOB/Dyspnea ~5 cm H₂O
18. Check for air leaks and readjust mask/straps as needed
19. Monitor patient closely for improvement or deterioration
20. IF RESPIRATORY STATUS DETERIORATES, REMOVE CPAP MASK, CONSIDER BAG VALVE MASK VENTILATION AND/OR ENDOTRACHEAL INTUBATION
21. If patient tolerating CPAP, continue and monitor closely and transport to hospital with CPAP. Transfer the CPAP mask tubing to the hospital flow meter and maintain the same flow rate as you were providing.
22. Documentation should include:
   a. CPAP level (10cm H₂O or 5 cm H₂O)
   b. FiO₂ (100%)
   c. SpO₂ q 5 minutes
   d. Vital signs q 5 minutes
   e. Response to treatment
   f. Any adverse reactions

Special Notes

1. Watch patient for gastric distention which may lead to vomiting
2. Use nitroglycerine tablets to avoid nitroglycerine spray from being dispersed on patient/EMS crew OR use spray before applying CPAP equipment
3. Do not remove CPAP until hospital therapy is ready to be placed on patient
4. Most patients will improve in 5 – 10 minutes
5. Periodically monitor the airway pressure gauge. The pressure should remain nearly constant (variation of +/- 2 cm H₂O or less) while the patient is breathing. As the
patient breathes, larger changes in pressure show that CPAP is not being effectively delivered.

6. Excessive pressure variation during CPAP treatment can cause fatigue and respiratory failure.

7. Potential side effects of continuous positive airway pressure may include:
   a. Fluid retention
   b. Pneumothorax
   c. Decrease cardiac output (hypotension)
   d. Gastric distention

4.12. Cyanokit (Hydroxocobalamin for injection)
Level of training: EMT-P

Indication
Cyanokit is indicated for the treatment of known or suspected cyanide poisoning.

Identifying Patients with Cyanide Poisoning

Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide-containing compounds, including smoke from closed-space fires. Sources of cyanide poisoning include hydrogen cyanide and its salts, cyanogenic plants, aliphatic nitriles, and prolonged exposure to sodium nitroprusside.

The presence and extent of cyanide poisoning are often initially unknown. There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of cyanide poisoning is high, Cyanokit should be administered without delay.

<table>
<thead>
<tr>
<th>Signs</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altered Mental Status (e.g., confusion, disorientation)</td>
<td>Headache</td>
</tr>
<tr>
<td>Seizures or Coma</td>
<td>Confusion</td>
</tr>
<tr>
<td>Mydriasis</td>
<td>Dyspnea</td>
</tr>
<tr>
<td>Tachypnea / Hyperpnea (early)</td>
<td>Chest</td>
</tr>
<tr>
<td>Bradypnea / Apnea (late)</td>
<td>tightness</td>
</tr>
<tr>
<td>Hypertension (early) / Hypotension (late)</td>
<td>Nausea</td>
</tr>
<tr>
<td>Cardiovascular collapse</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td></td>
</tr>
<tr>
<td>Plasma lactate concentration ≥ 8 mmol/L</td>
<td></td>
</tr>
</tbody>
</table>

In some settings, panic symptoms including tachypnea and vomiting may mimic early cyanide poisoning signs. The presence of altered mental status (e.g., confusion and disorientation) and/or mydriasis is suggestive of true cyanide poisoning although these signs can occur with other toxic exposures as well.
The expert advice of a regional poison control center may be obtained by calling 1-800-222-1222.

**Smoke Inhalation**

Not all smoke inhalation victims will have cyanide poisoning and may present with burns, trauma, and exposure to other toxic substances making a diagnosis of cyanide poisoning particularly difficult. Prior to administration of Cyanokit, smoke-inhalation victims should be assessed for the following:

- Exposure to fire or smoke in an enclosed area
- Presence of soot around the mouth, nose or oropharynx
- Altered mental status

Although hypotension is highly suggestive of cyanide poisoning, it is only present in a small percentage of cyanide-poisoned smoke inhalation victims. Also indicative of cyanide poisoning is a plasma lactate concentration ≥ 10 mmol/L (a value higher than that typically listed in the table of signs and symptoms of isolated cyanide poisoning because carbon monoxide associated with smoke inhalation also contributes to lactic acidemia). If cyanide poisoning is suspected, treatment should not be delayed to obtain a plasma lactate concentration.

**Use with Other Cyanide Antidotes**

Caution should be exercised when administering other cyanide antidotes simultaneously with Cyanokit, as the safety of co-administration has not been established. If a decision is made to administer another cyanide antidote with Cyanokit, these drugs should not be administered concurrently in the same intravenous line. [See DOSEAGE AND ADMINISTRATION.]

**DOSEAGE AND ADMINISTRATION**

1. Start a dedicated IV line
2. Reconstitution: Add 100 mL of 0.9% sodium chloride injection to the vial using a transfer spike. Fill to the line (with the vial in an upright position).
3. Mix: Rock or rotate the vial for 30 seconds to mix the solution. Do not shake.
4. **For 5 g vial:**
   - Infuse using vented tubing, over 15 minutes
5. **For 2.5 g per vial (two vial set):**
   - Infuse the first vial: Use vented IV tubing to hang the bag and infuse over 7.5 minutes.
Infuse the second vial: Repeat Steps 1 and 2 before the second infusion. Use vented IV tubing to hang the bag and infuse over 7.5 minutes.

Comprehensive treatment of acute cyanide intoxication requires support of vital functions. Cyanokit should be administered in conjunction with appropriate airway, ventilatory and circulatory support.

**Recommended Dosing**

The starting dose of hydroxocobalamin for adults is 5 g (i.e., both 2.5g vials) administered as an intravenous infusion over 15 minutes (approximately 15 mL/min), i.e., 7.5 minutes/vial. Depending upon the severity of the poisoning and the clinical response, a second dose of 5 g may be administered by intravenous infusion for a total dose of 10 g. The rate of infusion for the second dose may range from 15 minutes (for patients in extremis) to two hours, as clinically indicated.

**Preparation of Solution for Infusion**

Each 2.5 g vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of diluent (not provided with Cyanokit) using the supplied sterile transfer spike. The recommended diluent is 0.9% Sodium Chloride injection (0.9% NaCl). Lactated Ringers injection and 5% Dextrose injection (D5W) have also been found to be compatible with hydroxocobalamin and may be used if 0.9% NaCl is not readily available. The line on each vial label represents 100 mL volume of diluent. Following the addition of diluent to the lyophilized powder, each vial should be repeatedly inverted or rocked, not shaken, for at least 30 seconds prior to infusion.

Hydroxocobalamin solutions should be visually inspected for particulate matter and color prior to administration. If the reconstituted solution is not dark red or if particulate matter is seen after the solution has been appropriately mixed, the solution should be discarded.

**Incompatibility Information**

Physical incompatibility (particle formation) and chemical incompatibility were observed with the mixture of hydroxocobalamin in solution with selected drugs that are frequently used in resuscitation efforts. Hydroxocobalamin is also chemically incompatible with sodium thiosulfate and sodium nitrite and has been reported to be incompatible with ascorbic acid. Therefore, these and other drugs should not be administered simultaneously through the same intravenous line as hydroxocobalamin.
Simultaneous administration of hydroxocobalamin and blood products (whole blood, packed red cells, platelet concentrate and/or fresh frozen plasma) through the same intravenous line is not recommended. However, blood products and hydroxocobalamin can be administered simultaneously using separate intravenous lines (preferably on contralateral extremities, if peripheral lines are being used).

**Storage of Reconstituted Drug Product**

Once reconstituted, hydroxocobalamin is stable for up to 6 hours at temperatures not exceeding 40°C (104°F). Do not freeze. Any reconstituted product not used by 6 hours should be discarded.

**HOW SUPPLIED**

**Dosage Forms and Strengths**

Cyanokit (hydroxocobalamin for injection) 5 g for intravenous infusion consists of one 5 g vial or 2 vials, each containing 2.5 g lyophilized hydroxocobalamin dark red crystalline powder for injection.

For 2.5 g vials: After reconstitution, each vial contains hydroxocobalamin for injection, 25 mg/mL. Administration of both vials constitutes a single dose. [See **Storage and Handling for full kit description**.]

**Storage**

*Lyophilized form:* Store at 25°C (77°F); excursions permitted to 1530°C (59 to 86°F) [see **USP Controlled Room Temperature**].

Cyanokit may be exposed during short periods to the temperature variations of usual transport (15 days submitted to temperatures ranging from 5 to 40°C (41 to 104°F), transport in the desert (4 days submitted to temperatures ranging from 5 to 60°C (41 to 140°F)) and freezing/defrosting cycles (15 days submitted to temperatures ranging from -20 to 40°C (-4 to 104°F)).

*Reconstituted solution:* Store up to 6 hours at a temperature not exceeding 40°C (104°F). Do not freeze. Discard any unused portion after 6 hours.

Manufactured by: Merck Santé s.a.s., Semoy, France. Distributed by Meridian Medical Technologies™, Inc. Columbia, MD 21046 A wholly-owned subsidiary of King Pharmaceuticals, Inc. 1-800-776-3637. 850-1

*Last reviewed on RxList: 11/12/2010*
4.13.1. Twelve (12) Lead Application
Level: EMT-P or higher

Purpose: Early detection and notification of acute myocardial infarction

Indications:
1. Chest pain or anginal equivalents (dyspnea, syncope, near syncope, weakness, DKA, diaphoresis disproportionate to the environment, palpitations, etc.)
2. Electrical injuries
3. Suspected stroke
4. Syncope
5. Altered mental status, unknown cause
6. Pre and Post cardioversion of stable patients
7. Post cardioversion of unstable patients (including post arrest)
8. Suspected electrolyte disturbances
9. Overdose (unknown or suspected anti-depressant)
10. Blunt chest trauma (only after transport or more urgent care)
11. Dysrhythmia (to aid in the cause and diagnosis of the dysrhythmia)
12. Respiratory failure
13. Ventricular failure (CHF)

Procedure:
1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform 12 lead EKG.
4. Prepare EKG monitor and connect patient cable with electrodes.
5. Enter required patient information into the monitor.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA---right arm
   - LA---left arm
   - RL---right leg
   - LL---left leg
   - V1---4th intercostal space at right of sternal border
   - V2---4th intercostal space at left of sternal border
   - V3---directly between V2 and V4
   - V4---5th intercostal space at midclavicular line
   - V5---level of V4 at left anterior axillary line
   - V6---level of V5 at the left mid-axillary line
8. Alternatively, apply Unilead electrodes.
9. Instruct patient to remain still.
10. Press the appropriate button to acquire the 12 lead EKG.
11. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 lead acquisition will be interrupted or may yield base line artifact until the noise is removed.
12. Once acquired, transmit to the hospital if possible, otherwise when report is called, report the findings on the EKG.
13. Monitor the patient while continuing with the treatment protocol.
14. Document the procedure, time, and results with the medical record.
15. Leave a copy of the EKG and run report at the hospital and turn a copy of the EKG with your report into the office.

<table>
<thead>
<tr>
<th>I Lateral</th>
<th>aVR</th>
<th>V1 Septal</th>
<th>V4 Anterior</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Inferior</td>
<td>aVL Lateral</td>
<td>V2 Septal</td>
<td>V5 Lateral</td>
</tr>
<tr>
<td>III Inferior</td>
<td>aVF Inferior</td>
<td>V3 Anterior</td>
<td>V6 Lateral</td>
</tr>
</tbody>
</table>

4.13.2. External Pacing
Level: EMT-P

Indications: External pacing can be used in the following settings:

1. **Symptomatic bradycardia with pulse:** In patients with symptoms (significant hypotension, altered mentation, chest pain) due to any form of bradycardia, treatment should include supplemental oxygen, ventilatory support as needed, and establishment of IV access and placement of pacer on the patient. Pacing should be started if the patient does not respond to atropine, IV access cannot be obtained, if symptoms are so severe that waiting for a response to atropine would be dangerous or in lieu of atropine. Sedation should be given to patients who are aware of their situation before pacing is started. Sedation may include **Midazolam (Versed)** 1-2 mg IV or **Diazepam (Valium)** 5-10mg IV. If patient experiencing pain, you can administer **Fentanyl** 25 – 50 mcg IV slow. Repeat q 5 minutes up to 100 mcg then contact med control for additional dosing. In patients with severe bradycardia but no symptoms, the external pacer should be put in place, but not turned on unless the patient’s status deteriorates.

2. The treatment of hemodynamically compromised patients in settings where cardiac output is compromised due to the complete failure of cardiac rhythm or to an insufficient rate of the patient’s intrinsic pacemaker;
   a. Bradycardia. (ECG other than second-degree Mobitz type II or third-degree AV block)
   b. Second-degree Mobitz type II and third-degree AV block with a systolic BP of < 80 mm Hg (or 80 – 100 mm Hg with shock-like signs and symptoms)

3. Pediatric patients (40kg or less) with profound symptomatic bradycardia unresponsive to optimal airway management, oxygenation, epinephrine, and atropine.

Contraindications:
1. Open wounds or burns to chest wall
2. Wet environment

Adverse Effects/Complications:
1. Patient may experience mild to moderate discomfort
2. Musculoskeletal twitching in upper torso may occur during pacing, this is normal

Precautions:
1. When properly applied, chest compressions can be performed directly over the insulated electrodes while the pacer is operating.
External Pacing Procedure:

**Operation:** Several different external pacers are available. While control panels may look different, they have several features in common. The pace switch should be kept in the off position until all connections and settings are completed.

THE FOLLOWING STEPS ARE NEEDED TO INITIATE PACING:

1. **Set pacer mode to demand or fixed rate pacing:** Most prehospital pacers (Medtronic LP 10, LP 11, LP 12, Zoll; HP) are preset in the demand mode. Demand pacers are able to monitor the patient’s rhythm (either with their own monitors or attached to a defibrillator monitor), sensing each beat and firing only when the patient’s heart rate is too slow. Most demand pacers have an adjustment for sensitivity, which sets a threshold amount of electrical activity needed from the patient’s heart to be recognized as a beat. There may be some pacers that only have the fixed rate (“asynchronous”) mode, where the pacer will fire repeatedly at the selected rate, regardless of the patient’s own rhythm. However, fixed rate pacers are usually not used prehospital.

2. Evaluate the patient:
   - Medication patches: Remove the patches.
   - Patient located on wet surface: Relocate the patient to a dry area.
   - Patient with fluid on chest or back area: Dry with a towel.

3. Attach monitoring electrodes and cables. This is needed for pacers that set demand mode.

4. Attach pacing electrodes and cables. One electrode is placed anteriorly over the heart, and the other is placed posteriorly. Alternately one is placed on the anterior right chest (sternum) and the other is placed on the lateral left chest (apex). Record a strip of the patient’s rhythm prior to initiating pacing.

5. Set desired heart rate: usually 70 beats per minute.

6. Set desired energy level: Start with 40 mA.

7. To initiate pacing, turn on the pacing switch and look for pacer spikes on the monitor. If not present, recheck patient’s rhythm (may be fast enough to inhibit pacer) and equipment.

To Assess the Effectiveness of the Pacer:

1. **Check for pulse.** The pacer will make chest and back muscles twitch at the same rate as the heart, so palpation of the left carotid or left femoral artery can be misleading. Check for a right carotid, right femoral or either brachial pulse.

2. **Pulse present with pacer spikes:** Measure BP. If adequate, transport the patient and monitor frequently. If BP is inadequate, consider increasing the pacer rate to 80 beats per minute. If still hypotensive, consider a fluid challenge and/or dopamine. Record a strip of the pacer rhythm for documentation.
3. No pulse with pacer spikes: Check EKG for “capture”. A T-wave should follow each pacer spike if the pacer is stimulating the heart muscle.
   a. **Capture present but no pulse with pacer spike**: Continue treatment as if Pulseless Electrical Activity (PEA) - intravenous fluids and/or dopamine. Increasing the pacer’s energy setting won’t help.
   b. **No capture present**: Increase the pacer’s energy setting stepwise to maximize, checking for a pulse with each change. If still no pulse, no capture, then recheck all settings, cables, battery charge, and electrode placement. Recheck the patient’s own rhythm – it may be ventricular fibrillation which must be immediately defibrillated.
   c. Continue all other supportive measures (CPR, oxygen, ventilation, drugs, etc.)

**Note:** Conscious patients may be alarmed by the muscle twitching and will need reassurance. Patients who complain of intolerable pain from the pacer will require analgesics. To minimize the pain, use the lowest energy setting that will produce a pulse. External pacers are very safe to use. There is no risk of electrical shock from touching the patient or from performing other procedures during pacing.
4.13.3. Cardioversion
Level: EMT-P

**Purpose:** Electrical cardioversion has been the treatment of choice for unstable tachycardia and is gaining emphasis as the treatment of choice for stable tachycardia.

**Indications:**
1. The treatment of unstable tachycardia due to cardiac conduction disturbances with serious signs and symptoms. These may include chest pain, shortness heart failure and pulmonary edema may also cause unstable tachycardia but are better treated by correcting the underlying cause.

**Contraindications:** None in pre-hospital emergent setting

**Complications:** May result in ventricular fibrillation

**Precautions:** If calculated pediatric dose is less than the lowest setting, use the lowest setting.

**Procedure:**

**Adult:**
1. Monitor, O₂, IV access in place
2. Must have monitoring electrodes in place in order to synchronize
3. **TURN ON SYNCH BUTTON**
4. Suction and Airway/ Intubation equipment at patient bedside
5. Pre-medicate if possible: **Midazolam (Versed)** 1-2 mg IVP or **Diazepam (Valium)** 5 – 10 mg IV or **Morphine** 2 - 4 mg IV or Fentanyl 25 – 50 mcg
6. Assure that R wave is being detected by synchronizer circuit: Choose lead II for tall upright R waves, adjust gain if needed
7. Hands Free: Smooth pad with good contact
8. Monitor shows Atrial Flutter: Start with 50 J DC cardioversion
9. Monitor shows Polymorphic VT: Start with 200 J DC cardioversion
10. All other unstable tachycardia: start with 100 J DC cardioversion
11. “Clear” patient- all hands off patient
12. Hold discharge button down until it fires
13. If patient converts: Go to appropriate treatment algorithm. If any indication of continued ventricular irritability (PVCs or runs of V-tach) give:
   a. **Amiodarone** 150 mg IV/IO over 10 minutes, then 1mg/min IV/IO x 6 hrs.
      If Amiodarone is unavailable, give;
   b. Use **Lidocaine bolus** 1.5 mg/kg initial bolus, followed by a **Lidocaine drip** at an appropriate rate and ½ initial bolus in 15 minutes
14. No change in rhythm: Increase power if needed and re-apply the Synch circuit
Pediatric

1. Adult paddles/pads A/P or conventional (12 months or over 15 kg.)
2. Pediatric paddles/Pads less than 15 kg
3. 0.5 J/kg initial
4. 1 J/kg repeat shocks to max 360 J

1. Remove the patient from the contaminated area.
2. Attempt to identify the chemical and notify the receiving facility.
3. Remove the patient’s clothing (if necessary) and decontaminate with copious amounts of water.
4. Remove contact lenses (if present) to ensure that chemicals are not trapped under the lenses.
5. To ensure adequate rinsing behind the eyelid, hold the lid with your thumb and index finger, as it is normal for the eye to close when splashed.
6. Flush the eye away from the nose to avoid contamination of the other eye for a minimum of 20 minutes. Do not delay transport to complete the irrigation process.
7. Use any of these methods:
   - Flush using a faucet spray from a sink or shower.
   - Flush using a bottle of normal saline or sterile water.
   - Flush using a basin filled with water.
   - Flush using nasal cannula tubing.

4.14.1. Morgan Therapeutic Lens – if available and prior training

Level of training: EMT-(B-I-A), EMT-P

Purpose:
The Morgan Therapeutic Lens is indicated for flushing of the eye to remove contaminates (e.g. chemicals). It should not be used for patients with penetrating eye trauma or in cases where foreign material may be imbedded in the eye (e.g. broken glass, sand, etc.).

Procedure:
1. Remove contact lenses.
2. Instill topical local anesthetic (Tetracaine HCI 0.5% Eye Drops—one drop in each eye) to the affected eye(s). Lavage with Sodium Chloride and set for high continuous flow.
3. Have the patient look down, insert edge of the lens under the upper lid. Have the patient look up, retract the lower lid.
4. Release lower lid over the lens and continue flow. Tape tube and adaptor to patient's forehead to prevent accidental lens removal. Absorb outflow with towels.

4.15. Football Helmet/Other Helmet-Removal /Face Mask Removal/
Level of training:  EMT-(B-I-A), EMT-P

**Purpose:** A patient with a suspected spinal injury based upon a physical assessment and/or mechanism of injury, who is wearing a helmet.

**Football Helmets:** Indications for football helmet removal
- When a patient is wearing a helmet and not the shoulder pads.
- In the presence of head and or facial trauma.
- Patients requiring advanced airway management when removal of the facemask is not sufficient.
- When the helmet is loose on the patient’s head.
- In the presence of cardiopulmonary arrest. (The shoulder pads must also be removed.)

When the helmet and shoulder pads are both on, the spine is kept in neutral alignment. If you can access the airway by removing the face mask, leave the helmet and shoulder pads on as this can be used to help stabilize the C-spine.

**Note:**
If the patient is wearing only the helmet or the shoulder pads, neutral alignment must be maintained. Either remove the other piece of equipment or pad under the missing piece.

**All Other Helmets**
Due to the absence of offsetting padding as in football shoulder pads, all other helmets must be removed in order to maintain spinal alignment. These include but are not limited to motorcycle helmets, bicycle helmets, roller blading helmets and skiing helmets.

**Procedure:**

**4.15.1. To remove Face Shield on Football Helmet:**
1. Identify if the face shield is attached to the helmet by screws or quick release pins. If the face shield has a plastic loop that is screwed in, quickly cut the plastic loop holding face shield to helmet (unscrew the lateral plastic brackets only if nothing available to cut the plastic loop). You can then lift up the face shield using the upper/anterior brackets (at top of face shield) as hinge. Cut the upper plastic loops as needed and if needed to remove the face shield (again, unscrew the top brackets if nothing available to cut the plastic loop or use bolt cutters if available). The Inter-Association Task Force recommends that all loop-straps of the face mask be cut and that the face mask be removed from the helmet, rather than being retracted.
2. If face shield is attached to helmet by quick release pins, simply apply pressure in the center of the quick release pin with firm pointed object. If the face shield is held exclusively by the quick release pins, simply remove the face shield after pressing each release pin in the center.

3. If Face Shield is held by combination of quick release pins on the lateral side and screwed in brackets on the anterior/top (above the forehead), push the center of both the quick release pins on the side and life the face shield using the forehead brackets as a hinge.

4.15.2. To Remove Football helmet:

1. One person should stabilize the head, neck, and helmet (apply manual in-line stabilization) while another person cuts the chin strap

2. Accessible internal helmet padding, such as cheek pads, should be removed, and air padding should be deflated before removal of the helmet, while a second assistant manually stabilizes the chin and back of the neck, in a cephalad direction, making sure to maintain the athlete’s position.
   a. The pads are removed through the insertion of a tongue depressor or a similar stiff, flat-bladed object between the snaps and helmet shell to pry the cheek pads away from their snap attachment.
   b. If an air cell--padding system is present, deflate the air inflation system by releasing the air at the external port with an inflation needle or large-gauge hypodermic needle.

3. The helmet should slide off the occiput with slight forward rotation of the helmet. In the event the helmet does not move, slight traction can be applied to the helmet which can then be gently maneuvered anteriorly and posteriorly, although the head/neck unit must not be allowed to move. **The helmet should not be spread apart by the ear holes as this maneuver only serves to tighten the helmet on the forehead and occiput region.**

4. Transfer manual in-line stabilization to the second rescuer by placing one hand on the patient’s mandible (thumb on one side and fingers on the other side) and the other hand under the patient’s head at the occipital area.

5. Laterally move the helmet to clear the patient’s ears.

6. Tilt the helmet backward to raise it over the patient’s nose and remove it.

7. Apply a cervical collar.

8. If the patient has a chest pad on, it is important to apply padding under the head so the cervical spine is maintained in a neutral position on the spinal board.

9. Secure the patient to a long spine board.

NOTE: In general, any athletic helmet should be removed on the field only under any of the following circumstances:

- If after a reasonable period of time, the face mask cannot be removed to gain access to the airway
- If the design of the helmet and chin strap is such that even after removal of the face mask, the airway cannot be controlled or ventilation provided
- If the helmet and chin straps do not hold the head securely such that immobilization of the helmet does not also immobilize the head
- If the helmet prevents immobilization for transport in an appropriate position

4.15.2.1 To remove the shoulder pads:

When to Remove the Shoulder Pads. The padded plastic shell of a football player’s shoulder pads is of sufficient thickness that the pads elevate the torso of the supine player to the same height as the helmeted head. Spinal motion restriction must be maintained while the helmet is removed; therefore, during helmet removal, the shoulder pads must be removed simultaneously. The helmet/shoulder pad unit should be thought of as an all-or-none scenario with regard to spinal motion restriction. Studies have shown excess movement in the cervical spine when helmet or shoulder pads are removed alone.

Possible situations in which removal of shoulder pads would be necessary before transport to an emergency facility may include, but are not limited to, the following situations:

1. The helmet is removed
2. Multiple injuries require full access to shoulder area
3. Ill-fitting shoulder pads caused the inability to maintain spinal motion restriction

How to Remove the Shoulder Pads. The Inter-Association Task Force recommends that shoulder pads be removed only in conjunction with the athlete’s helmet and only when removal is warranted (see When to Remove the Shoulder Pads). Whenever the decision is made to remove the shoulder pads, it is favorable to follow the following steps:

1. Cut jersey and all other shirts from neck to waist and from the midline to the end of each arm sleeve.
2. Cut all straps used to secure the shoulder pads to the torso. Attempts to unbuckle or unsnap any fasteners should be avoided due to the potential for unnecessary movement.
3. Cut all straps used to secure the shoulder pads (and extenders) to the arms.
4. Cut laces or straps over the sternum. A consistent manufactured characteristic of shoulder pads is the mechanism to attach the two halves of the shoulder pad unit on the anterior aspect. This lace or strap system allows for quick and efficient access to the anterior portion of the chest.
5. Cut and/or remove any and all accessories such as neck rolls or collars, so they can be removed simultaneously with the shoulder pads. The shoulder pads can now be released with full access to chest, face, neck, and arms. The posterior portion of the shoulder pads helps to maintain spinal alignment when the helmet and shoulder pads are in place.

6. A primary responder maintains cervical stabilization in a cephalad direction by placing his or her forearms on the athlete’s chest while holding the maxilla and occiput. This is a skilled position that requires personnel who are practiced in this technique.

7. With responders at each side of the patient, their hands are placed directly against the skin in the thoracic region of the back.

8. Additional support is placed at strategic locations down the body as deemed appropriate in consideration of the size of the patient.

9. While the patient is lifted, the individual who was in charge of head/shoulder stabilization should remove the helmet and then immediately remove the shoulder pads by spreading apart the front panels and pulling them around the head.

10. All shirts, jerseys, neck rolls, extenders, and so on should be removed at this time.

11. The patient is lowered.

### 4.15.3. To remove Motorcycle Helmet:

1. The first rescuer kneels above the patient’s head. With the palms pressed on the sides of the helmet and his/her fingertips curled over its lower margin, he/she immobilizes the helmeted head in as close to a neutral in-line position as the helmet allows. The first rescuer performs manual immobilization of the head and neck.

2. The second rescuer kneels alongside the patient’s torso and opens (or removes) the face shield, checks the airway and breathing, and undoes (or cuts, if necessary) the chinstrap.

3. The second rescuer places one hand so that the mandible is grasped between the thumb at the angle of the mandible on one side and the first two fingers at the angle on the other side. He/she then places his/her other hand under the neck on the occiput of the skull and takes over the in-line immobilization of the head and neck.

4. The first rescuer now releases his/her hold on the sides of the helmet. He/she pulls the sides of the helmet slightly apart, away from the sides of the head. As the helmet is pulled apart from the sides, the helmet is rotated so that the lower end of the face piece rotates toward the first rescuer and is elevated, clearing the patient’s nose.

5. The first rescuer then carefully pulls the helmet in a straight line off the patient’s head, stopping before he/she pulls the helmet completely out from under the patient’s head or before the curved back of the helmet starts to elevate the patient’s occiput to flexion.

6. The second rescuer maintains head and neck immobilization while the first rescuer begins to remove the helmet.
7. Each time the first rescuer stops the movement of the helmet, he/she again takes over the in-line immobilization by squeezing the sides of the helmet against the head. The second rescuer now moves his/her hand, which is under the head superiorly, until it is further under the head and again is touching the inferior margin of the helmet.

8. The second rescuer’s lower hand will support the head and keep it from dropping when the helmet is finally withdrawn. His/her upper hand should be moved so that the thumb and first fingers grasp the maxilla at each side of the nose, in the maxillary notch. Once his/her hands are securely in place, he/she retakes the manual in-line immobilization.

9. The first rescuer is now ready to remove the helmet completely. The helmet is rotated about 30 degrees following the curve of the head. This causes the posterior lower margin of the helmet to point caudally rather than anteriorly. Now the helmet can be safely removed in a straight line toward the first rescuer’s abdomen.

10. Once the helmet has been fully removed, the first rescuer again takes hold of the head and provides manual in-line immobilization from that position. The assessment is continued and the second rescuer applies the cervical collar.

NOTE: Two key elements are involved in removing a helmet.
   a. While one rescuer provides immobilization, the other moves. Both rescuers never move their hands at the same time.
   b. The helmet must be rotated in different directions: to first clear the nose, and then the back of the head.

4.15.4. To remove other helmets:

Helmets that should be removed include:
1. Motorcycle helmets
2. Bicycle helmets
3. Skateboard/Ski helmets
4. Roller blading helmets
5. Lacrosse helmets

Steps for Helmet Removal

1. Stabilize the helmet in the neutral in-line position and have a second individual remove the chin strap.
2. The individual that removed the chin strap will then support the occiput and mandible while the helmet is gently slipped up and forward.
3. Once the helmet is removed, standard c-spine control will take place and an appropriate sized cervical collar applied.

Note: If the helmet is too snug or you encounter significant resistance during the removal attempt, then leave the helmet in place and pad the body. Make sure you can access the airway.
Always check the helmet for damage to help assess mechanism of injury. Transport the helmet with the patient if possible.

Motorcycle Helmet Removal
4.16. **Glucometer**

*Level: EMT-(B-I-A), EMT-P,*

**Purpose:** The glucometer is designed to be used to test capillary blood for the level of glucose. This information can be used to determine if hyper or hypoglycemia is present. Several types of glucometers are available. The paramedic should refer to the user’s manual for his/her specific type for further information.

**Indications:**
1. Any patient presenting with an altered mental status
2. Diabetic related emergencies
3. Unresponsive (unknown etiology)
4. Seizure
5. Alcohol related emergencies

**Procedure:**
1. Gather and assemble necessary equipment
2. Open sterile 4 X 4 for use
3. Turn on CBG monitor and pre-load with test strip
4. Open alcohol prep
5. Clean the side of the tip of one finger with the alcohol prep
6. Wipe the same area with the sterile 4 x 4 to remove excess alcohol. Allow the remainder to dry before proceeding. (Failure to do this can dilute blood and render a low reading)
7. Place the extremity being used lower than the level of the heart to allow for venous pooling
8. Apply pressure to the prepared site with the lancet device to assure a deep enough penetration and trigger the device to activate.
9. Place all sharps in the appropriate container
10. Wipe the area again with the sterile 4 x 4 and allow a drop of blood to form
11. Place the test strip in close proximity to the blood droplet to allow the blood to be absorbed by the strip. Saturate the entire area on the strip
12. Place a pressure bandage on the puncture site
13. Record the results.

**Note:** Alternatively, blood sample can be taken from the IV needle after starting an IV. There is usually enough blood left in the needle after an IV stick to use for glucose reading. Simply hold the needle upright over the strip to allow gravity to draw the blood drop down onto the strip.
4.17. **LVAD EMS Field Guide**
4.18. Medication Administration

4.18.1. Auto Injectors

4.18.1.1. AtroPen

Mild symptoms of nerve agent (nerve gas) or insecticide exposure appear in situations where exposure is known or suspected: blurred vision, miosis, excessive unexplained teary eyes, excessive unexplained runny nose, increased salivation such as sudden unexplained excessive drooling, chest tightness or difficulty breathing, tremors throughout the body or muscular twitching, nausea and/or vomiting, unexplained wheezing or coughing, acute onset of stomach cramps, tachycardia, or bradycardia. One AtroPen® is recommended if 2 or more of the above are identified.

Severe symptoms include: strange or confused behavior, severe difficulty breathing or severe secretions from the lungs/airway, severe muscular twitching and general weakness, involuntary urination and defecation (feces), convulsions, or unconsciousness. If a victim is encountered who is unconscious or has any of the severe symptoms, immediately administer 3 AtroPen® injections into the victim's midlateral thigh in rapid succession using the appropriate weight-based AtroPen dose.

1. Check the expiration date.
2. Remove the auto-injector’s safety cap.
3. Grasp the unit like a pen and position the tip of the AtroPen® on the outer thigh mid-way between waist and knee.
4. Push the auto-injector firmly against the site until the injector is activated.
5. Hold the auto-injector in place until the medication is fully injected (minimum of 10 seconds).
6. Record the time.
7. Dispose of the auto-injector in a biohazard puncture-resistant container.
8. Reassess the patient.

4.18.1.2. EpiPen auto-injector

Level: EMT-(B-I-A), EMT-P,

Indications: The EMT (or Paramedic) may administer prescribed Epinephrine via an auto injector for patients who are exhibiting signs of respiratory distress associated with allergic reaction. These signs include: dyspnea, hives, flushing of the skin, wheezing, edema, and possible unstable vital signs.

Procedure:
1. Initial patient assessment protocol 2.1.1
2. Assure auto-injector is prescribed for patient (Epi-Pen for adult patient and Epi-Pen Jr. for pediatric patient), check expiration date and cloudiness or discoloration if possible.
3. If patient is exhibiting signs of moderate to severe allergic reaction as described above, assist patient in administering Epinephrine via auto-injector.
4. Remove auto-injector safety cap
5. Grasp the unit like a pen and position the tip of the EpiPen on the outer thigh mid-way between waist and knee.
6. Select appropriate injection site.
   a. Thigh- lateral portion of thigh, midway between waist and knee
   b. Shoulder- fleshy portion of upper arm
7. Push auto-injector firmly against site until injector activates.
8. Hold in place until medication is fully injected (minimum of 10 seconds).
9. Record time
10. Dispose of injector in biohazard container
11. Reassess patient

4.18.1.3. DuoDote Auto-Injector

The DuoDote contains 2.1mg of atropine and 600 mg of pralidoxime chloride for use in nerve agent & insecticide poisoning.

Before injecting...
1. Tear open the plastic pouch at any of the notches. Remove the DuoDote auto-injector from its protective pouch.
2. Place the DuoDote in your dominant hand. Firmly grasp the center of the DuoDote with the green tip (needle end) pointing down.
3. With your other hand, remove the gray safety release. The DuoDote auto-injector is now ready to be administered.

**Select Site & Inject**
4. The injection site is the mid-outer thigh area. The DuoDote can inject through clothing. However, make sure pockets at the injection site are empty.
5. Swing and firmly push the green tip against the mid-outer thigh; it should be at a 90 degree angle to the thigh. Continue to firmly push until you feel the DuoDote trigger and begin injecting the antidote. **IMPORTANT:** After the auto-injector triggers, hold the DuoDote in place against the injection site for approximately 10 seconds.

**After Injecting**
6. Remove the DuoDote from the thigh and look at the green tip. If the needle is visible, the drug has been administered. If the needle is not visible, check to be sure the grey safety release has been removed and repeat the previous steps beginning with Step 4, but push harder in Step 5.
7. After the drug has been administered, dispose of the unit in a biohazard puncture-resistant container. If biohazard container is not available push the needle against a hard surface to bend the needle back against the auto-injector.
8. Reassess the patient, immediately move yourself and the patient away from the contaminated area and seek definitive care for the patient.
4.18.1.4. MARK I Auto-Injector

**Level:** EMT-(B-I-A), EMT-P  
**Indications:** The Mark I kit (NAAK) and DuoDote may be administered by the EMT or Paramedic who have had adequate training in the on-site recognition and treatment of nerve agent exposure. Some of the classic symptoms of nerve agent exposure include:

- Unexplained runny nose
- Tightness in chest/difficulty breathing
- Pinpoint pupils of the eye resulting in blurred vision
- Drooling, excessive sweating
- Nausea, vomiting and abdominal cramps
- Involuntary urination and defecation
- Jerking, twitching and staggering
- Headache, drowsiness, coma convulsions
- Respiratory arrest

Specific dosage and indications are found in the Hazardous Material Exposure Protocols.

**Contraindications:**  
Mark I auto-injector or DuoDote should not be used for pediatric patients less than 8 years of age.

**Procedure: Mark I**

When a first responder arrives on scene potentially contaminated with nerve agents, he/she must don a protective mask. If symptoms of nerve agent exposure manifest:

1. Remove Mark I kit from protective pouch.
2. Hold unit by plastic clip
3. Remove AtroPen from slot number 1 of the plastic clip. The yellow safety cap will remain in the clip and the AtroPen will now be armed. DO NOT hold unit by green tip. The needle ejects from the green tip.
4. Grasp the unit and position the green tip of the AtroPen on victim’s outer thigh.
5. Push firmly until auto-injector fires.
6. Hold in place for 10 seconds to ensure Atropine has been properly delivered.
7. Remove 2-PAM C1 ComboPen from slot number 2 of the plastic clip. The gray safety cap will remain in the clip and the ComboPen will now be armed. DO NOT hold the unit by the black tip. The needle ejects from the black tip.
8. Grasp the unit and position the black tip of the ComboPen on victim’s outer thigh.
10. Hold in place for 10 seconds to ensure Pralidoxime Chloride has been properly delivered.
11. If nerve agent symptoms are still present after 10 minutes, repeat injections. If symptoms still exist after and additional 10 minutes, repeat injections for a third time. If after the third set of injections, symptoms remain, do not give any more antidotes but seek medical help.
4.18.1.5. CANA Kit AUTO-INJECTOR KIT

Level of training: EMT-P (EMT-B on self or partner, not patient)

Purpose: Convulsant Antidote for Nerve Agent (CANA): The CANA consists of a single auto injector containing 10 mg of diazepam. Used to control convulsions and prevent brain and cardiac damage following severe exposure to nerve agents (and similar toxins). Often used in conjunction with NAPP and MARK I Kit. CANA is PDA approved.

The CANA Kit is specifically designed for use on the battlefield by both medical and non-medical personnel. As a result of its durability, simplicity, and similarity to other civilian medical auto-injectors (i.e. The EPI-PEN) the CANA KIT is being deployed into civilian medical arenas as well. The CANA KIT is particularly useful during "dirty" or "hot zone" medical care because no IV is needed.

The CANA kit may be available to EMS Personnel and other responders through EMS, civil defense authorities, FEMA sponsored groups, the military, or other agencies in a time of crisis or in response to increased terrorism threat assessments.

Indications:
1. CANA is safe and effective for use as an adjunct to control convulsions following severe exposure to nerve agents.
2. The use of the CANA Kit is especially desirable in hazardous environments, as they can be given through clothes and NBC Suits.

Doses:
Adults:
Administer a single CANA kit IM as needed.

Children:
Administer a single CANA kit IM as needed to children over 50 pounds

Infants:
The adult sized CANA injector should never be given to infants

Who May Use the CANA Kit?
1. EMS personnel may self-administer ("Self Aid") the CANA Kit if exposure to a nerve agent, organophosphate, or similar toxin is suspected.
2. A responder’s CANA kit may be administered by another responder if the first responder is unable to do so himself ("Buddy Aid").

Regardless, a responder should never use his/her own CANA kit on a patient.

3. CANA KIT should only be administered to non-responders (patients) by a Paramedic or other appropriately trained responder.

Procedure:
Administration of auto-injectors
The CANA is a single injector; the procedure is essentially the same as for an individual MARK I Injector.

To use the auto-injector:
1. Remove CANA kit from protective pouch.
2. Pull off gray safety cap.
3. Place Black end on mid outer thigh.
4. Push hard until injector functions.
5. Withdraw after 10 seconds,

According to CFR 1910.1030 (d)(2)(vii) through 1910.1030 (d)(2)(vii)(B), contaminated sharps can be bent if the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure. The CANA kit will be used primarily in areas outside of hospitals, clinical or research laboratories. It is prudent and a required procedure (i.e., using a one-handed technique) to bend the needle from the CANA kit to permanently blunt the exposed sharp until they can be disposed of properly.

Other Concerns:

1. The CANA Kit should be protected from temperatures below 32 degrees F. It may be necessary to carry next to body to keep warm.
2. CANA must be passed hand-to-hand or placed in secure storage; accountability necessary.
3. May hold CANA administration for Diazepam being administered by other routes.
4. Use of the CANA Kit is not a substitute for decontamination and use of proper protective gear.
4.18.1.6. Tetanus Immunization (as part of Disaster Response)

**Level of training:** EMT-P,

**Purpose:** During a disaster situation, there may be a large amount of destruction potentially exposing a large number of individuals to a tetanus prone wound. Our EMS service, (if allowed by state statute in disaster situations) may be called upon to assist in administering tetanus toxoid immunization to individuals involved in the disaster response/recovery efforts. This would help to decompress the demand for immunizations on hospital emergency departments, where following a disaster, may be the only location to obtain one. Tetanus is caused by a toxin produced in infected wounds by the bacillus bacteria *Clostridium tetani*. The disease is marked by extreme muscular rigidity, violent muscle spasms, and often, respiratory and autonomic failure. Tetanus immunizations are usually good for 10 years but it is not unreasonable for a patient to receive an immunization after 5 years if exposed to a
tetanus prone wound. The distribution of tetanus toxoid immunization to our EMS service will be governed/directed by the local health department and/or hospital. The type of immunization, i.e. Tetanus Toxoid or dPT (diphtheria, pertussis, tetanus) toxoid will also be determined by the health department and/or participating hospital. This protocol will explain who is permitted to participate in immunizing individuals during a disaster situation.

Policy/Procedure:
1. Only paramedics who have been briefed on the disaster situation and are working/participating in the immediate disaster area are authorized to give immunizations.
2. The duration of this authorization will be for as long as the local Health Department and/or participating hospital request our service and supply us with the necessary immunizations and supplies or inform us that our services are no longer needed for this disaster.
3. Keep in mind the tetanus toxoid and dPT immunizations needs to be kept refrigerated and therefore arrangements to keep cool is imperative.
4. Who gets a Tetanus Toxoid immunization?
   a. Patients with no injury who has not been immunized in 10 years.
   b. Patient with injury or possible exposure if > 5 years since last dose
   c. Hospital or Health Department may restrict us giving immunizations only to those individuals involved in the search, rescue, recovery, and cleanup operations, such as healthcare workers, law enforcement, EMS/Fire personnel, city/county employees, etc. If such a restriction is imposed upon us, any general public individual would need to be referred to the health department or their primary care MD for immunizations.
   d. An expectant mother (if included in the group approved by health department /hospital) whose tetanus immunization status is uncertain or whose last immunization was more than 10 years ago should be immunized against tetanus.
5. Tetanus Toxoid Immunization
   a. Dose: 0.5ml IM (give in deltoid muscle)
b. Contraindications
   i. Hypersensitivity to drug/class/compound
   ii. Hypersensitivity to thimerosal
   iii. Caution if hypersensitivity to latex (multidose vial)
   iv. Caution if tetanus toxoid-related Guillain-Barre syndrome hx
   v. Caution if immunocompromised

c. Adverse Reactions
   i. Serious reactions:
      1. Anaphylaxis
      2. Hypersensitivity reaction, Arthus-type
      3. Brachial neuritis
      4. Guillain-Barre syndrome
      5. CNS dz, demyelinating
      6. Mononeuropathy, cranial
      7. Mononeuropathy, peripheral
      8. Encephalopathy
      9. Death
   ii. Common reactions
      1. Injection site reaction
      2. Urticaria
      3. Rash
      4. Malaise
      5. Fever
      6. Pain
      7. Hypotension
      8. Nausea
      9. Arthralgia

d. Vaccine Adverse Reaction Reporting
i. In the event patient has an adverse reaction after receiving a dose of immunization, call 1-800-822-7967

6. **Before you administer Tetanus Toxoid Immunization:**
   
a. The "Five Rights" in administering medications are:
   
   1. Right patient
   2. Right time and frequency of administration
   3. Right dose
   4. Right route of administration
   5. Right drug

   b. Introduce yourself to your patient
   c. Make patient as comfortable as possible
   d. Ascertain patient’s ALLERGIES
   e. Ascertain when patient last had a tetanus immunization booster
      i. If < 10 years and no injury or exposure, does not need one, is up to date
      ii. If < 5 years and has a skin wound/injury received during disaster operations, does not need a one, is up to date. Provide wound care.
   f. Locate the injection site (deltoid) and clean with alcohol
   g. Administer 0.5 ml of Tetanus Toxoid (or dPT) IM.
   h. Observe for bleeding post injection and cover with band-aid if bleeding.
   i. Keep record of patient’s name, lot number of tetanus toxoid immunization given, location of injection site.
4.18.2. Intramuscular (IM) injections
Level of training: EMT-P

Intramuscular Injection (IM):
1. Prepare the equipment. The needle size should be 21-23 gauge and 1-1.5 inches long.
2. Preferred site is mid-lateral thigh, if the patient is obese use the distal portion of the thigh. The deltoid can also be used but has a longer absorption rate.
3. Check for proper medication, expiration date, vial integrity, and color and clarity. Draw the medication into the syringe.
4. Cleanse the injection site (deltoid, lateral thigh, or gluteus maximus) with alcohol or Betadine in an expanding circular pattern using a firm pressure.
5. With one hand, pull the skin taut and insert the needle at a 90-degree angle into the muscle.
6. Aspirate to ensure that a blood vessel has not been entered. If blood is aspirated, remove the needle and repeat the procedure at a different site.
7. Administer the appropriate dose.
8. Remove the needle from the injection site and dispose of it in a secure sharps container.
9. Monitor the patient.
4.18.3. Intranasal (IN) administration

4.18.3.1. Mucosal Atomizer Device (MAD)

Damaged nasal mucosa may inhibit absorption of the medication. For this reason, contraindications for a MAD include the following conditions:

- Facial trauma.
- Epistaxis (nose bleed).
- Nasal congestion or discharge.
- Any recognized nasal mucosal abnormality.

1. Prepare the equipment.
2. Check the medication for proper name, expiration date, vial integrity, and color and clarity.
3. Draw the medication into the syringe.
   - Maximum adult and pediatric administration is 1 mL per nostril. The medication should be split with ½ of the dose given in one nostril and the other ½ given in the other nostril.
4. Expel all of the air from the syringe.
5. Securely attach the mucosal atomizer to the syringe.
6. The patient should be in a recumbent or supine position. If the patient is sitting, compress the nares after administration.
7. Briskly compress the syringe plunger to properly atomize the medication.
8. Monitor the patient.

Note:
Medications which are appropriate for intranasal use include:
• Fentanyl (50 mcg/ml) 25 – 50 mcg
• Glucagon (solubilized 2 mg vials in 1 ml sterile water) 1 – 2 mg
• Ketamine (100 mg/ml) 50 – 100 mg
• Lorazepam (2 mg/ml) 0.5 – 4 mg
• Midazolam (5mg/ml) 1 – 10 mg
• Naloxone (1mg/ml) 0.4 – 2 mg
4.18.4. Intraosseous (IO)

4.18.4.1. Bone Injection Gun (BIG) – Intraosseous

**Adult**
1. Find and mark a penetration site located 2 cm medially and 1 cm proximally to the tibial tuberosity.
2. Clean the area with a povidone-iodine swab.
3. Position the BIG device with one hand to the site and pull out the safety latch with the other hand.
4. Trigger the BIG at a 90-degree angle to the surface.
5. Remove the BIG handle.
6. Pull out the stylet trocar.
7. Fix the cannula with the safety latch.
8. Attach a 10-cc syringe filled with normal saline.
   - Aspirate for bone marrow, and then flush with fluid.
   - Observe for any signs of infiltration.
9. If the route is patent, connect it to the drip set tubing.
10. Attach a pressure infuser.
11. Secure the site.

**Child**
1. Find and mark a penetration site located 1 cm medially and 1 cm distally to the tibial tuberosity.
2. Clean the area with a povidone-iodine swab.
3. Position the BIG device with one hand to the site and pull out the safety latch with the other hand.
4. Trigger the BIG at a 90-degree angle to the surface.
5. Remove the BIG handle.
6. Pull out the stylet trocar.
7. Fix the cannula with the safety latch.
8. Attach a 10-cc syringe filled with normal saline.
   - Aspirate for bone marrow, and then flush with fluid.
   - Observe for any signs of infiltration.
9. If the route is patent, connect it to the drip set tubing.
10. Attach a pressure infuser.
11. Secure the site.

**See Below (next page)**
Disposable Automatic Intraosseous Injector

Intravascular Access in seconds

Location Site for Adult Bone Injection Gun
- Tibial Tuberosity
- 2 cm Medially, towards inner leg
- 1 cm up, towards knee

Penetration Site

Location Site for Pediatric Bone Injection Gun
- Tibial Tuberosity
- 1 cm Medially, towards inner leg
- 1 cm Down

Pediatric depth is adjustable by age in years.

Adult depth is adjustable by 4 different anatomical locations.

NSN - # 6515-01-518-8487

NSN - # 6515-01-518-8497

1. Position the B.I.G. 90° to the bone
2. Remove Safety Latch
3. Trigger
4. Clip & Secure

5. Remove Stylet
6. Aspirate*
7. Flush*
8. Infuse Drugs / Fluids

* Bone Marrow may not always be present.
* 10-20 cc in Adults / 5-10 cc in Pediatrics.
4.18.4.2. Cook Pediatric IO – Intraosseous

1. Locate the site of cannulation. Palpate the tibial tuberosity, and move 1-3 cm below the tuberosity on the medial surface of the tibia, approximately one finger’s width below the tuberosity.
2. Prep the area with antiseptic solution (e.g., povidone-iodine).
3. Grasp the patient’s thigh and knee above and lateral to the insertion site with the palm of your non-dominant hand. Wrap your fingers and thumb around the knee to stabilize the proximal tibia. Do not let any portion of your hand rest behind the insertion site.
4. Palpate the landmarks again to confirm the insertion site.
5. Insert the needle through the skin, over the flat anteromedial surface of the tibia.
6. Advance the needle through the bony cortex of the proximal tibia, directing the needle perpendicular (90 degrees) to the long axis of the bone or slightly caudal (toward the toes) to avoid the epiphyseal plate, using a gentle back-and-forth twisting or drilling motion.
7. Stop advancing the needle when a sudden decrease in resistance to forward motion of the needle is felt.
8. Unscrew the cap and remove the stylet from the needle.
9. Stabilize the needle and attach a 10-mL syringe filled with normal saline.
10. Aspirate for bone marrow, and then flush the needle with normal saline. Check for any signs of increased resistance to injection or swelling of the surrounding tissue.
11. If the test injection is successful, remove syringe and connect the IV tubing.
12. Attach a pressure infuser.
13. Secure the site.
4.18.4.3. EZ-IO Intraosseous

**Level of training: EMT-P**

**Indications:** EZ-IO AD (40kg and over) & EZ-IO PD (3 – 39kg)

1. Intravenous Fluids or medications are needed and peripheral IV cannot be established in 2 attempts or 90 seconds AND the patient exhibits one or more of the following:
   a. An altered mental status (GCS of 8 or less)
   b. Respiratory compromise (SaO₂ 80% after appropriate oxygen therapy, respiratory rate < 10 or > 40 min)
   c. Hemodynamic instability (Systolic BP < 90)

2. EZ-IO AD & EZ-IO PD may be considered prior to peripheral IV attempts in the following situations:
   a. Cardiac Arrest (medical or traumatic)
   b. Profound hypovolemia with altered mental status
   c. Patient in extremis with immediate need for delivery of medications and or fluids
   d. Patients in need of vascular access where veins are not easily identified

3. If the initial IO attempt is unsuccessful, attempt again at another site

**Contraindications:**

1. Fracture of the bone selected for IO infusion (consider an alternative site)
2. Excessive tissue at insertion site with the absence of anatomical landmarks (consider alternative site)
3. Previous significant orthopedic procedures (IO within hours, prosthesis- consider alternative site)
4. Infection at the site selected for insertion (consider alternative site)

**Considerations:**

1. Flow rate:
   a. Administer a rapid syringe bolus (flush) of saline prior to infusion NO FLUSH = NO FLOW
      i. > 40 kg (EZ-IO AD) – 10 ml normal saline
      ii. < 40 kg (EZ-IO PD) with 5ml of normal saline
      iii. repeat syringe bolus (flush) as needed
   b. To improve continuous infusion flow rates always use pressure bag or infusion pump

2. Pain:
   a. Insertion of the EZ-IO AD and EZ-IO PD in conscious patients does not require local anesthesia. IO infusion for alert patients has been noted to cause severe discomfort
      i. Prior to IO syringe bolus in alert patients, administer 2% lidocaine (preservative free) through the EZ-IO hub.
      1. EZ-IO AD administer 20 – 40 mg 2% Lidocaine
2. EZ-IO PD administer .5mg/kg 2% Lidocaine

**Equipment:**
1. EZ-IO Driver
2. EZ-IO AD or EZ-IO PD Needle Set
3. Alcohol or Betadine Swab
4. EZ-Connect or Standard Extension Set
5. 10 ml syringe
6. Normal Saline (or suitable sterile fluid)
7. Pressure Bag or Infusion Pump
8. 2% Lidocaine (preservative free [cardiac lidocaine])

**Procedure:** If patient is conscious, advise of the EMERGENT NEED for this procedure and obtain informed consent
1. Wear approved Body Substance Isolation Equipment (BSI)
2. Determine EZ-IO AD or EZ-IO PD indications
3. Rule out contraindications
4. Locate an insertion site:
   - **Proximal Tibia**
     The proximal tibia insertion site is approximately 2 cm below the patella and approximately 2 cm medial to the tibial tuberosity (depending on patient anatomy).
   - **Proximal Humerus** – permitted in pediatrics when landmarks are clearly identified the proximal humerus insertion site is located directly on the most prominent aspect of the greater tubercle. Ensure that the patient’s hand is resting on the abdomen and that the elbow is adducted (close to the body). Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site. This is the preferred site for patients who are responsive to pain. Once the insertion is completed secure the arm in place to prevent movement and accidental dislodgement of the IO catheter.
   - **Distal Tibia** - The distal tibia insertion site is located approximately 3 cm proximal to the most prominent aspect of the medial malleolus (depending on patient anatomy). Place one finger directly over the medial malleolus; move approximately 3 cm proximal and palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone
5. Select the appropriate needle:
   - Medium (blue) 25mm needle: weight ≥ 5 kg
   - Large (yellow) 45mm needle: weight > 40 kg and patients with excessive tissue over insertion sites
6. Prepare insertion site using aseptic technique (If allergic to Betadine, use alcohol)
7. Prepare the EZ-IO driver and needle set
8. Stabilize site and insert appropriate needle set
9. Release the driver’s trigger until:
   • There is a sudden “give” or “pop.”
   or
   • The needle reaches the desired depth at 5 mm, which is indicated on the needle by
     the black lin
10. Remove EZ-IO driver from needle set while stabilizing catheter hub
11. Remove stylet from catheter, place stylet in shuttle or approved container
12. Confirm placement via aspiration of blood or marrow (Sept 2011)
13. Connect primed (with flush or 2% Lidocaine) EZ-Connect
14. Slowly administer dose of Lidocaine 2% (Preservative Free) IO to alert patients
15. Syringe bolus (flush) the EZ-IO catheter with the appropriate amount of normal
     saline
16. Begin infusion
17. Utilize pressure (pressure bag or infusion pump) for continuous infusions
18. Dress site, secure tubing and apply wristband as directed
19. Monitor EZ-IO site and patient condition
4.18.5. Intravenous Cannulation (IV)
Level: EMT-(B-I-A), EMT-P,

**Purpose**: To establish access to the patient’s vasculature for the administration of fluids and/or medications, to obtain blood samples. Only EMTs who have had the IV training and signed off by medical director are allowed to start un-medicated IVs.

**Indications**: 
1. Need for IV access in the emergency setting for the administration of fluids or medications.
2. As a lifeline when there is a high index of suspicion that access may be needed for fluids and medications.

**Contraindications**: None

**Adverse Effects/Complications**: 
1. Hematoma
2. Air Embolus
3. Pain
4. Infiltration
5. Infection
6. Nerve Injury
7. Thrombosis
8. Over-hydration
9. Cellulitis
10. Phlebitis
11. Sepsis
12. Arterial Puncture

**Procedure**: 
1. Peripheral catheterization procedure:
   a. Locate a suitable venipuncture site. The back of the hand, forearm, and antecubital fossa are preferred sites. The external jugular vein is acceptable if no other suitable site can be found.
   b. Inspect the catheter to be sure that catheter hub and primary push-off tab are fully seated to the needle housing assembly.
   c. Place a constricting band to halt venous return without obstructing arterial flow. Leave one end of the slip knot exposed to assure rapid release when the procedure is complete.
   d. Prepare skin with Betadine or alcohol swabs.
   e. Locate a suitable vein. Palpate one that is well fixed (not rolling) and that does not have valves (firm nubs of tissue) proximal to the intended site of entry.
   f. Secure vein with fingers; ask patient or assistant to secure extremity.
   g. Insert needle and catheter assembly into vein; watch for free blood return.
   h. When intraluminal placement confirmed by blood return, advance the catheter into vein and off of the needle. Remove needle. Remove tourniquet.
i. Attach IV fluid line to catheter hub; insure patency by briefly running fluid WO. Fluid should continue to run at a rate indicated by the status of the patient.

j. Secure catheter with tape, occlusive dressing, and/or Veniguard.

Trauma patients:
1. Establish 2 IV lines
2. Use largest available vein and catheter
3. Use blood tubing for second IV line
4. Avoid IV lines on fractured extremities or on the same side as a significant thoracic trauma.
5. External Jugular Access may be attempted if other peripheral sites not possible (c-spine permitting). ONLY ONE SIDE can be accessed!!
6. When upper extremity sites are inappropriate, lower extremity sites may be used (Medical control suggested)
7. Intravenous access should be attempted en route during rapid transportation of the priority trauma patients
8. For Adults, flow rates are wide open if pressure below 90 mm Hg up to 2000 ml total infused. Assess lung sounds for signs of pulmonary congestion frequently. If BP improves or 2 liters administered, contact medical control for IV rate or additional fluids
9. For Pediatric patients: 20ml/kg. Repeat x 3 max

Medical Patients
1. Establish IV in largest appropriate vein
2. Saline locks may be utilized whenever appropriate, however IVs should only be started if patient requires immediate fluid resuscitation or medication administration.
3. Flush lock after every use with 10cc saline
4. Limit IV attempts on scene when possible
5. Flow rate determined by protocol
6. If no specific rate given in protocol, rate is TKO
7. Monitor lung sounds closely for signs of over-hydration

Drawing Blood
1. Drawing blood is done at the discretion of the paramedic based on the hospital’s desire and willingness to accept our samples.
2. Using the Vacutainer’s Luer Lock adapter, attach the Vacutainer to the IV catheter. Insert the tube into the vacutainer, puncturing the tube seal. The negative pressure will draw the blood into the tube. When at least halfway filled, remove the tube and reinsert the second tube and repeat.
3. Discard the entire Vacutainer device
4. Write the patient’s name and birth date on the tube and deliver to ED personnel
Troubleshooting a Non-flowing IV

- Has the constricting band been removed? This is the most common cause.
- Is there swelling at the cannulation site? This indicates infiltration into the tissues.
- Are the tubing control valves open?
- Does the cannula need to be repositioned because it is up against a valve or wall of the vein? You may have to remove the securing device to check for this condition.
- Is the IV bag hung high enough?
- Is the drip bag completely filled with solution? If it is, turn bag upside down and squeeze the drip chamber to return some of the fluid to the bag.
- Lower the bag below the level of the insertion site. If blood return is seen in the IV site, the site is patent.
- If problems persist, remove the IV and reestablish it at another site.

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Peds Medical Supportive Care   Peds Trauma Supportive Care
4.18.6. Nebulizer Treatment
Level: EMT-P,

**Purpose:** Delivery of medications, e.g. albuterol and or ipratropium via an inhaled mist.

**Indications:**
1. Treatment of acute Bronchospasm due to exacerbation of asthma or COPD
2. Albuterol nebs are used as one of the treatments of Hyperkalemia
3. Epinephrine for severe croup

**Potential Adverse Effects:**
1. Allergic reaction to the medication
2. Failure to achieve the desired dose if patient does not inhale through nebulizer
3. Respiratory depression secondary to high O₂ concentrations with long term COPD

**Precautions:**
1. Limited treatments to 8 – 10 minutes
2. Discontinue treatment if: LOC decreases or Respiratory rate or depth drops below normal

**Procedure:**
1. Unless indicated in specific protocols, the patient should be on the cardiac monitor and have an IV established
2. Assemble nebulizer unit and connect to unhumidified oxygen delivery port
3. Place appropriate dose of medication into the reservoir of the nebulizer unit
   a. Albuterol 2.5mg (3ml unit dose). < 2 years old, use 1.25mg (1.5ml)
   b. Atrovent 500microgm (2.5ml unit dose)
      1. Use only in 1st neb treatment
      2. For < 12 years old, use 250 micro gm (1.25ml) in first neb only
4. Adjust oxygen liter flow to administer the treatment over 7 –10 LPM
5. Have patient place mouthpiece of nebulizer into mouth with tightly sealed lips and breathe as deeply as possible.
6. Significantly less medication is delivered using the facemask, do not use unless patient cannot keep a seal without assistance.
   a. Use the mask with an attached nebulizer unit only for patients too fatigued or unable to hold the mouthpiece.
7. Continue treatment until misting of medication has stopped.
8. Place patient back on previous oxygen delivery device and save nebulizer unit for subsequent treatments if necessary
9. Treatments of Albuterol can be given every 15 minutes prn up to three treatments.
4.18.7. Rectal Administration

Level: EMT-P

Purpose: As an alternative method for administering certain medications

Procedure:

1. Place the patient lying on side with the upper most leg flexed (Sim’s position)
2. Use the smallest possible syringe size
3. Draw up into the syringe only the amount of medication ordered
4. Remove the needle from the syringe and dispose of it into a sharps container
5. Apply a small amount of lubricant to the end of the syringe
6. Expose the anus by elevating patient’s upper buttock with your non-dominant hand
7. Instruct the patient to take a deep breathe
8. As the patient inhales, gently insert the tip of the syringe into the anus exerting sideways pressure on the syringe to direct it toward the lateral wall of the mucosa
9. Slowly inject the medication taking care to not remove the tip of the syringe
10. Gently withdraw the syringe from the anus.
11. Gently squeeze the patient’s buttocks together for up to a minute until the reflex urge to empty the bowel passes
12. Properly dispose of the syringe
13. Remove your gloves by peeling from the hand, turning them inside out. Wash your hands
14. Document the procedure, noting the time, dose and route of the medication.
4.18.8. EMT Assisted Administration of Prescribed Medication

Level: EMT-(B-I-A), EMT-P

**INHALERS**: The EMT may assist the patient in administering prescribed inhalers (e.g. Albuterol, Proventil, Ventolin, Isoethraine, Alupent, metaproteranol, Bronkosol, Bronkometer, etc.) when the patient is experiencing respiratory distress.

1. Initial Patient Assessment Protocol 2.1.1
2. Assure Inhaler is prescribed for patient, check expiration date.
3. If patient is short of breath, has wheezes, and has not administered more than one dose in the last hour, assist the patient in administering inhaler.

**NITROGLYCERIN**: The EMT may assist the patient in administering prescribed Nitroglycerin when the patient is experiencing chest pain and the systolic BP is > 90 mm Hg. The following procedure should be followed:

1. Initial patient assessment protocol 2.1.1
2. Assure Nitroglycerin is prescribed for patient, check expiration date.
   Nitroglycerin is contraindicated when patient takes Viagra, Levitra, etc.
3. If patient is having chest pain and systolic BP is > 90 mm Hg, administer Nitroglycerin by either placing a tablet or spray under tongue, one dose.
4. After 3 minutes, if chest pain continues, recheck BP. If systolic BP is ≥ 90 mm Hg, repeat dose.
5. After 3 minutes, if chest pain continues, recheck BP. If systolic BP is ≥ 90 mm Hg repeat dose. Do not repeat dose after third dose given.

**ORAL GLUCOSE**: The EMT may assist the patient in administering prescribed oral glucose when the patient’s blood sugar is < 60mg/dl

1. Initial patient assessment protocol 2.1.1
2. Assure oral glucose is prescribed for patient, check expiration date.
3. If blood glucose is < 60 mg/dl and patient is able to control his/her airway, assist the patient in administering oral glucose.

**ASPIRIN**: The EMT may assist the patient in administering Aspirin when the patient is complaining of chest pain and there is concern for a cardiac cause.

1. Initial patient assessment protocol 2.1.1
2. Allow patient to take or assist in taking 325 mg Aspirin (one full adult or four baby aspirin).
Epi-Pen (Auto injector Epinephrine): The EMT may assist the patient in administering a dose of Epinephrine via the auto-injection pen.

1. Initial patient assessment protocol 2.1.1
2. Usual site of injection is the outside lateral mid-thigh. Clean with alcohol wipe or similar skin cleanser before injection.
3. See Epi-Auto Injector protocol

TYLENOL: The EMT can assist a parent with administering Tylenol (or Ibuprofen) to a child if none has been given in the previous four hours and the child has a documented fever.

4. Initial patient assessment protocol 2.1.1
5. Assist parent in measuring the temperature if it hasn’t been taken
6. If temp > 101.0, allow parent to give Tylenol to child per dosing instructions on bottle/package. Should measure out to be 10 mg/kg of acetaminophen.

IBUPROFEN (MOTRIN): The EMT can assist the parent with administering Ibuprofen (or Tylenol) to a child if none has been given in the previous 6 hours and the child has a documented fever.

1. Initial patient assessment protocol 2.1.1
2. Assist parent in measuring the temperature if it hasn’t been taken
3. If temp > 101.0, allow parent to give Ibuprofen to child per dosing instructions on bottle/package. Should measure out to be 10 mg/kg of Ibuprofen.
4.18.9. Indwelling Vascular Access Catheters

Level of training: EMT-P

Indication(s):
1. Any patient with an indwelling catheter whom you need to obtain vascular access for administration of IV fluids and/or medications. This procedure can also be performed if blood collection is needed. ONLY EMS PERSONNEL WHO HAVE BEEN PROPERLY TRAINED IN THIS PROCEDURE ARE TO PERFORM IT.

Contraindications: None

Adverse Effects/Complications:
1. Localized pain and bruising.
2. Rupture of the membrane may occur if pressure >40 mmHg is used during infusion.
3. Infection

Materials needed:
1. Gloves
2. Pre-made “Indwelling Catheter Access Kit” which includes:
   a. ChloraPrep® swab
   b. 20 gauge Huber needle
   c. Sterile 2x2 gauze sponges
   d. Large tegaderm
   e. IV extension set
   f. Saline flush
3. 10, 20 or 30mL syringes (at least 2)
4. Luer-lock blood transfer adapter

Procedure:
1. Explain the procedure and obtain verbal consent.
2. Place the patient in a seated position.
3. Prime the IV extension tubing with normal saline, and clamp the tubing.
4. Ensure that clean gloves are on.
5. Modestly expose the site of the indwelling catheter and palpate the device. Make sure to isolate the base of the device, as well as the septum.
6. Holding the device with your non-dominant hand, vigorously cleanse the site with the ChloraPrep® swab. Use a back-and-forth stroking technique for 30 seconds and cover the entire area with antiseptic. Allow it to air dry for a minimum of 30 seconds.
7. Still holding the base of the device with your non-dominant hand, have your partner hand you the Huber needle and hold it by the wings with your dominant hand.
8. At a 90 degree angle, insert the needle into the center of the septum and advance it until it comes in contact with the bottom of the chamber.
9. You may release the device, but ensure that you don’t pull on the tubing.
10. Unclamp the tubing and gently flush 2-3 mL’s of normal saline. If the saline does not flush easily, the patient may need to be repositioned or the needle withdrawn a few millimeters.
11. Take the two sterile 2x2 gauze sponges and fold them, placing one under each wing of the needle device.
12. Take a large tegaderm and place over the needle assembly and device. Secure the base of the assembly/extension device with tape.
   a. If blood collection is desired, using a 10-30 mL syringe, withdraw 5-7 mL of blood and discard.
   b. Obtain a new syringe (10-30mL) and withdraw the appropriate amount of blood needed.
   c. Using a lure-lock transfer device, safely transfer blood from the syringe(s) into the appropriate blood collection tubes.
   
   \textit{Note: In some patients, you may be able to administer fluids and medications, but unable to withdraw blood.}

13. Flush the line with saline and clamp, or administer any appropriate medications and/or IV fluids.

14. Document the size of the needle, the date, time and your initials on the tegaderm, as well as in the electronic chart.

Notes:
\begin{itemize}
\item Once a patient’s indwelling catheter is accessed in the field, the patient must be transported to the hospital for appropriate de-accessing (ie, administration of heparin flush solution).
\item If you are unsuccessful at accessing the device, simply continue to hold the base of the device and withdraw the Huber needle. The procedure may be repeated.
\item Patients are most often aware of the particular behavior of their catheters. It’s often beneficial to ask them about any problems with positioning or collection of blood.
\item This procedure should be performed under the cleanest of conditions. Maintaining a sterile/sterile-like environment is desired.
\end{itemize}
4.19. Morgan Lens

Hyperlink to: Morgan Therapeutic Lens


4.20. Nasogastric Tube Insertion

Level of training: EMT-P

Purpose: Nasogastric Tube insertion is indicated to relieve gastric distention in the ventilated patient who meet the following criteria:

1. The adult patient with noticeable gastric distention that interferes with ventilatory support.
2. Any pediatric patient that is intubated or receives long term (>3 minutes) ventilation by Bag Valve Mask.

Cautions:
1. This procedure should not be performed in the presence of frontal head or mid-facial trauma where the cribriform plate may be fractured.
2. DO NOT FORCE THE NG TUBE. If resistance is felt, withdraw slightly and gently reinsert using a twisting motion to avoid the turbinates in the nose.
3. The NG tube should be passed in a horizontal position.

Procedure:

1. Ready the proper size tube (adult 16 French/pediatric as per the Broselow Tape 6 - 16 French), 60 cc syringe, water soluble lubricant, and tape.
2. Measure the tube by placing over the stomach region and extend to the ear and then to the nose. (Note tube mark at this time.)
3. Coil the tip of the tube around your finger and stretch the tube to create a slight curve of the tip. This will help navigate the curve in the nasopharynx
4. Lubricate the end of the tube with Lidocaine gel and insert into the largest nares, advancing until the tube mark noted above is at the nares opening. (The conscious patient can assist while swallowing during insertion.)
5. Verify placement by auscultating epigastric sounds while inserting 20-30 cc's of air while listening with your stethoscope over the epigastrium.
6. Tape in place and note depth of tube on the run report.
4.21. Nitrous Oxide- Nitronox  
(For future consideration)

Level: Paramedic

1. Prepare the equipment. Nitronox units consist of a nitrous oxide cylinder, a blending regulator, an oxygen cylinder, and a mask.
2. Contraindications: altered state of consciousness, COPD, acute pulmonary edema, pneumothorax, decompression sickness, air embolus, pregnancy (except during delivery), abdominal pain with distention or suspicion of obstruction, and inability to self-administer the medication.
3. Turn the oxygen and nitrous oxide cylinder valves to the “on” position. Make sure the device shows appropriate blending of the gases.
4. Attach a mask to the Nitronox unit regulator and provide it to the patient for self-administration. The patient must be able to self-administer the medication; if he/she cannot, Nitronox cannot be used.
5. Monitor the patient’s vital signs and pulse oximeter. If the patient’s vital signs become unstable or the patient becomes symptomatic from the side effects, discontinue Nitronox.
4.22. Pediatric Weight-Base Emergency Tape: Broselow and Handtevy
Level of training: EMT-(B-I-A), EMT-P

**Purpose:** The Broselow Pediatric Emergency Tape and Handtevy System are designed to be used as a quick reference drug dosing and equipment sizing on pediatric patients. The Broselow tape is calibrated in different colors according to different lengths. The color that corresponds to the patient’s length is used. If the Broselow bag is also used, the color on the tape can be matched with the color on the pouch that contains the appropriately sized equipment and drugs.

**Procedure:**
1. Place the patient in a supine position.
2. Remove tape from the package and unfold.
3. Place tape next to patient, ensuring that the multicolored side is facing up.
4. Place red end of tape even with the top of the patient’s head.
5. Place the edge of one hand on the red end of the tape.
6. Starting from the head, run the edge of your free hand down the tape.
7. Stop hand even with the heel of the patient’s foot (if patient is larger than tape, stop here and use appropriate adult technique).
8. Verbalize the color block (on edge of tape) and weight range where your free hand has stopped. If patient falls on the line, go to the next higher section.
9. Use the color block (on the edge of the tape) to identify the weight range of the patient.
10. Use **weight range** to determine appropriate sizes of equipment and approximate dosages for medications.

**NOTE:** The “First Five Minutes” tape is used in the same manner as the Broselow Tape. The only difference is the Broselow tape uses color codes where the “First Five Minutes” Tape uses letters.

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4.23. Pulse Oximeter

**Level:** EMT-(B-I-A), EMT-P

**Purpose:**
SPO2 monitors display a digital readout showing an estimate of the amount of saturated hemoglobin. Pulse oximetry measures two light frequencies, red and infrared and compares how much of each frequency is absorbed in order to obtain a reading.

Normal SPO2 readings:
- Adult: > 94%
- Children > 94 - 96%

**Indications:**
1. Any patient requiring monitoring of oxygenation status
2. Mechanical ventilation
3. Oxygen administration
4. Assessing oxygenation during patient assessment

**Caution:** Withholding oxygen based upon an SPO2 reading with signs and symptoms of hypoxia (treating the monitor instead of the patient). Many outside factors such as fever, acidosis, and alkalosis affect the SPO2 reading. Because of this, it is possible to get a reading of 95% and still be hypoxic. Always treat the patient, not the monitor.

**Procedure:**
1. Use an extremity not being used for BP if possible. Remove any nail polish.
2. Provide oxygen by whatever means is appropriate.
3. Clean selected probe area with alcohol
4. Connect oximetry sensor to patient
5. Assess the SPO2 reading and document.
   Evaluate the results:
   - Normal range: oxygen saturation of 92-100%
   - Mild distress: oxygen saturation of 90-92%
   - Moderate distress: oxygen saturation of 80-89%
   - Severe distress: oxygen saturation of less than 80%
6. Evaluate the patient for possibly false high readings:
   - Carbon monoxide poisoning: Elevated carboxyhemoglobin can falsely elevate saturation readings because carboxyhemoglobin modulates light similar to oxyhemoglobin as it passes through the tissue.
   - Trauma: Despite a normal saturation level, severe hemorrhage can cause the patient to not have enough blood to perfuse the organs, so that the patient is hypoxic.
7. Monitor for changes.
8. If SPO2 falls more than 10%, investigate possible causes for decrease:
   - a. Respiratory failure (CHF, mechanical, circulatory, etc).
   - b. Improper ET tube placement
c. Pressure changes (altitude in aircraft)
d. Sensor failure due to:
   1. Poor contact.
   2. Circulatory compromise (shock, ASCVD, etc)
   3. Excessive movement
   4. Dirty or bloody site of sensor,
   5. Devices constricting extremity (BP cuff, clothes, etc)
   6. Hypothermia

9. Monitor cardiac rhythm
10. Match SPO2 monitor with pulse rate
11. Other causes of false readings:
    a. Nail polish or fake nails: may diminish light transmission.
    b. Sickle Cell
    c. Patient movement: may cause the pulse oximeter to not register.
    d. Low blood flow states: may cause the pulse oximeter to not register.
    e. Bright lights
    f. Edema
    g. Peripheral vascular disease
    h. Do not use any extremity that has an AV fistula (dialysis shunt)
    i. Deeply pigmented patients: may diminish light transmission.
4.24. Patient Restraints
4.24.1. Pediatric Restraint Device (Pedi-Mate)

The Pedi-Mate® is designed to secure infants and toddlers from 10 to 40 lbs (4.5 to 18.1 kg) on a stretcher.

The Pedi-Mate® is designed for use only in an emergency setting and only by suitably trained personnel. Where child restraint is needed outside of this setting, the transport applicable local standards and regulations, including but not limited to, the United States Federal Motor Vehicle Safety Standards and Regulations. The Pedi-Mate® is not designed as an immobilization device and should not be used to immobilize the patient, or as part of an immobilization system.

Positioning the Pedi-Mate®
1. Remove any restraints attached to the cot.
2. Raise the cot backrest and lock in place at an angle between 15 and 45 degrees. This will keep the patient’s shoulders higher than the pelvis and maintain the proper center of gravity.
3. Unroll the Pedi-Mate® mattress with all straps extended.
4. Center the blanket left to right on the mattress.
5. Position the blanket with the black backrest strap at the point where you expect the patient’s shoulders to rest.
6. Using the Pedi-Mate®
7. Run the ends of the backrest strap around the cot backrest until they meet in the back, then fasten the buckle. Leave some slack in the strap for

Securing the Pedi-Mate® to the stretcher
1. Place the patient on the Pedi-Mate®. If the black backrest strap is not at the patient’s shoulder level, adjust the blanket position.
2. With the blanket properly positioned, tighten the strap until the mattress is compressed.
3. Fasten a main frame strap by threading the free end downward between the cot main frame and the mattress next to the head--end sidearm casting.
4. Wrap the strap up around the cot main frame and fasten the buckle. Leave a little slack in the strap for final adjustment
5. Repeat with the other main--frame strap.
6. Tighten each main frame strap by holding onto the buckle with one hand and pulling firmly on the free end of the strap.
**Note:** To loosen a main--frame strap, unfasten it, then grasp the buckle tang, and pull outward. Refasten the buckle.

**Securing the Pedi-Mate® to the stretcher**
1. Place the patient on the Pedi-Mate®. If the black backrest strap is not at the patient’s shoulder level, adjust the blanket position.
2. With the blanket properly positioned, tighten the strap until the mattress is compressed.
3. Fasten a main frame strap by threading the free end downward between the cot main frame and the mattress next to the head--end sidearm casting.
4. Wrap the strap up around the cot main frame and fasten the buckle. Leave a little slack in the strap for final adjustment.
5. Repeat with the other main--frame strap.
6. Tighten each main frame strap by holding onto the buckle with one hand and pulling firmly on the free end of the strap.

**Securing the Patient**
1. Pull the crotch strap buckle up between the patient's legs and lay the strap on the patient's abdomen.
2. Lift a shoulder strap over one shoulder of the patient. Place patient's arm through the strap, then lock the buckle half into the central buckle.
3. Repeat with the other shoulder strap.
4. Thread the shoulder strap on the patient's left side through the chest clip and slide the chest clip to armpit level.
5. To snug the shoulder/torso straps, refer to Figure 6 and use the following procedure:
   - Snug the shoulder strap against the shoulder and chest by pulling the end of the strap of the strap with one hand while steadying the central buckle with the other hand.
   - Repeat with the other shoulder strap.
   - Snug the torso strap by pulling on the end of the strap with one hand while steadying the central buckle with the other hand.
   - Repeat with the other torso strap.
6. Snug the crotch strap by pulling on the free end.

**Disinfecting the Pedi-Mate®**
Wipe or spray disinfectant on all Pedi-Mate® and surfaces and straps. Follow the disinfectant manufacturer's directions for application and contact time.

**Cleaning the Pedi-Mate®**
Hand wash the Pedi-Mate® blanket and straps with warm, soapy water and a clean cloth or soft brush. Rinse with clear water. Dry the blanket with a towel and allow the straps to air dry. Do not immerse the buckles in water.
3 Components

- Blanket
- Shoulder Straps
- Chest Clip
- Straps for Cot Backrest
- Strap Adjustment Tab
- Buckle and Strap for Cot Main Frame
- Crotch Strap Adjustment Tab
- Crotch Strap
- Central Buckle
4.24.2. Physical Restraints
Level: EMT-(B-I-A), EMT-P

**Introduction:** Restraint is defined as any mechanism that physically restricts a person’s freedom of movement, physical activity, or normal access to his/her body. Restraint should be used only as a last resort, since restraint has the potential to produce serious consequences such as physical and psychological harm, loss of dignity, violation of the individual’s rights and even death. Justification for the restraints must be noted in the EMS run report.

**Indications:**

- a. Restraint use may be necessary in clinically justified situations (e.g. Incapacitated persons that require emergency medical intervention such as the head injured patient or the patient in shock) and are applied only when less restrictive measures such as pharmacological intervention (when applicable), verbal intervention, and family intervention are deemed ineffective.
- b. Restraint use may be necessary for those patients exhibiting behaviors that are harmful to self or others and have been Baker Acted or a patient deemed mentally incompetent and are applied only when less restrictive measures such as pharmacological intervention (when applicable), verbal intervention, and family intervention are deemed ineffective.
- c. Restraint use may be necessary for those patients attempting an act that poses an immediate threat of harm to self or others (e.g. attempting to move a live electrical wire, attempting to walk into the path of a moving vehicle, patient is attempting to inflict bodily harm on EMS personnel despite their attempts to flee) and are applied only when less restrictive measures such as verbal intervention are deemed ineffective.

**Procedure:**

**Methods of Restraint**

1. **Partial Restraint**
   - a. Place patient supine on stretcher
   - b. Secure straps across chest, waist and thighs
   - c. If necessary, secure wrist and ankles on ipsilateral side (same side) of stretcher frame (not side rails).
   - d. Continually insure that restraints do not restrict patient’s ventilatory effort.

2. **Full restraint**
   - a. Place patient supine on stretcher
   - b. Secure straps across chest, waist, thighs, and calves.
   - c. Secure wrists with one arm on ipsilateral side and the other above head on stretcher frame (not side rails).
   - d. Secure ankles on ipsilateral sided of stretcher frame (not side rails).
   - e. Continually insure that the restraints do not restrict patient’s ventilatory effort (beware of positional asphyxia).
3. **Padded backboard** (for purposes of restraining a patient)
   a. The patient should be placed supine on a well-padded long spine board (or backboard). Never place a patient in the prone position
      - Use of a long spine board provides the flexibility to easily move the patient should he/she vomits.
      - It also provides a safe means of transfer from the stretcher to the bed.
   b. Wrap the cuff pad around each limb.
      - Do not cinch the strap tight. You should be able to insert one finger between the limb and the device.
      - Ensure that the device is properly applied per the manufacturer’s instructions, as some products can constrict circulation when improperly installed.
   c. Secure one of the patient’s arms on the upper part of the long spine board and the other arm on the lower part of the long spine board.
   d. Secure the patient’s ankles to the lower portion of the long spine board.
   e. Secure the strap to the long spine board with a quick-release tie.
   f. Check for and correct any circulatory, respiratory, or neurological compromise caused by the restraint.
   g. Document the time when the restraint is applied.
   h. Utilize the strapping mechanisms of the long spine board to provide additional security and support for the patient with moving.
   i. Continuously monitor the patient for the following issues:
      - Tightening of the strap around the limb.
      - Changes in mental status.
      - Changes in vital signs.
      - Changes in pulse oximetry.
      - ECG changes.
      - Changes in respiratory effort (positional asphyxia).
      - Vomiting.
      - Signs of circulatory and/or neurological compromise at the site of the restraint.
   j. Immediately address any changes in patient status.
   k. Document the duration of the restraint.

**Types of Restraints.**
1. **Hard Restraints** (leather or rubber type alternative cuffs and straps)
   a. Choose slot on ankle/wrist cuff, allowing one or two fingers to pass between skin and cuff.
   b. Secure cuff by passing leather strap through anchor on cuff, thread loose end through anchor again.
c. Thread loose end of strap through mattress support (not side rail) and then through buckle. For restraints with round key, it snaps shut and locks. For flat key locks, depress button on top of side bar of lock while pushing the side bar in.
d. To unlock, place flat key into slot on opposite side of the side bar until side bar pops out.
e. To unlock round key lock, insert key into fitted hole on top of the buckle and turn to right. To remove key, return to starting position.

2. **Soft restraints** (small towels, sheets, cravats, triangular bandages or webbed straps).
   a. Webbed straps, sheets, or cravats may be used to secure the patient’s chest, wrist, thighs, and calves. Secure then to stretcher frame (not side rail).
   b. Small towels, cravats, and triangular bandages may be used to secure the patient’s wrists and ankles.
      1. Form a bight around the wrist/ankle and use tape to hold the running ends together close to the patient. Do not use a knot around the patient, as this may later tighten and restrict patient circulation distal to wrist/ankle.
      2. Wrap other end around stretcher frame and either knot or tape as described above.
      3. Do not use tape alone as a restraint.
   c. Webbed straps with velcro closures may be used for the non-violent patient to secure the wrist and ankles. These types of restraints should not be used for patients who are extremely agitated and unsafe with this type of device.
   a. Physically holding a patient may be necessary when employing other methods of restraint and when there is an immediate need to protect the patient or others from harm by the patient.
   b. When using manual restraint, care should be taken to avoid harm to the patient and EMS personnel.
   c. Use as many EMS and Police personnel as possible when using manual restraint to limit the chance of harm to the patient or personnel.

**d. Beware of positional asphyxia.**

**Patient monitoring:**
1. Any time physical restraint is used, the patient’s status must be monitored with special attention to avoid positional asphyxia.
2. Monitor end tidal CO2 via nasal cannula on all physically and chemically restrained patients. If marked elevation or marked decrease, immediately assess your patient, and in particular, their respiratory status.
3. Note the time the patient was restrained for future reference.
4.25. Spinal Motion Restriction

4.25.1. Spinal Motion Restriction Decision Flowchart

**Spinal Motion Restriction Decision Flowchart**

- **Neuro Exam:** Any focal deficits or AMS?
  - No
  - Yes

- **Significant Traumatic Mechanism or > 75 yr or < 5 yrs w/sig trauma**
  - No
  - Yes

- **Evidenced of Major Injury which may distract patient's awareness of pain**
  - No
  - Yes

- **Evidence of Intoxication or Mental impairment**
  - No
  - Yes

- **Pain to palpation of spinous process of cervical, thoracic or lumbo-sacral spine**
  - No
  - Yes

- **Neck pain to patient's range of motion**
  - No
  - Yes

- **Spinal immobilization NOT required**
- **Spinal immobilization REQUIRED**
Spinal Motion Restriction Decision Assessment (see flow chart)

i. Spinal motion restriction is required if any of the following is present in the trauma patient (remember NSAIDS):
   1. Neurological Deficit (e.g. focal deficit, tingling, reduced strength, numbness in extremity).
   2. Significant traumatic mechanism and extremes of age (> 75YRS, < 5 YRS).
   3. Altered mental status
   4. Intoxicated or Mental impairment
   5. Distracting painful injury- other painful injury that may distract the patient from the pain of c-spine injury
   6. Spinal exam reveals point tenderness or pain to range of motion to spinal process (e.g. cervical, thoracic, or lumbar-sacral). Any neck pain with or without movement

ii. If all of the above are absent, spinal motion restriction is not required

iii. The decision not to implement spinal motion restriction is the responsibility of the Paramedic

iv. Pearls:
   1. The patient should be oriented to person, place, situation and time.
   2. Significant mechanism of trauma includes windshield spider, dash deformity, ejection, rollover, and space invasion of > 1 foot.
   3. Patient’s range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn side-to-side (shoulder-to-shoulder) without pain.
   4. Major injuries that may distract a patient’s awareness of pain include pelvic fracture, femur fracture, extensive burns or soft tissue injury, acute abdomen, or significant pain from other injuries.

v. IF DECISION MADE TO Restrict Spinal Motion:

Spinal Motion Restriction Equipment:

1. Long spine board.
2. Appropriate Cervical Collar
3. Cervical immobilization device (CID)
   a. Headbed
   b. Ferno head block
   c. Blanket roll
4. Straps (minimum of 3)
5. Padding (for head)
6. Tape (2 inch or 3 inch)
7. Additional devices (KED, Pediatric Immobilizer)
vi. Spinal precautions can be maintained by application of a cervical collar and securing patient firmly to the stretcher without a long backboard if all 4 of these criteria are met:
   1. Patient is ambulatory at the scene
   2. Patient does not demonstrate an altered level of consciousness or inability to communicate
   3. Patient does not have complaints suggestive of spinal injury
   4. Patient does not have distracting injuries

Spinal Motion Restrict all patients with the following conditions:
   - High voltage electrical injuries (does not include Taser use)
   - Shallow water drowning or diving injuries

If spinal motion restriction is indicated but refused by the patient:
   - Advise the patient of the indication for immobilization, and the risks of refusing the intervention
   - If the patient allows, apply the cervical collar even if backboard is refused
   - Maintain spinal alignment as best as can be achieved during transport
   - Clearly document refusal of spinal motion restriction

If spinal motion restriction is indicated but the patient cannot tolerate supine position:
   - Apply all elements of spinal motion restriction that the patient will tolerate
   - Maintain spinal alignment as best as can be achieved during transport
   - Clearly document the clinical condition that interfered with full spinal motion restriction

4.25.2. Supine/Prone Position
   1. Begin with manual immobilization of the head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.
   2. Contraindications to placement in an in-line position.
      a. Neck spasm that prohibits neutral alignment.
      b. Increased pain
      c. Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
      d. Compromise of the airway or ventilation
      e. If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.
3. Size and apply the appropriate cervical collar. To size the collar, measure the distance, using your fingers, between the bottom of the jaw to the top of the trapezius muscle or according to manufacturer’s recommendations. (NOTE: In the rare instance an appropriately sized cervical collar is not available, maintain manual immobilization and complete the spinal motion restriction process without a cervical collar.)

4. While maintaining manual stabilization with a cervical collar in place:
   a. Log roll the patient.
   b. Position the backboard next to the patient so that the head of the backboard is approximately 1-2 feet above the patient’s head.
   c. Roll the patient onto the backboard in a supine position.
   d. Reposition patient, in order to center on backboard, by sliding patient in an upward motion (axial) on the board. Do not slide patient in a direct lateral position, as this may manipulate the spine.

5. Place cervical motion restriction device in place.

6. Pad the space, as needed, between the back of the head and the backboard to prevent hyperextension of the cervical vertebrae.

7. Secure the patient’s body to the board with straps.
   a. Immobilize the upper torso to prevent upward sliding of patient’s body during movement and transportation. This can be accomplished by bringing straps over the shoulders and across the chest to make an X.
   b. Additional straps must be placed to prevent side-to-side movement of the body on the board. This can be accomplished by placing straps across the iliac crests and mid-to-distal thigh or at the pelvis with groin loops.
   c. Arms should be placed at the patient’s side to prevent movement of the shoulder girdle.
   d. Secure both feet together to prevent rotary movement of the legs.
   e. Apply 1 or 2 inch tape directly across the forehead and secure the head while extending the tape under the backboard. DO NOT apply tape directly under the chin as this may create an airway obstruction. Tape may be placed across the surface of the semi-rigid cervical collar.

4.25.3. Pediatric Spinal Motion Restriction

1. Manually immobilize the patient’s head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.

2. Contraindications to placement in an in-line position:
   - Neck muscle spasm that prohibits neutral alignment.
   - Increased pain.
• Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
• Compromise of the airway or ventilation.
• If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.

3. Size and apply a cervical collar according to the manufacturer’s recommendations.

4. While maintaining manual stabilization with a cervical collar in place:
   • Log-roll the patient.
   • Position the pediatric immobilizer next to the patient so that the head of the immobilizer is approximately 6-12 inches above the patient’s head.
   • Roll the patient onto the backboard in a supine position.
   • Reposition the patient to center him/her on the immobilizer, by sliding the patient in an upward motion (axial) on the immobilizer.
   • Do not slide the patient in a direct lateral position, as this may manipulate the spine.

5. Secure the patient’s body to the board with straps.
   • Pediatric immobilizers with integrated strapping design: Secure them according to the manufacturer’s recommendation.
   or
   • Immobilize the upper torso to prevent upward sliding of the patient’s body during movement and transportation. This is accomplished by bringing the straps over the shoulders and across the chest to make an X.
   • Additional straps must be placed to prevent side-to-side movement of the body on the board. This can be accomplished by placing the straps across the iliac crests and mid-to distal thigh or at the pelvis with groin loops.

6. If the patient is so small that there is a space left between straps and sides of patient, take up space with pads (e.g., blanket, towel).

7. The patient’s arms should be placed at his/her side to prevent movement of the shoulder girdle.

8. Secure the patient’s head with a cervical immobilization device.
   • Commercially available cervical immobilization device: Follow manufacturer’s recommendation
   or
   • Towel rolls applied to each side of the head: Secure the towels by placing 1- or 2-inch tape directly across the patient’s forehead to the underpart of the backboard. Also secure the towels with tape across the surface of the semi-
rigid cervical collar to the underpart of the backboard. Do not apply tape directly under the patient’s chin, as this may create an airway obstruction.

9. Pad the space, as needed, between the back of the patient’s head and the backboard to prevent hyperextension of the cervical vertebrae.

**4.25.4. Vest-type Extrication Device (KED)**

1. Rescuer One should be positioned behind the patient to stabilize the head and neck.
2. Contraindications to placement in an in-line position:
   - Neck muscle spasm that prohibits neutral alignment.
   - Increased pain.
   - Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.
   - Compromise of the airway or ventilation.
   - If the patient’s injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.
3. Rescuer Two checks neurological and vascular response of all extremities.
4. Rescuer Two measures and applies the cervical collar.
5. The KED is slide into position behind the patient.
6. The KED is wrapped around the patient, and the middle strap is secured. The KED should be snug beneath the patient’s armpits.
7. The bottom strap is secured next.
8. Each leg strap is wrapped around the leg and secured.
9. The top strap of the KED is secured.
10. The patient’s head is secured into the KED.
11. All of the straps are tightened down.
12. The patient’s wrist and legs are secured.
13. A long spine board is placed under the patient’s buttocks.
14. The patient is removed from the vehicle and transferred to the long spine board.
15. Disconnect the leg straps, allowing the patient’s legs to lay flat on the long spine board.
16. Secure the patient to the Long Spine Board.

Note: Neurological and vascular checks should be performed on the patient prior to and after extrication, and any changes noted.

4.26. Splinting

4.26.1. Air Splints
1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity.
   • Do not align a joint injury if resistance is met. Use another device instead.
4. Place your arm through the splint and grasp the patient’s hand or foot.
5. Apply gentle traction while sliding the splint into position.
6. Inflate the splint to a point that a slight dent can be made into the plastic when pressed with a finger.
7. Reevaluate the patient’s distal pulse, motor function, and sensory function.

4.26.2. Rigid Splint
1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity. Do not align a joint injury if resistance is met.
4. Acquire the appropriate-length wood planks. Provide padding to ensure even contact with the splint.
5. Place the wood on each side of the injury.
6. Secure the extremity to the rigid splint with tape, cling, or Ace wraps.
   • Long bone injury: Immobilize the joint above and joint below the injury.
   • Joint injury: Immobilize the bone above and bone below the injury.
7. Reevaluate the patient’s distal pulse, motor function, and sensory function.

4.26.3. HARE Traction Splint
Level of training: EMT-(B-I-A), EMT-P

Purpose: The hare traction splint is designed to be used on those patients who have suffered a suspected femur fracture. Proper use can decrease the pain and damage caused by the fracture.

Indications: suspected femur fracture

Contraindication: Open femur fracture

Procedure:
1. Upon recognizing the injury, Rescuer One should stabilize the leg in position found while applying manual traction.
2. Rescuer Two will then expose the injured leg
   a. Assess neurological function distal to injury site.
b. Assess circulatory function distal to injury site.

3. Rescuer Two should prepare traction splint
   a. Position splint against injured leg.
   b. Place the ischial pad against the iliac crest.
   c. Adjust splint to length, extending the splint so the bend is even with the heel of the foot.
   d. Tighten locking collars.
   e. Open and position the Velcro straps along the splint.
   f. Release the ratchet, extending the entire length of the traction strap.
   g. Place the splint next to the injured leg.

4. Rescuer Two should apply the ankle hitch to the patient.
5. Rescuer Two should apply gentle but firm traction.
6. Rescuer One will now move the splint into position. Slide the splint into position under the injured leg.
   a. The splint should be firmly seated against the ischial tuberosity.
7. Rescuer One secures the pubic strap.
   a. The strap is brought over the groin and high over the thigh and secured.
8. Rescuer One attaches the ankle hitch to the traction splint.
9. The traction strap is taken in, applying mechanical traction until the pain and muscle spasms are relieved.
   a. Maintain manual traction until the mechanical traction takes over.
   b. Traction can be stopped when the injured leg is approximately the same length as the uninjured leg.
10. Secure the remaining Velcro straps around the leg.
11. Reevaluate all of the straps.
   a. When splint is properly applied, the patient’s foot should be upright.
12. Reassess circulation and neurological function distal to injury site.
   a. Compare to original findings and note any changes.
13. Transport patient on firm surface, such as a long spine board, so that the splint is supported.

Notes:
1. If the patient is determined to be unstable, do not waste time applying the traction splint. Splint the injured leg against the uninjured leg to expedite transport.
2. Continue to monitor patient’s vital signs during transport
3. Continue to reassess circulatory and neurological function distal to injury site.
   a. Compare to original findings and note any changes.
4. If the hospital has not removed the splint prior to departing, request the hospital staff to notify the EMS Supervisor once the splint is removed. It should be picked up as soon as possible and placed back on the unit.

4.26.4. Sager Traction Splint

1. Assemble two person team
2. Check distal pulses and sensation (be certain to document the presence/absence of pulses and sensation).
3. One team member may maintain slight manual traction on the fractured leg. Check distal pulses and sensation (document again).
4. Assemble the splint and adjust to the proper length. Adjust the ankle strap to the approximate size of the patient’s ankle.
5. Place the padded brace between patient’s legs, resting the ischial perineal cushion against the ischial tuberosity. Avoid undue pressure on external genitalia. Apply the abductor bridle (thigh strap) around the upper thigh of the fractured leg and tighten firmly. The perineal area and the area under the abductor strap may be padded with a towel for comfort and to minimize pressure over the femoral vessels. Extend the inner shaft of the Sager until the crossbar rests adjacent to the patient’s heels.
6. Position the malleolar (ankle) harness beneath the heel(s) and around the ankle(s). Secure these snugly.
7. Shorten the loop straps on the harness to ensure that the cable ring is secure up against the foot.
8. Grasp the shaft with one hand and the traction bar with the other hand, gently extend the inner shaft until the desired amount of traction is obtained on the calibrated scale located on the wheel. The correct amount of traction would be approximately 10% of body weight to a maximum of 15 pounds. If more traction is indicated, contact on-line Medical Control.
9. Posterior to the knees, gently slide the largest elastic cravat through and upwards to the thigh, repeating with the smaller elastic cravats to minimize lower and mid-limb movement.
10. Re-tighten the adductor bridle (thigh strap) at the upper thigh and firmly secure the three elastic cravats.
11. Apply pedal binding (figure eight strap) to feet.
12. Check and document pedal pulses and sensation.
13. Consider elevating the extremity. Stabilize extremity to backboard or stretcher (be certain that splint does not extend past backboard or stretcher to avoid contact with door).
BASIC APPLICATION

SAGER 201 Single Leg Traction Splint pg. 1 & 2
SAGER 202 Bilateral Leg Traction Splint pg. 3
SUPER SAGER 204 Bilateral Traction Splint pg. 3

Training Video available in VHS for Super Sager 204.
*Coming Spring 1990—Training Video for Sager 201.

Before applying the splint to the leg, slide the adductor bridle (thigh strap) so that when it is closed, it will be located on the anterior (top) surface of the thigh.

*Prior to application of the splint, get a rough measure of the length of splint needed. Extend it so that the wheel is at the heel. NOTE: Patients wearing tight jeans or underwear, especially men, may not find the splint comfortable to wear unless clothing is removed or cut open, which, of course, should be done as part of patient evaluation prior to application of splint.

Roughly estimate the size of the ankle and fold down the number of pads needed to provide padding all around the lower leg.

Grip the adductor bridle and slide it up under the thigh so that the perineal cushion is snug against the perineum and ischial tuberosity.
5. Tighten the adductor bride (thigh strap), drawing the ischiatic perineal cushion to the lateral portion of the crotch.

6. Apply the malleolar (ankle) harness tightly around the ankle above the medial and lateral malleoli of the ankle. *Check posterior tibial and dorsalis pedis pulses before hitch application and after traction is established.

7. Shorten the loop of the harness connected to the cable ring by pulling on the strap threaded through the square "D" buckle. Do this to ensure that the cable ring is pulled snugly up against the bottom of the foot.

8. Extend the inner shaft of the splint by pulling it out until the desired amount of traction is noted on the calibrated wheel. Rough guide to determine amount of traction needed: apply 10% of body weight to maximum of 15 pounds (6.8 kg) traction.

9. Apply the longest elasticized leg cravat as high up the thigh as possible.

10. Apply the remaining elasticized leg cravats: a.) Around knee. Use padding if needed. b.) Over the malleolar (ankle) harness and lower leg.
4.26.6. Vacuum Splint

1. Expose the injured area.
2. Evaluate the patient’s distal pulse, motor function, and sensory function.
3. Align the extremity, stabilize it, and support the extremity. Do not align a joint injury if resistance is met.
4. Wrap and secure the vacuum splint around the extremity.
5. Draw the air out of the splint.
6. Reevaluate the patient’s distal pulse, motor function, and sensory function

Features
1. One Person Application - frees 2nd attendant for other patients and procedures.
2. Compatible with Anti-Shock Trousers - inside or outside.
3. Universal - single or bilateral (S202 and S204), adult or child (S201, S202 and S204).
4. Patient can be moved to any position with splint in place.
5. Light weight, Small storage space.
8. Compatible with back boards, stretchers, baskets and gurneys.
9. Stays within the body silhouette (Model S-204 only).
10. Quantifiable Dynamic Traction, (Patented)

Benefits
1. Prevents excessive traction. Traction is “quantifiable”, a positive consideration for Medical Legal Purposes.
2. Can be applied in a confined space.
4. SAGER's counter traction design permits movement and lifting without slippage of traction device.
5. Secures and packages patient for optimal transportation.
6. Easy access to Dorsalis Pedis and Posterior Tibial pulses.
7. Does not require foot to be elevated, anatomically allows for natural body alignment.
8. Traction device can be applied with minimum movement of fractured legs.

4.27. Vagal Maneuvers

Level: EMT-P

**Description and Indications:**
The degree of stimulation in the vagus nerve affects the heart rate. The greater the degree of vagal stimulation, the more the vagus nerve will SLOW the heart rate inhibiting the SA node. Therefore, vagal stimulation is modality in the treatment of clinically dangerous supraventricular tachycardia (SVT) due to primary cardiac rhythm disturbances, such as paroxysmal reentry disorders.

**Contraindications:**
Carotid sinus massage should not be used in patients with inequality of carotid pulses or past history of carotid surgery (endarterectomy). Do not use these procedures to treat SVT secondary to hypovolemia. Due to the risks of the procedure, it should only be employed when the SVT itself poses a significant clinical danger.

**Warnings:**
Carotid sinus massage may break off a plaque in the elderly and patients who have diabetes or hypertension, resulting in a CVA secondary to the embolus. Bradycardia or asystole may occur during stimulation; hence, ALL vagal stimulations must be performed under constant ECG monitoring.

**Procedure:**

**4.27.1. Valsalva maneuver** - This is the least dangerous method and should be used before others are attempted. The procedure may be repeated.

1. Attach the patient to an ECG for continuous monitoring.
2. Establish intravenous access.
3. Determine that the patient is conscious and cooperative.
4. Document the ECG and any dysrhythmia.
5. Describe the procedure to the patient.
   - Have the patient inhale and hold his/her breath.
   - Bear down as if to have a bowel movement.
   - Hold for 20-30 seconds.
   - Try to turn the face red.
   OR
   - Have the patient blow forcefully through a straw or IV catheter for as long as possible.
6. Continue to monitor the heart rhythm during the procedure. Stop the procedure if:
   - The patient becomes confused.
4.27.2. Ice water immersion of the face - This technique should be attempted if the Valsalva was ineffective. The results, if any, will be almost immediate. This procedure may be repeated. This method should NOT be used in patients with a cardiac history (e.g. MI, angina, HTN, heart transplants, etc.).

1. Attach the patient to an ECG for continuous monitoring.
2. Establish intravenous access.
3. Determine that patient is conscious and cooperative.
4. Note that this procedure is contraindicated for patients with history of acute coronary syndrome, hypertension, and heart transplant.
5. Document the ECG and any dysrhythmia.
6. Describe the procedure to the patient.
   • Fill a large basin or sink with ice water. It must be very cold.
   • Ask the patient to hold his/her breath and put the entire face into the water for several seconds.
   OR
   • Fill a large latex exam glove with ice water.
   • Place the glove on the patient’s face for several seconds.
7. Continue to monitor the heart rhythm during the procedure. Stop the procedure if:
   • The patient becomes confused.
   • The heart rate drops below 100 BPM.
   • Asystole occurs.
4.28. Wound Care

4.28.1. Hemostatic Gauze (QuickClot, Celox, Combat Gauze, etc.)

**Indications**
1. Wounds involving the scalp, face, neck, axilla, groin or buttocks.
2. Severe wounds that cannot be controlled by other means (direct pressure/tourniquet).
3. Junctional hemorrhage

**Contraindications**
1. Avoid contact with eye injuries
2. Vaginal bleeding
3. Internal bleeding
4. Open abdominal or chest wounds

**Procedure**
1. Provide supportive care.
2. Apply direct pressure to wound or proximal pressure point (axillary junction or medial groin).
3. If extremity wound and a trauma tourniquet is indicated, apply tourniquet.
4. If direct pressure is insufficient, apply hemostatic dressing; maintain direct pressure when using hemostatic dressing.
5. Open the hemostatic dressing package and remove dressing.
6. Remove clothing around wound. Remove excess pooled blood from wound with gauze.
   a. Preserve any clots already in the wound to aid in the clotting process.
   b. When the source of the bleeding is located, pack the wound tightly and directly onto the wound with the hemostatic dressing.
   c. Use as much of the dressing as needed to stop the blood flow. The remainder of the dressing can be used to cover the top of the wound.
7. Quickly apply pressure until the bleeding stops. Estimated time 3-5 minutes of continuous pressure.
8. Leave the hemostatic dressing in place and wrap the area with kling or ace bandage to secure wound and dressing.
9. Do NOT remove the bandage or hemostatic dressing, elevate the injury if needed.
10. Reassess the wound and patient for any changes and document.
11. Transport the patient to the appropriate trauma center.

**Note:**
Hemostatic dressings are NOT appropriate for minor bleeding, bleeding that can be controlled by direct pressure, or bleeding that can be controlled by the application of a trauma tourniquet.
4.28.2. C-A-T TOURNIQUET (Combat-Application-Tourniquet)

Level of training: EMT-(B-I-A), EMT-P

**Purpose:** This protocol is to be used by EMTs or Paramedics to control life threatening hemorrhaging and prevent exsanguinations in situations where there is a serious injury to an extremity with severe bleeding and direct pressure fails to control the bleeding.

**Indications for tourniquet use:**
1. To stop bleeding when:
   a. Life-threatening limb hemorrhage is not controlled with direct pressure or other simple measures, as may occur with a mangled extremity.
   b. Traumatic amputation has occurred.

**Contraindications:**
1. Non-extremity hemorrhage
2. Proximal extremity location where tourniquet application is not practical.

**Procedure:** Application of Combat Application Tourniquet (CAT)
1. Placement
   a. Expose the extremity by removing clothing in proximity to the injury.
   b. Place CAT directly over exposed skin at least 5 cm proximal to the injury.
   c. Route the self-adhering band around the extremity.
   d. Pass the band through the outside slit of the buckle.
   e. Pull the self-adhering band tight and secure the band back on itself with the Velcro adhesive strap.
   f. Twist the rod until bright red bleeding stops.
   g. Lock the rod in place with the windlass clip.
   h. Record the date/time of application on the tourniquet.

2. Evaluation
   a. The tourniquet is effectively applied when there is cessation of bleeding from the injured extremity, indicating total occlusion of arterial blood flow.
   b. Any preexisting distal pulse should be absent at that time as well.

3. Tourniquet time and removal
   a. Tourniquets should be removed as soon as possible under conditions where the hemorrhage can be directly controlled.
   b. Tourniquet placement must be communicated in patient reports for all pre-hospital to hospital and inter-hospital transfers.
   c. Tourniquet time > 6 hours is associated with distal tissue loss.
Training: Appropriate tourniquet use requires initial and annual renewal training with skill demonstration.

Note: If one tourniquet correctly applied does not completely control hemorrhage, in addition to direct pressure, an additional tourniquet may be applied just proximal to the first tourniquet. Once bleeding has been controlled by a tourniquet, leave the tourniquet in place throughout the remainder of scene care and transport.
5 Drug Reference
5. QUICK DRUG REFERENCE

**Purpose:** This section contains a brief description of drugs used in these protocols. This list will be periodically updated as new drugs are added and some removed. It is intended to supplement other standard references (Paramedic Emergency Care, ACLS, PALS, BTLS, PHTLS, etc). Drugs are listed alphabetically by their generic name. Trade names are shown in parentheses.

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5.1 MEDICAL PROTOCOL DRUGS

5.1.1 Adenosine (Adenocard)

**Class:** Antiarrhythmic

**Actions:** slows AV conduction. Adenosine exerts its effects by decreasing conduction through the AV mode. The half-life of Adenocard (Adenosine) is less than 10 seconds. Thus, its effects, desired and undesired, are self-limited

**Indications:** symptomatic PSVT, including that associated with accessory bypass tracts (Wolf-Parkinson-White Syndrome). *NEW: It can now also be used for regular monomorphic wide-complex tachycardia.*

**Contraindications:** second- or third-degree heart block, sick-sinus syndrome, known hypersensitivity to the drug.

**Precautions:** Arrhythmias, including blocks, are common at the time of cardioversion. Use with caution in patients with asthma. Make sure that adenosine is not used for irregular, polymorphic wide-complex tachycardia or VT. Use in these cases may cause clinical deterioration.

**Side Effects:**

- **Serious:** Severe bradycardia, V-fib, V-tach, atrial fib, asystole, complete heart block, bronchospasm
- **Common:** Facial flushing, headache, shortness of breath, dizziness, nausea, brief asystole or bradycardia.

**Dosage:** 6 mg given as a rapid IV bolus over a 1-2 second period followed by a 20 ml bolus of NS; if, after 1-2 minutes, cardioversion does not occur, administer a 12-mg dose over 1-2 seconds followed by a 20 ml NS bolus. All efforts should be made to administer adenosine as quickly as possible.

**Routes:** IV, IO; should be administered directly into a vein or into the medication administration port closest to the patient and followed by flushing of the line with IV fluid.

**Pediatric Dosage:** 0.1 mg/kg (max. 6 mg) rapid IVP immediately followed by 6 ml NS flush. Repeat in 2 minutes, at 0.2 mg/kg (max. 12 mg) rapid IVP followed by 6 ml NS flush PRN.
5.1.2 Acetaminophen (Tylenol)
Class: Analgesic, Antipyretic
Actions: Analgesic mechanism of action unknown, antipyretic effect via direct action on the hypothalamic heat-regulating center
Indications: Mild pain, fever
Contraindications: hypersensitivity to drug class
Precautions: Hepatic impairment, renal impairment (long term use), severe hypovolemia, PKU, malnutrition, chronic alcohol use.
Side Effects: Anaphylactic rxns, hepatotoxicity, acute renal tubular necrosis, chronic analgesic nephropathy, anemia, thrombocytopenia
Dosage: 325 – 1000 mg
Routes: Oral (or rectal suppositories)
Pediatric dose: 10 – 15 mg/kg

5.1.3 Activated Charcoal
Class: Adsorbent
Actions: Adsorbs toxins by chemical binding and prevents gastrointestinal adsorption.
Indications: Poisoning following emesis or when emesis is contraindicated.
Contraindications: None in severe poisoning.
Precautions: Should only be administered following emesis, in cases in which it is so indicated. Use with caution in patients with altered mental status.
Side Effects: Nausea, vomiting, and constipation.
Dosage: 1 g/kg (typically 50-75 grams) mixed with a glass of water to form a slurry.
Routes: Oral
Pediatric Dosage: 1 g/kg mixed with a glass of water to form a slurry

5.1.4 Albuterol (Proventil) (Ventolin)
Class: Sympathomimetic (ß2 selective)
Actions: Bronchodilation. Albuterol is primarily a beta-2 sympathomimetic and as such produces bronchodilation. Because of its greater specificity for beta-2 adrenergic receptors it produces fewer cardiovascular side effects and more prolonged bronchodilation than isoproterenol. Onset is within 15 minutes; peaks in 60-90 minutes. Therapeutic effects may
be active up to 5 hours. Albuterol also helps to shift potassium back into cells thus reducing the concentration of extracellular K+.

Albuterol is a β2-agonist that is believed to exert a hypokalemic effect by binding to a β2-adrenoreceptor, resulting in adenylate cyclase activation. Adenylate cyclase stimulates the production of cyclic adenosine monophosphate, which is then used by the Na+–K+ ATPase pump to transfer potassium into the intracellular space.

**Indications:** Asthma, reversible bronchospasm associated with COPD. Treatment of Hyperkalemia.

**Contraindications:** Known hypersensitivity to the drug, symptomatic tachycardia

**Precautions:** Blood pressure, pulse, and EKG should be monitored use caution in patients with known heart disease, hypokalemia, diabetes, seizure disorder, hyperthyroidism, pheochromocytoma, pregnancy, elderly patients.

**Side Effects:** Palpitations, anxiety, headache, dizziness, and sweating, hypertension, angina, MI, tachycardia, throat irritation, URI symptoms, cough, bad taste, tremor, nervousness, hypokalemia, arrhythmia, arrhythmia nausea.

**Dosage:**
- Strength clarification: 2.5 mg/3ml = 0.083%;
  - 5mg/ml = 0.5%
- **Metered Dose Inhaler:** 1-2 sprays (90 micrograms per spray)
- **Small-Volume Nebulizer:** 2.5 mg in 2.5 ml normal saline over 5-15 minutes
- **Rotohaler:** one 200-microgram rotocap should be placed in the inhaler and breathed by the patient

**Routes:** Inhalation

**Pediatric Dosage:**
- Strength clarification: 0.63 mg/3ml = 0.021%
  - 1.25 mg/3ml = 0.042%
  - 2.5 mg/3ml = 0.083%
  - 5 mg/ml = 0.5%
- **< 2 yr:** 0.15 mg/kg in 2.5 ml NS. (If <1 year or <10 kg: add 1.25 mg of Albuterol mixed in 1.5 ml of NS (0.083%) to nebulizer and flow oxygen at 3 liters/min. Treatment will be delivered over approximately 5 to 15 minutes). Max 1.25 mg/dose
- **2-5 yr:** 0.15 mg/kg in 2.5 ml of NS. Max. 2.5 mg/dose
- **> 5 yr:** 2.5 mg in 2.5 ml of NS

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Indications:  
a) Life-threatening recurrent V-Fib and  
b) Recurrent hemodynamically unstable ventricular tachycardia.  
c) Can be considered for atrial fibrillation with RVR, if a-fib onset is less than 48 hours (must use medical control). It should not be used for a-fib > 48 hours.

Contraindications: Severe sinus node dysfunction causing marked sinus bradycardia; 2nd and 3rd degree AV block, hypersensitivity to iodine, cardiogenic shock, neonatal or infants, pregnancy, breast-feeding.

Precautions: Hypotension may be due to rate of infusion, caution in: elderly patients, and patients with liver dysfunction, thyroid disease, pregnancy, pulmonary disease, QT prolongation, hypokalemia, hypomagnesemia, implantable cardiac device, surgery

Side Effects: Serious; Arrhythmias, prolonged QT interval, bradycardia, severe AV block, complete sinus arrest, Torsades de pointes, cardiogenic shock, hypotension, severe CHF, pulmonary toxicity, severe skin reaction, ARDS, hypo are hyper thyroidism, rhabdomyolysis, hepatotoxicity, pancreatitis, optic neuritis, blood dyscrasias.  
Common: nausea/ vomiting, malaise/fatigue, ataxia, tremor, hyperkinesia, peripheral neuropathy, constipation, anorexia.

Dosage: V-Fib/Pulseless V-Tach; 300mg IV/IO, may repeat 150mg IV. Rapid IV/IO if pulseless/no BP, otherwise administer over 10 minutes to decrease risk of hypotension.

Wide Complex Tachycardia: 150 mg IV/IO over 10 minutes, then 1mg/min IV/IO x 6 hrs.

Atrial Fibrillation with RVR < 48 hours onset (must go through medical control) 150mg IV/IO over 10 minutes.

If patient is on a drip or a drip is started, see; Amiodarone IV Drip 450mg or Amiodarone IV Drip 900mg

Routes: IV, IO

Pediatric Dosage: V-Fib/Pulseless V-Tach: 5mg/kg IV/IO (maximum dose 15mg/kg).  
Supraventricular Tachycardia: 5mg/kg IV/IO (maximum dose 15mg/kg) over 20 min
overall mortality from acute myocardial infarction.

**Indications:** New-onset chest pain suggestive of ACS or MI

**Contraindications:** Patients with history of hypersensitivity to the drug. Known allergy to Aspirin (e.g. asthma), active GI ulceration or bleeding, hemophilia or other bleeding disorders, during pregnancy, children under 2 years of age.

**Precautions:** GI bleeding and upset.

**Side Effects:**

- **Serious:** Anaphylactic Rxn, bronchospasm/wheezing, angioedema, bleeding, DIC, thrombocytopenia, GI ulceration/bleeding, pancytopenia, agranulocytosis, aplastic anemia, hypoprothrombineia, nephrotoxicity, hepatotoxicity, salicylism, Reye syndrome
- **Common:** Nausea, vomiting, dyspepsia/heartburn, Tinnitus, urticaria, hyperuricemia, bleeding, ecchymosis, constipation, diarrhea, dizziness

**Dosage:** 150-325 mg PO or chewed.

**Routes:** PO.

**Pediatric Dosage:** not recommended.

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### 5.1.7 Atropine for Cardiac Use or increased secretions from Ketamine and other drugs

**Class:** Parasympatholytic (anticholinergic).

**Actions:** Blocks acetylcholine receptors, increases heart rate, and decreases gastrointestinal secretions. It is a potent anticholinergic (parasympathetic blocker, parasympatholytic) that reduces vagal tone and thus increases automatically the SA node and increases A-V conduction.

**Indications:** Hemodynamically-significant bradycardia, hypotension secondary to severe bradycardia, organophosphate poisoning.

**Contraindications:** None when used in emergency situations.

**Precautions:** Dose of 0.04 mg/kg should not be exceeded except in cases of organophosphate poisonings, tachycardia, and hypertension. Too small of a dose (< 0.5 mg) or if pushed too slowly, may initially cause the heart rate to decrease. Antihistamines and antidepressants potentiate atropine.

For 2nd degree AV block type II and 3rd degree AV block, omit Atropine and go to external pacer.

**Side Effects:** Palpitations and tachycardia, headache, dizziness, and anxiety, dry mouth (xerostomia), pupillary dilation, and blurred vision, urinary retention (especially older males), restlessness, agitation, confusion, psychotic reaction, insomnia mydriasis, delirium, ataxia, tremor and headache.

**Dosage:**
- Bradycardia: 0.5 mg IV/IO every 5 min to max of 0.04 mg/kg or 3 mg total.
- Organophosphate poisoning: 2-5 mg.

**Routes:** IV, IO, ET (ET dose is 2 - 2.5 times IV dose).

**Pediatric Dosage:** Bradycardia or increased bronchial secretions: 0.02 mg/kg IV.
5.1.8 Atropine for Antidote to Poisoning

**Class:** Parasympatholytic (anticholinergic).

**Action:** Atropine is a potent parasympatholytic that binds to acetylcholine receptors thus diminishing the actions of acetylcholine.

**Indications:** Anticholinesterase syndrome poisoning such as; Organophosphate (e.g. parathion, Parathion, Rid-A-Bug) and Carbamate (Baygon, Sevin and many common roach & ant sprays). Signs of organophosphate poisoning are: Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis, pinpoint pupils, bradycardia, and excessive sweating.

**Contraindications:** None when used in the management of severe organophosphate poisoning.

**Precautions:** It is important that the patient be adequately oxygenated and ventilated prior to using atropine as Atropine may precipitate ventricular fibrillation in a poorly oxygenated patient. Even after Atropine is administered, the patient may require intubation and aggressive ventilatory support.

**Side Effects:** Victims of organophosphate poisoning can tolerate large doses (1000 mg) of Atropine. Signs of atropinization are the end point of treatment: flushing, pupil dilation, dry mouth, and tachycardia.

**Dosage:**

**Adult:** 2 mg IM/IV x 1 for mild to moderate (frail/elderly start 1 mg IM x 1). 4-6 mg IM/IV for severe symptoms (frail/elderly start 2-4 mg IM x 1). Continue atropinization @ 1-2 mg IM/IV Q 10-30 min until muscarinic symptoms gone. Give Atropine first if also using Pralidoxime (2-PAM).

**Pediatric:**

< 2 yr old: 0.05 mg/kg (max. 3 mg) IM or 0.02 mg/kg IV, repeat q 5-10 minutes until atropinization occurs. (If nerve agent, Start 0.05 mg/kg IM x 1 for mild/moderate sx. Start 0.1 mg/kg IM for severe sx).

2 – 10 yrs: 1 – 2 mg IM/IV q 10 – 30 min prn; Start 1 mg IM/IV x 1. (If nerve agent, Start 1 mg/kg IM x 1 for mild/moderate sx. Start 2 mg/kg IM for severe sx).

> 10 yrs: 1-2 mg IV/IV q 10 – 30 min prn; Start 2 mg IM/IV x 1. (If nerve agent, Start 2 mg/kg IM x 1 for mild/moderate sx. Start 4 mg/kg IM for severe sx).
Note: Give Atropine first if also using Pralidoxime (2 PAM).

5.1.9 Calcium Chloride 10% (CaCl)
Class: Electrolyte.
Actions: Increases cardiac contractility.
Indications: Acute hyperkalemia (elevated potassium), acute hypocalcemia (decreased calcium), calcium channel blocker (Nifedipine, Verapamil, etc.), overdose, abdominal muscle spasm associated with spider bite and Portuguese man-o-war stings, antidote for magnesium sulfate.
Contraindications: Patients receiving digitalis, hypercalcemia, hypophosphatemia, ventricular fibrillation.
Precautions: IV line should be flushed between calcium chloride and sodium bicarbonate administration. Extravasation may cause tissue necrosis.
Side Effects: Serious: Hypercalcemia, Arrhythmias (bradycardia and asystole), syncope, nephrolithiasis, extravasation necrosis.
Common: hypercalcemia, hypercalciuria, vasodilation, hypotension, bradycardia, arrhythmia, syncope, nephrolithiasis, hypomagnesemia, flushing, dizziness, constipation, nausea.
Dosage: [Strength clarification: 10% IV sol = 1 gm calcium chloride/10 ml = 270 mg (13.5 mEq) elemental Ca].
Arrhythmias: 500 – 1000 mg IV (5 – 10 ml of 10% Ca Chloride); may be repeated at 10-minute intervals.
Calcium Channel Blocker OD: 1-2 gm IV over 10 min q 20 min x 5 doses
Routes: IV.
Pediatric Dosage:
Arrhythmias due to hyperkalemia: 20 mg/kg IV/IO q 10 min pm
Calcium Channel Blocker OD: 20mg/kg IV over 10 min q 20 min x5

5.1.10 Clonidine/(Catapres)
Class: Anti-hypertensive, Adrenergic
Action: Stimulates alpha 2-adrenergic receptors (centrally acting antihypertensive).
Indications: Uncontrolled hypertension in patients able to take PO medication.
Contraindications: Allergy to this medication
**Precautions:** Caution if severe coronary insufficiency, conduction disturbances, recent MI, chronic renal failure, or cerebral vascular disease. Remove patch before defibrillation or cardioversion. Avoid abrupt discontinuation

**Side Effects:** *Serious:* Hypotension, bradycardia, AV block, syncope, tachycardia, depression, hypersensitivity rxn, angioedema, withdrawal sx if abrupt D/C, rebound HTN if abrupt D/C.

*Common:* Dry Mouth (xerostomia), drowsiness, dizziness, constipation, sedation, hypotension, bradycardia, fever, weakness, nausea, vomiting, fatigue, nervousness, agitation, sexual dysfunction/ impotence, headache, alopecia, orthostatic symptoms, localized skin reaction

**Dosage:** 0.1 mg PO

**Pediatric Dosage:** not for peds in EMS

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5.1.11 **Dextrose 50%, 25% and 10%**

**Class:** Carbohydrate.

**Actions:** Elevates blood glucose level rapidly.

**Indications:** Hypoglycemia.

**Contraindications:** None in the emergency setting.

**Precautions:** A blood sample should be drawn before administering 50% dextrose.

**Side Effects:** Local venous irritation.

**Dosage:**
- 25 grams (50 ml)
- 100 - 250 ml D10W (titrate to effect)

**Routes:** IV.

**Pediatric Dosage:**
- Neonates: 10% Dextrose: 2-5 ml/kg (0.2-0.5 g/kg)
- Infants: 10% Dextrose: 5 ml/kg (0.5 g/kg)
- Children: 10% Dextrose: 5 ml/kg (0.5 g/kg) not to exceed total of 250 ml (25gms)

**NOTE:**
- D50W = 50 gm Dextrose in 100 ml Sterile Water (0.5 gm/ml)
- D25W = 25 gm Dextrose in 100 ml Sterile Water (0.25 gm/ml)
- D10W = 10 gm Dextrose in 100 ml Sterile Water (0.1 gm/ml)

**To make D25W** dilute 1:1 of D50W with sterile water (or NS) to form a 25% solution (0.25 gm/ml).

**To make a D10W** dilute 2 ml of D50W with 8 ml of sterile water or NS (0.1gm/ml). If using D25W, dilute 4 ml of D25W with 6ml of sterile water or NS (0.1gm/ml)

5.1.12 Diazepam (Valium)

**Class:** Tranquilizer (Benzodiazepine).

**Actions:** Anticonvulsant, skeletal muscle relaxant, sedative.

**Indications:** Generalized seizures, status epilepticus, premedication before cardioversion, skeletal muscle relaxant, acute anxiety states.

**Contraindications:** Patients with a history of hypersensitivity to the drug. Avoid abrupt withdrawal (long term use).

**Precautions:** Can cause local venous irritation. Has short duration of effect. Do not mix with other drugs because of possible precipitation problems. Use with caution in patients with: renal impairment, pulmonary impairment, sleep apnea, CNS depression, alcohol use, alcohol or drug abuse, seizure hx, elderly debilitated pts, depression, porphyria

**Side Effects:**

- **Serious:** Hypotension, respiratory depression, apnea, seizures, suicidality, bradycardia, syncope, cardiovascular collapse, blood dyscrasias, jaundice, paradoxical CNS stimulation, withdrawal symptoms if abrupt D/C.

- **Common:** Drowsiness, fatigue, asthenia, ataxia, venous thrombosis, phlebitis, confusion, depression, dysartrhria, headache, tremor, dystonia, amnesia, urinary retention, constipation, nausea, incontinence, diplopia, dizziness, irritability, disinhibition, libido changes, rash, xerostomia, sialorrhea, menstrual irregularities, hypotension, ALT/AST elevation.

**Dosage:**

- **Status epilepticus:** 5-10 mg IV. (alternative; 0.2 mg/kg Per Rectum x 1)
- **Acute anxiety:** 2-10 mg IM or IV.
- **Premedication before cardioversion:** 5-15 mg IV.
- **Acute muscle spasm:** 2-10 mg IV.
- **Post intubation management:** 2 – 5 mg IV then 1-2 mg increments IV prn

**Routes:** IV, IO (care must be taken not to administer faster than 1 ml/min), IM, rectal.

**Pediatric Dosage:**

- **Status epilepticus:**
  - [1 mo – 5 yr] 0.1 - 0.3 mg/kg IV/IO q 5-10 min.
  - Max 5 mg total.
  - [5 yr – 12 yr] 0.1 - 0.3 mg/kg IV/IO q 5-10 min.
  - Max 10 mg total
  - [> 12 yr] 2 – 10 mg IV/IO q 10 – 15 min. Max 30 mg total

- **RECTAL DOSE:** Varify dose with Broselow tape
  - [up to 5 yrs] 0.5 mg/kg PR x 1
  - [6 – 11 yrs] 0.3 mg/kg PR x 1
  - [> 11 yrs] 0.2 mg/kg PR x 1

**Procedure Sedation:** 0.1 mg/kg IV/IO
**Anxiety**: (Med Control): [6mo-12yr] 0.04 – 0.2 mg/kg IM or IV. Max: 0.6 mg/kg/8hr

[> 12 yr] 2-10 mg IV/IM q 3-4 hrs

**Muscle Spasm** (Med Control) [6mo-12yr] 0.04 – 0.2 mg/kg IM/IV q 2-4 hrs. Max: 0.6 mg/kg/8hr

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### 5.1.13 Dilaudid (Hydromorphone)

**Class**: Schedule II narcotic, Opioid

**Actions**: Binds to various opioid receptors, producing analgesia and sedation. Opioid agonist

**Indications**: Treatment of moderate to severe pain

**Contraindications**: Hypersensitivity to drug, hypersensitivity to sulfites, opioid non-tolerant pts (high potency dosage form), severe respiratory depression, acute or severe asthma, hypercarbia, GI obstruction, paralytic ileus, labor and delivery, avoid abrupt withdrawal,

**Precautions**: hypersensitive to latex (branded vial form), elderly and debilitated, 3rd trimester pregnancy, impaired renal fx, impaired hepatic fx, pulmonary impairment, CNS depression, alcohol use, delirium tremors, hypothyroidism, adrenal insufficiency, ICP increase, seizure disorder, toxic psychosis, cardiovascular dz, volume depletion, circulatory shock, GI motility disorder, acute abdomen, biliary surgery or dz, prostatic hypertrophy, urethral stricture, substance abuse history

**Side Effects**:

- **Serious**: Respiratory depression, circulatory depression, hypotension (severe), ICP increase, seizures, dependency (abuse), withdrawal if abrupt D/C, neonatal withdrawal sx (long-term maternal use), paralytic ileus, biliary spasm, hypersensitivity rxn.

- **Common**: Dizziness, somnolence, nausea/vomiting, hyperhidrosis, flushing, dysphoria/euphoria, xerostomia, pruritus, headache, constipation, anorexia, rash, insomnia, anxiety/agitation, muscle spasm, depression, abdominal cramps, injection site rxn (IV use).

**Dosage**: 1-4 mg. Start 0.5 – 1 mg IV; or 2-4 mg IM/SC
5.1.14 Diltiazem (Cardizem)

**Class:** Calcium channel blocker.

**Actions:** Inhibits the influx of calcium (Ca\(^{2+}\)) ions during membrane depolarization of cardiac and vascular smooth muscle, decreasing sinoatrial and atrioventricular conduction and inhibits the contractile process of the myocardial smooth muscle cells leading to dilatation of the coronary and systemic arteries and improved oxygen delivery to the myocardial tissue. Slows conduction through the AV node, causes vasodilation, decreases rate of ventricular response, and decreases myocardial oxygen demand.

**Indications:** To control rapid ventricular response associated with atrial fibrillation and flutter. Paroxysmal supraventricular tachycardia

**Contraindications:** Severe Hypotension, wide complex tachycardia, conduction system disturbances, second or third degree AV block (except functioning ventricular pacemaker), sick sinus syndrome (except functioning ventricular pacemaker), severe hypotension and cardiogenic shock, concomitant use or use in close proximity of intravenous Diltiazem and intravenous beta blockers, atrial fibrillation or atrial flutter associated with the sensory bypass tract such as WPW syndrome or short PR syndrome, ventricular tachycardia

**Precautions:** Use caution in patients with Hypotension.

**Side Effects:**

- **Serious:** bradycardia, first and second degree AV block, arrhythmia, hypotension, syncope, congestive heart failure, cardiac failure, acute hepatic injury, erythema multiforme, exfoliative dermatitis, acute exanthemeatous pustulosis.

- **Common:** Peripheral edema, headache, dizziness, asthenia, orthostatic hypotension, dyspepsia, constipation, rash, bradycardia, 1\(^{st}\) degree AV block, ALT/AST elevation

**Dosage:** 0.25 mg/kg bolus (typically 20 mg) IV over 2 minutes. If inadequate response after 15 min, repeat at 0.35 mg per kilogram IV bolus over 2 min. This should be followed by a maintenance infusion of 5-15 mg/hour (see Diltiazem IV Drip Chart).

**Routes:** IV, IV drip.

**Pediatric Dosage:** Rarely used.
5.1.15 Diphenhydramine (Benadryl)
Class: Antihistamine, antiemetic.
Actions: Non-selectively antagonizes central and peripheral histamine H1 receptors (antihistamine); suppresses the medullary cough center (antitussive); possesses anticholinergic (Atropine like effect) properties, resulting in antidyskinetic, antiemetic and sedative effects.
Indications: Anaphylaxis, allergic reactions, dystonic reactions due to phenothiazines (Haldol), antiemetic, sedation, vertigo/motion sickness.
Contraindications: Hypersensitive to drug/class, neonates and premature infants, Asthma, nursing mothers.
Precautions: Hypotension. Use with caution on the following patients: < 2 year of age (must be used with extreme caution and usually only given for anaphylactic rx or extrapyramidal rx, go through medical control), < 6 yrs old, elderly, CNS depressant use, IOP (intra-ocular pressure) increase glaucoma (angle-closure), hyperthyroidism, cardiovascular dz, HTN, COPD, lower resp tract sx, G1 obstruction, Peptic ulcer disease, prostatic hypertrophy, bladder neck obstruction, poor CYP2D6 metabolizer, high environmental temperature.
Side Effects:
Serious: Anaphylaxis, hemolytic anemia, thrombocytopenia, agranulocytosis, leucopenia, pancytopenia, arrhythmias, seizures, toxic psychosis, labyrinthitis, heat stroke,
Common: drowsiness/sedation, dizziness, impaired coordination, headache, epigastric discomfort, thickened bronchial secretions, dry mucous membranes, CNS stimulation (paradoxical), constipation, dysuria, urinary retention, hypotension, blurred vision, diplopia, palpitations, tachycardia, photosensitivity, diaphoresis, erectile dysfunction
Dosage: 25-50 mg.
Routes: Slow IV push, deep IM, I/O.
Pediatric (≥ 2 yrs of age) Dosage: 1 – 2 mg/kg; max 50 mg/dose. (< 2 years old, contact medical control).

5.1.16 Dopamine (Intropin)
Class: Sympathomimetic.
Actions: Increases cardiac contractility, causes peripheral vasoconstriction.
Indications: Hemodynamically significant hypotension (systolic BP of 70-100 mm Hg) not resulting from hypovolemia, cardiogenic shock.
**Contraindications:** Hypovolemic shock where complete fluid resuscitation has not occurred.

**Precautions:** Should not be administered in the presence of severe tachyarrhythmias. Should not be administered in the presence of ventricular fibrillation, ventricular irritability. Beneficial effects lost when dose exceeds 20 µg/kg/min.

**Side Effects:** Ventricular tachyarrhythmias, hypertension, and palpitations.

**Dosage:**

- **Shock:** 1-50 mcg/kg/min IV, (Max; 20-50 mcg/kg/min). Incr 1-4 mcg/kg/min q 10-30 min, titrate to effect
- **Heart Failure:** 1-3 mcg/kg/min. Start 0.5 – 2 mcg/kg/min
- **ALS Bradycardia:** 2-10 mcg/kg/minute.
- **Cardiac output maint:** 2 – 20 mcg/kg/min. Start 2 – 5 mcg/kg/min; Max 20 mcg/kg/min

**Method:** 800 mg should be placed in 500 ml of D5W giving a concentration of 1600 µg/ml. Start low and increase as needed. See IV Drip Calculations Appendix(400mg) and/or Dopamine IV Drip Calculation (800 mg)

**Routes:** IV/IO drip only.

**Pediatric Dosage:**

- **Shock:** 5-20 µg/kg/minute. Incr 1 – 4 mcg/kg/min q 10 – 30 min
- **Cardiac Output Maint:** 2-20 mcg/kg/min. Start 2 – 5 mcg/kg/min; Max 20 mcg/kg/min
Common: Palpitations and tachycardia, anxiousness, headache, tremor, nausea/vomiting, pallor, diaphoresis, dizziness, weakness, tremor, apprehension, nervousness, restlessness.

**Dosage:** 0.3-0.5 mg.

**Routes:** SQ, IM (IV, IO and/or ET for pediatric cardiac arrest).

**Pediatric Dosage:**
- For Resp distress/Allergic rxn: 0.01 mg/kg IM/SQ up to 0.3 mg.
- For Bradycardia: 0.1mg/kg ETT q 3-5 min (max 10 mg/dose)
- For subsequent doses of Epi following 1st 1:10,000 dose: 0.1 mg/kg IV/IO

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**5.1.18 Epinephrine 1:10,000**

**Class:** Sympathomimetic.

**Actions:**
- Increases heart rate and automaticity.
- Increases cardiac contractile force.
- Increases myocardial electrical activity.
- Increases systemic vascular resistance.
- Increases blood pressure.
- Causes bronchodilation.

**Indications:** Cardiac arrest, anaphylactic shock, severe reactive airway disease.

**Contraindications:** Epinephrine 1:10,000 is for intravenous, intraossious or endotrachealuse; it should not be used in patients who do not require extensive resuscitative efforts.

**Precautions:** Should be protected from light. Can be deactivated by alkaline solutions.

**Side Effects:** Palpitations, anxiety, tremulousness, nausea and vomiting.

**Dosage:**
- **Cardiac arrest:** 0.5-1.0 mg repeated every 3-5 minutes.
- **Severe anaphylaxis:** 0.3-0.5 mg (3-5 ml); occasionally and Epinephrine drip (med control) is required. Epinephrine drip may be 2 - 10 mcg/min, start 1mcg/min. See **IV Drip Calculations** (for 1 mg in 250ml) and/or **Epi IV Drip Chart** (for 2 mg in 250ml)

**Routes:** IV, IO, IV drip, ET.

**Pediatric Dosage:**
- For Bradycardia; **1:10,000** 0.01 mg/kg (0.1ml/kg) IV/IO
- For Pulseless Arrest; **1:10,000** 0.01 mg/kg (0.1 ml/kg) IV/IO. May repeat q 3-5 minutes. If unable to establish an IV/IO, administer **Epinephrine (1:1,000)** 0.1 mg/kg (0.1 ml/kg) via ET. Repeat every 3-5 minutes for duration of pulselessness.

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5.1.19 Etomidate/ (Amidate)

**Class:** Induction/Maintenance

**Action:** Etomidate is a short-acting, non-barbiturate hypnotic, lacking analgesic properties used for induction of general anesthesia. The action is at the level of the reticular activating system in the brainstem. Etomidate is generally considered to have minimal adverse effect on cardiac and respiratory function. The duration of action is 3-5 minutes and excretion is through the renal system.

**Indications:** The use of this drug as well as paralytic drugs in performing R.S.I. under the SMART Airway Management protocol is reserved for those paramedics that have received extensive training in advanced airway management. The administration of Etomidate and paralytic drugs found in the SMART Airway Management procedure must only be done by those paramedics that have prior medical director authorization. Authorized paramedic(s) may induce and paralyze patients to facilitate intubation. See Medical Procedure – SMART Airway Management.

**Contraindications:** Allergy to this class of drugs

**Precautions:** Causes respiratory paralysis; supportive airway control must be continuous and under direct observation at all times. Etomidate can decrease the adrenal gland’s production of steroid hormones. Use caution may be synergistic with other CNS depressants. Monitoring of vital signs is important.

**Adverse effects:**
1. Respiratory depression or apnea.
2. Hypotension (infrequent)
3. Involuntary myoclonus (muscle twitching)
4. Adrenal suppression (possible with repeated dosing)

**Precautions:**
1. The effects of Etomidate can be accentuated by CNS depressants (such as narcotics and alcohol).
2. Myoclonic movements are common and should not be confused for fasciculations due to a depolarizing neuromuscular blocking agent or seizure activity.

**Dosage:** Adult & Pediatric (over 10 years of age): 0.3 mg / kg slow administration (about one minute) IV. Maximum dose: 0.6 mg / kg.

**Onset:** Rapid

**Duration:** 15 to 30 minutes (dose dependant)

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5.1.20 Fentanyl (Sublimaze)

**Class:** Schedule II narcotic, Analgesic

**Action:** Binds to various opioid receptors producing analgesia and sedation.

**Indications:** Pain control (analgesic action of short duration), sedation, as pre-treatment for head injury patients before RSI (Do Not use as pre-treatment in pediatric patients less than 10 years old), Chest pain unrelieved by Nitro.

**Contraindications:** Hypersensitivity to drug.
Precautions: Caution in: elderly, renal impaired, liver impaired, head injury, increased ICP, impaired pulmonary fxn, cardiovascular fxn, bowel obstruction, hypotension, enlarged prostate, CNS depression, biliary disease, seizure disorder.

Side Effects: Serious; Resp depression, resp arrest, dependency, bradycardia, hypotension, anaphylaxis, laryngospasm, bronchioconstriction, muscle rigidity, cardiac arrest, circulatory collapse, arrhythmias, ICP increase, delirium, seizures, paralytic ileus 

Common: Somnolence, nausea, vomiting, confusion, asthenia, constipation, xerostomia, diaphoresis, dizziness, urinary retention, nervousness, euphoria, hallucinations, dyspnea, pruritus, hypotension, bradycardia, muscle rigidity, biliary spasm, impaired coordination.

Dosage: 1. For acute onset of pain: 50 – 100 mcg IV/ IO, IM, or IN initial dose (titrate to pain), then contact med control for additional orders prn.
2. As pre-treatment in head injury for RSI: 3 mcg/kg ~200 mcg given over 30-60 seconds) Do Not use as pre-treatment in pediatric patients less than 10 years old.
3. Acute Coronary Syndrome/Chest pain: Fentanyl may be given 50 mcg IN increments every 3-5 minutes to a maximum of 200 mcg IN
   **OR**
   IM/IV dose 1mcg/kg SLOW IV increments every 3-5 minutes up to a maximum initial dose of 100 mcg, titrated to pain and BP remains above 90 mm Hg. Second dose if needed, maximum total dose of 200mcg IV/IN/IM. If Fentanyl was initially given IN and an IV is then established, one IV dose (50mcg) can be given if needed.
4. Bradycardia: Analgesia for Cardiac Pacing: 25 – 50 mcg slow IV. May repeat q 5 min prn up to 100 mcg then contact med control for additional dosing if needed.
5. Post intubation management: use alone on in conjunction with a benzodiazepine. Give 50 – 100 mcg slow IV/IO push. May repeat q 15 minutes as needed to total of 200 mcg.

Routes: IV / IO, IM, or IN (intra-nasal)

Pediatric dosage: 1-3 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN via atomizer
3 – 12 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN via atomizer
>12 yrs old: 1 – 2 mcg/kg IV slow or 1.5 mcg/kg IN via atomizer
2. Hypertension.
3. Cerebral edema.

**Contraindications:** Anuria. - Should be used in pregnancy only when benefits clearly outweigh risks. Sulfà – Avoid if allergic to Sulfa products. Hepatic coma, electrolyte imbalances. Use with caution in patients with: DM, acute MI, arrhythmias, hearing impaired, concurrent ototoxic agents, Systemic Lupus Erythematosis, Hepatic impairment, renal dz, urinary retention, gout, pancreatitis, gestational HTN, premature neonates, elderly pts, iodinated contrast.

**Side Effects:** Serious: Hypokalemia, electrolyte imbalance, metabolic alkalosis, hypovolemia/dehydration, ototoxicity, thrombocytopenia, anemia (hemolytic), aplastic anemia, leukopenia, agranulocytosis, anaphylaxis, vasculitis, interstitial nephritis, necrotizing angiitis, erythema multiforme, exfoliative dermatitis, Stevens-Johnson syndrome, toxic epidermal necrolysis, pancreatitis, cholestatic jaundice, SLE exacerbation, thrombosis, eosinophilia, rash, exanthematous pustulosis

**Common:** Urinary frequency, dizziness, nausea/vomiting, weakness, muscle cramps, hypokalemia, hypomagnesemia, hypotension (orthostatic), ALT/AST elevation, blurred vision, anorexia, abdominal cramps, diarrhea, pruritus, rash, hyperuricemia, hyperglycemia, hypocalcemia, tinnitus, paresthesia, photosensitivity, incr cholesterol, incr triglycerides.

**Precautions:** Furosemide should be protected from light. Dehydration and electrolyte imbalance can result from excessive dosages. Rapid diuresis can lead to hypotension and thromboembolic episodes.

**Dosage:** Adult: Start 20 – 40 mg IV/IO/IM. IF giving IV/IO, give slowly over 1-2 minutes.

**Route:** IV/IO/IM

**Pediatric:**

**Edema:** Neonates: 0.5-1.0 mg/kg IV/IM. (If IV slowly over 1-2 minutes). Start 1 mg/kg IM/IV

**Infants/Children:** 0.5 – 2 mg/kg IV/IM. Start 1 mg/kg IM/IV x 1

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5.1.22 Glucagon

**Class:** Hormone (anti-hypoglycemic agent).

**Actions:** Causes breakdown of glycogen to glucose. Inhibits glycogen synthesis. Elevates blood glucose level. Increases cardiac contractile force. Increases heart rate.

**Indications:** Hypoglycemia, Beta blocker overdose, calcium channel blocker overdose, anaphylaxis.

**Contraindications:** Hypersensitivity to the drug, insulinoma, pheochromocytoma.

**Precautions:** Only effective if there are sufficient stores of Glycogen within the liver. Use with caution in patients with cardiovascular or renal disease. Draw blood glucose before
Side Effects: Few in emergency situations.

Serious: Hypersensitivity rxn, anaphylaxis, hypotension

Common: nausea, vomiting, urticarial, rash, hyperglycemia

Dosage: Hypoglycemia: 1 mg IM/IV/SQ

Beta Blocker Overdose: 3 – 10 mg IV x 1 (alt: 0.05 – 0.15 mg/kg IV x 1, then 0.05-0.1 mg/kg/hr IV)

Calcium Channel Blocker Overdose: 1-5 mg IV.

Anaphylaxis: 0.3 – 0.9 mg/h IV (start 1-2 mg IV x 1) Note: this is for patients not responsive to beta agonist due to beta blocker use.

Routes: IV, IM, SQ.

Pediatric Dosage: Hypoglycemia: [<20kg] 0.5mg SQ/IV/IM x 1, max dose 1mg/dose

[>20 kg] 1 mg SQ/IV/IM x 1, max dose 1mg/dose

Beta Blocker Overdose: [Children] 0.03 – 0.15 mg/kg x 1, (then 0.07 mg/kg/h IV, max 5 mg/hr)

[Adolescents] start 5-10 mg IV x 1; (then 1-5mg/hr IV

5.1.23 Haldol (Haloperidol)

Class: Antipsychotic, 1st generation

Action: Selective antagonizes dopamine D2 receptors. Pecise mechanism of action unknown.

Indication: Acute psychosis (including excited delirium), acute agitation, Tourette syndrome,

Contraindications: Hypersensitivity to drug, Parkinson dz, CNS depression, avoid abrupt withdrawal, Coma

Precautions: Elderly pts with dementia-related psychosis treated with antipsychotics are at increased risk of death. Caution if: High dose treatment, congenital QT syndrome, Fmly hx of QT prolongation, electrolyte abnormalities, hypokalemia, hypomagnesemia, cardiac abnormalities, cardiovascular dz, seizure hx, seizure risk, smoking habit changes, hepatic impairment, hypothyroidism, dementia, drug-induced leukopenia or neutropenia, thyrotoxicosis, if high environmental temperature.

Side effects: Serious: Extrapyramidal sx, tardive dyskinesia, dystonia, hyperpyrexia, heat stroke, neuroleptic malignant syndrome, pneumonia, hypotension, HTN, QT prolongation, Torsades de Pointes, arrhythmias, sudden death, hyponatremia, seizures, withdrawal if abrupt d/c, hepatic impairment, leukopenia, neutropenia, agranulocytosis, cataracts, retinopathy

Common: extrapyramidal sx, tardive dyskinesia, akathisia, insomnia, anxiety, drowsiness, lethargy, weight changes, anticholinergic effects, gynecomastia, breast tenderness, galactorrhea, menstrual irregularities, photosensitivity
**Dosage:** 5 - 10 mg. NOTE: MUST give Benadryl 25 mg IM or IV in conjunction with Haldol

**Route:** IM (NOT approved for IV administration)

**Pediatric Dosage:** Safety and effectiveness in pediatric patients has not been established.
3. Alternative pain medication

**Contraindications:** Hypersensitivity to drug/class. HTN, Stroke, Head Trauma, Known Schizophrenia, Intraocular trauma or high intraocular pressures, intracranial mass or hemorrhage.

**Precautions:** CAD, CHF, Thyrotoxicosis, psychosis, hepatic impairment, acute alcoholism, chronic alcohol use, substance abuse.

**Side Effects:**
- **Serious:** respiratory depression, laryngospasm, ICP incr., IOP incr., hypotension, bradycardia, arrhythmias, emergence delirium, hallucinations, tonic clonic movements, anaphylaxis, withdrawl sx (long-term use)
- **Common:** sialorrhea, anorexia, nausea/vomiting, BP elevated, HR elevated, diplopia, nystagmus, fasciculations, depressed reflexes, hallucinations, bradycardia, hypotension, cystitis

**Dosage:**

**Sedation (excited delirium/violent pt):**
- Adult: Up to 5 mg/kg IM x 1, (consider starting with 3 mg/kg IM) or 2 mg/Kg IN (concentration 100 mg/ml). Note: (1 – 2 mg/kg IV slow if IV established, titrate to effect)
- NOTE: in excited delirium, do NOT risk injury to yourself by attempting to hold down the patient to start an IV. Give the drug IM. IF the patient already has an IV, then give Ketamine 1 – 2 mg/kg IV slow over 30 – 60 seconds and titrate to effect
- Pediatric: use a benzodiazepine for violent pediatric patients

**Pain:**
- Adult: IV/IO dose: 0.1 – 0.5 mg/kg titrate to effect over one to two minutes
  - IM dose: 5mg/kg x 1
  - IN dose: 0.5 mg/kg. (use MAD, limit to 1 ml/nostril)
  - Contact medical control for additional dosing if needed
- Pediatric: IV/IO dose: 0.1 – 0.5 mg/kg titrate to effect over one to two minutes
  - IM dose: 5mg/kg x 1
  - IN dose: 0.5 mg/Kg (use MAD, do not exceed 1 ml max each nostril)
  - Contact med control for additional dosing if needed or

**Induction for RSI:**
- Adult: 1 - 2 mg/kg IV/IO; (4mg/kg IM)
- Pediatric: 1 – 2 mg/kg IV/IO; (4mg/kg IM)

**Routes:** IM for excited delirium/violent pt (can give IV if one is established but do not risk injury trying to start an IV on a violent patient just to give medication)
- IV/IO/IM/IN for pain or violent/excited delirium
- IV/IO/IM for RSI

**Pediatric Dosage:**
- **RSI induction** – IV/IO: 2 mg/kg; (IM: 4 mg/kg)
- **Pain** - IV/IO: 0.1 – 0.5mg/kg titrate to effect or
  - IM: 5mg/kg or
  - IN: 0.5 mg/kg (use MAD [atomizer], max 1 ml/nostril)
**Maintenance Infusion (Med control only): Ketamine Drip:** Mix 250 mg in 250 ml NS (1:1 concentration = 1mg/1ml). Start within 20 minutes of the initial bolus. If more than 20 minutes passed give the patient a second bolus prior to the initiation of the infusion.

- **2 – 4 mg/kg/hr (sedation).** Begin with 2 mg/kg/hr and titrate to 4 mg/kg/hr
- **1 – 2 mg/kg/hr (analgesia).** Begin with 1mg/kg/hr and titrate to 2 mg/kg/hr

5.1.26 **Ketorolac (Toradol)**

**Class:** Non-steroidal anti-inflammatory agent.

**Actions:** Anti-inflammatory, analgesic (peripherally-acting).

**Indications:** Mild to moderate pain.

**Contraindications:** Patients with a history of hypersensitivity to the drug, patients allergic to Aspirin or anti-inflammatories. Potential Surgical candidate (e.g. Trauma Patient). History of nasal polyps, angioedema, bleeding disorder, kidney dysfunction. GI bleeding or Peptic Ulcer Disease.

**Precautions:** GI irritation or hemorrhage can occur. Use with caution if: elderly, debilitated, inflammatory bowel dz, coagulation disorder, alcohol use, smoker, asthma, hepatic impairment, renal impairment, CHF, HTN, cardiovascular dz

**Side Effects:**
- **Serious:** GI bleeding, GI perforation, ulcerative stomatitis, bleeding, MI, stroke, thromboembolism, HTN, CHF, renal papillary necrosis, nephrotoxicity, hepatotoxicity, bronchospasm, anaphalactoid rxn, exfoliative dermatitis, Stevens-Johnson syndrome, toxic epidermal necrolysis, anemia, blood dyscrasias, inflammatory bowel dz exacerbation.
- **Common:** headache, nausea, abdominal pain, dizziness, somnolence, constipation, diarrhea, edema, rash, ALT & AST elevation, fluid retention, tinnitus, injection site pain, HTN, pruritus, flatulence, diaphoresis, ecchymosis, photosensitivity, edema, rash, heartburn.

**Dosage:** IV 15-30 mg, IM 30-60 mg, (if > 65 yo or < 50kg, 30 mg IM or 15 mg IV).

**Routes:** IV, IM.

**Pediatric Dosage:** > 2 years; 0.5 mg/kg. Max; 30mg/dose IM or 15mg/dose IV

5.1.27 **Labetalol (Trandate) (Normodyne)**
Class: Sympathetic blocker.

Actions: Selectively blocks ß1 receptors and nonselectively blocks ß receptors.

Indications: Hypertensive crisis.

Contraindications: Bronchial asthma, congestive heart failure, bradycardia, cardiogenic shock, sick sinus syndrome without pacemaker.

Precautions: Blood pressure, pulse, and EKG must be constantly monitored. Atropine and transcutaneous pacing should be available. Use with caution in patients with: peripheral vascular dz, bronchospastic dz, major surgery, DM, thyroid disorder, WPW syndrome, hepatic or renal impairment, pheochromocytoma, myasthenia gravis.

Side Effects: Serious: Bradycardia, heart block, congestive heart failure, bronchospasm, postural hypotension, syncope, angina exacerbation if abrupt D/C, MI if abrupt D/C. Raynaud phenomenon, bronchospasm, lupus erythematosus, hepatotoxicity, hypersensitivity rxn, anaphylactoid rxn.

Common: Hypotension (orthostatic), dizziness, paresthesia, nausea/vomiting, elevated BUN/Cr, fatigue, dyspepsia, rhinitis, headache, ejaculatory dysfxn, dyspnea, edema.

Dosage: Method 1: 20 mg by slow IV infusion over 2 minutes; doses of 40 mg can be repeated in 10 minutes until desired supine blood pressure is obtained or until 300 mg of the drug has been given. Method 2: 500 mg placed in 250 ml d5w(conc of 2mg/ml) to deliver ~2 mg/minute. See Labetolol IV Drip Chart.

Routes: IV infusion or slow IV bolus as described earlier.

Pediatric Dosage: Method 1: 0.2 – 1 mg/kg IV q 10 min prn. Max 20mg/dose Method 2: 0.4 – 1 mg/kg/hr IV. May give 0.2 – 1 mg/kg IV x 1 before infusion.

5.1.28 Lorazepam (Ativan)

Class: Schedule IV narcotic, anti-anxiety.

Action: Binds to benzodiazepine receptors: enhances GABA effects.

Indications: Seizures, Anxiety, procedural sedation, violent, combative, excited delirium.


Precautions: Monitor all parameters to maintain vital function. Risk of respiratory depression or airway obstruction in heavily sedated patients. May cause fetal damage during pregnancy. Increased risk of CNS and respiratory depression in elderly. Avoid with hepatic/renal disease.

Side Effects: Serious: Respiratory depression/failure, apnea, dependency, seizures, suicidality, tachycardia, hypotension, syncope, blood dyscrasias, jaundice, CNS stimulation (paradoxical), gangrene (intra-arterial), withdrawal sx if abrupt D/C.

Common: sedation, dizziness, asthenia, ataxia, local injection site rxn, resp depression, hypoventilation, hypotension, fatigue, amnesia, confusion.
disinhibition, irritability, libido changes, menstrual irregularities, diplopia, dysarthria, appetite changes, constipation, incontinence, urinary retention, dystonia, elevated ALT/AST.

**Dosage:** Adults: 2 – 4 mg IV/IO, IM or IN  
**Routes:** IV, IM, IO, IN  
**Pediatric dose:**  
- Anxiety: 0.05 mg/kg IV slow or IN. (Max 2mg/dose)  
- Status Seizures: 0.05 – 0.1 mg/kg IV over 2 – 5 minutes. Can also be given IM or IN; not to exceed 4 mg/dose; repeat 0.05 mg/kg prn q 10 – 15 min

### 5.1.29 Lidocaine (Xylocaine) Bolus

**Class:** Antiarrhythmic.

**Actions:** Suppresses ventricular ectopic activity, increases ventricular fibrillation threshold, reduces velocity of electrical impulse through conductive system.

**Indications:** Malignant PVCs, ventricular tachycardia, ventricular fibrillation, prophylaxis of arrhythmias associated with acute myocardial infarction and thrombolytic therapy, premedication prior to rapid sequence induction.

**Contraindications:** High-degree heart blocks, WPW, PVCs in conjunction with bradycardia, Stokes-Adams syndrome. If PVC's occur in conjunction with sinus bradycardia, the bradycardia should be treated first. Ventricular dysrhythmias associated with tricyclic antidepressant overdose.

**Precautions:** Dosage should not exceed 300 mg/hr. Monitor for CNS toxicity. Dosage should be reduced by 50% in patients older than 70 years of age or who have liver disease in cardiac arrest, use only bolus therapy.

**Side Effects:** **Serious:** Seizures, resp arrest, arrhythmia exacerbation, status asthmaticus, heart block, bradycardia, coma, anaphylaxis, Methemoglobinemia, convulsions, widening of QRS.

**Common:** injection site pain, lightheadedness, tremor, confusion, hypotension, blurred vision, tinnitus, anxiety, dizziness, euphoria, drowsiness, lethargy, nausea, vomiting, agitation, hallucinations.

**Dosage:** Bolus: (Use 2%)  
**Ventricular Arrhythmia:** 1.5 mg/kg q3-5 min, Max: 300 mg total  

**ACLS VF/pulseless VT:** 1.5 mg/kg IV/IO x 1. Then 0.5 - 0.75 mg/kg q5-10-minute prn up to max 3mg/kg; reduce dosage by 50% in patients older than 70 years of age.

**Routes:** IV, IO bolus, IV infusion, IN, SQ.  
**Pediatric Dosage:** (Use 1%) 1 mg/kg bolus. Max 100mg/dose. May repeat q10 – 15 min x 2
5.1.30 **Lidocaine (Xylocaine) Drip**

**Class:** Antiarrhythmic

**Action:** Decreases ventricular automaticity and raises the ventricular fibrillation threshold.

**Indications:** Same as 1% and 2% Lidocaine. Used as a maintenance infusion.

**Contraindications:** Same as 1% and 2% Lidocaine.

**Side Effects:** Same as 1% and 2% Lidocaine.

**Precautions:** Lidocaine is metabolized in liver. Maintenance dosage should be decreased in half in patients with liver disease and low cardiac output states (e.g. acute MI, shock, congestive heart failure); patient older than 70 years old.

**Dosage:**
- **Adult:** Mix 1,000 mg in 250 ml of D5W and flow at 1-4 mg/min. as follows:
  - 2 mg/min. (30 gtt/min).
  - 3 mg/min. (45 gtt/min).
  - 4 mg/min. (60 gtt/min).  See IV Drip Calculations for 1gm and/or (Lidocaine Drip Chart for 2 gm)
- **Pediatric:** Mix 120 mg in 100 ml of D5W (or 60 mg in 50 ml of D5W) and flow at 20-50 mcg/kg/min.

5.1.31 **Magnesium Sulfate**

**Class:** Anticonvulsant/Antiarrhythmic.

**Actions:** CNS depressant, anticonvulsant, antiarrhythmic, labour suppression/tocolytic, Minerals.

**Indications:** Obstetrical eclampsia (toxemia of pregnancy), pre-eclampsia/PIH, cardiovascular severe refractory ventricular fibrillation, pulseless ventricular tachycardia, post-MI as prophylaxis for arrhythmias, Torsades de pointes (multi-axial ventricular tachycardia). Severe respiratory distress.

**Contraindications:** Shock, heart block, Diabetic coma, myocardial damage.

**Precautions:** Caution should be used in patients receiving digitalis. Hypotension. Calcium Chloride should be readily available as an antidote if respiratory depression ensues. Use with caution in patients in renal failure.

**Side Effects:**
- **Serious:** Cardiovascular collapse, respiratory paralysis, hypothermia, depressed cardiac fxn, pulmonary edema
- **Common:** depressed reflexes, hypotension, flushing, drowsiness, impaired cardiac fxn, diaphoresis, hypocalcemia, hypophosphatemia, hyperkalemia, vision changes.

**Dosage:**
- **Vent Arrhythmias:** 2-6 gms IV over several minutes.
- **Seizures, preeclampsia:** start 4 mg IV x1 (or 4-5 gm IM each buttock), then 1-2gm/hr IV
**Tocolysis:** Start 4-6gm IV over 20 min then 2-4 g/hr IV x 12-24hr.  
**Torsades de Pointes:** 1-2 gm IV/IO prn. May follow w/ 0.5-1g/hr IV  
**Severe Asthma:** 2 gm IV over 10-15 min  
If patient on a maintenance drip, see [IV Drip Calculation](#)  
**Routes:** IV/IO, IM.  
**Pediatric Dosage:** **Torsades de Pointes:** 25 – 50 mg/kg (maximum 2gm) IV/IO (mixed in 50 ml of D5W given over 10 – 20 minutes).  
**Severe Respiratory Distress:** 25 – 40 mg/kg (maximum 2gm) IV/IO (mixed in 50 ml of D5W given over 10 – 20 minutes).  

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**5.1.32 Metaclopramide (Reglan)**  
**Class:** Anti-emetic  
**Action:** Mechanism unknown; sensitizes tissues to acetylcholine, stimulating upper GI tract motility; antagonizes central and peripheral dopamine receptors, producing antiemetic effects.  
**Indications:** Nausea and Vomiting when allergic to Phenergan.  
**Contraindications:** Allergic to drug, pheochromocytoma, seizure disorder, GI bleed, GI obstruction  
**Precaution:** Depression, Parkinson’s Disease, Hypertension, CHF, cirrhosis, elderly patients,  
**Side Effects:** Extrapyramidal symptoms, dystonia, Parkinsonian syndrome, tardive dyskinesia, neuroleptic malignant syndrome, seizures, depression, suicidality, hallucinations, blood dyscrasias, CHF, AV block, SVT  
**Dosage:** Adult: 5 – 10 mg IV or IM  

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**5.1.33 Methylprednisolone (Solu-Medrol)**  
**Class:** Steroid.  
**Actions:** Anti-inflammatory, suppresses immune response (especially in allergic reactions).  
**Indications:** Severe allergic reaction, anaphylaxis, asthma/COPD,  
**Contraindications:** Hypersens to drug, neonatal/infants (benzyl alcohol-containing INJ forms), thrombocytopenic purpua (IM use), systemic fungal infxn, active or recent varicella infxn, active or recent measles infxn, local infection at injection site, head injury (high dose use), cerebral malaria, ocular HSV infxn.  
**Precautions:** Must be reconstituted and used promptly. Onset of action may be 2-6 hours and thus should not be expected to be of use in the critical first hour following an anaphylactic reaction.  
**Side Effects:** Serious: anaphylaxis rxn, HPA axis suppression, hyperglycemia, IOP incr,
glaucoma, cataracts, growth suppression, infection, cardiac arrest, arrhythmias, CHF, pulmonary edema, syncope, thromboembolism, vasculitis, osteoporosis, steroid psychosis, GI perforation/ulcer, pancreatitis, pseudotumor cerebri, seizures, Kaposi sarcoma, tendon rupture, Charcot-like arthropathy, steroid myopathy, angioedema

**Common:** IOP inc, glucose intolerance, sodium and fluid retention, hypokalemia, HTN, edema, skin disorder, rash, skin atrophy, impaired wound healing, weight gain, appetite incr., emotional lability, depression, hyperhidrosis, Cushing syndrome, hirsutism, menstrual irregularities, nausea, LFT elevated, hepatomegaly, muscle weakness, muscle atrophy, headache, insomnia, paresthesia, vertigo, neuropathy, psychiatric disorders

**Dosage:** Acute Exacerbation of Asthma/COPD: 80 mg IV/IO/IM
Severe allergic Reaction/Anaphylaxis: 125 mg IV/IO. If patient already on oral steroids or elderly (>75 yrs old) and frail, give 80 mg IV/IO/IM.

**Routes:** IV, IO, IM

**Pediatric Dosage:**
*Status Asthmaticus and/or severe allergic reactions*; start 2 mg/kg x 1, then 0.5-1 mg/kg IV/IO q 6 hrs.

**Adrenal Insufficiency:** 2mg/kg IM, max 125 mg

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5.1.34 **Midazolam (Versed)**

**Class:** Benzodiazepine tranquilizer.

**Actions:** Hypnotic, sedative.

**Indications:** Premedication prior to cardioversion/RSI, acute anxiety states, sedation post intubation, procedural sedation, seizures, acute psychotic states, nerve agent antidote.

**Contraindications:** Patients with known hypersensitivity to the drug, narrow-angle glaucoma, shock.

**Precautions:** Emergency resuscitation equipment should be available. Flumazenil (Romazicon) should be available in ED. Dilute with normal saline or D5W prior to intravenous administration. Respiratory depression more common with Midazolam than with other Benzodiazepines. Use with caution if: BP < 110 systolic, pulmonary impairment, sleep apnea, CHF, CNS depression, alcohol use, alcohol or drug abuse hx, avoid abrupt withdrawal, seizure hx, renal impairment, hepatic impairment, elderly or debilitated.

**Side Effects:**

**Serious:** Respiratory depression, Apnea, Respiratory failure, cardiac arrest, hypotension, bradycardia, tachycardia, syncope, seizures, CNS stimulation (paradoxical), dependency, abuse, withdrawal if abrupt discontinuation, bronchospasm, anaphylaxis.

**Common:** sedation, nausea, vomiting, injection site pain, hiccups, hypotension, agitation, dystonia (prolonged involuntary muscular contractions, repetitive
movements, increased muscle tones), amnesia, Diplopia, disinhibition, confusion, ataxia, weakness, dysarthria (impairment in uttering words due to problem with oral, lingual or pharyngeal muscles), euphoria, rash.

Dosage:

For Procedural, post intubation, anxiety (med control) sedation:

- 1.0- 2.5 mg IV, I/O, IM, IN
- The initial intravenous dose for sedation in adult patients may be as little as 1 mg, but should not exceed 2.5 mg in a normal healthy adult. Lower doses are necessary for older (over 60 years) or debilitated patients and in patients receiving concomitant narcotics or other central nervous system (CNS) depressants. The initial dose and all subsequent doses should always be titrated slowly; administer over at least 2 minutes and allow an additional 2 or more minutes to fully evaluate the sedative effect.

For Ventilator Sedation infusion (per MD order):

- 0.02 – 0.1 mg/kg/hr IV.

For seizures:

- 5 mg IM (as alternative, can give 1 – 2.5 mg IV or I/O but IM shown to work better). May repeat x1 prn
- 10 mg IN. May repeat x 1 prn

For RSI induction:

- 0.3 mg/kg IV or I/O, max 0.6 mg/kg cumulative dose

Routes: IV, IM, intranasal, I/O.

Pediatric Dosage:

For procedural sedation; IV route;

- (6 mo – 5 yr); 0.05 – 0.1 mg/kg IV x 1 repeat q 2 – 3 min prn; max 0.6 mg/kg total
- (6 – 12 yr); 0.025 – 0.05 mg/kg IV x 1, repeat q 2 – 2 min prn; max 0.4 mg/kg total
- (> 12 yr old): 0.5 – 2 mg IV x 1; may repeat q 2 -3 min prn; max 10 mg

For procedure sedation; IM route;

- > 6 mo; 0.1 - 0.15 mg/kg IM; max 0.5 mg/kg (use ideal body wt in obese pt)

For Mechanical Vent sedation infusion (MD order):

- > 32 wk gest - < 1 mo; 1 mcg/kg/min IV; titrate to desired effect; use min effective dose.
- 1 mo – 12 yr; 1 – 2 mcg/kg/min IV, (start 0.05 – 0.2 mg/kg IV x 1)

For Status Seizures: 2 mo – 12 yrs;

- For IV/IO start 0.15 mg/kg x1. Maximum 4 mg
- For IN (intranasal [use atomizer]) 0.2 mg/kg. Maximum 10 mg
- For IM tx of seizures, 0.2 mg/kg. Maximum 10 mg

Return to: Contents at Top  Drug Reference  Bradycardia Proto  Behavioral/Violent/Psych  Narrow complex tachycard unstable  COPD protocol  Wide complex tach w/pulse  Excited delirium  Seizure proto  CVA  Tox OD  Peds Seizure  Heat related emerg

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
5.1.35 Morphine

**Class:** Narcotic, opioids.

**Actions:** CNS depressant, causes peripheral vasodilation, decreases sensitivity to pain. Binds to various opioid receptors, producing analgesia and sedation (opioid agonist).

**Indications:** Severe acute pain, any etiology, unstable angina, acute MI.

**Contraindications:** Hypersensitivity to the drug, Coma or impaired consciousness, respiratory depression, asthma, paralytic ileus, hypercarbia, circulatory shock

**Precautions:** renal impairment, hepatic impairment, pulmonary impairment, CNS depression, seizure disorder, substance abuse, acute alcoholism

**Side Effects:**

- **Serious reactions:** Respiratory depression (Narcan should be available), severe hypotension, apnea, cardiac arrest, shock, bradycardia, paralytic ileus, toxic megacolon, seizure, ICP increase, dependency and abuse, anaphylaxis, anemia, thrombocytopenia, withdrawal if abrupt, neonatal withdrawal (long term maternal use)

- **Common reactions:** somnolence, constipation, nausea/vomiting, dizziness, hypotension, histamine release, dysphoria, euphoria, sweating, edema, abdominal pain, pruritus, Flushing, dry mouth, asthenia, paresthesia, urinary retention, biliary spasm, libido decreased, miosis.

**Dosage:**

- **IM route:** 2 – 10 mg (consider lower dose in elderly or patients < 50 kg)
- **IV/IO route:** 2-5 mg initial, followed by 2 mg increments every few minutes until the pain is relieved or until respiratory depression ensues. After 10 mg, you should contact medical control for further guidance.
- **Rectal route:** 10 – 20 mg per rectum. Consider lower dose, longer duration if elderly or patients < 50 kg.

**Routes:** IV, IM, IO, per rectum

**Pediatric Dosage:**

- < 6 months; 0.05 – 0.2 mg/kg SQ/IM/IV (avoid IM route if possible)
- 6 months- 12 yrs; 0.1-0.2 mg/kg IV/IM/SQ.

Return to: Contents at Top Drug Reference Pain Management Chest Pain suspicious for MI

Marine Enven Sickle Cell Cold related emerg Electrical/Lightening Extremity Injuries
Burns Dental Trauma Gen Crush Injury Peds Pain Management Peds Sickle Cell
Cardioversion Post intubation management

5.1.36 Naloxone (Narcan)

**Class:** Narcotic antagonist.

**Actions:** Reverses effects of narcotics.

**Indications:**

- Narcotic overdoses including the following: Codeine, Demerol, Dilaudid, Fentanyl, Heroin, Lortabs, Methadone, Morphine, Paregoric, Percodan, Tylox, Vicodin, synthetic analgesics,
- Overdoses including the following: Darvon, Nubain, Stadol, Talwin, alcoholic coma,
• To rule out narcotics in coma of unknown origin.

**Contraindications:** Patients with a history of hypersensitivity to the drug.

**Precautions:** Should be administered with caution to patients dependent on narcotics as it may cause withdrawal effects. Short-acting, should be augmented every 5 minutes. Use with caution on patients with: cardiovascular dz, hepatic impairment, renal impairment, w/cardiototoxic drugs

**Side Effects:** **Serious:** Ventricular fibrillation, cardiac arrest, seizures.

**Common:** Tachycardia, HTN, hypotension, nausea, vomiting, tremor, withdrawal sx, diaphoresis, pulmonary edema, irritability (peds pts)

**Dosage:** Start with 0.4 mg and titrte to effect up to 2 mg q 2-3 min prn.

**Routes:** SC, IV, IM, IN

**ET (ET dose is 2.0-2.5 times IV dose).**

**Pediatric Dosage:**

- **< 1 month:** 0.1 mg/kg IV q 2-3 min or 0.1 mg/kg IM q 3-8 min
- **l mo - < 5 yrs old and < 20 kg:** 0.1 mg/kg IV q 2-3 min or 0.1 mg/kg IM/SQ/ETT/IN q 3-8 min
- **> 5 yrs old or > 20 kg:** Titrato 0.4 mg up to 2.0 mg IV/IO/IM/SQ/ETT/IN q 2-3 min prn

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**Nitroglycerin; Spray (Nitrolingual Spray) or Tablet (Nitro 0.4mg) or IV Drip**

**Class:** Antianginal.

**Actions:** Smooth-muscle relaxant, decreases cardiac work, dilates coronary arteries, dilates systemic arteries.

**Indications:** Angina pectoris, chest pain associated with myocardial infarction, hypertension, CHF.

**Contraindications:** Hypersensitivity to drug, hypotension, Anemia, elevated ICP, Methemoglobinemia. Sildenafil (Viagra) use (or other erectile dysfunction rx). NOTE: IV use contraindicated if: pericardial tamponade, restrictive cardiomyopathy, contractive pericarditis

**Precautions:** Constantly monitor vital signs. Syncope can occur. Use with caution for patients with: hypovolemia, hypotension, IHSS, Acute MI, CHF, cerebral hemorrhage, head injury.

**Side Effects:** **Serious:** severe hypotension, anaphylactictoid reaction, nitrate tolerance (excessive or continuous use), Methemoglobinemia, paradoxical bradycardia,

**Common:** Dizziness, headache, lightheadedness, flushing, orthostatic hypotension, reflex tachycardia, edema, burning oral sensation, tingling oral sensation.

**Dosage:** **Spray:** One spray administered under the tongue; may be repeated in 10-15 minutes; no more than three sprays in a 15-minute period; spray should not be inhaled.

**Sublingual:** 0.4 sublingual q 5 min x 3

**IV Drip:** (Critical Care Transport) see IV Drip Calculation. 5 – 200 mcg/min

**Routes:** Sublingual, IV, Sprayed under tongue on mucous membrane.

**Pediatric Dosage:** (Critical Care Transport only):
5.1.38 Nitropaste (Nitro-Bid)

**Class:** Antianginal.

**Actions:** Smooth-muscle relaxant, decreases cardiac work, dilates coronary arteries, dilates systemic arteries.

**Indications:** Angina pectoris, chest pain associated with myocardial infarction, hypertension, CHF.

**Contraindications:** Hypersensitive to drug, hypotension, Anemia, elevated ICP, Methemoglobinemia. Sildenafil (Viagra) use (or other erectile dysfunction rx). NOTE: IV use contraindicated if: pericardial tamponade, restrictive cardiomyopathy, contractive pericarditis, and hypotension. Children younger than 12 years of age.

**Precautions:** Constantly monitor blood pressure, syncope. Use with caution for patients with: hypovolemia, hypotension, IHSS, Acute MI, CHF, cerebral hemorrhage, head injury.

**Side Effects:**
- **Serious:** Severe hypotension, anaphylactoid reaction, nitrate tolerance (excessive or continuous use), Methemoglobinemia, paradoxical bradycardia,
- **Common:** Dizziness, headache, lightheadedness, flushing, orthostatic hypotension, reflex tachycardia, edema, burning oral sensation, tingling oral sensation.

**Dosage:** 1/2 to 2 inches.

**Routes:** Topical.

**Pediatric Dosage:** Not indicated.
Serious: Bradycardia, hypertension, arrhythmias, ischemic injury, asthma exacerbation, anaphylaxis, extravasation necrosis
Common: Headache, anxiety, bradycardia, dyspnea

Dosing: Mix 8 mg in 250 ml D5W (32 mcg/ml); 
Weight based dosing: 0.02 – 1 mcg/kg/min; Start -.1 – 0.5 mcg/kg/min IV then titrate. 
Non-weight based dosing: 2 – 4 mcg/kg/min IV. Start: 8 – 12 mcg/min. Dose may be titrated to patient response. See Levophed IV Drip Chart

Routes: IV on PUMP!! Preferably via a central IV line.

Pediatric Dosing: 0.05 – 0.1 mcg/kg/min then titrate to effect. Max: 2 mcg/kg/min

5.1.40 Ondansetron (Zofran)
Class: Antiemetic,
Action: Selectively antagonizes serotonin 5-HT3 receptors
Indications: Nausea and Vomiting
Contraindications: Hypersensitivity to drug, congenital long QT syndrome
Precautions: Impaired liver function, Caution if abdominal surgery, caution if prolonged Qt interval risk

Side Effects:
Serious: Severe allergic reaction, anaphylaxis, bronchospasm, extrapyramidal symptoms, oculogyric crisis, transient blindness, QT prolongation, torsades de pointes.
Common: Headache, constipation, fatigue, diarrhea, hypoxia, pyrexia, urinary retention, dizziness, agitation, pruritus

Dosage: Adults; 4 – 8 mg IV or IM,
Routes; IV or IM for adults, IV for pediatric
Pediatric Dosage: Peds (6 months – 12 Yrs) 0.1 mg/kg IV (maximum dose 4 mg)
Children > 12 yrs; 4 mg IV x1;

Can give Zofran ODT (oral dissolvable tablet) sublingual when possible.

5.1.41 Procainamide (Pronestyl)
Class: Antiarrhythmic.
Action: Slows conduction through myocardium, elevates ventricular fibrillation threshold, and suppresses ventricular ectopic activity.

Indications: Persistent cardiac arrest due to ventricular fibrillation and refractory to Lidocaine, PVCs refractory to Lidocaine, ventricular tachycardia refractory to Lidocaine.
Contraindications: High-degree heart blocks, PVCs in conjunction with bradycardia.
Precautions: Dosage should not exceed 17 mg/kg. Monitor for central nervous system toxicity.
**Side Effects:** Anxiety, nausea, convulsions, widening of QRS.

**Dosage:** *Vent Arrhythmias:* Load 15-17 mg/kg IV over at least 30 min, or 100 mg IV q 5-10 min. Max 1.5 gm load

*Supraventricular arrhythmias (a-fib/flutter, reentrant tachys, PSVT, WPW):* Load 15-17 mg/kg over at least 30 min, or 100 mg IV q5-10 min. Max 1.5gm load.

**NOTE:** Give at 20 mg/minute until:
- Arrhythmia abolished,
- Hypotension ensues,
- QRS widened by 50% of original width
- Total of 17 mg/kg has been given.

*Maintenance Drip:* 1-4 mg/minute. See [IV Drip Calculation](#) (for 1 gm) or [Procainimide IV Drip Chart](#) (for 4 gms)

**Routes:** slow IV/IO bolus, IV drip.

**Pediatric Dosage:** Rarely used.

*Vent Arrhythmias:* 15 mg/kg IV/IO over 30 minutes or 3-6 mg/kg up to 100 mg IV q5-10 min. (Max 15mg/kg load)

*SVT:* 15mg/kg IV x 1

*V-Tach:* 15mg/kg IV x 1

*Maintenance drip:* 20-80 mcg/kg/min

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**5.1.42 Promethazine (Phenergan)**

**Class:** Antihistamine (h1 antagonist).

**Actions:** Mild anticholinergic activity, antiemetic, potentiates actions of analgesics.

**Indications:** Nausea and vomiting, motion sickness, to potentiate the effects of analgesics, sedation.

**Contraindications:** Comatose states, patients who have received a large amount of depressants (including alcohol).

**Precautions:** Avoid accidental intra-arterial injection.

**Side Effects:** May impair mental and physical ability, drowsiness.

**Dosage:** 25 mg.

**Routes:** IV.

**Pediatric Dosage:** 0.5 mg/kg.

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**5.1.43 Ranitidine (Zantac)**

**Class:** Antihistamine H2 blocker

**Actions:** Selectively antagonizes H2 receptors
**Indications**: Treatment of allergic reactions in conjunction with H1 blocker. Used for treatment of reflux, duodenal ulcer, gastric ulcer, hypersecretory conditions.

**Contraindications**: Hypersensitivity to drug class, porphyria,

**Precautions**: Hepatic or renal impaired, elderly or debilitated, chronic pulmonary disease, diabetes mellitus, immunocompromised

**Side Effects**: Serious: Thrombocytopenia, hepatotoxicity, pneumonia, 
Common: headache, diarrhea, constipation, muscle aches, vertigo, malaise, dizziness, dry mouth (xerostomia), dry skin (xeroderma), nausea, vomiting, rash, confusion, fatigue.

**Dose**: 75 - 150 mg

**Route**: PO

**Peds Dosage**: 2 -5 mg/kg po. Omit this drug in the prehospital setting if child unable to swallow pill.

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**5.1.44 Rocuronium (Zemuron)**

**Class**: Paralytic

**Action**: is a nondepolarizing neuromuscular blocking agent with a rapid to intermediate onset depending on dose and intermediate duration.

**Indications**: It is indicated for patients as an adjunct to general anesthesia to facilitate both rapid sequence and routine tracheal intubation, and to provide skeletal muscle relaxation during surgery or mechanical ventilation.

The use of paralytic drugs in the SMART Airway Management protocol under (R.S.I) is reserved for those paramedics that have received extensive training in advanced airway management. The administration of paralytic drugs found in this procedure must only be done by those paramedics that have prior medical director authorization. See Medical Procedure–SMART Airway Management

**Contraindications**: Allergy to the drug.

**Precautions**: Caution in impaired liver function, severe obesity and impaired respiratory function patients.

**Side Effects**: Arrhythmias, anaphylaxis, bronchospasm, HTN, hypotension.

**Dosage**: FOR INTRAVENOUS USE ONLY. INDIVIDUALIZATION OF DOSAGE SHOULD BE CONSIDERED IN EACH CASE.

**Rapid Sequence Intubation**: In appropriately premedicated and adequately anesthetized patients, ZEMURON® (Rocuronium Bromide) Injection 0.6-1.2 mg/kg will provide excellent intubating conditions in most patients in less than 2 minutes.

**Dose for Tracheal Intubation**: The recommended initial dose regardless of anesthetic technique is 0.6 mg/kg.

Neuromuscular block sufficient for intubation is attained in a median (range) time of 1 minute(s) and most patients have intubation completed within 2 minutes. Maximum blockade is achieved in most patients in less than 3 minutes.

**Duration**: 30 minutes

Use in Pediatrics:
Initial doses of **0.6 mg/kg in pediatric patients** under anesthesia produce excellent to good intubating conditions within 1 minute. The median (range) time to maximum block was 1 minute(s). This dose will provide a median (range) time of clinical relaxation of 41 minutes in 3 months-1 year infants and 27 minutes in 1-12 year-old pediatric patients.

Compatibility:
ZEMURON® (Rocuronium Bromide) Injection is compatible in solution with:
1. 0.9% NaCl solution Sterile water for injection
2. 5% glucose in water Lactated Ringers
3. 5% glucose in saline

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**5.1.45 Sodium Bicarbonate**

**Class:** Alkalinizing agent.

**Actions:** Combines with excessive acids to form a weak volatile acid, increases ph. Helps drive Potassium back into cells.

**Indications:** Late in the management of cardiac arrest, if at all, tricyclic antidepressant overdose, severe acidosis refractory to hyperventilation. Hyperkalemia

**Contraindication:** Alkalotic states, hypochloremia, hypersensitivity to drug.

**Precautions:** Correct dosage is essential to avoid overcompensation of ph. Can deactivate catecholamines. Can precipitate with calcium preparations. Delivers large sodium load.

**Side Effects:**
- **Serious:** Metabolic alkalosis, CHF exacerbation, seizures, tetany, extravasation cellulitis (IV use).
- **Common:** Flatulence (po use), gastric distension (po use), metabolic alkalosis, edema, hypernatremia, injection site pain.

**Dosage:** 1 mEq/kg initially followed by 0.5 mEq/kg every 10 minutes as indicated by blood gas studies.

**Routes:** IV, IO.

**Pediatric Dosage:** 1 mEq/kg initially IV/IO (1ml/kg of 8.4% solution) followed by 0.5 mEq/kg every 10 minutes. In neonates and infants, dilute the 8.4% solution 1:1 with sterile water (not saline) making a 4.2% solution to reduce the hyperosmolarity of the solution.

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**5.1.46 Succinylcholine (Anectine)**

**Class:** Neuromuscular blocking agent (depolarizing).

**Actions:** Skeletal muscle relaxant, paralyzes skeletal muscles including respiratory muscles.

**Indications:** To achieve paralysis to facilitate endotracheal intubation.

**Contraindications:** Patients with known hypersensitivity to the drug, maglignant hyperthermia hx (pt or family), myopathies/neuromuscular dz, muscular dystrophy, ALS, multiple sclerosis,
major trauma or burns after 5 days and until healed, penetrating eye injury, unstable fractures, spinal cord injury or stroke between 5 days and 6 months, patients who are hyperkalemic, intra-abdominal sepsis between 5 days and time healed.

**Precautions:** Should not be administered unless persons skilled in endotracheal intubation are present. You must be authorized by the medical director to use this drug. Endotracheal intubation equipment must be available. Oxygen equipment and emergency resuscitative drugs must be available. Paralysis occurs within 1 minute and lasts for approximately 8 minutes. Use with caution on patients with: pulmonary dz, severe anaphylactic rxn hx, hepatic impairment, renal impairment, electrolyte abnormality, cardiovascular dz, at risk for hyperkalemia, arrhythmias, severe hypothermia, febrile, chronic abdominal infection, subarachnoid hemorrhage,

**Side Effects:**

**Serious:** Prolonged paralysis, respiratory depression, apnea, malignant hyperthermia, anaphylaxis, arrhythmias, ventricular arrhythmias (peds pts), cardiac arrest (peds pts), rhabdomyolysis w/ hyperkalemia (peds pts), myoglobinemia,

**Common:** Myalgia, muscle fasciculations, jaw rigidity, IOP elevation, HTN, hypotension, bradycardia, tachycardia, sialorrhea, rash.

**Dosage:** 1-1.5 mg/kg (40-100 mg in an adult).

**Routes:** IV.

**Pediatric Dosage:** 1 mg/kg.

### 5.1.47 Tetracaine Hydrochloride 0.5% Ophthalmic Drops

**Class:** Topical Anesthetic

**Action:** Tetracaine is an ophthalmic solution that anesthetizes the eyes. The onset of anesthesia usually begins within 20 seconds and lasts up to 15 minutes.

**Indications:** Tetracaine is intended for use in the patient who is unable to cooperate with you in adequately flushing the eye(s) due to discomfort or pain. If flushing can be accomplished easily, Tetracaine may not be needed.

**Contraindications:** Allergy to topical anesthetics.

**Precautions:** Do not use the solution if it contains crystals, or if it is cloudy or discolored.

Tetracaine Eye Drops are for topical ophthalmic use only, not for injection. The patient should be advised not to touch or rub the eye(s) until the effect of the anesthesia has worn off. Tetracaine is NOT for long term use and can be potentially harmful to the eye(s) if used for other than the purpose stated above.

**Dosage:** 1 or 2 drops in the eye(s)
5.1.48 Thiamine (Vitamin B1)

**Class:** Vitamin.

**Actions:** Allows normal breakdown of glucose.

**Indications:** Coma of unknown origin, alcoholism, delirium tremens, malnourished patient with altered mental status.

**Contraindications:** None in the emergency setting.

**Precautions:** Rare anaphylactic reactions have been reported.

**Side Effects:**

- **Serious:** Angioedema, cyanosis, anaphylaxis.
- **Common:** Warmth sensation, pruritus, urticarial, injection site pain

**Dosage:** 100 mg.

**Route:** IV/IM

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5.1.49 Tranexamic Acid (TXA)

**Class:** Antifibrinolytic Agent

**Action:** Tranexamic acid competitively inhibits activation of plasminogen (via binding to the kringle domain), thereby reducing conversion of plasminogen to plasmin (fibrinolysin), an enzyme that degrades fibrin clots, fibrinogen, and other plasma proteins, including the procoagulant factors V and VIII. It inhibits both plasminogen activation and plasmin activity, thus preventing clot break-down rather than promoting new clot formation.

**Indications:** Treatment of hemorrhagic shock from trauma. Trauma must have occurred < 3 hours. Must have obvious bleeding external wounds neck to mid-thigh or suspected severe internal injuries from blunt or penetrating trauma. Must have sustained HR > 110 beats/min and sustained hypotension with systolic BP < 90 mm Hg.

**Contraindications:** Non-hemorrhagic shock, Non-traumatic hemorrhagic shock, hemorrhagic shock stabilized with other hemostatic agents/measures. Active intravascular clotting (DVT, PE). Hypersensitivity to TXA or any ingredients. Subarachnoid hemorrhage. Color vision defect

**Precautions:** Delayed effects up to 48 hours consistent with anti-inflammatory actions. Precaution if thromboembolism risk, DIC, upper urinary tract bleeding, if cardiovascular surgery.

**Side effects:**

- **Serious:** Hypersensitivity rxn, anaphylaxis, thromboembolism, seizures, cerebral edema, ureteral obstruction, lignonous conjunctivitis, retinal degeneration
- **Common:** headache/migraine, URI sx, back pain, abdm pain, musculoskeletal pain, arthralgia, muscle cramps, anemia, nausea, fatigue, vomiting, diarrhea, dizziness, lignonous conjunctivitis, allergic contact derm, hypotension, vision change

**Dosage:** Bolus: 1 gm mixed in 100 ml NS infused IV over 10 minutes
**Maintenance**: If transport is > 1 hr: 1 gm in 1 liter (1000ml) NS infused at 125 ml/hr IV.

**Routes**: IV

**Pediatric Dose**: Bolus: 20 mg/kg IV over 10 minutes. Do not exceed adult does

**Maintenance**: If transport time is greater than 1 hour, start maintenance infusion: 20 mg/kg to be infused over 8 hours. Not to exceed 1000 mg (1gm) over 8 hours.

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### 5.1.50 Terbutaline (Brethine)

**Class**: Labor suppression/Tocolytics, Beta-2 Agonist

**Action**: Stimulates beta-2 adrenergic receptor, relaxing airway smooth muscle

**Indications**: Tocolysis (for EMS purpose)

**Contraindications**: Hypersensitivity to drug, acute or maintenance tocolysis (PO use), prolonged tocolysis >48 – 72 hours (SC/IV use)

**Precautions**: arrhythmias, cardiovascular disease, hypertension, hyperthyroidism, diabetes mellitus, seizure disorder.

**Side Effects**: Serious: Hypersensitivity rxn, paradoxical Bronchospasm, HTN, QT prolongation, myocardial ischemia, pulmonary edema, hypokalemia, hyperglycemia, seizures, neonatal hypoglycemia, fetal tachycardia

**Common**: Nervousness, tremor, headache, tachycardia, palpitations, drowsiness, nausea, vomiting, diaphoresis, muscle cramps, hypokalemia, hyperglycemia

**Dosage**: for Tocolysis; 0.25 mg SQ q20-30 min, max 1 mg/4hr SC. Alternative: 0.0025-0.01 mg/min IV, increase 0.005 mg/min q 10 min until contractions stop or max dose.

**Route**: SC or IV

---

### 5.1.51 Vasopressin

**Class**: ACLS drug, Antidiuretic hormone.

**Action**: Vasopressin is the naturally occurring antidiuretic hormone. In unnaturally high does much higher than those needed for antidiuretic hormone effects – vasopressin acts as a non-adrenergic peripheral vasoconstrictor. Vasopressin acts by direct stimulation of smooth muscle V1 receptors.

In recent studies, after a short duration of ventricular fibrillation, vasopressin during CPR increased coronary perfusion pressure, vital organ blood flow, ventricular fibrillation median frequency, and cerebral oxygen delivery.

**Indications:**
1) Asystole
2) Pulseless Electrical Activity (PEA)
3) Ventricular Fibrillation
4) Ventricular Tachycardia without a pulse.

**Contraindications:** None in cardiac arrest.

**Precautions:** None in cardiac arrest.

**Side Effects:** None in cardiac arrest.

**Dosage:** One-time dose to replace first or second dose of epinephrine.

Adult: 40 units IV push or ET.

---

5.1.52 Vecuronium (Norcuron)

**Class:** Neuromuscular blocking agent (non-depolarizing).

**Actions:** Skeletal muscle relaxant, paralyzes skeletal muscles including respiratory muscles.

**Indications:** To achieve paralysis to facilitate endotracheal intubation.

**Contraindications:** Patients with known hypersensitivity to the drug, IM administration.

**Precautions:** Should not be administered unless persons skilled in endotracheal intubation are present. This drug should not be used unless you have been authorized to do so by the medical director. Endotracheal intubation equipment and or extra-glottic device must be available. Oxygen equipment and emergency resuscitative drugs must be available. Paralysis occurs within 1 minute and lasts for approximately 30 minutes.

**Side Effects:** Prolonged paralysis, hypotension, bradycardia, apnea, anaphylaxis, bronchospasm, muscle weakness.

**Dosage:** 0.08-0.10 mg/kg.

**Routes:** IV.

**Pediatric Dosage:** 0.08 - 0.1 mg/kg.

---

5.1.53 Verapamil

**Class:** Calcium Channel Blocker

**Action:** Inhibits calcium influx into vascular smooth muscle and myocardium

**Indications:** Control heart rate in rapid a-fib, a-flutter and supraventricular arrhythmias, treatment hypertension, angina

**Contraindications:** Hypersensitivity to drug, left ventricular dysfunction, severe AV block, a-fib/flutter with bypass tract, sick sinus syndrome, hypotension, severe cardiogenic shock,

**Precautions:** Caution in patients with: CHF, bradycardia, IHSS, impaired liver function, renal function, muscular dystrophy, myasthenia, GERD

**Side Effects:** Serious: CHF, severe hypotension, AV block, severe bradycardia, hepatotoxicity (rare), paralytic ileus (rare),

**Common:** constipation, dizziness, nausea, hypotension, headache, edema, fatigue
**Dosage:** 2.5 – 10 mg IV over 2 minutes. May repeat 5-10 mg dose after 15 – 30 minutes. Maximum dose 20 mg total

**Route:** IV

**Pediatric:** for supraventricular arrhythmias;
- < 1 yr: 0.1 – 0.2 mg/kg over 2 min. Use continuous ECG monitoring; may repeat x 1 in 30 minutes; not generally recommended for PSVT in children < 2 y/o.
- 1 – 15 y/o: 0.1 – 0.3 mg/kg IV over 2 minutes; Maximum dose 5mg/first dose; may give second dose up to 10 mg at 30 minutes after first dose; not generally recommended for PSVT in children < 2 y/o

**5.2 HAZARDOUS EXPOSURE/ HAZ-MAT DRUGS:**

**5.2.1 Amyl Nitrate**

**Action:** In cyanide toxicity, nitrite ions combine with hemoglobin to form methemoglobin, which binds with cyanide and assists in cyanide elimination. Converts hemoglobin (Fe²⁺) into methemoglobin (Fe³⁺), which binds with the cyanide.

**Indications:** Used initially in management of cyanide toxicity

**Contraindications:** Hypersensitivity to nitrates, Intracranial pressure/closed head injury, cerebral hemorrhage.

**Side Effects:** Headache, dizziness, weakness, orthostatic hypotension, tachycardia, nausea, vomiting, methemoglobin, flammable, looks similar to ammonia inhalants

**Dosage:** Adult and Pediatric: 0.2 – 0.3 ml inhaled for 15 – 30 seconds every 3 – 5 minutes, until Sodium Nitrite IV solution is available.

**5.2.2 CANA KIT (Diazepam) KIT (Hazardous Material-WMD Only)**

Convulsant Antidote for Nerve Agent (CANA): The CANA consists of a single auto injector containing 10 mg of diazepam. Used to control convulsions and prevent brain and cardiac damage following severe exposure to nerve agents (and similar toxins). Often used in conjunction with NAPP and MARK I Kit. CANA is PDA approved.
The CANA Kit is specifically designed for use on the battlefield by both medical and non-medical personnel. As a result of its durability, simplicity, and similarity to other civilian medical auto-injectors (I.E. The EPI-PEN) the CANA KIT is being deployed into civilian medical arenas as well. The CANA KIT is particularly useful during "dirty" or "hot zone" medical care because no IV is needed.

The CANA kit may be available to EMS Personnel and other responders through EMS, civil defense authorities, FEMA sponsored groups, the military, or other agencies in a time of crisis or in response to increased terrorism threat assessments.

**Indications:**

CANA is safe and effective for use as an adjunct to control convulsions following severe exposure to nerve agents. The use of the CANA Kit is especially desirable in hazardous environments, as they can be given through clothes and NBC Suits.

**Dose:**

- **Adults:** Administer a single CANA kit IM as needed.
- **Children:** Administer a single CANA kit IM as needed to children over 50 pounds
- **Infant:** The adult sized CANA injector should never be given to infants

**Procedure:**

**Who May Use the CANA Kit?**

EMS personnel may self-administer ("Self Aid") the CANA Kit if exposure to a nerve agent, organophosphate, or similar toxin is suspected.

A responders CANA kit may be administered by another responder if the first responder is unable to do so himself ("Buddy Aid"). Regardless, a responder should never use his/her own CANA kit on a patient.

A responders CANA kit may be administered by another responder if the first responder is unable to do so himself ("Buddy Aid"). Regardless, a responder should never use his/her own CANA kit on a patient.

CANA KIT should only be administered to non-responders (patients) by a Paramedic or other appropriately trained responder.

**Administration of auto-injectors:**

The CANA is a single injector; the procedure is essentially the same as for an individual MARK I Injector.

To use the auto-injector:

1. Remove CANA kit from protective pouch.
2. Pull off gray safety cap.
3. Place Black end on mid outer thigh.
4. Push hard until injector functions.
5. Withdraw after 10 seconds,

According to CFR 1910.1030 (d)(2)(vii) through 1910.1030 (d)(2)(vii)(B), contaminated sharps can be bent if the employer can demonstrate that no alternative is feasible or that such action is required by a specific medical or dental procedure. The CANA kit will be used primarily in areas outside of hospitals, clinical or research laboratories. It is prudent and a required procedure (i.e., using a one-handed technique) to bend the needle from the CANA kit to permanently blunt the exposed sharp until they can be disposed of properly.

**Other Concerns:**
The CANA Kit should be protected from temperatures below 32 degrees F. It may be necessary to carry next to body to keep warm.
CANA must be passed hand-to-hand or placed in secure storage; accountability necessary. May hold CANA administration for Diazepam being administered by other routes. Use of the CANA Kit is not a substitute for decontamination and use of proper protective gear.

Return to:  Contents at top   Drug Reference   Hazardous Material Exposure
            Haz/Mat Drugs
5.2.3 Cyanokit

**Indication**

Cyanokit is indicated for the treatment of known or suspected cyanide poisoning.

**Identifying Patients with Cyanide Poisoning**

Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide-containing compounds, including smoke from closed-space fires. Sources of cyanide poisoning include hydrogen cyanide and its salts, cyanogenic plants, aliphatic nitriles, and prolonged exposure to sodium nitroprusside.

The presence and extent of cyanide poisoning are often initially unknown. There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of cyanide poisoning is high, Cyanokit should be administered without delay.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
</tr>
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<tbody>
<tr>
<td>Headache</td>
<td>Altered Mental Status (e.g., confusion, disorientation)</td>
</tr>
<tr>
<td>Confusion</td>
<td>Seizures or Coma</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Mydriasis</td>
</tr>
<tr>
<td>Chest</td>
<td>Tachypnea / Hyperpnea (early)</td>
</tr>
<tr>
<td>tightness</td>
<td>Bradypnea / Apnea (late)</td>
</tr>
<tr>
<td>Nausea</td>
<td>Hypertension (early) / Hypotension (late)</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular collapse</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Plasma lactate concentration ≥ 8 mmol/L</td>
</tr>
</tbody>
</table>

In some settings, panic symptoms including tachypnea and vomiting may mimic early cyanide poisoning signs. The presence of altered mental status (e.g., confusion and disorientation) and/or mydriasis is suggestive of true cyanide poisoning although these signs can occur with other toxic exposures as well.

The expert advice of a regional poison control center may be obtained by calling 1-800-222-1222.

**Smoke Inhalation**
Not all smoke inhalation victims will have cyanide poisoning and may present with burns, trauma, and exposure to other toxic substances making a diagnosis of cyanide poisoning particularly difficult. Prior to administration of Cyanokit, smoke-inhalation victims should be assessed for the following:

- Exposure to fire or smoke in an enclosed area
- Presence of soot around the mouth, nose or oropharynx
- Altered mental status

Although hypotension is highly suggestive of cyanide poisoning, it is only present in a small percentage of cyanide-poisoned smoke inhalation victims. Also indicative of cyanide poisoning is a plasma lactate concentration ≥ 10 mmol/L (a value higher than that typically listed in the table of signs and symptoms of isolated cyanide poisoning because carbon monoxide associated with smoke inhalation also contributes to lactic acidemia). If cyanide poisoning is suspected, treatment should not be delayed to obtain a plasma lactate concentration.

**Use with Other Cyanide Antidotes**

Caution should be exercised when administering other cyanide antidotes simultaneously with Cyanokit, as the safety of co-administration has not been established. If a decision is made to administer another cyanide antidote with Cyanokit, these drugs should not be administered concurrently in the same intravenous line. [See **DOSAGE AND ADMINISTRATION**.]

**DOSAGE AND ADMINISTRATION**

Comprehensive treatment of acute cyanide intoxication requires support of vital functions. Cyanokit should be administered in conjunction with appropriate airway, ventilatory and circulatory support.

**Recommended Dosing**

The starting dose of hydroxocobalamin for adults is 5 g (i.e., both 2.5 g vials) administered as an intravenous infusion over 15 minutes (approximately 15 mL/min), i.e., 7.5 minutes/vial. Depending upon the severity of the poisoning and the clinical response, a second dose of 5 g may be administered by intravenous infusion for a total dose of 10 g. The rate of infusion for the second dose may range from 15 minutes (for patients in extremis) to two hours, as clinically indicated.

**Preparation of Solution for Infusion**

Each 2.5 g vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of diluent (not provided with Cyanokit) using the supplied sterile transfer spike. The recommended diluent is 0.9% Sodium Chloride injection (0.9% NaCl). Lactated Ringers injection and 5% Dextrose injection (D5W) have also been found to be compatible with hydroxocobalamin and may be used if 0.9% NaCl is not readily available. The line on each vial label represents 100
mL volume of diluent. Following the addition of diluent to the lyophilized powder, each vial should be repeatedly inverted or rocked, not shaken, for at least 30 seconds prior to infusion.

Hydroxocobalamin solutions should be visually inspected for particulate matter and color prior to administration. If the reconstituted solution is not dark red or if particulate matter is seen after the solution has been appropriately mixed, the solution should be discarded.

Incompatibility Information

Physical incompatibility (particle formation) and chemical incompatibility were observed with the mixture of hydroxocobalamin in solution with selected drugs that are frequently used in resuscitation efforts. Hydroxocobalamin is also chemically incompatible with sodium thiosulfate and sodium nitrite and has been reported to be incompatible with ascorbic acid. Therefore, these and other drugs should not be administered simultaneously through the same intravenous line as hydroxocobalamin.

Simultaneous administration of hydroxocobalamin and blood products (whole blood, packed red cells, platelet concentrate and/or fresh frozen plasma) through the same intravenous line is not recommended. However, blood products and hydroxocobalamin can be administered simultaneously using separate intravenous lines (preferably on contralateral extremities, if peripheral lines are being used).

Storage of Reconstituted Drug Product

Once reconstituted, hydroxocobalamin is stable for up to 6 hours at temperatures not exceeding 40°C (104°F). Do not freeze. Any reconstituted product not used by 6 hours should be discarded.

HOW SUPPLIED

Dosage Forms And Strengths

Cyanokit (hydroxocobalamin for injection) 5 g for intravenous infusion consists of 2 vials, each containing 2.5 g lyophilized hydroxocobalamin dark red crystalline powder for injection. After reconstitution, each vial contains hydroxocobalamin for injection, 25 mg/mL. Administration of both vials constitutes a single dose. [See Storage and Handling for full kit description.]

Storage And Handling

Each Cyanokit carton (NDC 11704-270-01) consists of the following:

- Two 250 mL glass vials, each containing lyophilized hydroxocobalamin for injection, 2.5 g
- Two sterile transfer spikes
- One sterile intravenous infusion set
- One quick use reference guide
- One package insert

Diluent is not included

Storage

**Lyophilized form:** Store at 25°C (77°F); excursions permitted to 1530°C (59 to 86°F) [see USP Controlled Room Temperature].

Cyanokit may be exposed during short periods to the temperature variations of usual transport (15 days submitted to temperatures ranging from 5 to 40°C (41 to 104°F), transport in the desert (4 days submitted to temperatures ranging from 5 to 60°C (41 to 140°F)) and freezing/defrosting cycles (15 days submitted to temperatures ranging from -20 to 40°C (-4 to 104°F)).

**Reconstituted solution:** Store up to 6 hours at a temperature not exceeding 40°C (104°F). Do not freeze. Discard any unused portion after 6 hours.

Manufactured by: Merck Santé s.a.s., Semoy, France. Distributed by Meridian Medical Technologies™, Inc. Columbia, MD 21046 A wholly-owned subsidiary of King Pharmaceuticals, Inc. 1-800-776-3637. 850-1

Last reviewed on RxList: 11/12/2010

5.2.4 DuoDote Kit

I. **BACKGROUND:**

Nerve Agent Antidote Kit (DUODOTE™): A DUODOTE™ kit is an alternative way to administer atropine and 2-PAM Chloride in response to symptomatic nerve agent (or similar toxin) exposure. It replaces the MARK I kit in all situations. Unlike the MARK I kit, the DUODOTE™ is a single auto injector. The DUODOTE™ contains:

- **2.1 mg of Atropine Sulfate**
- **600 mg of 2-PAM Chloride (Pralidoxime)**

Like the older MARK I kit, the DUODOTE™ kit is specifically designed for use on the battlefield by both medical and non-medical personnel. As a result of its durability, simplicity, and similarity to other civilian medical auto-injectors (I.E. The EPI-PEN) the DUODOTE™ kits are being deployed into civilian medical arenas as well. The DUODOTE™ kits are particularly useful during “dirty” or “hot zone” medical care because no IV is needed.

II. **INDICATIONS DUODOTE™:**

Any patient who is symptomatic from suspected exposure to a nerve agent, organophosphate poisoning, or similar toxin.
The Use of the DUODOTETM Kit is especially desirable in hazardous environments, as they can be given through clothes and NBC Suits.

**Dose:**

**Adults:** DUODOTETM: Administer up to three DUODOTETM IM as needed.  
CANA: Administer a single CANA kit IM as needed.  

**Children:** DUODOTETM: A single DUODOTETM injector can be given IM to children over 50 pounds.  

**Infants:** The adult-size DUODOTETM injector should not be given to infants.  

**NOTE WELL:** The above limitations are due to the 2-PAM Chloride component of the DUODOTETM KIT. FURTHER (APPROPRIATE) DOSES OF ATROPINE ARE PERMITTED WITHIN THE BOUNDS OF THE STANDING WRITTEN ORDERS OR MEDICAL DIRECTION.

### III. CONTRAINDICATIONS:

None in the Nerve Agent / Organophosphate casualty except as noted above.

### IV. PROCEDURE:

**Who May Use the DUODOTETM Kit?**

EMS personnel may self-administer (“Self Aid”) the DUODOTETM kit if exposure to a nerve agent, organophosphate, or similar toxin is suspected. A responders DUODOTETM kit may be administered by another responder if the first responder is unable to do so himself (“Buddy Aid”). Regardless, a responder should never use his/her own DUODOTETM kit on a patient.  
DUODOTETM Kit should only be administered to non-responders (patients) by a Paramedic or other appropriately trained responder.

**Administration of auto-injectors:**

DUODOTETM: The DUODOTETM is a single injector; the procedure is essentially the same as for an individual MARK I Injector, ATROPEN, EPIPEN, or similar auto-injectors.

**To use the auto-injector:**

1. Remove DUODOTETM kit from protective pouch. Hold unit in dominant/strong hand by its “body”.
2. Keep GREEN tip pointed down. This is the “needle” end of the auto-injector.
3. REMOVE THE GRAY “SAFETY” CAP. If the gray safety cap is in place, the auto injector will not fire.
4. Chose the location to inject. It should be a large muscle mass, the outer thigh is the most common site. Remove any wallets, pocket guides, or other potential obstructions. The DUODOTETM should be able to deploy through light clothing.
5. Grasp the unit and position the green tip of the injector on victim’s outer thigh at an approximately 90 degree angle.
7. Hold in place for 10 seconds to ensure Atropine has been properly delivered.
8. Remove the DUODOTETM auto injector and inspect for the (now visible) needle from the green tip. If the needle is not visible, the auto injector has not fired. Make sure the gray safety cap is removed and repeat the process.
9. Once fired, place in appropriate sharps container.

V. OTHER CONCERNS:
The DUODOTETM Kit should be protected from temperatures below 32 degrees F. It may be necessary to carry next to body to keep warm. Providers may hold DUODOTETMkit administration if Atropine and/or 2-Pam Chloride being administered by other routes, methods, or preparations. Use of the DUODOTETM Kit is not a substitute for decontamination and use of proper protective gear. Individuals should not rely solely upon agents such as atropine and 2-Pam Chloride to provide complete protection from chemical nerve agents and insecticide poisoning. Primary protection against exposure to chemical nerve agents and insecticide poisoning is the wearing of protective garments, including masks designed specifically for this use. The DuoDoteTM Auto-Injector is intended as an initial treatment of the symptoms of organophosphorus insecticide or nerve agent poisonings; definitive medical care should be sought immediately. Evacuation and decontamination procedures should be undertaken as soon as possible. Medical Personnel assisting evacuated victims of nerve agent poisoning should avoid contaminating themselves by exposure to the victim’s clothing.

5.2.5 MARK 1 KIT (Atropine and 2-PAM)

Indications:
The Mark I kit (NAAK) may be administered by the EMT or Paramedic who have had adequate training in the on-site recognition and treatment of nerve agent exposure. Some of the classic symptoms of nerve agent exposure include:

- unexplained runny nose
- tightness in chest/difficulty breathing
- pinpointed pupils of the eye resulting in blurred vision
- drooling, excessive sweating
- nausea, vomiting and abdominal cramps
- involuntary urination and defecation
- jerking, twitching and staggering
- headache, drowsiness, coma convulsions
- stoppage of breathing

Specific dosage and indications are found in the Hazardous Material Exposure Protocols 8.1 and Chemical Treatment Guides 4A and 4P Green.
Contraindications:
See specific drug summary. Mark I auto injector should not be used for pediatric patients less than 8 years of age.

Procedure: When a first responder arrives on a scene potentially contaminated with nerve agents, she/he must don a protective mask. If symptoms of nerve agent exposure manifest:
1. Remove Mark I kit from protective pouch.
2. Hold unit by plastic clip. (See graphic A.)
3. Remove AtroPen from slot number 1 of the plastic clip. The yellow safety cap will remain in the clip and the AtroPen will now be armed. DO NOT hold unit by green tip. The needle ejects from the green tip. (See graphics B & C.)
4. Grasp the unit and position the green tip of the AtroPen on victim's outer thigh.
5. Push firmly until auto-injector fires.
6. Hold in place for 10 seconds to ensure Atropine has been properly delivered.
7. Remove 2-PAM CI Combo Pen from slot number 2 of the plastic clip. The gray safety cap will remain in the clip and the Combo Pen will now be armed. DO NOT hold the unit by the black tip. The needle ejects from the black tip.
8. Grasp the unit and position the black tip of the Combo Pen on victim's outer thigh. (See graphics D & E.)
10. Hold in place for 10 seconds to ensure Pralidoxime Chloride has been properly delivered.
11. If nerve agent symptoms are still present after 10 minutes, repeat injections. If symptoms still exist after an additional 10 minutes, repeat injections for a third time. If after the third set of injections, symptoms remain, do not give any more antidotes but seek medical help.

Reference

5.2.6 Methylene Blue

Actions: Low concentrations will convert methemoglobin to hemoglobin (methemoglobin is toxic and gives the blood a chocolate-brown color; it does not carry oxygen). High concentrations convert ferrous iron of hemoglobin to ferric iron, thus forming methemoglobin.

Indications: Indicated in the initial treatment of Methemoglobinemia.

Contraindications: Renal insufficiency (excreted in urine and bile).

Adverse reactions: Cyanosis, profuse sweating, dizziness, headache, nausea, vomiting, diarrhea (turns urine and stool blue-green). May induce hemolysis in patients deficient in glucose-6-phosphate dehydrogenase.

Dosage: 1-2 mg/kg of 1% solution. Very slow IV push 1ml (10 mg) every 5 minutes

Reference
5.2.7 Sodium Nitrite

**Actions:** Sodium nitrite produces methemoglobinemia that combines with cyanide ion to form cyanmethemoglobin. It dissociates to liberate free cyanide, which is then converted to thiocyanate by sodium thiosulfate. The end product is excreted in the urine.

**Indications:** Cyanide toxicity, Hydrogen sulfide toxicity

**Contraindications:**
1. **Hypotension:** if the patient presents in hypotensive state, consider skipping this step and proceeding to Sodium thiosulfate.
2. **Pregnancy:** Sodium nitrite crosses the placenta and can induce methemoglobinemia in the fetus

**Adverse Reactions:** Syncope, hypotension, excessive methemoglobinemia is likely to occur with decrease arterial oxygenation

**Dosage:**
- Adult: 300 mg IV over 4 – 5 minutes
- Pediatric: 0.2 ml/kg IV over 4 – 5 minutes. Use extreme caution because methemoglobin can be fatal in children. Repeat Dose: For both adults and children ½ the initial dose after 30 minutes.

---

5.2.8 Sodium Thiosulfate

**Action:** Sodium thiosulfate converts cyanide to the less toxic thiocyanate. The thiocyanate is then excreted in the urine.

**Indications:** Used in acute Cyanide toxicity. (Not useful in Hydrogen sulfide toxicity).

**Contraindications:** None in acute cyanide toxicity

**Dosage:** Adult: 12.5 grams (50 ml of 25% solution) slow IV over 10 minutes.

---
6 Appendix
### 6.1 ABDOMINAL PAIN DIFFERENTIAL

<table>
<thead>
<tr>
<th>Upper GI Bleed</th>
<th>Lower GI Bleed</th>
<th>Gynecological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hx of peptic ulcer disease; can cause massive hemorrhage</td>
<td>May be occult or bright red; a common cause of orthostatic hypotension and undetected anemia</td>
<td>Think ectopic!! if patient still having menses; diagnosis includes: 1. lower abdominal pain 2. hypotension 3. shoulder pain 4. vaginal bleeding +/- 5. syncope</td>
</tr>
</tbody>
</table>

## Common causes associated with the different types of presenting pain

<table>
<thead>
<tr>
<th>Upper GI Bleed</th>
<th>Lower GI Bleed</th>
<th>Gynecological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal Varices (Hx of cirrhosis, hepatitis)</td>
<td>Diverticulitis</td>
<td>Ectopic Pregnancy</td>
</tr>
<tr>
<td>Peptic Ulcer Disease</td>
<td>Hemorrhoids</td>
<td>Pelvic Inflammatory Disease / STD's</td>
</tr>
<tr>
<td>Aspirin, NSAID's</td>
<td>Cancer</td>
<td>Ovarian Cyst</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Inflammatory Bowel Disease</td>
<td>Kidney / Urinary Tract Infection</td>
</tr>
<tr>
<td>Ingestion of caustic substances</td>
<td>Chronic Diarrhea, overuse of laxatives</td>
<td>Endometriosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Back Pain</th>
<th>Colicky Pain</th>
<th>Peritoneal Pain</th>
<th>Vomiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every pain presenting with new onset back pain (&gt;60 yrs.) should have an abdominal exam R/O AAA</td>
<td>Spasmotic - usually results from smooth muscle contracting against obstruction of hollow organ</td>
<td>Rigid board-like abdomen, resulting from infection or long standing rupture</td>
<td>Non-specific syndrome, can be caused by a wide variety of underlying problems some of which are serious</td>
</tr>
</tbody>
</table>

## Common causes associated with the different types of presenting pain

<table>
<thead>
<tr>
<th>Back Pain</th>
<th>Colicky Pain</th>
<th>Peritoneal Pain</th>
<th>Vomiting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal Aortic Aneurysm</td>
<td>Bowel Obstruction</td>
<td>Ruptured Appendix</td>
<td>Infection of GI Tract</td>
</tr>
<tr>
<td>Cholelithiasis</td>
<td>Renal Obstruction &quot;Kidney Stones&quot;</td>
<td>Ruptured Ovarian Cyst</td>
<td>Ulcers</td>
</tr>
<tr>
<td>Medical Condition</td>
<td></td>
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<td></td>
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<tr>
<td>------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Pancreatitis</td>
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<tr>
<td>Gallbladder Obstruction</td>
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<tr>
<td>Pelvic Inflammatory Disease (PID)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Toxic Ingestions</td>
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<td></td>
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<tr>
<td>Perforated Ulcer</td>
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<td></td>
<td></td>
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<tr>
<td>Ulcerative Colitis</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Perforated Ulcer</td>
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<td></td>
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<tr>
<td>Bowel Obstruction</td>
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<tr>
<td>Crohn's Disease</td>
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<td></td>
<td></td>
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<tr>
<td>Peritonitis Advanced</td>
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<tr>
<td>Stones of the Gallbladder or Kidney</td>
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</tbody>
</table>

Reference: "The 60 second EMT."
# 6.2 APGAR SCORE:

## The APGAR Scoring Chart

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>1 Min</th>
<th>5 Min</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong> (Skin Color)</td>
<td>Blue, Pale</td>
<td>Body Pink, Hand and Feet Blue</td>
<td>Completely Pink</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pulse Rate</strong> (Heart Rate)</td>
<td>Absent</td>
<td>Below 100</td>
<td>Above 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grimace</strong> (Irritability-Response to Flick on sole)</td>
<td>No Response</td>
<td>Some Motion, Weak Cry</td>
<td>Vigorous Cry</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activity</strong> (Muscle Tone)</td>
<td>Flaccid, Limp</td>
<td>Some Flexion of Extremities</td>
<td>Active Motion</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory</strong> (Effort)</td>
<td>Absent</td>
<td>Slow, Irregular</td>
<td>Good, Crying</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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6.3 APPROVED MEDICAL ABBREVIATIONS.

A
ā = before
@ = at
ABC = airway, breathing, circulation
abd. = abdomen
A/C = antecubital fossa
AICD = automatic implantable cardiac defibrillator
ACLS = advanced cardiac life support
A.D. = right ear
ALS = advanced life support
AMA = against medical advice
a.m. = morning
AMI = acute myocardial infarction
amp. = ampule
amt. = amount
AP = anteroposterior
APGAR
ASA = aspirin
ASAP = as soon as possible
ASHD = arteriosclerotic heart disease
ATV = all terrain vehicle
A/V = atrioventricular
===================================
B
bbb = bundle branch block
BBS = bilateral breath sounds
B/F = black female
B/M = black male
BG = Blood Glucose
b.i.d. = twice a day
BKA = Below the Knee Amputation
BLS = basic life support
BM = bowel movement
BP = blood pressure
BSA = body surface area (burns)
BSI = body substance isolation
BVM = bag/valve/mask

C
Č = with
CA = cancer
CABG = coronary artery bypass graft
CAD = coronary artery disease
CAO = conscious, alert, oriented
C/C = chief complaint
CCU = coronary care unit
CHD = congenital heart disease
CHF = congestive heart failure
cm = centimeter
CNS = central nervous system
C/O = complains of
CO2 = carbon dioxide
COPD = chronic obstructive pulmonary disease
CP = chest pain
CPAP
CPR = cardiopulmonary resuscitation
CSF = cerebrospinal fluid
C-spine = cervical spine
CT
CVA = cerebrovascular accident

DC = discontinue
DCAP- BLS = deformity, contusions, abrasions, penetrations, burns, lacerations, and swelling
D & C = dilation and curettage
diff. = differential
DKA = Diabetic Ketoacidosis
DOA = dead on arrival
DNR = do not resuscitate
DNRO = do not resuscitate order
DVT= Deep Vein Thrombosis
D5W = 5% Dextrose in water
D25 = Dextrose 25%
D50 = Dextrose 50%
DX. = diagnosis

ED = emergency department
EENT = eyes, ears, nose and throat
ECG or EKG = electrocardiogram
EEG = electroencephalogram
e.g. = for example
EGTA = esophageal gastric tube airway
EMD = electromechanical dissociation
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EMS = emergency medical services
EMT = emergency medical technician
ENT = ears, nose and throat
EOA = esophageal obturator airway
EOM = extraocular movement
Epi = epinephrine
ER = emergency room
EET tube = endotracheal tube
ETA = estimated time of arrival
ETOH = ethyl alcohol
============================================
F
FBAO = foreign body airway obstruction
F= Female
fl. = fluid
flex. = flexion
ft. = foot
FROM = full range of motion
fx = fracture
============================================
G
g = gauge (diameter)
GI= Gastrointestinal
GCS = Glasgow Coma Scale
GERD = Gastroesophageal Reflux Disease
Gm = gram
GSW = gunshot wound
gtt. = drop
GU = genitourinary
GYN = gynecology
============================================
H
H/F = Hispanic female
H/M = Hispanic male
HBP = high blood pressure
hr. = hour
HEENT = head, ears, eyes, nose and throat
HIV = human immune deficiency virus
hgb = hemoglobin
hosp. = hospital
HTN = hypertension
Hx = history
============================================
I
ICU = intensive care unit
I & D = incision and drainage
IM = intramuscular
I & O = intake and output
IO = intraosseous
IUD = intrauterine device
IV = intravenous
IVP = intravenous push

J
JVD = jugular vein distention
J = Joule

K
kg. = kilogram
KCl = potassium chloride
KVO = Keep Vein Open

L
(L) or lt. = left
lac. = laceration
lat = lateral
LBBB = left bundle branch block
lb(s) = pound(s)
L & D = labor and delivery
L/min or lpm = liters per minute
LLE = Left Lower Extremity
LUE = Left Upper Extremity
LLQ = left lower quadrant
LMA = laryngeal mask airway
LMP = last menstrual period
LOC = loss of consciousness
LP = lumbar puncture
LR = lactated ringers
LUQ = left upper quadrant

M
MAE = moves all extremities
MAST = medical anti-shock trousers
mA = milliampere
mcg = microgram
MCI = mass casualty incident
meds = medications
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M = Male
mEq = milliequivalent
MI = myocardial infarction
min. = minute
mg. = milligram
mkd. = marked
ml. = milliliter
mod. = moderate
MVC = Motor Vehicle Crash
MOE = movement of extremities
MS = morphine sulfate

N
N2O = nitrous oxide
NaCl = sodium chloride
NAD = no acute distress
neg. = negative
NKA = no known allergies
n/g = nasogastric
NPA = Nasal Pharyngeal Airway
NPO = nothing by mouth
NS = normal saline
NSR = normal sinus rhythm
NTG = nitroglycerin
N & V = nausea and vomiting

O
O2 = oxygen
OB = obstetrics
OBS = organic brain syndrome
OD = overdose - also means right eye
OPA = Oropharyngeal Airway
OPQRST = onset, provocation, quality, radiation, severity, time
Ophth = ophthalmology
OR = operating room
OS = left eye
OU = both eyes

P
PA = posteroanterior
PAC = premature atrial contraction
PaCO2 = partial pressure of CO2 in arterial blood
PaO2 = partial pressure of O2 in arterial blood
PAT = paroxysmal atrial tachycardia
PDR = physician's desk reference
PE = pulmonary embolus
per = by
PERL = pupils equal and reactive to light
PERLA = pupils equal and reactive to light, and accommodation
PICC = Peripherally Inserted Central Catheter
PID = pelvic inflammatory disease
PJC = premature junctional contraction
p.m. = evening
PMD = private medical doctor
PO = mouth
post = after
pre = before
prn = as needed
PSVT = paroxysmal supraventricular tachycardia
pt. = patient
PVC = premature ventricular contraction
Px. = physical history

Q
q = every
q.h. = hourly
q.i.d. = four times daily
q.o.d. = every other day

R
RBBB = right bundle branch block
RBC = red blood count
(R) or rt. = right
RLE = Right Lower Extremity
RUE = Right Upper Extremity
RLQ = right lower quadrant
R/O = rule out
ROM = range of motion
RUQ = right upper quadrant
Rx = prescription

S
□ = without
SAMPLE = signs/symptoms, allergies, medications, past Hx, last oral intake, events prior
SaO2 = percentage of oxygen in arterial blood
SIDS = sudden infant death syndrome
SL = sublingual
SOAP = subjective, objective, assessment, plan
SOB = short (ness) of breath
sol. = solution
spec. = specimen
Sub. Q (SQ) = subcutaneously
SpO2 = percentage of oxygen in the blood via pulse oximeter (equal to SaO2)
SVT = Supraventricular Tachycardia
STEMI = ST elevated myocardial infarction

T
tab. = tablet
TB = tuberculosis
temp. = temperature
TIA = transient ischemic attack
t.i.d. = three times daily
TKO= To Keep Vein Open
TMJ = temporomandibular joint
TPR = temperature, pulse and respiration
Tx. = treatment

U
UA = urinalysis
ULQ = upper left quadrant
URI = upper respiratory infection
URQ = upper right quadrant
UTI= Urinary Tract Infection

V
V - fib (VF) = ventricular fibrillation
V - tach (VT) = ventricular tachycardia
VD = venereal disease
via = by way of
vol. = volume
VS = vital signs

W
WBC = white blood count
W/F = white female
W/M = white male
WNL = within normal limits
wt. = weight

Y
Y/O = years old

Miscellaneous
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˜ = approximately
< = less than
> = more than
- = negative
+ = plus/positive
# = number
% = percent
@ = at
∆ = change
♂ = male
♀ = female
↑ = increase
↓ = decrease
(R) = right
(L) = left

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6.4 BURN PATIENT: RULE OF NINES

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Appendix   Burn Injuries   Peds Burn Injuries
### 6.5 BURN PATIENT: SEVERITY CATEGORIZATION

<table>
<thead>
<tr>
<th>Burn Classification</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| Minor Burn Injury           | 1º Burn  
2° Burn < 15% BSA in Adults  
2° Burn < 5% BSA in Children / aged  
3º Burn < 2% BSA |
| Moderate Burn Injury        | 2° Burn 16-25% BSA in adults  
2° Burn 5-20% BSA in Children / aged  
3° Burn 2-10% BSA |
| Major Burn Injury           | 2° Burn > 25% BSA in Adults  
2° Burn > 20% BSA in Children/Aged  
3° Burn > 10% BSA  
Burns involving the hands, face, eyes, ears, feet or perineum  
Most patients with inhalation injury, electrical injury, concomitant major trauma, or significant pre-existing diseases. |
6.6 Conversion Table of Measurements - Commonly used for medication and drug computations

- 1 gram (g) = 1000 milligrams (mg)
- 1 kilogram (kg) = 1000 grams (g)
- 1 microgram (mcg) = .001 milligram (mg)
- 1 milligram = 1000 microgram (mcg)
- 1 liter (L) = 1000 milliliters (ml)
- 1 milliliter (ml) = 1 cubic centimeter (cc)
- 1 meter = 100 centimeters (cm)
- 1 meter = 1000 millimeters (mm)
- 1 cubic centimeter (cc) = 1 milliliter (ml)
- 1 teaspoon = 5 cubic centimeter (cc) = 5 milliliters (ml)
- 1 tablespoon = 15 cubic centimeter (cc) = 15 milliliters (ml)
- 1 tablespoon = 3 teaspoon
- 1 ounce = 30 cc = 30 ml = 2 tablespoons = 6 teaspoons
- 8 ounces = 240 cc = 240 ml = 1 cup
- 1 milliliter (ml) = 15 minims (M) = 15 drops (gtt)
- 5 milliliters (ml) = 1 fluidram = 1 teaspoon
- 15 milliliters (ml) = 4 fluidrams = 1 tablespoon
- 30 milliliters (ml) = 1 ounce (oz) = 2 tablespoons
- 500 milliliters (ml) = 1 pint (pt)
- 1000 milliliters (ml) = 1 quart (qt)

Weight

- 1 kilogram = 2.2 pound (lb)
- 1 gram (g) = 1000 milligrams = 15 grains (gr)

Length

- 2.5 centimeters = 1 inch

Centigrade/Fahrenheit Conversions

- C = (F - 32) X 5/9
- F = (C X 9/5) + 32
### Ratios and Percent Solutions

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Concentration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:100</td>
<td>1g/100ml [10mg/ml]</td>
<td>1%</td>
</tr>
<tr>
<td>1:200</td>
<td>500mg/100ml [5mg/ml]</td>
<td>0.5%</td>
</tr>
<tr>
<td>1:1,000</td>
<td>100mg/100ml [1mg/ml]</td>
<td>0.1%</td>
</tr>
<tr>
<td>1:5,000</td>
<td>20mg/100ml [200mcg/ml]</td>
<td>0.02%</td>
</tr>
<tr>
<td>1:10,000</td>
<td>10mg/100ml [100mcg/ml]</td>
<td>0.01%</td>
</tr>
</tbody>
</table>

### Solid Metric Conversions

<table>
<thead>
<tr>
<th>Unit (Avoirdupois)</th>
<th>Equivalent (Apothecary)</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pound</td>
<td>453.592 g</td>
<td>1/2 grain = 30 mg</td>
</tr>
<tr>
<td>1 pound</td>
<td>373.242 g</td>
<td>1/4 grain = 15 mg</td>
</tr>
<tr>
<td>1 ounce</td>
<td>28.35 g</td>
<td>1/8 grain = 8 mg</td>
</tr>
<tr>
<td>1 ounce</td>
<td>31.10 g</td>
<td>1/12 grain = 5 mg</td>
</tr>
<tr>
<td>15 grains</td>
<td>1 g</td>
<td>1/100 grain = 600 mcg</td>
</tr>
<tr>
<td>10 grains</td>
<td>600 mg</td>
<td>1/150 grain = 400 mcg</td>
</tr>
<tr>
<td>7 1/2 grains</td>
<td>500 mg</td>
<td>1/200 grain = 300 mcg</td>
</tr>
<tr>
<td>5 grains</td>
<td>300 mg</td>
<td>1/250 grain = 250 mcg</td>
</tr>
<tr>
<td>1 1/2 grains</td>
<td>100 mg</td>
<td>1/300 grain = 200 mcg</td>
</tr>
<tr>
<td>1 grain</td>
<td>64.79891 mg</td>
<td>1 kilogram = 2.2 pounds</td>
</tr>
<tr>
<td>1 pound</td>
<td>0.45 kilograms (kg)</td>
<td>1 stone = 6.35 kg</td>
</tr>
<tr>
<td>1000 mcg</td>
<td>300 to 7000 iu (below)</td>
<td>1000 mcg = 1 mg</td>
</tr>
<tr>
<td>1 scruple</td>
<td>1.2 g</td>
<td>1 drachm = 28.8 g</td>
</tr>
</tbody>
</table>

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### CHEST PAIN DIFFERENTIAL

<table>
<thead>
<tr>
<th></th>
<th>MYOCARDIAL INFARCTION</th>
<th>ANGINA PECTORIS</th>
<th>DISSECTING ANEURYSM</th>
<th>PERICARDITIS</th>
<th>PEPTIC ULCER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONSET</strong></td>
<td>Usually sudden</td>
<td>Exertional / Emotional</td>
<td>Acute</td>
<td>Subacute</td>
<td>Acute / Subacute</td>
</tr>
<tr>
<td><strong>QUALITY</strong></td>
<td>Crushing, Heaviness, Dull, Pressure, Band-like, Constricting, Squeezing, Burning, Bursting</td>
<td>Discomfort, Choking, Pressing, Squeezing, Strangling, Constricting, Bursting, Burning</td>
<td>Deep tearing, Shearing, &quot;Knife-like&quot;</td>
<td>Sharp</td>
<td>Burning</td>
</tr>
<tr>
<td><strong>LOCATION</strong></td>
<td>Substernal, may vary</td>
<td>Substernal</td>
<td>Substernal</td>
<td>Substernal, more left sided</td>
<td>Epigastric, Substernal</td>
</tr>
<tr>
<td><strong>RADIATION</strong></td>
<td>Across, mid-thorax, anterior, arms, shoulder, neck, jaw, teeth, fingers</td>
<td>Same as MI</td>
<td>Back lumbar region</td>
<td>Usually none, occasionally tip of shoulder, neck, flank</td>
<td>Occasionally back</td>
</tr>
<tr>
<td><strong>DURATION</strong></td>
<td>Usually &gt; 30 minutes</td>
<td>5-15 minutes</td>
<td>Hours</td>
<td>Hours</td>
<td>Hours</td>
</tr>
<tr>
<td><strong>PROVOCATION</strong></td>
<td>Usually none, see comments</td>
<td>Exercise, Excitement, Stress, Cold, Meals</td>
<td>None</td>
<td>Worsened: lying, down, breathing, swallowing, coughing, twisting</td>
<td>Alcohol, lack of food, acid foods</td>
</tr>
<tr>
<td><strong>ALLEVIATION</strong></td>
<td>None</td>
<td>Rest, NTG</td>
<td>None</td>
<td>Tripod position, shallow respirations</td>
<td>Antacids, Food</td>
</tr>
<tr>
<td><strong>COMMENTS</strong></td>
<td>After heavy meals, severe emotional stress, S/S: SOB, N&amp;V, pallor, diaphoresis, impending doom, elderly - atypical</td>
<td>May be nocturnal</td>
<td>May be sudden onset, may subside spontaneously or be associated with paralysis</td>
<td>May be associated with URI, flu, Pronestyl, Hydralazine, lupus; MAY BE FEBRILE</td>
<td>ASA, NSAID's, e.g. Voltaren, Feldene, Naprosyn, Motrin, Advil, may trigger</td>
</tr>
</tbody>
</table>

(Continued on Next Page)
<table>
<thead>
<tr>
<th></th>
<th>PANCREATITIS</th>
<th>ESOPHAEGAL RUPTURE</th>
<th>PULMONARY EMBOLISM</th>
<th>ESOPHAEGAL SPASM</th>
<th>COSTOCHONDRTIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONSET</strong></td>
<td>Acute / Subacute</td>
<td>Acute</td>
<td>Sudden or Gradual</td>
<td>Subacute</td>
<td>Sudden or Gradual</td>
</tr>
<tr>
<td><strong>QUALITY</strong></td>
<td>Severe or Dull</td>
<td>Severe</td>
<td>Sharp or Dull</td>
<td>Dull, Pressure, Colicky</td>
<td>Sharp, Superficial</td>
</tr>
<tr>
<td><strong>LOCATION</strong></td>
<td>Epigastric</td>
<td>Retrosternal</td>
<td>Multiple</td>
<td>Substernal, Epigastric</td>
<td>Anterior / lateral costochondral junction</td>
</tr>
<tr>
<td><strong>RADIATION</strong></td>
<td>Back</td>
<td>Lateral</td>
<td>None</td>
<td>Jaw, Either arm</td>
<td>None</td>
</tr>
<tr>
<td><strong>DURATION</strong></td>
<td>Hours</td>
<td>Hours</td>
<td>Variable</td>
<td>5 – 60 Minutes</td>
<td>Variable</td>
</tr>
<tr>
<td><strong>PROVOCATION</strong></td>
<td>Alcohol, trauma, gall bladder disease</td>
<td>Swallowing</td>
<td>Respirations, Cough</td>
<td>Spontaneous, Cold liquids, Recumbency</td>
<td>Movement, Palpation, Cough, Respirations</td>
</tr>
<tr>
<td><strong>ALLEVIATION</strong></td>
<td>Time</td>
<td>None</td>
<td>None</td>
<td>Antacids, Occasionally NTG</td>
<td>Time, Heat, Analgesia</td>
</tr>
<tr>
<td><strong>COMMENTS</strong></td>
<td>May be viral – e.g. Mumps</td>
<td>Alcoholics with forceful vomiting; associated with pleural effusion, shock and hydro pneumothorax</td>
<td>May have hemoptyis, signs of peripheral phlebitis, cough and fever</td>
<td>Mimics angina, may occur after meals, at night with an acid taste, sensation-linear</td>
<td>Signs and symptoms: Fever, Cough, URI</td>
</tr>
</tbody>
</table>

(Continued on Next Page)
<table>
<thead>
<tr>
<th></th>
<th>CERVICAL DISK</th>
<th>ANXIETY</th>
<th>PNEUMONIA</th>
<th>PNEUMOM-THORAX</th>
<th>PLEURISY</th>
<th>GALL BLADDER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>QUALITY</strong></td>
<td>Superficial</td>
<td>Occasionally sharp, may be heavy or pressure-like</td>
<td>Sharp or Dull Ache</td>
<td>Sharp</td>
<td>Sharp</td>
<td>Spasms, Colicky, may wax and wane</td>
</tr>
<tr>
<td><strong>ONSET</strong></td>
<td>Subacute / Acute</td>
<td>Subacute</td>
<td>Slow</td>
<td>Sudden</td>
<td>Subacute</td>
<td>Acute / Subacute</td>
</tr>
<tr>
<td><strong>LOCATION</strong></td>
<td>Arm / Neck</td>
<td>Varies in chest, Substernal</td>
<td>Frequently lateral or substernal</td>
<td>Lateral</td>
<td>Lateral</td>
<td>Right upper quadrant</td>
</tr>
<tr>
<td><strong>RADIATION</strong></td>
<td>Along course of nerve being irritated</td>
<td>Usually none</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Epigastric, Substernal, Right thoracic, Interscapular</td>
</tr>
<tr>
<td><strong>DURATION</strong></td>
<td>Variable</td>
<td>2 - 3 Minutes</td>
<td>Variable</td>
<td>Variable</td>
<td>Variable</td>
<td>Hours</td>
</tr>
<tr>
<td><strong>PROVOCATION</strong></td>
<td>Motion of head, neck palpation, bending</td>
<td>Emotions, Tachypnea</td>
<td>Respirations, Cough</td>
<td>Respirations, Cough</td>
<td>Respirations, Cough</td>
<td>Spontaneous or with food</td>
</tr>
<tr>
<td><strong>ALLEVATION</strong></td>
<td>Time, Analgesics</td>
<td>Stimulus removal, Relaxation</td>
<td>None</td>
<td>None (shallow breathing)</td>
<td>Shallow breathing</td>
<td>Time Analgesics</td>
</tr>
<tr>
<td><strong>COMMENTS</strong></td>
<td>Not relieved by rest</td>
<td>Paraesthesia-Facial, Circumoral, Finger or Toe, Spasms</td>
<td>Signs and Symptoms: Fever, Cough, URI</td>
<td>More common in tall, thin people</td>
<td>Usually associated with flu-like symptoms</td>
<td>1 - 2 hours after meals, Usually nausea and vomiting</td>
</tr>
</tbody>
</table>

Reference: The University of Miami School of Medicine.
Chest pain/suspected MI
6.8 GLASGOW COMA SCALE

Determine the level of response with the following Glasgow Coma Scale:

**Best Verbal Response:**
- 5 = alert, lucid, oriented
- 4 = confused, but talks in sentences
- 3 = uses words, not sentences, incoherent
- 2 = moans, no words
- 1 = silent

**Best eye opening response:**
- 4 = spontaneously opens
- 3 = opens eyes to verbal stimulus
- 2 = opens eyes to noxious stimuli or pain
- 1 = closed, won’t open eyes

**Best motor response:**
- 6 = spontaneous movement, or to command
- 5 = localizes noxious stimuli
- 4 = withdraws from noxious stimulus
- 3 = decorticate (abnormal flexor response)
- 2 = decerebrate (abnormal extensor response)
- 1 = no motor response to noxious stimuli
### 6.9 PEDIATRIC GLASGOW COMA SCALE

<table>
<thead>
<tr>
<th></th>
<th>&gt; 1 year</th>
<th>&lt; 1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye Opening</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spontaneously</td>
<td>Spontaneously</td>
</tr>
<tr>
<td>3</td>
<td>To verbal command</td>
<td>To verbal command</td>
</tr>
<tr>
<td>2</td>
<td>To pain</td>
<td>To pain</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>&gt; 1 year</th>
<th>&lt; 1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best Motor Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Obeys</td>
<td>Localizes pain</td>
</tr>
<tr>
<td>5</td>
<td>Localizes pain</td>
<td>Flexion - normal</td>
</tr>
<tr>
<td>4</td>
<td>Flexion - withdrawal</td>
<td>Flexion – abnormal</td>
</tr>
<tr>
<td>3</td>
<td>Flexion - abnormal (decorticate rigidity)</td>
<td>Flexion – abnormal (decorticate rigidity)</td>
</tr>
<tr>
<td>2</td>
<td>Extension (decerebrate rigidity)</td>
<td>Extension (decerebrate rigidity)</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>&gt; 5 years</th>
<th>&lt;2-5 years</th>
<th>0-23 months</th>
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<tbody>
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<td><strong>Best Verbal Response</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Oriented and converses</td>
<td>Appropriate words and phrases</td>
<td>Smiles, coos, cries appropriately</td>
</tr>
<tr>
<td>4</td>
<td>Disoriented and converses</td>
<td>Inappropriate words</td>
<td>Cries</td>
</tr>
<tr>
<td>3</td>
<td>Inappropriate words</td>
<td>Cried and/or screams</td>
<td>Inappropriate crying and/or screaming</td>
</tr>
<tr>
<td>2</td>
<td>In-comprehensible</td>
<td>Grunts</td>
<td>Grunts</td>
</tr>
<tr>
<td>1</td>
<td>No response</td>
<td>No response</td>
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</table>
### 6.10 HOSPITAL CAPABILITIES

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<tr>
<th>Hospital Name:</th>
<th>Trauma Center</th>
<th>Primary Stroke Center</th>
<th>Comprehensive Stroke (Intervention)</th>
<th>Psych</th>
<th>Cardiac Cath/MI Lab</th>
<th>Maternity (OB)</th>
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</thead>
<tbody>
<tr>
<td>Tallahassee Memorial Healthcare (Main)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Capital Regional Medical Center</td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>TMH Northeast (Free-standing ED)</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tbody>
</table>

Return to: [Contents at top](#) [Administrative Guidelines](#) [Drug Reference](#) [Adult Medical Protocols](#) [Appendix](#)
## DOPAMINE

Mix 400 mg in 250 ml of D5W  
Concentration = 1600 mcg/ml  
Dosage: 5-15 mcg/kg/min

Using a microdrip (60 gtt/ml):  
15 gtt/min = 400 mcg/min  
30 gtt/min = 800 mcg/min  
45 gtt/min = 1200 mcg/min  
60 gtt/min = 1600 mcg/min

*Alternately,* mix 400 mg in 500 ml of D5W  
Concentration = 800 mcg/ml

Using a microdrip (60 gtt/ml):  
30 gtt/min = 400 mcg/min  
60 gtt/min = 800 mcg/min  
90 gtt/min = 1200 mcg/min  
120 gtt/min = 1600 mcg/min

**Quick Calculation**

Take patient’s weight in pounds, drop the last number and then subtract 2. This will give you the starting drip rate at 5 mcg/kg/min. For every change in micrograms, add or subtract 3 drops.

**Example:**

Patient weighs 175 lb.  
175 drop 5 = 17  
17 – 2 = 15  
5 mcg/kg/min = 15 gtt/min  
6 mcg/kg/min = 15 + 3 = 18 gtt/min

(Note that this quick calculation is a very close approximate dose)

## EPINEPHRINE

Mix 1 mg of 1:10,000 in 250 ml D5W  
Concentration = 4 mcg/ml  
Dosage: 2-10 mcg/min

Using a microdrip (60 gtt/ml):  
15 gtt/min = 1 mcg/min  
30 gtt/min = 2 mcg/min  
45 gtt/min = 3 mcg/min  
60 gtt/min = 4 mcg/min  
75 gtt/min = 5 mcg/min  
90 gtt/min = 6 mcg/min  
105 gtt/min = 7 mcg/min  
120 gtt/min = 8 mcg/min  
135 gtt/min = 9 mcg/min  
150 gtt/min = 10 mcg/min

## LIDOCAINE

**Maintenance:**  
Mix 1 gm (4%, 10%, or 20%) in 250 ml of D5W  
Concentration = 4 mg/ml  
Dosage: 1-4 mg/min

Using a minidrip (60 gtt/min):  
15 gtt/min = 1 mg/min  
30 gtt/min = 2 mg/min  
45 gtt/min = 3 mg/min  
60 gtt/min = 4 mg/min

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<table>
<thead>
<tr>
<th><strong>MAGNESIUM SULFATE</strong></th>
<th><strong>NITROGLYCERIN</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eclamptic Seizures:</strong></td>
<td>Mix 5 mg in 100 ml of D5W (glass bottle)</td>
</tr>
<tr>
<td>Mix 4 gm in 50 ml of D5W</td>
<td>Concentration = 50 mcg/ml</td>
</tr>
<tr>
<td>Concentration = 80 mg/ml</td>
<td>Dosage: 5-20 mcg/min</td>
</tr>
<tr>
<td>Dosage: 4 gm over 5-10 minutes</td>
<td></td>
</tr>
<tr>
<td>Using a macrodrip (10 gtt/min):</td>
<td>Using a microdrip (60 gtt/ml):</td>
</tr>
<tr>
<td>Run at 58-116 gtt/min</td>
<td>6 gtt/min = 5 mcg/min</td>
</tr>
<tr>
<td><strong>Torsades de pointes and VF:</strong></td>
<td>7 gtt/min = 6 mcg/min</td>
</tr>
<tr>
<td>Mix 1-2 gm in 50 ml of D5W</td>
<td>8 gtt/min = 7 mcg/min</td>
</tr>
<tr>
<td>Concentration = 20-40 mg/ml</td>
<td>10 gtt/min = 8 mcg/min</td>
</tr>
<tr>
<td>Dosage: 1-2 gm over 1-2 minutes</td>
<td>11 gtt/min = 9 mcg/min</td>
</tr>
<tr>
<td>Using a macrodrip (10 gtt/min):</td>
<td>12 gtt/min = 10 mcg/min</td>
</tr>
<tr>
<td>Run at 270 gtt/min</td>
<td>13 gtt/min = 11 mcg/min</td>
</tr>
<tr>
<td><strong>Maintenance:</strong></td>
<td>14 gtt/min = 12 mcg/min</td>
</tr>
<tr>
<td>Mix 1 gm in 250 ml of D5W</td>
<td>16 gtt/min = 13 mcg/min</td>
</tr>
<tr>
<td>Concentration = 4 mg/ml</td>
<td>17 gtt/min = 14 mcg/min</td>
</tr>
<tr>
<td>Dosage: 2-4 mg/min</td>
<td>18 gtt/min = 15 mcg/min</td>
</tr>
<tr>
<td>Using a microdrip (60 gtt/ml):</td>
<td>19 gtt/min = 16 mcg/min</td>
</tr>
<tr>
<td>30 gtt/min = 2 mg/min</td>
<td>20 gtt/min = 17 mcg/min</td>
</tr>
<tr>
<td>45 gtt/min = 3 mg/min</td>
<td>22 gtt/min = 18 mcg/min</td>
</tr>
<tr>
<td>60 gtt/min = 4 mg/min</td>
<td>23 gtt/min = 19 mcg/min</td>
</tr>
<tr>
<td></td>
<td>24 gtt/min = 20 mcg/min</td>
</tr>
<tr>
<td><strong>Return:</strong> Magnesium Rx</td>
<td><strong>Return:</strong> Nitroglycerine Rx</td>
</tr>
</tbody>
</table>
### PROCAINAMIDE

**Loading Dose:**
Mix 1000 mg in 100 ml of D5W  
Concentration = 10 mg/ml  
Dosage: 20-30 mg/min

Using a macrodrip (10 gtt/ml):
- 20 gtt/min = 20 mg/min  
- 30 gtt/min = 30 mg/min

**Maintenance:**
Mix 1000 mg in 250 ml of D5W  
Concentration = 4 mg/ml  
Dosage: 1-4 mg/min

Using a microdrip (60 gtt/ml):
- 15 gtt/min = 1 mg/min  
- 30 gtt/min = 2 mg/min  
- 45 gtt/min = 3 mg/min  
- 60 gtt/min = 4 mg/min

Return to: [Procainamide Rx](#)

### AMIODARONE

**SVT / VT with a Pulse:**
Mix 150mg in 50 ml of D5W  
Dosage: 150 mg over 8-10 min

Using a macrodrip (10 gtt/ml):
- Run at 60-75 gtt/min

**VF / Pulseless VT:**
Mix 300 mg in 50 ml of D5W  
Dosage: 300 mg over 8-10 min

Using a macrodrip (10 gtt/ml):
- Run at 60-75 gtt/min

**Pediatric:**
Mix 5 mg/kg in 50 ml of D5W  
Dosage: 5 mg/kg over 8-10 min

Using a macrodrip (10 gtt/ml):
- Run at 60-75 gtt/min
Additional IV Drug Drip Charts used on patients transported by EMS
### Norepinephrine (Levophed)

- **Drug Name:** Norepinephrine (Levophed)
- **Drug Amount:** 8 mg
- **Diluent:** 250 ml D5W
- **Final Conc:** 32 mcg/ml
- **Usual Dose:** 2-16 mcg/min
- **Maximum Dose:** 20 mcg/min

**Instructions:**
1. Find the column for the desired dosage in mcg/min
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>18</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>3.8</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>17</td>
<td>19</td>
<td>21</td>
<td>23</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>34</td>
<td>38</td>
</tr>
</tbody>
</table>

### Phenylephrine (Neosynephrine)

- **Drug Name:** Phenylephrine (Neosynephrine)
- **Drug Amount:** 10 mg
- **Final Volume:** 250 ml
- **Final Conc:** 40 mcg/ml
- **Initial Dose:** 100 – 180 mcg/min
- **Maintenance Dose:** 40 -60 mcg/min

**Instructions:**
1. Find the column for the desired dosage in mcg/min
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>1.5</td>
<td>3</td>
<td>4.5</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>100</th>
<th>110</th>
<th>120</th>
<th>130</th>
<th>140</th>
<th>150</th>
<th>160</th>
<th>170</th>
<th>180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>150</td>
<td>165</td>
<td>180</td>
<td>195</td>
<td>210</td>
<td>225</td>
<td>240</td>
<td>255</td>
<td>270</td>
</tr>
</tbody>
</table>

Return to: [Contents at top](#)  [Drug Reference](#)  [Adult Medical Protocols](#)  [Appendix](#)  [Rx-Levophed](#)  [Sepsis Protocol](#)
Drug Name: Procainamide (Pronestyl)
Drug Amount: 4gm
Final Volume: 500 ml
Final Conc: 8 mg/ml
Loading Dose: 17 mg/kg (Maximum 1 - 1.5 gms) at 20 – 30 mg/min
Usual Dose: 1 – 4 mg/min
Maximum Dose: 4 mg/min
Instructions: 1. Find the column for the desired dosage in mg/hr
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mg/min)</th>
<th>Rate (ml/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>1.1</td>
<td>8</td>
</tr>
<tr>
<td>1.2</td>
<td>9</td>
</tr>
<tr>
<td>1.3</td>
<td>10</td>
</tr>
<tr>
<td>1.4</td>
<td>11</td>
</tr>
<tr>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>1.6</td>
<td>12</td>
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<tr>
<td>1.7</td>
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<tr>
<td>1.8</td>
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<tr>
<td>1.9</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>2.5</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>3.5</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
</tr>
</tbody>
</table>
Drug Name: Propofol (Diprivan)
Indications: Intiation and maintenance of ICU sedation in intubated, mechanically ventilated patient
Concentration: 10 mg/ml (10,000 mcg/ml)
Loading Dose: 5 mcg/kg/min IV x 5 min
Usual Dosage: 5 – 50 mcg/kg/min. May increase by 5 – 10 mcg/kg/min q 5 – 10 min
Contraindications: Sulfite Allergies

<table>
<thead>
<tr>
<th>Wt (kg)</th>
<th>Wt (lbs)</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
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<tbody>
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Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
Drug name: Amiodarone

Drug amount: 450 mg

Diluent: 250 ml D5W glass bottle
(Must use 0.22 micron in-line filter)

Final Concentration: 1.80 mg/ml (max 1.8 mg/ml)

Initial Dose: 150 mg in 100 ml

Usual dose: 0.5 – 1 mg/min

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Drug name: Amiodarone

Drug amount: 900 mg

Diluent: 500 mL in D5W glass bottle

Final concentration: 1.8 mg/mL (maximum 1.8 mg/mL).

Initial dose: 150 mg in 100 mL D5W over 10 min. (may use plastic bag) stable for two hours in plastic

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Drug name: Diltiazem.

Drug amount: 125 mg

Diluent: 125 ml (100 mL normal saline bag plus 25 mL of 5 mg/mL Diltiazem injection)

Continuous infusion

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Return to: Contents at top  Drug Reference  Adult Medical Protocols  Appendix
Drug name: Dobutamine

Drug amount: 500 mg

Final volume 250 ml

Final concentration: 2000 mcg/mL

Usual dose: 2 – 20 µg/kg/min (Typical maximum dose 40 µg/kg/min).

1. Find a role for the patient's weight.

2. Find the column for the desired dosage in µg/kg/min

3. Locate the rate in ml/hr where the row and column meet

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Return to: Contents at top  Drug Reference  Adult Medical Protocols  Appendix
Drug name: Dobutamine

Drug amount: 1000 mg premixed.

Final volume: 250 mL

Final concentration: 4000 mcg/mL

Usual dose: 2 – 20 µg/kg/min (typical maximum dose 40 µg/kg/min)

Instructions:

1. Find a role for the patient's weight.
2. Find the column for the desired dosage in µg/kg/min
3. Locate the rate in ML/HR where the row and column meet.

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<tr>
<td>105</td>
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<td>3.2</td>
<td>4.7</td>
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<td>16</td>
<td>17</td>
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<td>24</td>
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<td></td>
</tr>
<tr>
<td>110</td>
<td>1.7</td>
<td>3.3</td>
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<tr>
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<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
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<tr>
<td>135</td>
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<td>4.1</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
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<td>20</td>
<td>22</td>
<td>26</td>
<td>30</td>
<td>41</td>
<td>61</td>
<td></td>
</tr>
</tbody>
</table>

ML/HR
Drug name: Dopamine.

Drug amount: 800 mg

Diluent: 250 mL

Final concentration: 3200 mcg/mL

Usual dose: 1 – 20 µg/kg/min (Typical maximum dose; 20 mcg/kg/min)

Instructions:
1. Find the row for the patient’s weight
2. Find the column for the desired dosage in mcg/kg/min
3. Locate the rate in ml/hr where the row and column meet.

| Wt (kg) | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 30 |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 40      | 0.8| 1.5| 2.3| 3  | 3.8| 4.5| 5  | 6  | 7  | 8  | 8  | 8  | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 23 |
| 45      | 0.8| 1.7| 2.5| 3.4| 4.2| 5  | 6  | 7  | 8  | 8  | 9  | 11 | 13 | 14 | 16 | 17 | 25 |
| 50      | 0.9| 1.9| 2.8| 3.8| 4.7| 6  | 7  | 8  | 8  | 9  | 10 | 12 | 14 | 16 | 18 | 19 | 28 |
| 55      | 1  | 2.1| 3.1| 4.1| 5  | 6  | 7  | 8  | 9  | 10 | 11 | 13 | 15 | 18 | 20 | 21 | 31 |
| 60      | 1.1| 2.3| 3.4| 4.5| 6  | 7  | 8  | 9  | 10 | 11 | 12 | 15 | 17 | 19 | 21 | 23 | 34 |
| 65      | 1.2| 2.4| 3.7| 4.9| 6  | 7  | 9  | 10 | 11 | 12 | 13 | 16 | 18 | 21 | 23 | 24 | 37 |
| 70      | 1.3| 2.6| 3.9| 5  | 7  | 8  | 9  | 11 | 12 | 13 | 14 | 17 | 20 | 22 | 25 | 26 | 39 |
| 75      | 1.4| 2.8| 4.2| 6  | 7  | 8  | 10 | 11 | 13 | 14 | 15 | 18 | 21 | 24 | 27 | 28 | 42 |
| 80      | 1.5| 3  | 4.5| 6  | 8  | 9  | 11 | 12 | 14 | 15 | 17 | 20 | 23 | 26 | 29 | 30 | 45 |
| 85      | 1.6| 3.2| 4.8| 6  | 8  | 10 | 11 | 13 | 14 | 16 | 18 | 21 | 24 | 27 | 30 | 32 | 48 |
| 90      | 1.7| 3.4| 5  | 7  | 8  | 10 | 12 | 14 | 15 | 17 | 19 | 22 | 25 | 29 | 32 | 34 | 51 |
| 95      | 1.8| 3.6| 5  | 7  | 9  | 11 | 12 | 14 | 16 | 18 | 20 | 23 | 27 | 30 | 34 | 36 | 53 |
| 100     | 1.9| 3.8| 6  | 8  | 9  | 11 | 13 | 15 | 17 | 19 | 21 | 24 | 28 | 32 | 36 | 38 | 56 |
| 105     | 2  | 3.9| 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 26 | 30 | 33 | 37 | 39 | 59 |
| 110     | 2.1| 4.1| 6  | 8  | 10 | 12 | 14 | 17 | 19 | 21 | 23 | 27 | 31 | 35 | 39 | 41 | 62 |
| 115     | 2.2| 4.3| 6  | 9  | 11 | 13 | 15 | 17 | 19 | 22 | 24 | 28 | 32 | 37 | 41 | 43 | 65 |
| 120     | 2.3| 4.5| 7  | 9  | 11 | 14 | 16 | 18 | 20 | 23 | 25 | 29 | 34 | 38 | 43 | 45 | 68 |

Rate: (ml/hr)
### Dopamine (Intropin) 2 - 20 mcg/kg/min

A mixture of 400 mg Dopamine in 250 ml = 1,600 mcg/ml

<table>
<thead>
<tr>
<th>mcg/kg/minute</th>
<th>2.5</th>
<th>5</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mcg</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>5 mcg</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>17</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>10 mcg</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>19</td>
<td>23</td>
<td>26</td>
<td>30</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>15 mcg</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>11</td>
<td>17</td>
<td>23</td>
<td>28</td>
<td>34</td>
<td>39</td>
<td>45</td>
<td>51</td>
<td>56</td>
</tr>
<tr>
<td>20 mcg</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>15</td>
<td>23</td>
<td>30</td>
<td>38</td>
<td>45</td>
<td>53</td>
<td>60</td>
<td>68</td>
<td>75</td>
</tr>
</tbody>
</table>

With a 60 drop per ml drip set this is the number of drops/minute (or ml/hr)

Observe for extravasation - swelling, pallor, pain, etc. at IV site.
Drug Name: Epinephrine
Drug Amount: 2 mg
Final Volume: 250 ml D5W
Final Concentration: 8 mcg/ml
Usual Dose: 1-10 mcg/min
Instructions: 1. Find the column for the desired dosage in mcg/min
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose mcg/min</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
<th>3.5</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate ml/hr</td>
<td>3.8</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>19</td>
<td>23</td>
<td>26</td>
<td>30</td>
<td>38</td>
<td>45</td>
<td>53</td>
<td>60</td>
<td>68</td>
<td>75</td>
</tr>
</tbody>
</table>

Return to: Contents at top    Drug Reference    Adult Medical Protocols    Appendix
Drug Name: Esmolol (Brevibloc)
Amount: 2.5 gms
Diluent: 250 ml
Final Conc: 10,000 mcg/ml
Loading Dose: 0.5 mg/kg over one minute

Instructions:
1. Find the row for the patient’s weight
2. Find the column for the desired dosage in (mcg/kg/min)
3. Locate the rate in (ml/hr) where the row and column meet

<table>
<thead>
<tr>
<th>WT (kg)</th>
<th>Dose (mcg/kg/min)</th>
<th>Loading Dose 0.5 mg/kg over 1 min (From 10 mg/ml vial)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>140</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>45</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>55</td>
<td>17</td>
<td>25</td>
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<tr>
<td>60</td>
<td>18</td>
<td>27</td>
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<tr>
<td>65</td>
<td>20</td>
<td>29</td>
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<tr>
<td>70</td>
<td>21</td>
<td>32</td>
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<tr>
<td>75</td>
<td>23</td>
<td>34</td>
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<tr>
<td>80</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>85</td>
<td>26</td>
<td>38</td>
</tr>
<tr>
<td>90</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>95</td>
<td>29</td>
<td>43</td>
</tr>
<tr>
<td>100</td>
<td>30</td>
<td>45</td>
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<tr>
<td>105</td>
<td>32</td>
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<tr>
<td>110</td>
<td>33</td>
<td>50</td>
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<tr>
<td>115</td>
<td>35</td>
<td>52</td>
</tr>
<tr>
<td>120</td>
<td>36</td>
<td>54</td>
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<tr>
<td>125</td>
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<td>56</td>
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<tr>
<td>130</td>
<td>39</td>
<td>59</td>
</tr>
<tr>
<td>135</td>
<td>41</td>
<td>61</td>
</tr>
</tbody>
</table>

Infusion rate (ml/hr)  ML

Return to: Contents at top  Drug Reference  Adult Medical Protocols  Appendix
Drug Name: Heparin
Drug Amount: 25,000 units
Final Volume: 250 ml
Final Conc: 100 units/ml
Usual Dose: 500-2000 units/hr
Instructions: 1. Find the column for the desired dosage in (units/hr)
               2. Locate the rate in (ml/hr) where the row and column meet

<table>
<thead>
<tr>
<th>Dose (units/hr)</th>
<th>300</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
<th>1100</th>
<th>1200</th>
<th>1300</th>
<th>1400</th>
<th>1500</th>
<th>1600</th>
<th>1700</th>
<th>1800</th>
<th>1900</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

Return to: Contents at top  Drug Reference  Adult Medical Protocols  Appendix
Drug Name: Heparin
Drug Amount: 25,000 units
Final Volume: 250 ml
Final Conc: 100 units/ml
Starting dose: 15 units/kg/hr

Instructions:
1. Find the row for the patient's weight.
2. Find the colony on the desired dosage units/kg/hr.
3. Locate the rate in ml/hr where the row and column meet.
### Drug Name: Insulin, Human Regular

**Amount:** 100 units

**Final Volume:** 100 ml normal saline

**Final Conc:** 1 unit/ml

**Usual dose:** 5-100 units/hr

**Instructions:**
1. Find the column for the desired dosage in units/hr
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (units/hour)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>60</td>
<td>65</td>
<td>70</td>
<td>75</td>
</tr>
</tbody>
</table>
Drug name: Integrilin (eptifibatide)
Indications: Percutaneous coronary intervention (PCI) and acute coronary syndrome
Loading dose: 180 mcg/kg intravenous bolus.
Repeat loading dose: For PCI only, repeat loading dose 10 min. after first loading dose
Maintenance infusion: 2 mcg/kg/min: creatinine clearance ≥ 50 ml/min or if creatinine clearance is unavailable a serum creatinine ≤ 2 mg/dL

1 mcg/kg/min: Cr Clearance < 50 ml/min or if Cr Clearance is unavailable a Serum Creatinine > 2 mg/dl

Incompatible drugs: Furosemide (Lasix)
Compatible drugs: Atropine, Dobutamine, heparin, Lidocaine, metoprolol, midazolam, morphine, nitroglycerin, potassium, verapamil
Contraindications: Bleeding diathesis, HTN (SBP > 200, DBP > 110), major surgery within 6 wks, history of stroke within 30 days or any history of hemorrhagic stroke, dependency on renal dialysis, hypersensitivity to component.

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Loading Dose From 2 mg/ml Vial</th>
<th>Maintenance Infusion from 0.75 gm/ml Bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3.6</td>
<td>6.4</td>
</tr>
<tr>
<td>45</td>
<td>4.1</td>
<td>7.2</td>
</tr>
<tr>
<td>50</td>
<td>4.5</td>
<td>8</td>
</tr>
<tr>
<td>55</td>
<td>5.0</td>
<td>8.8</td>
</tr>
<tr>
<td>60</td>
<td>5.4</td>
<td>9.6</td>
</tr>
<tr>
<td>65</td>
<td>5.9</td>
<td>10.4</td>
</tr>
<tr>
<td>70</td>
<td>6.3</td>
<td>11.2</td>
</tr>
<tr>
<td>75</td>
<td>6.8</td>
<td>12</td>
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<tr>
<td>80</td>
<td>7.2</td>
<td>12.8</td>
</tr>
<tr>
<td>85</td>
<td>7.7</td>
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<td>8.6</td>
<td>15.2</td>
</tr>
<tr>
<td>100</td>
<td>9.0</td>
<td>16</td>
</tr>
<tr>
<td>105</td>
<td>9.5</td>
<td>16.8</td>
</tr>
<tr>
<td>110</td>
<td>9.9</td>
<td>17.6</td>
</tr>
<tr>
<td>115</td>
<td>10.4</td>
<td>18.4</td>
</tr>
<tr>
<td>120</td>
<td>10.8</td>
<td>19.2</td>
</tr>
<tr>
<td>121</td>
<td>11.3</td>
<td>20</td>
</tr>
<tr>
<td>&gt;121</td>
<td>11.3</td>
<td>20</td>
</tr>
</tbody>
</table>

Ml ml/hr
Drug Name: Labetalol
Drug Amount: 500 mg
Final Volume: 250 ml NS
Final Conc: 2 mg/ml
Usual Dose: 2 mg/min
Instructions: 1. Find the column for the desired dosage in mcg/min
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mg/min)</th>
<th>0.25</th>
<th>0.5</th>
<th>0.75</th>
<th>1</th>
<th>1.25</th>
<th>1.5</th>
<th>1.75</th>
<th>2</th>
<th>2.25</th>
<th>2.5</th>
<th>2.75</th>
<th>3</th>
<th>3.25</th>
<th>3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>8</td>
<td>15</td>
<td>23</td>
<td>30</td>
<td>38</td>
<td>45</td>
<td>53</td>
<td>60</td>
<td>68</td>
<td>75</td>
<td>83</td>
<td>90</td>
<td>98</td>
<td>105</td>
</tr>
</tbody>
</table>

Return to: Contents at top   Drug Reference   Adult Medical Protocols
Appendix
**Drug Name:** Lidocaine (Xylocaine)  
**Drug Amount:** 2 gm  
**Diluent:** 250 ml  
**Final Conc:** 8 mg/ml  
**Usual Dose:** 0.5 - 5 mg/min  
**Maximum Dose:** 4 mg/min  
**Instructions:**  
1. Find the column for the desired dosage in mg/hr  
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mg/min)</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
<th>3.5</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>3.8</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>19</td>
<td>23</td>
<td>26</td>
<td>30</td>
</tr>
</tbody>
</table>
Drug Name: Milrinone (Primacor)
Drug Amount: 20 mg premixed
Final Volume: 100 ml D5W
Final Conc: 200 mcg/ml
Loading Dose: 50 mcg/kg over 10 minutes
Usual Dose: 0.375 – 0.75 mcg/min
Maximum Dose: 0.75 mcg/min

Instructions: 1. Find the row for the patient’s weight in kilograms
2. Find the column for the desired dosage in mcg/kg/min
3. Locate the rate in ml/hr where the row and the column meet

<table>
<thead>
<tr>
<th>Wt (Kg)</th>
<th>Dose (mcg/kg/min)</th>
<th>Loading Dose (from bag) 50 mcg/kg over 10 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.38</td>
<td>0.4</td>
</tr>
<tr>
<td>40</td>
<td>4.5</td>
<td>4.8</td>
</tr>
<tr>
<td>45</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>55</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>60</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>65</td>
<td>7</td>
<td>8</td>
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<tr>
<td>70</td>
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<td>8</td>
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<tr>
<td>75</td>
<td>8</td>
<td>9</td>
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<tr>
<td>80</td>
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<tr>
<td>85</td>
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<tr>
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<tr>
<td>110</td>
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<tr>
<td>115</td>
<td>13</td>
<td>14</td>
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<tr>
<td>120</td>
<td>14</td>
<td>14</td>
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<tr>
<td>125</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>130</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>136</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

Rate (ml/hr)  Vol. to infuse (ml)
Drug Name: Nitroglycerine
Drug Amount: 50 mg
Final Volume: 250 ml
Final Conc: 200 mcg/ml
Usual Dose: 1 - 20 mcg/min
Maximum Dose: 200 mcg/min
Instructions:
1. Find the column for the desired dosage in mg/hr
2. Locate the rate in ml/hr in the row below

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3</td>
<td>0.6</td>
<td>0.9</td>
<td>1.2</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td>2.7</td>
<td>3</td>
<td>4.5</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Rate (ml/hr)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>110</th>
<th>120</th>
<th>130</th>
<th>140</th>
<th>150</th>
<th>160</th>
<th>170</th>
<th>180</th>
<th>190</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
<td>21</td>
<td>24</td>
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<td>30</td>
<td>33</td>
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<td>42</td>
<td>45</td>
<td>48</td>
<td>51</td>
<td>54</td>
<td>57</td>
<td>60</td>
</tr>
<tr>
<td>Rate (ml/hr)</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drug Name: Natrecor (Nesiritide)
Drug Amount: 1.5 gm
Final Volume: 250 ml D5W
Final Conc: 6 mcg/ml
Prime Tubing: Prime initial/new tubing before administering bolus or infusion
Stability: Bag 54 hours after dilution per manufactures in-house data

Initial loading dose: 2 mcg/kg over 1 minute
Follow up loading doses: 1 mcg/kg over 1 min
Usual infusion dose: 0.01 mcg/kg/min
Dosage titration: 0.005 mcg/kg/min at 3 hours intervals
Maximum Dose: 0.03 mcg/kg/min

Instructions:
1. Find the row for the patient’s weight in kg
2. Find the column for the desired dosage in mcg/kg/min
3. Locate the rate in ml/hr where the row and column meet

<table>
<thead>
<tr>
<th>Wt (kg)</th>
<th>0.005</th>
<th>0.01</th>
<th>0.015</th>
<th>0.02</th>
<th>0.025</th>
<th>0.03</th>
<th>Loading Dose (mcg/kg) 1</th>
<th>2</th>
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<tbody>
<tr>
<td>40</td>
<td>2</td>
<td>4</td>
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<td>13</td>
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<td>45</td>
<td>2.3</td>
<td>4.5</td>
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<td>34</td>
<td>41</td>
<td>23</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Rate (ml/hr)</td>
<td>ml from bag over 1 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Return to: Contents at top    Drug Reference    Adult Medical Protocols
Drug Name: Nicardipine (Cardene)

The Standard Nicardipine drip is 25 mg in 250 ml saline
This yields a concentration of 0.1 mg/ml.

The infusion site should be changed every 12 hours if nicardipine is administered via a peripheral vein.

<table>
<thead>
<tr>
<th>Dose (mg/hr)</th>
<th>Infusion Rate (ml/hr)</th>
</tr>
</thead>
<tbody>
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</tr>
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<td>50</td>
</tr>
<tr>
<td>7.5</td>
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</tr>
<tr>
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</tr>
<tr>
<td>12.5</td>
<td>125</td>
</tr>
<tr>
<td>15</td>
<td>150</td>
</tr>
</tbody>
</table>

Return to: Contents at top    Drug Reference    Adult Medical Protocols
Drug Name: Nitroprussode (Nipride)
Drug Amount: 100 mg
Diluent: 250 ml
Final Conc: 400 mcg/ml
Usual Dose: 0.5 – 3 mcg/kg/min, Rarely higher than 4 mcg/kg/min
Titrate: Increase by 0.25 – 0.3 mcg/kg/min
Maximum Dose: 10 mcg/kg/min

Instructions:
1. Find the row for the patient’s weight in kilograms
2. Find the column for the desired dosage in mcg/kg/min
3. Locate the rate in ml/hr where the row and column meet

<table>
<thead>
<tr>
<th>Wt (Kg)</th>
<th>Dose (mcg/kg/min)</th>
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<tbody>
<tr>
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<td>0.25</td>
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<td>40</td>
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</tr>
<tr>
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<td>1.9</td>
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<td>2.1</td>
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<td>2.6</td>
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<td>4.9</td>
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<tr>
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<td>5.0</td>
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</table>

Rate (ml/hr)

Return to: [Contents at top](#)  [Drug Reference](#)  [Adult Medical Protocols](#)
### 6.12 PEDIATRIC VITAL SIGNS

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight in kg</th>
<th>Minimum Systolic BP</th>
<th>Normal Heart Rate</th>
<th>Normal Respiratory Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature</td>
<td>&lt; 2.5</td>
<td>40</td>
<td>120-170</td>
<td>40-60</td>
</tr>
<tr>
<td>Term</td>
<td>3.5</td>
<td>60</td>
<td>100-170</td>
<td>40-60</td>
</tr>
<tr>
<td>3 months</td>
<td>6</td>
<td>60</td>
<td>100-170</td>
<td>30-50</td>
</tr>
<tr>
<td>6 months</td>
<td>8</td>
<td>60</td>
<td>100-170</td>
<td>30-50</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>72</td>
<td>100-170</td>
<td>30-40</td>
</tr>
<tr>
<td>2 years</td>
<td>13</td>
<td>74</td>
<td>100-160</td>
<td>20-30</td>
</tr>
<tr>
<td>4 years</td>
<td>15</td>
<td>78</td>
<td>80-130</td>
<td>20</td>
</tr>
<tr>
<td>6 years</td>
<td>20</td>
<td>82</td>
<td>70-115</td>
<td>16</td>
</tr>
<tr>
<td>8 years</td>
<td>25</td>
<td>86</td>
<td>70-110</td>
<td>16</td>
</tr>
<tr>
<td>10 years</td>
<td>30</td>
<td>90</td>
<td>60-105</td>
<td>16</td>
</tr>
<tr>
<td>12 years</td>
<td>40</td>
<td>94</td>
<td>60-100</td>
<td>16</td>
</tr>
</tbody>
</table>

Typical blood pressure in children 1 to 10 years of age:
80 mmHg + (child's age in years x 2)

Lower limits of systolic blood pressure in children 1 to 10 years of age:
70 mmHg + (child's age in years x 2)
6.13 Oxygen Cylinder Duration Calculation

- Oxygen Cylinder Capabilities
- 1 cubic foot of gas = 28.3 liters of oxygen
- Various cylinder sizes and capabilities
  - D cylinder = 12.7 cu.ft. = 359.4 liters
  - E cylinder = 22 cu.ft = 622.6 liters
  - F cylinder = 55 cu.ft. = 1,556.5 liters
  - G cylinder = 187 cu.ft. = 5,292 liters
  - H/K cylinder = 244 cu.ft. = 6905.2 liters

- Calculation of Duration of Oxygen Availability

\[
\frac{\text{cu.ft.} \times 28.3 \times (\text{PSI} \div 2200)}{\text{liter flow}} = \text{number of minutes of oxygen left in tank}
\]

- Where
  - cu.ft. = capacity of tank in cubic feet
  - 28.3 = liters of oxygen per cu.ft. of gas
  - PSI = Psi reading on gauge of cylinder
  - 2200 = a constant (maximum psi when full)

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6.14 OXYGEN TOLERANCE IN COPD

It is common to find protocols that caution against the use of high concentrations of supplemental oxygen for patients with COPD (emphysema). Such protocols may restrict supplemental oxygen for a spontaneously breathing COPD patient at 2 liters/minute by nasal cannula. The intent is to avoid inhibition of their spontaneous respiratory efforts. However, it is desirable to minimize how long a patient, including those with COPD, or serious hypoxia must endure. Shock from hypoxia is life threatening. All patients should receive supplemental oxygen as quickly and as high a concentration as their systems will tolerate when serious hypoxia is present. The clinical problem in the field is determining how much supplementary oxygen a COPD patient can safely tolerate.

The COPD patient regulates their spontaneous ventilation by internal measurement of the oxygen content in their blood. This is different from normal patients who use CO₂ content to guide ventilation. When a COPD patient is hypoxic, ventilation is over-stimulated. If the COPD patient has a large surplus of oxygen, as may occur with inappropriate use of high concentrations of supplemental oxygen, spontaneous ventilation decreases or becomes apneic. An understanding of this simple physiologic control mechanism can be used to safely titrate oxygen administration with COPD patients.

When COPD patients have acute respiratory distress, oxygen may be given in high concentrations until the rapid respiratory rate begins to slow down towards normal. This shows that hypoxia is becoming less severe and respiratory drive is starting to return to normal. The supplemental oxygen dosage may then be reduced in a titrated manner as the respiratory rate returns to normal. This approach allows oxygenation to be restored as quickly as possible and reduces the potential harm of extended hypoxia.

If spontaneous ventilation becomes severely compromised, perform bag-mask ventilations without supplemental oxygen until adequate spontaneous ventilations resume. If the spontaneous ventilation becomes further compromised from an acute respiratory emergency, and not from excessive oxygen, assist ventilations with supplemental oxygen. These two situations may be distinguished from one another by signs of severe hypoxia such as cyanosis, pallor, or diaphoresis. These would indicate acute respiratory distress. If there is uncertainty about whether or not to give oxygen, always give the oxygen and be ready to assist ventilations as needed. This will be less dangerous than withholding oxygen from a patient that may be in desperate need of it.
6.15 REPORT OF ABUSE

FLORIDA ABUSE HOTLINE (800) 962-2873

State Substantive Laws (Crimes)
CHAPTER 415 - PROTECTION FROM ABUSE, NEGLECT AND EXPLOITATION

415.102 Definitions of terms used in FS 415.101-415.113.
(1) "Abuse" means the non-accidental infliction of physical or psychological injury or sexual abuse upon a disabled adult or an elderly person by a relative, caregiver, or household member, or an action by any of those persons which could reasonably be expected to result in physical or psychological injury, or sexual abuse of a disabled adult or an elderly person by any person. "Abuse" also means the active encouragement of any person by a relative, caregiver, or household member to commit an act that inflicts or could reasonably be expected to result in physical or psychological injury to a disabled adult or an elderly person.
(10) "Disabled adult" means a person 18 years of age or older who suffers from a condition of physical or mental incapacitation due to a developmental disability, organic brain damage, or mental illness, or who has one or more physical or mental limitations that substantially restrict ability to perform the normal activities of daily living.
(11) "Elderly person" means a person 60 years of age or older who is suffering from the infirmities of aging as manifested by advanced age or organic brain damage, or other physical, mental, or emotional dysfunctioning to the extent that the ability of the person to provide adequately for the persons' own care or protection is impaired.

415.111 Criminal penalties.
(1) A person who knowingly and willfully fails to report a case of known or suspected abuse, neglect, or exploitation of a disabled adult or an elderly person or who knowingly and willfully prevents another person from doing so commits a misdemeanor of the second degree...

415.503 Definitions of terms used in FS 415.502-415.514.
(1) "Abused or neglected child" means a child whose physical or mental health or welfare is harmed, or threatened with harm, by the acts of omissions of the parent or other person responsible for the child's welfare or, for the purposes of reporting requirements, by any person.
(2) "Child abuse or neglect" means harm or threatened harm to a child's physical or mental health or welfare by the acts or omissions of a parent, adult household member, or other person responsible for the child's welfare, or, for purposes of reporting requirements, by any person.

415.504 Mandatory reports of child abuse or neglect; mandatory reports of death; central abuse hotline.
(1) Any person, who knows, or has reasonable cause to suspect, that a child is an abused, abandoned, or neglected child shall report such knowledge or suspicion to the department...
415.511 Immunity from liability in cases of child abuse or neglect.

(1) Any person, official, or institution participating in good faith in any act authorized or required by FS 415.502-415.514, or reporting in good faith any instance of child abuse to any law enforcement officer shall be immune from any civil or criminal liability which might otherwise result by reason of such action.

415.513 Penalties relating to abuse reporting.

(1) A person who is required by FS 415.504 to report known or suspected child abuse or neglect; and who knowingly and willfully fails to do so, or who knowingly or willfully prevents another person from doing so, is guilty of a misdemeanor of the second degree...
6.16 SIGNS OF CHILD ABUSE

Physical Assessment Suggestive of Child Abuse
1. Fractures in children less than 2 years of age.
2. Injuries in various stages of healing.
3. Frequent injuries.
4. Bruises or burns in patterns (e.g. iron or cigarette burns, cord marks, bite or pinch marks, and bruises to head, neck, back or buttocks).
5. Widespread injuries over the body.
6. Obvious physical neglect (malnutrition, lack of cleanliness).
7. Inappropriate dress (e.g. very little clothes in winter).

History Suggestive of Child Abuse
1. The history does not match with the nature or severity of injury.
2. The parents' and/or caregivers' account is vague or changes.
3. The "accident" is beyond the capabilities of the child (e.g. a 12 month old that burns himself by turning on the hot water in the bath tub).
4. There is a delay in seeking help.
5. The parent and/or caregiver may be inappropriately unconcerned about the child's injury.

Characteristics of the Abused Child
1. If less than 5 years old, is likely to be passive.
2. If over 5 years of age, is likely to be aggressive.
3. Does not look to the parent (the abuser) for support, comfort, or reassurance.
4. May cry without any expectation of receiving help.
5. May be quiet and withdrawn.
6. May be fearful of the parent (the abuser).

Characteristics of the Abuser
1. Crosses all religious, ethnic, occupational, educational, and socioeconomic boundaries.
2. May resent or reject the child.
3. May have feelings of worthlessness about self or about the child.
4. May have unrealistic expectations of what the child is capable of doing.
5. May be very critical of the child.
6. Oftentimes the abuser is repeating what was learned as a child (the abuser was more than likely abused as a child).
7. May be overly defensive rather than concerned.
6.17 SUDDEN INFANT DEATH SYNDROME (SIDS)

Sudden Infant Death Syndrome, or "crib death," is the sudden and unexpected death of an apparently healthy infant, usually under one year of age, which remains unexplained after a complete medical history, death scene investigation and postmortem examination.

The majority of SIDS deaths (90%) occur in infants less than six months of age.

SIDS is more common in males (60%) than females (40%). SIDS almost always occurs when the infant is asleep or thought to be asleep. SIDS is more prevalent in winter months and in infants with low birth weights. SIDS occurs in all socioeconomic, racial and ethnic groups. Occasionally, a mild upper respiratory infection may be present prior to death.

Physical examination of a SIDS infant may reveal lividity or settling of blood, which produces mottled, blue or gray skin. The lividity may give the appearance of "bruising." There may also be a froth, blood tinged mucus draining from the infant's mouth and nostrils. In addition, cooling and rigor mortis may be present. The SIDS infant usually appears well-developed and does not exhibit any signs of external injury.

SIDS should not be confused with child abuse (see Appendix - Signs of Child Abuse). Initially it is difficult to distinguish a SIDS death from other causes of death in infants. SIDS is the leading cause of death between one week and one year of age in the United States.

For specific treatment for SIDS see Pediatric SIDS Protocol 3.4.2.

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6.18 Toxidromes
6.19 RECOMMENDED GUIDELINES FOR OCCUPATIONAL EXPOSURES TO INFECTIOUS DISEASE

I. PREVENTION
   A. Purpose. Emergency Medical and Public Safety employees ("Workers") are at risk for exposure to and possible transmission of vaccine preventable diseases. Maintenance of immunity is therefore an essential part of prevention and infection control programs.

   1. At-Risk Workers. Workers who are exposed to blood, body fluids, feces and/or respiratory secretions should have on record before employment or should be offered during employment all immunizations currently recommended by the US Public Health Service.

   2. Low-Risk Workers. Timely post-exposure prophylaxis rather than pre-exposure vaccination may be considered for other workers whose exposure to infectious agents is infrequent.

   3. Special Risk Groups. Periodic evaluations may be done as indicated for job reassignment, for ongoing programs (e.g., TB screening), or for evaluation of work related problems.

   4. History of Immunity. A medical evaluation that includes childhood immunity or immunization history for Measles, Mumps, Rubella and Varicella Zoster (Chicken Pox) should be obtained from and recorded for all new workers at the time of hire or as part of a catch-up program. (CDC MMWR 1997; 46 (No. RR-18)). (NFPA 1581, 2-5.2.2)).

II. BASELINE AND ANNUAL SCREENING
   A. Baseline Screening: Baseline screening for TB, hepatitis A, B, and C is indicated for presumptive law requirements. (FS 112.181 6(a)(b))

   B. TB Screening. Tuberculin skin test shall be performed for all workers who do not have a history of a positive skin test result. A two-step Mantoux skin testing shall be used for the initial screening of workers who have not been tested. The two-step procedure should only be performed once. (CDC MMWR 1994; 43 (RR13)). After that, only a PPD skin test should be administered annually. Workers with a new positive PPD should have a baseline chest x-ray performed with one follow up chest X-ray a year later.

   C. Hepatitis Screening. If baseline screening for hepatitis A and B shows that immunity is absent, the employer should offer vaccination to the worker. Hepatitis C screening is performed for baseline and post-exposure only.

   D. Test Result Maintenance. Baseline and annual screening test results shall be maintained according to applicable laws governing medical confidentiality; and released strictly by and between the medical provider conducting the tests and the worker. The employer may maintain a sealed copy of baseline, titer and/or annual test results in the worker's infection control file and may not cause to open said result(s) without the specific written consent from the worker. (29 CFR 1910.1030 (h)).

III. IMMUNIZATION
A. **Education**: Workers shall have Blood borne/Airborne Pathogen Training prior to immunization. (29 CFR 1910.1030(f) (2)). Medical providers and/or Designated Infection Control Officers should offer upon request vaccine product and safety information to workers considering or undergoing vaccination. Educational materials need to be appropriate in content and vocabulary to the educational level and literacy of the worker.

B. **Declination**. Workers who waive vaccination shall sign a Declination Form. If the worker initially declines vaccination(s) but at a later date decides to accept the vaccination(s), the employer shall make the vaccination(s) available. (29 CFR 1910.1030(f)).

C. **Hepatitis Vaccination**. Hepatitis B vaccination shall be offered to at risk workers within 10 days of initial assignment, unless the worker has documentation of previously completed vaccination series, documentation of immunity or physician’s documentation of medical contraindication for the vaccine. (29 CFR 1910.1030(f) (2)). Hepatitis A vaccination may be offered if specific local conditions dictate. (NFPA 1581, 2-5.2.2).

1. **Post-Vaccination Screening for Hepatitis A**. Post-vaccination screening for immunity to Hepatitis A is not indicated if the vaccine series is completed, because of the high rate of adult vaccine response.

2. **Post-vaccination Screening for Hepatitis B**. Post-vaccination screening for immunity to Hepatitis B is indicated. If vaccinated workers fail to develop a protective hepatitis B antibody level, the entire HBV vaccination series should be repeated only once.

3. **Periodic Serologic Screening and Booster Doses**. Any periodic post-vaccination screening is not recommended. Booster doses are not currently recommended. If the U.S. Public Health Service recommends a routine booster dose(s) of hepatitis vaccine at a future date, such booster dose(s) shall be made available. (29 CFR 1910.1030(f) (1) (ii)).

D. **Influenza**. Workers are considered to be at significant risk for acquiring or transmitting influenza (the common flu). Influenza vaccine should be made available to workers from October through February annually. (CDC MMWR 1997; 46(No. RR-18)).

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### AIRBORNE TRANSMISSION PREVENTION POST-EXPOSURE FOLLOW UP

<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmission</th>
<th>Prevention</th>
<th>Post-exposure</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tuberculosis (TB)</strong></td>
<td>Droplets: coughing, sneezing, intubation, suctioning.</td>
<td>Initial 2 step test, then annual PPD. Wear HEPA masks.</td>
<td>Source = PPD, Employee = PPD, unless PPD tested within prior 12 weeks or previously PPD reactive.</td>
<td>PPD at week 12 post-exposure. If new positive: chest x-ray and Rx with Isoniazid for 6 months.</td>
</tr>
<tr>
<td><strong>Influenza</strong></td>
<td>Close contact, droplets: coughing, sneezing, intubation, suctioning. Also direct contact with vesicle fluid.</td>
<td>Flu shot.</td>
<td>Treatment: analgesics, Rimantadine, Tamiflu, Relenza.</td>
<td>As determined by medical professional.</td>
</tr>
<tr>
<td><strong>Varicella Zoster (Chicken Pox)</strong></td>
<td>Close contact, droplets: coughing, sneezing, intubation, suctioning. Also direct contact with vesicle fluid.</td>
<td>Vaccine = 1 shot (Varivax). HEPA mask</td>
<td>Treatment: Varicella Zoster Immune Globulin (VZIG) within 96 hours of exposure.</td>
<td>As determined by medical professional.</td>
</tr>
</tbody>
</table>

### OTHER TRANSMISSION PREVENTION POST-EXPOSURE FOLLOW UP

<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmission</th>
<th>Prevention</th>
<th>Post-exposure</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tetanus</strong></td>
<td>Soiled object causing open wound.</td>
<td>Vaccine good for 10 years.</td>
<td>If no vaccine, administer at this time. If over 7 years from last vaccination and sustained open wound, booster dose.</td>
<td>Seek medical care if symptoms of tetanus develop: lockjaw, rigid muscles.</td>
</tr>
<tr>
<td><strong>Lyme Disease</strong></td>
<td>Tick-borne: tick attached 24 hours.</td>
<td>Avoid tick infested areas. Vaccine = 3 shot series for prone areas.</td>
<td>Antibiotics: Amoxicillin, Doxycycline</td>
<td>As determined by medical professional</td>
</tr>
<tr>
<td><strong>Scabies</strong></td>
<td>Direct contact:</td>
<td>Avoid infected</td>
<td>Lindane and Kwell</td>
<td>Close supervision</td>
</tr>
<tr>
<td></td>
<td>mite infested areas, bedding/clothing, nursing homes.</td>
<td>areas.</td>
<td>applied to the whole body for 24 hours.</td>
<td>of treatment including bathing.</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------</td>
<td>--------</td>
<td>----------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Rabies</td>
<td>Virus laden saliva of infected animal: animal bites.</td>
<td>Avoid animal bites.</td>
<td>Wash infected areas. Administer rabies anti-serum injection and first dose of rabies vaccine. Contact animal control, monitor animal for presence of infection.</td>
<td>If animal is positive, continue to treat employee with vaccine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BLOOD-BORNE</strong></th>
<th><strong>TRANSMISSION</strong></th>
<th><strong>PREVENTION</strong></th>
<th><strong>POST-EXPOSURE</strong></th>
<th><strong>FOLLOW UP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV</strong></td>
<td>Blood to blood, to non-intact skin and mucous membranes.</td>
<td>No Vaccine.</td>
<td>See Post Exposure Management (<a href="https://example.com">Administrative Protocol 1.1.11</a>)</td>
<td>Periodic screening: 6, 12, 26 weeks after exposure.</td>
</tr>
<tr>
<td><strong>Syphilis</strong></td>
<td>Blood and/or open sores/lesions.</td>
<td>No Vaccine.</td>
<td>Source = RPR, Employee = RPR. Penicillin. Repeat test at 3 and 6 months, if positive refer to FTA</td>
<td>As determined by medical professional.</td>
</tr>
<tr>
<td><strong>HBV</strong></td>
<td>Blood to blood, to non-intact skin and mucous membranes.</td>
<td>Vaccine = 3 shot series. Titer and reimmunize if necessary.</td>
<td>Source = Acute Hep Panel. Employee = Acute Hep Panel. If source positive, employee not immune:</td>
<td>Periodic screening: 6, 12, 26 weeks after exposure.</td>
</tr>
<tr>
<td>HCV</td>
<td>Blood to blood, to non-intact skin and mucous membranes.</td>
<td>No Vaccine.</td>
<td>Source = Acute Hep Panel. Employee = Acute Hep Panel.</td>
<td>Periodic screening: 6, 12, 26 weeks after exposure. If source positive, consider employee qualitative HCV RNA &amp; ALT testing 6 weeks after exposure. If employee becomes HCV RNA positive, treat with interferon / Ribavirin x 6 months.</td>
</tr>
</tbody>
</table>

### TERMINOLOGY

| HEPA masks | A personal protective device worn on the face to remove particles equal to and greater than 0.3 microns (which essentially includes all bacteria, spores and viruses) with an efficiency of 99.97%. |
| PPD | A method of assessing whether someone has become infected with M. tuberculosis complex. The test involves measurement of a subject’s immune response to an injection of tuberculin purified protein derivative (PPD) manufactured from killed Mycobacterium tuberculosis bacilli. Also referred to as tuberculin skin tests or PPD tests. |
| Vesicle fluid | The serum from the blister formed during a varicella zoster infection. |
| VZIG | Varicella Zoster Immune Globulin. |
| Qualitative HCV-RNA | Blood test to detect the presence of Hepatitis C virus. |
| ALT | Blood test to measure a liver-specific enzyme which indicates liver cell death or inflammation. |
6.21 TRAUMA ALERT CRITERIA (ADULT)

Florida:

I. For blunt trauma, penetrating trauma or burn trauma cases call trauma alert for:
   a. Any One of the following:
      i. Airway
         1. Needs assistance beyond oxygen
      ii. Circulation:
         1. Lacks radial pulse with HR > 120/min
         2. BP < 90 mm Hg
      iii. Best Motor Response
         1. 4 or < on BMR of GCS
         2. Paralysis
         3. Loss of sensation
         4. Suspected Spinal Cord Injury
      iv. Cutaneous
         1. 2nd or 3rd degree burns > 15% TBSA
         2. Amputation proximal to ankle or wrist
         3. Penetrating injury to head, neck or torso
      v. Long Bone Fractures:
         1. Patient reveals signs or symptoms of 2 or more long bone fractures
            (Humerus, Radius and Ulnar, Femur, Tibia and Fibula)
   b. Any Two of the following:
      i. Airway: Respiratory rate >= 30
      ii. Circulation: HR >= 120
      iii. Best Motor Response = 5
      iv. Cutaneous:
         1. Major degloving
         2. Flap avulsion > 5 inches
         3. GSW to extremity
      v. Long bone Fracture: Single fracture resulting from a MVC or fall of >= 10
         feet.
      vi. Age greater than or equal to 55 years
      vii. Mechanism:
         1. Ejection from a motor vehicle
         2. Driver impacted the steering wheel with deformity to it.
   c. After evaluation: Assessment of GCS <= 12
   d. Paramedic judgment based on patient’s condition.
6.21.1 ADULT TRAUMA TRIAGE CRITERIA & METHODOLOGY

The EMT or paramedic shall assess the condition of those injured persons with anatomical and physiological characteristics of a person sixteen (16) years of age or older for the presence of at least one of the following four (4) criteria to determine whether to transport as a trauma alert. These four criteria are to be applied in the order listed, and once any one criterion is met that identifies the patient as a trauma alert; no further assessment is required to determine the transport destination.

CRITERIA:

☐ Meets color-coded triage system (see below)
☐ GCS ≤ 12 (Patient must be evaluated via GCS if not identified as a trauma alert after application of criterion 1.)
☐ Meets local criteria (specify):
☐ Patient does not meet any of the trauma criteria listed above but, in the judgment of the EMT or paramedic, should be transported as a trauma alert (document)

<table>
<thead>
<tr>
<th>Component</th>
<th>B= Any two (2) – Transport as a Trauma alert</th>
<th>R= Any one (1) – transport as a Trauma alert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airway</td>
<td>□ Respiratory rate of 30 or greater</td>
<td>□ Active airway assistance¹</td>
</tr>
<tr>
<td>Circulation</td>
<td>□ Sustained HR of 120 beats per minute or greater</td>
<td>□ Lack of radial pulse with sustained heart rate (&gt;120) or BP &lt; 90 mm Hg</td>
</tr>
<tr>
<td>Best Motor Response</td>
<td>□ BMR = 5</td>
<td>□ BMR = 4 or less or Presence of paralysis, or suspicion of spinal cord injury or loss of sensation</td>
</tr>
<tr>
<td>Cutaneous</td>
<td>□ Soft Tissue Loss² or GSW to the extremities</td>
<td>□ 2nd or 3rd degree burns to 15% or more TBSA or Amputation proximal to the wrist or ankle or Any penetrating injury to head, neck, or torso³</td>
</tr>
<tr>
<td>Long bone Fracture</td>
<td>□ Single Fx site due to MVA or Fall ≥ 10 ft.</td>
<td>□ Fracture of two or more long bones⁴</td>
</tr>
<tr>
<td>Age</td>
<td>□ ≥ 55 years old</td>
<td></td>
</tr>
<tr>
<td>Mechanism of injury</td>
<td>□ Ejection from vehicle⁵ or deformed steering wheel⁶</td>
<td></td>
</tr>
</tbody>
</table>

1. Airway assistance beyond administration of oxygen
2. Major degloving injuries, or major flap avulsions (> 5in)
3. Excluding superficial wounds in which the depth of the wound can be determined
4. Long bone (including humerus, (radius, ulna), femur, (tibia or fibula)
5. Excluding motorcycle, moped, all-terrain vehicle, bicycle, or open body of pickup truck
6. Only applies to driver of vehicle
6.21.2 Pre-hospital Elder Gray-Area Non-Trauma Alert Criteria:

**HILLSBOROUGH COUNTY TRAUMA AGENCY**
**PRE-HOSPITAL ELDER GRAY-AREA**
**NON-TRAUMA ALERT CRITERIA**

**Purpose:** To identify “at-risk” older/geriatric trauma patients who might benefit from a trauma center

**First check to see** if your older trauma patient already meets trauma alert criteria and call an alert as appropriate.

**If not a trauma alert,** but patient is 65 years or older, consider transporting that individual to a trauma center if one or more of the following conditions are satisfied:

**Mechanism of injury:**
- Burns
- Motor vehicle collision associated with:
  - Rapid deceleration of automobile (> 35 mph)
  - Pedestrian
  - Golf cart
  - Unrestrained vehicle occupant
  - Significant passenger space invasion
  - Prolonged extrication greater than 20 minutes
  - Significant vehicular damage
  - Rollover
  - Fatality (other occupant)

**Injuries associated with an above mechanism:**
- Evidence of chest or pelvic trauma

**Other events associated w/high-energy dissipation:**
- Fall (> ground level)
- Blast

**Traumatic injury and currently taking:**
- Anticoagulants and blood thinners
- Cardiac medications such as beta blockers and antiarrhythmics
- Diabetic medications

**Traumatic injury and medical history of:**
- Cardiac
- CHF
- COPD
- Paralysis
- Dementia
- Recent surgery
- Organ transplant
- Diabetes

Revised February 2008

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### 6.22 TRAUMA ALERT CRITERIA; PEDIATRIC TRAUMA SCORECARD METHODOLOGY

The EMT or Paramedic shall assess the condition of those injured individuals with anatomical and physical characteristics of a person fifteen (15) years of age or younger for the presence of one or more of the following three (3) criteria to determine the transport destination per 64J-2.001, Florida Administrative Code, (F.A.C.)

1. Pediatric Trauma Triage Checklist: The individual is assessed based on each of the six (6) physiologic components listed below (left column). The single, most appropriate criterion for each component is selected (along the row to the right). Refer to the color-coding of each criteria and legend below to determine the transport destination:

<table>
<thead>
<tr>
<th>Component</th>
<th>Size</th>
<th>Airway</th>
<th>Consciousness</th>
<th>Circulation</th>
<th>Fracture</th>
<th>Cutaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 20 kg (44+ lbs.)</td>
<td>Normal</td>
<td>Awake</td>
<td>Good peripheral pulses: SBP &gt; 90 mm Hg</td>
<td>None seen or suspected</td>
<td>No visible injury</td>
</tr>
<tr>
<td></td>
<td>&gt; 11 – 20 kg (24 – 44 lbs.)</td>
<td>Supplemented O₂</td>
<td>Amnesia or Loss of consciousness</td>
<td>Carotid or Femoral pulses palpable, but the radial or pedal pulse not palpable or SBP &lt; 90 mm Hg</td>
<td>Single closed long bone fracture</td>
<td>Contusion or Abrasion</td>
</tr>
<tr>
<td></td>
<td>Wt ≤ 11 kg or length ≤ 33 inches on a pediatric length and weight emergency tape</td>
<td>Assisted or Intubated</td>
<td>Altered Mental Status or Coma or Presence of paralysis</td>
<td>Faint or Non-palpable carotid or femoral pulse or SBP &lt; 50 mm Hg</td>
<td>Open long bone fracture or multiple fracture sites or multiple dislocations</td>
<td>Major soft tissue disruption or Major flap avulsion or 2nd or 3rd degree burns to ≥ 10% TBSA or Amputation or any penetrating injury to head, neck, or torso</td>
</tr>
</tbody>
</table>

**R = Red**, any one (1) transport as a trauma alert  
**B = Blue**, any two (2) transport as a trauma alert  
**G = Green**, follow local protocols

2. Meets local criteria (specify):
3. Patient does not meet any of the trauma criteria listed above, but the EMT or Paramedic can call a “Trauma Alert” if, in his or her judgment, the trauma patient’s condition warrants such action. Must be documented on the run report pursuant to 64J-2.013, (F.A.C.)

1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
2. Altered mental status includes drowsiness, lethargy, inability to follow commands, unresponsiveness to voice, totally unresponsive.
3. Long bones include the humerus, (radius, ulna), femur, (tibia or fibula).
4. Long bone fractures do not include isolated wrist or ankle fractures
5. Long bone fractures do not include isolated wrist or ankle fractures or dislocations
6. Includes major degloving injury.
7. Amputation proximal to wrist or ankle
8. Excluding superficial wounds where the depth of the wound can be determined
6.23 Ventilator Assist Support Document

<table>
<thead>
<tr>
<th>ABBR:</th>
<th>Definition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCV</td>
<td>Volume Controlled Ventilation</td>
</tr>
<tr>
<td>PCV</td>
<td>Pressure Controlled Ventilation</td>
</tr>
<tr>
<td>PSV</td>
<td>Pressure Support Ventilation</td>
</tr>
<tr>
<td>A/C</td>
<td>Assist / Controlled</td>
</tr>
<tr>
<td>SIMV</td>
<td>Synchronized Intermittent Mandatory Ventilation</td>
</tr>
<tr>
<td>SIMV+PS</td>
<td>SIMV+ Pressure Support</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous Positive Airway Pressure</td>
</tr>
<tr>
<td>NPPV</td>
<td>Noninvasive Positive Pressure Ventilation</td>
</tr>
<tr>
<td>VT</td>
<td>Tidal Volume</td>
</tr>
<tr>
<td>PIP</td>
<td>Peak Inspiratory Pressure</td>
</tr>
<tr>
<td>F</td>
<td>Frequency = Rate</td>
</tr>
<tr>
<td>FiO2</td>
<td>Fraction of Inspired Oxygen</td>
</tr>
<tr>
<td>PEEP</td>
<td>Positive End Expiatory Pressure</td>
</tr>
<tr>
<td>PS</td>
<td>Pressure Support</td>
</tr>
<tr>
<td>I-Time</td>
<td>Inspiratory Time</td>
</tr>
<tr>
<td>pPlat</td>
<td>Plateau Pressure</td>
</tr>
<tr>
<td>VTE</td>
<td>Exhaled Tidal Volume</td>
</tr>
<tr>
<td>VE</td>
<td>Minute Ventilation</td>
</tr>
<tr>
<td>MV</td>
<td>Minute Volume</td>
</tr>
<tr>
<td>I:E</td>
<td>Inspiratory : Expiatory</td>
</tr>
<tr>
<td>EtCO2</td>
<td>End Tidal Carbon Dioxide</td>
</tr>
<tr>
<td>IBW</td>
<td>Ideal Body Weight</td>
</tr>
</tbody>
</table>

**Minute Ventilation Calculation**

Exhaled Tidal Volume X Total Respiratory Rate = VE

Tidal Volume 6-8 ml/kg of IBW

<table>
<thead>
<tr>
<th>Age</th>
<th>Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm</td>
<td>&lt;40</td>
</tr>
<tr>
<td>Newborn-1 month</td>
<td>24-35</td>
</tr>
<tr>
<td>1 month-6 years</td>
<td>20-30</td>
</tr>
<tr>
<td>6 years-12 years</td>
<td>12-25</td>
</tr>
<tr>
<td>Over 12 years old</td>
<td>12-18</td>
</tr>
</tbody>
</table>

Normal Minute Ventilation for Adults 4-8 (4000ml-8000ml)

**Ideal Body Weight Chart for Men**

(Height in feet and inches, while weight is in pounds.)

<table>
<thead>
<tr>
<th>Height</th>
<th>Small Frame</th>
<th>Medium Frame</th>
<th>Large Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' 2&quot;</td>
<td>128-134</td>
<td>131-141</td>
<td>138-150</td>
</tr>
<tr>
<td>5' 3&quot;</td>
<td>130-136</td>
<td>133-143</td>
<td>140-153</td>
</tr>
<tr>
<td>5' 4&quot;</td>
<td>132-138</td>
<td>135-145</td>
<td>142-156</td>
</tr>
<tr>
<td>5' 5&quot;</td>
<td>134-140</td>
<td>137-148</td>
<td>144-160</td>
</tr>
<tr>
<td>5' 6&quot;</td>
<td>136-142</td>
<td>139-151</td>
<td>146-164</td>
</tr>
<tr>
<td>5' 7&quot;</td>
<td>138-145</td>
<td>142-154</td>
<td>149-168</td>
</tr>
<tr>
<td>5' 8&quot;</td>
<td>140-148</td>
<td>145-157</td>
<td>152-172</td>
</tr>
<tr>
<td>5' 9&quot;</td>
<td>142-151</td>
<td>148-160</td>
<td>155-176</td>
</tr>
<tr>
<td>5' 10&quot;</td>
<td>144-154</td>
<td>151-163</td>
<td>158-180</td>
</tr>
<tr>
<td>5' 11&quot;</td>
<td>146-157</td>
<td>154-166</td>
<td>161-184</td>
</tr>
</tbody>
</table>
### Ideal Body Weight Chart for Women

<table>
<thead>
<tr>
<th>Height</th>
<th>Small Frame</th>
<th>Medium Frame</th>
<th>Large Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' 10&quot;</td>
<td>102-111</td>
<td>109-121</td>
<td>118-131</td>
</tr>
<tr>
<td>4' 11&quot;</td>
<td>103-113</td>
<td>111-123</td>
<td>120-134</td>
</tr>
<tr>
<td>5' 0&quot;</td>
<td>104-115</td>
<td>113-126</td>
<td>122-137</td>
</tr>
<tr>
<td>5' 1&quot;</td>
<td>106-118</td>
<td>115-129</td>
<td>125-140</td>
</tr>
<tr>
<td>5' 2&quot;</td>
<td>108-121</td>
<td>118-132</td>
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6.24 Overview of QA process
7. Forms
(See agency specific forms)
8 Hazardous Material Exposure (CHEMICAL AGENTS)
HAZARDOUS MATERIAL EXPOSURE

Overview: These protocols have been developed to address the specialized treatment of patients exposed to hazardous materials. Some of the agents covered in these protocols may be used as a weapon of mass destruction in a terrorist attack. In these instances, scene safety and a need to stage at a safe distance from the scene should be a primary concern for all personnel. The protocols cover exposure to Chemical (8.1), Biological (8.2) and Radiological (8.3) agents. A color-code is assigned to each protocol in the Chemical section (8.1) which coincides with chemical treatment guide.

Toxidromes

Toxidromes are clinical syndromes that the patient presents with. These patterns of signs and symptoms are essential for the successful recognition of chemical exposure. The toxidromes identified in this protocol are chemical exposure based while others such as the opioids are found within general medical protocol. These chemical toxidromes are identified clinically into five syndromes:

- Irritant Gas Toxidrome
- Asphyxiant Toxidrome
- Corrosive Toxidrome
- Hydrocarbon and Halogenated Hydrocarbons Toxidrome
- Cholinergic Toxidrome

Each can present as a clinical manifestation of the chemical/poisoning involved with some cross-over between toxidromes. This list combines the toxic syndromes found within NFPA 473 (A.5.4.1 (2) and traditional syndromes.
# Toxidrome Correlation to NFPA Standard 473 and Traditional Syndromes

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## General Symptomology Correlation to Toxidrome

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8.1 HAZARDOUS MATERIAL EXPOSURE (CHEMICALS)

Purpose: This protocol is to be used for those patients suspected of exposure to hazardous materials via any route of exposure (e.g. inhalation, absorption, etc.). Scene safety should be of primary concern, with attention to the need for personal protective equipment. Additional assistance may be necessary in certain cases (e.g. hazardous materials team for toxic exposure, police for scene control, fire department, etc.

A history of the events leading to the illness or injury should be obtained from the patient and bystanders, to include:

1. What poison or other substances was the patient exposed to?
2. When and how much?
3. Duration of symptoms?
4. Is there any pertinent medical history?
5. Accidental? Nature of accident?
6. Duration of exposure? (If applicable)

All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

Contact Poison information center (1-800-222-1222) if needed for consultation regarding specific therapy. It is imperative that the emergency department is made aware early that a contaminated patient is being transported in order for proper preparations to be made to receive the patient. The remainder of the chemical exposure section will review many of the chemicals involved in exposure situations. It will also direct you to the appropriate treatment section.

Responder self-protection is a paramount of importance when dealing with hazardous materials. The hazards of the materials involved need to be identified and a well developed risk assessment must be made by qualified hazardous materials technicians.

During the initial stages of the event and prior to the arrival of HazMat Technicians, the EMS responder needs to review and follow the recommendations of the North American Emergency Response Guide Book (NAERG) and their agencies policies and procedures. If the material involved cannot be readily identified, then follow the recommendations of the first guide page in the NAERG, guide page # 111, until more definitive information can be found.

Any attempts to rescue a victim from a hazardous environment needs to be based upon a risk/benefit analysis. The size-up of the scene, likelihood of victim survival, likelihood of success and the protective abilities the responder’s personal protective equipment (PPE) all must be assessed prior to implementing any such rescue attempts. The NAERG provides guidance with regarding PPE capabilities and limitations during “quick in and out” life saving rescues and should be consulted.
Responders need to value the difference between “exposure” and “contamination”. Not all exposures result in a contaminate patient. Physical state of the product, location of the patient with regards to the release and direct contact with the product all play in determining possibly of contamination.

In addition to the patient care discussed below, protection of downstream medical facilities from contamination must be considered. Early notification of receiving facilities and field decontamination are essential.

The following are general guidelines for managing victims of hazardous material exposure. Specific treatment is further addressed in this section based on the causative agent identified.

- **Request Hazardous Material Team and Toxmedic and/or HazMat Medic assistance early.**

- **Self-protection of personnel.** Follow PPE recommendations of the NAERG until further hazard/risk assessment can be performed by qualified technicians.

- **MCI incidents follow S.T.A.R.T. Triage**

- **Prevent further exposure of the patient.** Rapidly remove viable victims from hazardous environment.

- **Provide supportive (BLS) care only when safe to do so.** Maintain Airway and provide supplemental oxygen PRN

- **Decontaminate as deemed necessary** Remove contaminated clothing. Victims exposed only to gases an vapors present little risk of secondary contamination/exposure once clothing is removed. If exposed to corrosive gases and vapors (Chlorine, ammonia, HCL, etc.) remove contaminated clothing then flush with water. Flush with water for contamination by liquids and solids. Stable, non-life threatening patients who are contaminated by liquids and solids that are not readily water soluble should be provided secondary decontamination in the field.

- **Provide Supportive ALS Care (all paramedics)**
  - Provide supplemental oxygen by appropriate means and rate (supplemental oxygen contraindicated in dipyridyl poisoning such as paraquat and diquat) seek guidance of supervising physician or poison control center.
  - Establish vascular access IV/IO when appropriate.
  - Initiate cardiac monitoring,
  - Treat dysrhythmias PRN in accordance with Medical Protocols 2.3 and 2.4 for “Cardiac arrest” and for “Cardiopulmonary Emergencies”.
Monitor oxygen saturation and if available carboxyhemoglobin and methemoglobin levels.

Proceed to “Acid, Alkali and Respiratory Irritant Protocol” H-2 (Yellow) as appropriate.

Proceed to “Cholinesterase Crisis Protocol” H-5 (Green) for suspected nerve agent, organophosphate or carbamate pesticide poisoning (Mark I autoinjectors or DuoDote are authorized for suspected nerve agent exposure in accordance with the technical protocol for Mark I Autoinjectors or DuoDote. If patient is seizing, administer one of the following:

- **midazolam (Versed)** 0.05 mg/kg bolus (maximum dose 5 mg) titrated to cessation of seizure activity or
- **diazepam (Valium)** 5 – 10 mg slow IV/IO/IN. Repeat once prn. (Refer to Seizure-Adult Protocol 2.5.3).
- **10 mg/IM Valium autoinjectors** are authorized for Hazmat Personnel and the mass casualty incidents involving 5 or more patients with seizures.

Treat hypotension by appropriate means

☐ **Consider contacting Poison Information Center at 1 – 800 – 222 – 1222 for further information and guidance**

☐ **Provide ALS Material Specific Care (HazMat Medic)** If applicable, follow protocol at the ToxMedic or HazMatMedic Level based upon the material involved
8.1.1 ACIDS AND ACID MISTS

Treatment:

Chemical Treatment Guide 1: YELLOW

Description:
Acids are colorless to yellow liquids with strong irritating odors. Some acids may be FLAMMABLE agents. Acids act as direct irritants and corrosive agents to moist membranes and to intact skin to a lesser extent.

Signs and Symptoms:
- **Low concentrations** of airborne acids can produce rapid onset of eye, nose, and throat irritation.
- **Higher concentrations** can produce cough, stridor, wheezing, chemical pneumonia and (non-cardiogenic pulmonary edema). Ingestion of acids can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse, as well as partial or full thickness burns.

End-stage symptoms may resemble organophosphate poisoning. However, Patients will have NORMAL OR DILATED PUPILS (patient will not have pin-point pupils). These patients should not be given Atropine or 2-PAM.

Note:
This protocol does not include Hydrofluoric Acid (see Protocol 8.1.13).

Examples:
- Sulfuric Acid (battery acid)
- Muriatic Acid (pool cleaner)
- Hydrochloric Acid (HCL)
- Some drain cleaners

8.1.2 ALKALINE COMPOUND

Treatment:

Chemical Treatment Guide 1: YELLOW

Description:

Most alkaline compounds are solids. Alkalis will impart a soapy texture to aqueous solutions. Alkalis act as direct irritants and corrosive agents to moist membranes and to intact skin to a lesser extent. The extent of tissue penetration and severity of injury is usually greater with alkalis than with acids.

Signs and Symptoms:

Low concentrations of airborne alkalis can produce rapid onset of eye, nose, and throat irritation.

Higher concentrations can produce cough, stridor, wheezing, chemical pneumonia and non-cardiogenic pulmonary edema. Ingestion of alkalis can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse, as well as partial or full thickness burns.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have NORMAL OR DILATED PUPILS (patient will not have pinpoint pupils). These patients should not be given Atropine or 2-PAM.

Examples:

- Lye (baseball field line chalk)
- Cement
- Some drain cleaners
- Sodium Hydroxide
8.1.3 AMMONIA (LIQUID AND GAS)

Treatment:

Chemical Treatment Guide 1: **YELLOW**

Description:
Ammonia is a colorless gas having an extremely pungent odor, which may be in an aqueous solution or gaseous state. Liquefied compressed gas may produce a cryogenic (freezing) hazard as it is released into the atmosphere. Common household ammonia contains 5-10% ammonia. It is a direct irritant and in much higher concentrations, an alkaline corrosive agent to moist mucous membranes and, to a lesser extent, to intact skin. A chloramine gas can be liberated when household ammonia is mixed with a hypochlorite solution (bleach), which may injure the airway.

Signs & Symptoms:
- **Low concentrations or airborne ammonia** can produce cough, stridor, wheezing, and chemical pneumonia (non-cardiogenic pulmonary edema).
- **Ingestion of concentrated ammonia** (e.g. >5%) may cause corrosive injury to the esophagus, stomach, and eye.

End-stage symptoms may resemble organophosphate poisoning However, patients will have NORMAL OR DILATED PUPILS (patient will not have pinpoint pupils). These patients should not be given Atropine or 2-PAM.

Examples:
- Component of household cleaners
- Refrigerant gas
- Used in manufacture of plastics, explosives, and pesticides
- Corrosion inhibitor
- Used in water purification process
- Component of fertilizers

8.1.4 AROMATIC HYDROCARBONS (BENZENE, TOLUENE, XYLENE) KETONES

Treatment:
Chemical Treatment Guide 2: Blue

Description:
Aromatic hydrocarbons may be found as colorless liquids or in a solid form with an ether-like or pleasant odor. These compounds may be highly FLAMMABLE. Ketones are organic compounds derived from secondary alcohols by oxidation. They generally have low viscosity, low to moderate boiling points, moderate vapor pressures, and high evaporation rates. Most ketones are chemically stable liquids. Routes of exposure include: absorption through the skin and eyes, inhalation, and ingestion.

Signs & Symptoms:
Mild exposure: Cough hoarseness, headache, drowsiness, dizziness, weakness, tremors, transient euphoria, vision and hearing disturbances, nausea/vomiting, salivation, and stomach pain.

Moderate to severe exposure: cardiovascular collapse, tachy-dysrhythmias (especially ventricular fibrillation), chest pain, pulmonary edema, dyspnea, tachypnea, respiratory failure, paralysis, altered mental status, seizures, excessive salivation, and delayed carcinogenic effects.

Halogenated hydrocarbons (chloride, bromide, iodide, fluoride) may present with ventricular tachycardia, ventricular fibrillation, and supraventricular tachycardias.

Aromatic hydrocarbons may present with altered mental status.

End-stage symptoms may resemble organophosphate poisoning. However, patients will have NORMAL OR DILATED PUPILS (patient will not have pinpoint pupils). These patients should not be given Atropine or 2-PAM.

Examples:
Components of gasoline, methyl benzene, methyl benzol, phenyl methane
8.1.5 ARSENIC COMPOUNDS (OR HEAVY METAL POISONING)

Treatment:

Chemical Treatment Guide 2: [Blue] (Blue)

Description:
Arsenic compounds may be found as white, transparent, or colorless crystals, colorless liquids or colorless gas (e.g., Ant poison). They are either odorless or have a garlic-like odor. Some are FLAMMABLE. Exposure can be fatal or cause severe injury at concentrations too low to detect. Lewisite is a blistering agent made from arsenic that causes immediate pain, irritation, and blistering of skin and mucous membranes. It is very similar in action to mustard and may be treated as mustard (see Protocol 8.1.18). Arsine gas is made from arsenic and a strong acid, which causes renal failure and destruction of red blood cells. Most exposures commonly occur when arsine gas is used to extract precious metals from ore.

Signs & Symptoms:
Severe gastrointestinal fluid loss, burning abdominal pain, watery or bloody diarrhea, muscle spasm, seizures, cardiovascular collapse, tachycardia, hypotension, ventricular dysrhythmias, shock, and coma. There may be respiratory or cardiac arrest and acute renal failure may occur with bronze urine within a few minutes.

Examples:
• Component of wood preservatives, insecticides, and herbicides.
• Arsine gas is used to extract precious metals from ore.
8.1.6 CARBAMATE INSECTICIDE POISONING

Treatment:

Chemical Treatment Guide 4: GREEN (Green)

Description:
Carbamate may be found in a solid, powder, or liquid form with a white or gray color and a weak odor. It is a reversible acetylcholinesterase inhibitor found in insecticides, herbicides, and some medicinal products. Many carbamates are well absorbed through intact skin and thus pose a serious exposure risk to rescuers. Simple water washing may be sufficient to remove oily compounds. Carbamates affect both the parasympathetic (muscarinic effects) and the sympathetic (nicotinic effects) nervous systems. Although the muscarinic effects may be reversed with Atropine, the nicotinic effects may cause respiratory paralysis and require intubation and aggressive ventilatory support. Carbamate may be in a FLAMMABLE base.

Signs & Symptoms:
Muscarinic effects are the same as seen with organophosphates, which are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effects include: bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis) with inhalation or skin exposure. Ingestion may or may not cause myosis. However, stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasciculations, and seizures.

Examples:
Insecticides used for house tenting (Temic, Matacil, Isolan, Furadan, Lannate, Zectran, Mesurol, Dimetilan, Bagon)
PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
8.1.7 CARBON MONOXIDE POISONING

Treatment:

Chemical Treatment Guide 2: [Blue]

Description:
Carbon Monoxide poisoning should be suspected when the patient has been exposed to the products of combustion (e.g. smoke, automobile exhaust, exhaust fumes from fuel powered machinery, etc.) and are experiencing symptoms. These symptoms may vary with level of carbon monoxide exposure.

Colorless, odorless, tasteless, non-irritating gas. Converts hemoglobin into carboxyhemoglobin, a non-oxygen carrying compound causing chemical asphyxiation. Pulse oximetry can indicate an incorrect, false high oxygen saturation.
Pulse oximetry should be obtained with a device that has the ability to read carboxyhemoglobin and methemoglobin. Units that do not have this capability may give falsely high PaO2 readings.

Signs & Symptoms:

Mild CO exposure: headache, nausea/vomiting, poor concentration, irritability, agitation, and anxiety. May resemble flu-type symptoms (suspect CO exposure during cold snap with use of charcoal heaters, etc. and where there are multiple victims in the same house or building).

Moderate to severe CO exposure: altered mental status, chest pain, cardiac dysrhythmias, pale skin, cyanosis, seizures, and rarely cherry red skin.

Examples:
• Suspect with multiple victims in same building exhibiting above symptoms.
• Use of petroleum fueled heaters, machinery, etc. inside a building (especially with improper ventilation).
• Incomplete burning of natural gas, LP gas, gasoline, kerosene, oil, coal, wood, etc. (any material containing carbon).
• Firefighters working at a fire scene, especially during overhaul operations.
8.1.8 CHLORINATED HYDROCARBONS

Treatment:

Chemical Treatment Guide 2: BLUE

Description:
Methylene Chloride is a volatile liquid that yields heavy vapors. At room temperature it is a clear, colorless liquid with a pleasant (ether-like) odor. Exposure can occur through skin absorption, eye contact, inhalation, and ingestion. Methylene Chloride is converted inside the body to carbon monoxide.

Signs & Symptoms:
Cardiovascular collapse, ventricular dysrhythmias, respiratory arrest, pulmonary edema, dyspnea and tachypnea, headache, drowsiness, dizziness, altered mental status, seizures, nausea/vomiting, diarrhea, abdominal cramps, and chemical burns.

Examples:
• Component (solvent) in paint, varnish strippers, and degreasing agents.
• Used in production of photographic films, synthetic fibers, pharmaceuticals, adhesives, inks, and printed circuit boards.
• Employed as a blowing agent for polyurethane foams, as a propellant for insecticides, air fresheners, and paints.
8.1.9 CHLORINE GAS AND PHOSGENE (CG)

Treatment:

**Chemical Treatment Guide 1: YELLOW (yellow)**

Description:

Chlorine can be found in the form of a colorless to amber-colored liquid (aqueous chlorine is usually in the form of hypochlorite [bleach] in variable concentrations) or a greenish-yellow gas (anhydrous) with a characteristic odor. The liquid hypochlorite solutions are very unstable and react with acids to release chlorine gas (e.g. bleach mixed with vinegar or toilet bowl cleaner containing HCl). Liquefied compressed chlorine gas may produce a cryogenic (freezing) hazard as it is released into the atmosphere. Clothing that has been soaked in a hypochlorite solution can be a hazard to rescuers. A chloramines gas may be liberated when a hypochlorite solution (bleach) is mixed with household ammonia, which may cause injury to the airway.

Phosgene (CG) is a chemical warfare agent. Phosgene gas can be liberated when Freon or chlorinated compounds (e.g. Bleach mixed with ammonia) are heated. Phosgene has similar effects on the body as chlorine; however, symptoms from phosgene may be delayed for several hours.

Signs & Symptoms:

Both agents: dyspnea, tachypnea, cough, choking sensation, rhinorrhea, acute or delayed chemical pneumonia (non-cardiogenic pulmonary edema), ventricular dysrhythmias, cardiovascular collapse, severe irritation and burns of the mucous membranes and lungs, headache, dizziness, altered mental status, nausea/vomiting, severe irritation and burns to the eyes and skin.

Examples:

- Chlorine gas is used in water purification process at water plants and sewage treatment plants, as well as pesticides, refrigerants, solvents, etc.
- Hypochlorite solutions used in cleaning solutions and as disinfectant for water (drinking, waste, swimming pools).
- Phosgene used in paint removers, dry cleaning fluid, dyes, and pesticides.
8.1.10 CYANIDE-HYDROGEN CYANIDE, HYDROCYANIC ACID (AC), CYANOGEN CHLORIDE (CK), POTASSIUM CYANIDE, SODIUM CYANIDE

Treatment:
Chemical Treatment Guide 5: [Red]

Description:
Cyanide can be found in a liquid (solutions of cyanide salts), solid (cyanide salts), or gaseous (hydrogen cyanide) form. In solid form, it is white with a faint almond odor (20% of the population are genetically unable to detect the odor). Hydrogen cyanide gas may be formed when acid is added to cyanide salt or a nitrite or when plastics burn. If there is a large amount of liquid or solid cyanide material on the victim's clothing or skin, there is a significant risk of exposure to rescuers. Exposure can occur through skin absorption, eye contact, inhalation, and ingestion.

Signs & Symptoms
Cardiovascular - initially, pulse decreases and BP rises, in later stages, dysrhythmias and cardiovascular collapse can occur; there may also be palpitations and/or chest tightness.
Respiratory - can cause immediate respiratory arrest, although initially there is usually an increase in the rate and depth of respirations, and later becoming slow and gasping.
CNS - can cause immediate coma, although initially there is usually weakness, headache, and confusion; seizures are common.
GI - nausea/vomiting, salivation.
Skin - pale, cyanotic or reddish color. Death is caused by an inhibitory action on the cytochrome oxidase system, preventing tissue usage of oxygen.

PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
8.1.11 DINITROBENZENE (D.N.B.)

Treatment:
Chemical Treatment Guide 3: **GRAY** (Gray)

Description:
D.N.B. is found as a colorless, oily liquid with a characteristic and peculiar sweet odor. It can also be found as a solid. D.N.B. causes methemoglobinemia, resulting in a state of relative hypoxia due to the inability of RBCs to carry oxygen. DNB is EXPLOSIVE, detonated by heat or shock.

Signs & Symptoms:
Signs and symptoms of the methemoglobinemia from this exposure include: chocolate-brown-colored blood, headache, ataxia, vertigo, tinnitus, dyspnea, CNS depression, hypotension, heart blocks, ventricular dysrhythmias, seizures (rare), cyanosis, and cardiovascular collapse.

Examples:

8.1.12 ETHYLENE GLYCOL

**Treatment**

Chemical Treatment Guide 6: **PINK** (Pink)

**Description:**
Ethylene Glycol is an odorless, colorless, syrupy liquid found in antifreeze, brake fluid, and other industrial products. Because it is readily available and relatively inexpensive, it is often used in suicide attempts. Ingestion is the primary route of exposure. The potential lethal dose is reported to be 100 ml (1.0 to 1.5 ml/kg) in adults. It is the toxic metabolites, however, not the parent compound, that is responsible for the associated toxic effects. The effects include: metabolic acidosis, tetany, QT interval prolongation on the ECG, and irreversible kidney failure. Ethylene glycol poisoning can be fatal, and quick diagnosis and intervention are imperative to prevent the damaging effects of the metabolites. If the patient has concurrently ingested ethanol, symptoms of ethylene glycol toxicity may be delayed.

**Signs & Symptoms:**
The clinical manifestations of ethylene glycol poisoning are described in three phases:

- **Phase I** (30 minutes to 12 hours)—ethanol-like inebriation, metabolic acidosis, seizures, and coma.
- **Phase 2** (12 to 36 hours)—tachycardia, tachypnea, hypertension, pulmonary edema.
- **Phase 3** (36 to 48 hours)—crystalluria, acute tubular necrosis with oliguria renal failure.

**Examples:**
Component of antifreeze (including new generation type), brake fluid, inks in stamp pads and ballpoint pens, paints, and plastics.

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Leon County EMS & Tallahassee Fire Department **Medical Protocols**
Revised April 2018 – Version 1.0 – Live May 15th, 2018
8.1.13 HYDROFLUORIC ACID (HF)

Treatment:

Chemical Treatment Guide 7: **ORANGE** (Orange)

Description:

Hydrofluoric acid is a colorless to yellow liquid with a strong, irritating odor. Since the boiling point of HF is 67 F, when exposed to air, HF will readily change to a gaseous state. When HF comes in contact with metals, it forms hydrogen gas, which is extremely FLAMMABLE. Once HF is absorbed into the tissues, it binds to calcium and magnesium. This form of fluoride poisoning can be fatal, even if exposure is due to a dilute solution (<3%). As little as 7 ml of 100% solution can cause death. Injury is twofold in that the compound causes corrosive burning of the skin and deep underlying tissue, also binds with calcium and magnesium from the nerve pathways, bone, and blood stream. Systemic effects may be delayed. The results are spontaneous depolarization producing excruciating pain, and hypocalcemia, resulting in tetany and cardiac dysrhythmias, which may degenerate to cardiac arrest. Skin may look deceptively normal at the surface. Pain is an indication for treatment, and that it’s managed through the administration of calcium not analgesic.

Signs & Symptoms:

Hypovolemic shock and collapse, tachycardia with weak pulse, acute pulmonary edema, asphyxia, chemical pneumonitis, upper airway obstruction with stridor, pain and cough, decreased LOC, nausea/vomiting, diarrhea, possible GI bleeding, and possible blindness. HF also causes severe skin burns.

The damage may be severe with no outward signs or minimal redness initially, except that the patient will complain of severe pain.

Examples:

Used in rust removers, metal plating, glass etching, and computer manufacturing.
8.1.14 HYDROGEN SULFIDE, SULFIDES & MERCAPTANS

Treatment:

Chemical Treatment Guide 5:  ☢️ (Red)

Description:

This class of gases is colorless with a strong offensive odor, like rotten eggs or sewer gas. However, at high levels, olfactory senses will be overwhelmed making it –“odorless”. They may be found in a liquid form at low temperatures or high pressures. Clothing that has become soaked in sulfide solutions or mercaptans may pose a risk to rescuers. These types of chemicals can cause severe respiratory irritation, including pulmonary edema and respiratory paralysis (especially Hydrogen Sulfide).

Signs & Symptoms:

Cardiovascular collapse, tachycardia, dysrhythmias, irritation of the respiratory Tract, cough, dyspnea, tachypnea, respiratory arrest, pulmonary edema, headache, altered mental status, garlic taste in mouth, seizures, nausea/vomiting diarrhea, profuse salivation, dermatitis, sweating, and possible cyanosis.

Examples:

- Found in sewers, septic tanks, livestock waste pits, manholes, well pits, etc.
- Also found in chemical wastes, petroleum or natural gas (28%).
- Produced in industrial processes that work with sulfur compounds.
8.1.5 METHANOL

Treatment:

Chemical Treatment Guide 6: PINK (Pink)

Description:

Methanol is found as a highly volatile clear liquid and in mixtures. It is used in solvents, additives, and emulsifiers. It is a frequent ingredient in windshield washer fluid. Routes of exposure include: skin absorption, eye contact, inhalation, and ingestion. Methanol has CNS depressant properties that are highly toxic upon aspiration and can cause respiratory failure and cardiac dysrhythmias. The metabolites, formaldehyde and formic acid, that are formed following the metabolism of methanol can cause a severe delayed toxicity.

Signs & Symptoms:

Cardiovascular - dysrhythmias and hypotension.
Respiratory - respiratory insufficiency or arrest, pulmonary edema, chemical pneumonitis, and bronchitis.
CNS - CNS depression and coma, seizures, headache, muscle weakness, and delirium.
GI - GI bleeding, nausea/vomiting, and diarrhea.
Eye - chemical conjunctivitis, blindness, "snow storm" vision, loss of peripheral vision.
Skin - irritation to full thickness burns.

Examples:

• Sterno

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Chemical Treatment Guide index
8.1.16 METHYLENE BIPHENYL ISOCYANATE, ETHYL ISOCYANATE, AND METHYLENE DILSOCYANATE (MDI)

Treatment:

**Chemical Treatment Guide 1: Yellow (yellow)**

Description:
MDI is found as a solid in white to yellow flakes. Various liquid solutions are used for industrial purposes. There is no odor to the solid or liquid solutions. The vapor is approximately eight times heavier than air. This chemical is a strong irritant to the eyes, mucous membranes, skin, and respiratory tract. MDI is also a very potent respiratory sensitizer. Various industrial processes utilize MDI in production and usage of (poly)urethane foams, lacquers, and sealants, as well as, the production of insecticides and laminating materials. These are not cyanide compounds.

Signs & Symptoms:
Irritation to the eyes, mucous membranes, skin, and respiratory tract (cough, dyspnea, wheezing, and pulmonary edema).

Examples:
Component of smoke in plastic fires.
8.1.17 MUSTARD (SULFUR MUSTARD) LEWISITE, BLISTERING AGENTS (H, HD, HS)

Treatment:

Chemical Treatment Guide 1: [YELLOW (Yellow)]

Description:

Mustard is a "blister agent" that causes cell damage and destruction. It is a colorless to light yellow to dark brown oily liquid with the odor of garlic, onion, or mustard. It does not evaporate readily, but may pose a vapor hazard in warm weather. It is a vapor and liquid hazard to skin and eyes, and a vapor hazard to airways. Its vapor is five times heavier than air. Sulfur mustard has been used as a research tool to study DNA damage and repair. A variety of military munitions are filled with mustard, including projectiles, mortars, and bombs. Mustard damages DNA in cells, which leads to cellular damage and death. Mustard penetrates skin and mucous membranes very quickly, and cellular damage begins within minutes. Lewisite is also a "blister agent" that has the same effect on the body as Mustard with the exception of onset of symptoms being immediate.

Signs & Symptoms:

Mustard: Clinical effects begin within 2 to 24 hours. The initial effects include: eyes: itching or burning, redness, corneal damage, skin: Erythema with itching and burning, blisters, and respiratory tract: epistaxis, hoarseness, sinus pain, dyspnea, and cough.

Lewisite: Same effect on the body as Mustard with the exception of onset of symptoms being immediate.

Examples:

- Chemical warfare agents
8.1.18 NITROGEN PRODUCTS AND OTHER PRODUCTS CAUSING METHEMOGLOBINEMIA

Treatment:

Chemical Treatment Guide 3: [GRAY (Gray)]

Description:
Commonly found in fertilizers, paints, inks, and dyes. Changes hemoglobin into a non-oxygen carrying compound, methemoglobin. Blood color changes from red to a chocolate brown. Pulse oximetry will indicate an inaccurately low reading due to the opaqueness of the compound. Pulse oximetry should be obtained with a device that has the ability to read carboxyhemaglobin and methemaglobin levels. These products can be found in a gas, liquid, or solid form. They are released from the combustion or decomposition of substances that contain nitrogen. Depending on the individual compound, these agents may pose a significant health hazard for rescuers. Many are well-absorbed through intact skin. Simple water washing may be sufficient to remove oil compounds. Other routes of exposure include: eye contact, inhalation, and ingestion. These products are respiratory tract irritants that can cause a severe, delayed pulmonary edema or immediate upper airway irritation and edema. They also change Fe²⁺ to Fe³⁺ (methemoglobinemia), which does not bind to oxygen.

Signs & Symptoms:

Cardiovascular - cardiovascular collapse with weak and rapid pulse.
Respiratory - a mild-transient cough and tachypnea are the only symptoms at the time of exposure to most agents. A delayed onset of dyspnea, tachypnea, violent coughing, cyanosis, and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing and possible upper airway obstruction spasm or edema of the glottis.
CNS - headache, dizziness, vertigo, fatigue, restlessness, and decreased LOC are usually delayed signs.
GI - burning of the mucous membranes, nausea/vomiting, and abdominal pain.
Eye - chemical conjunctivitis.
Skin - irritation of moist skin areas, pallor and cyanosis with normal Sp02 reading. Note: symptoms may be immediate or may be delayed for 5 to 72 hours.

Examples:

• Most gases are propellant fuels, and agricultural fumigants.
• Also used in laboratory research solvents, bleaching agents, and refrigerants.
• Found in grain silos (silo filler's disease).
• Product of combustion in most fires (structure fires, etc.).

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8.1.19 ORGANOPHOSPHATE INSECTICIDE POISONING AND NERVE AGENTS (GA (TABUN), GB (SARIN), GD (SOMAN), GF, VX)

Treatment:
Chemical Treatment Guide 4: GREEN (Green)

Description:
Organophosphate compounds are used as insecticides in residential as well as commercial agriculture. They are found as liquids, dusts, wetable powders, concentrates, and aerosols. Chemical nerve agents include: Tabun (GA), Sarin (GB), Soman (GD), GF and VX. Many are well-absorbed through intact skin, and thus pose a serious hazard to rescuers. Simple water washing may be sufficient to remove oily compounds. Routes of exposure include: skin absorption, eye contact, inhalation, and ingestion. Organophosphates affect both the parasympathetic (muscarinic effects) and the sympathetic (nicotinic effects) nervous systems. Although the muscarinic effects may be reversed with Atropine, the nicotinic effects may cause respiratory paralysis and require intubation and aggressive ventilatory support. Organophosphates may be in a FLAMMABLE base.

Signs & Symptoms:
Muscarinic effects are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effects include: bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis, which may last up to two months) with inhalation or skin exposure. Ingestion may or may not cause miosis. However, stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasciculations, and seizures.

Examples:
• Pesticides (Chlorthion, Diazinon, Dipterex, Di-Syton, Malathion, Parathion, Phosdrin, etc.)
• Chemical warfare agents (VX, Sarin, Tabun, Soman, etc.)

PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
8.1.20 PHENOL (CARBOLIC ACID)

Treatment:

Chemical Treatment Guide 9: **WHITE** (white)

Description:

Phenol (carbolic acid), at room temperature, is a translucent, colorless, crystalline mass, white powder, or thick, syrupy liquid. The crystals turn pink to red in air. Phenol has a sweet, tar-like odor that is readily detected at low concentrations. Phenol is soluble in alcohol, glycerol, petrolatum and, to a lesser extent, water. Phenol is absorbed rapidly by all routes; however, the inhalation hazard is limited. In dilute concentrations (1% to 2%), Phenol may cause severe burns. Systemic toxicity can rapidly lead to death. Phenol is mainly used in the manufacture of phenolic resins and plastics. It is also used as a disinfectant and has medicinal applications as well (e.g. Campho Phenique®).

Signs & Symptoms:

Nausea/vomiting, diarrhea, excessive sweating, headache, dizziness, ringing in the ears, seizures, loss of consciousness, coma, respiratory depression, inflammation of the respiratory tract, shock, and death. Exposure to skin can result in severe burns which will cause the skin to have a white, red or brown appearance. Failure to decontaminate the skin may allow the Phenol to absorb into the system and result in death.

Examples:

- Used in the manufacture of phenolic resins and plastics.
- Used as a disinfectant.
- Campho Phenique

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Chemical Treatment Guide index
8.1.21 PHOSPHINE

Treatment:

Chemical Treatment Guide 8: PURPLE (Purple)

Description:

Phosphine can be found in a gas, liquid, or solid form. Most gases are colorless to brown with a sharp odor. It is used as a chemical warfare and protection agent, propellant fuels, and agricultural fumigants. Others are used in laboratory research, solvents, and pesticides. They are released from the combustion or decomposition of substances that contain nitrogen. A toxic exposure can result from working on or in grain silos. Very small amounts of phosphine can be trapped in a victim's clothing after an overwhelming exposure, posing a risk to rescuers. Routes of exposure include: skin absorption, eye contact, inhalation, and ingestion. Phosphine is a respiratory tract irritant that can cause a severe, delayed pulmonary edema or immediate upper airway irritation and edema.

Signs & Symptoms:

**Cardiovascular** - cardiovascular collapse with weak and rapid pulse. It can show a reflex bradycardia.

**Respiratory** - a mild and transient cough is the only symptom at the time of exposure to most agents. A delayed onset of dyspnea, tachypnea, violent coughing and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing and possible upper airway obstruction spasm or edema of the glottis.

**CNS** - fatigue, restlessness, and decreased LOC are usually delayed signs.

**GI** - burning of the mucous membranes, nausea/vomiting, and abdominal pain.

**Eye** - chemical conjunctivitis.

**Skin** - irritation of moist skin areas, pallor and cyanosis. Note: symptoms may be immediate or may be delayed for 5 to 72 hours.

Examples:

Pesticides (especially rodenticides). Also see description.

PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
8.1G. Chemical Treatment Guides
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Signs and symptoms:

**Low concentrations** of airborne acids and alkalis can produce:
- Rapid onset of eye, nose, and throat irritation.

**Higher concentrations** (low concentrations of ammonia) can produce:
- Cough,
- Stridor,
- Wheezing,
- Chemical pneumonia (non-cardiogenic pulmonary edema).

**Ingestion of acids and alkalis** can result in severe injury to the upper airway, esophagus, and stomach. In addition, there may be circulatory collapse as well as partial or full thickness burns.

**End-stage symptoms** may resemble organophosphate poisoning. However, patients will have NORMAL OR DILATED PUPILS (patient will not have pinpoint pupils). **These patients should not be given Atropine or 2-PAM.**

Procedure:

**BASIC LEVEL:**

1. Remove patient from hazardous area (a).
2. If patient was exposed externally, remove clothing and jewelry and decontaminate with copious amounts of water. Provide ocular irrigation with normal saline (do not attempt to neutralize with another solution) (see Medical Procedure 4.21 Morgan Therapeutic Lens).
3. If patient has external burns, see Adult/Pediatric Protocol 2.10.6/3.9.7 (Burn injuries).
4. **Medical Supportive Care Protocol 2.1.3** (adults)/3.1.3(peds). (Ipecac, charcoal, and NG tube are contraindicated; avoid oral airways).
5. **Contact Poison Information Center (1-800-222-1222)** for guidance or questions if time permits.
6. If patient has pulmonary edema, maintain adequate ventilation and oxygenation, as well as providing pulmonary suction to remove fluid. Noncardiogenic pulmonary edema should not be treated with Lasix,
but with positive end expiratory pressure (PEEP) or CPAP mask (see Medical Procedure).

**ALS LEVEL 1:**

1. If patient has bronchospasm, administer **Albuterol** (**Ventolin®**) 1 nebulizer treatment:
   a. **Adult**: 2.5 mg of **Albuterol** pre-mixed with 2.5 ml normal saline (see Medical Procedure 4.24). May repeat twice PRN (b) (c).
   b. **Pediatric**:
      i. If < 1 year or < 10 kg, mix 1.25 mg in 1.5 ml of Normal Saline {0.083%};
      ii. If > 1 year or > 10 kg mix 2.5 mg in 3 ml of Normal Saline {0.083%}) (see Medical Procedure 4.24). May repeat twice PRN (a).

2. If bronchodilator is administered, may add **Ipratropium Bromide** (**Atrovent®**) 0.5 mg (0.5 ml) to Albuterol nebulizer treatment on first nebulizer treatment only (b) (c).

3. If patient has inhaled chlorine or hydrochloric acid (HCl) and has significant respiratory distress, administer **Sodium Bicarbonate** via nebulizer (8.4% 3ml mixed with Normal Saline 3ml or 4.2% 6ml).

4. If patient is seizing, administer one of the following benzodiazepines:
   a. **Diazepam** (**Valium®**)  
      i. **Adult**: 5 - 10mg IV. If unable to start IV, administer **Diazepam** (**Valium®**) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (d) (e).
      ii. **Pediatric**: 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer **Diazepam** (**Valium®**) 0.2 mg/kg IV (d) (e) (g).
   or  
   b. **Midazolam** (**Versed®**)  
      i. **Adult**: 2 mg IV. If unable to start IV, administer **Midazolam** 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (d).
      ii. **Pediatric**: 0.1 mg/kg (maximum 2 mg) IV (d)

5. If hypotension persists, treat PRN (see Adult Protocol 2.4.4). For pediatric patients, administer 20 ml/kg Normal Saline IV PRN (maximum 60 ml/kg total)

**ALS LEVEL 2:**

1. Contact medical control or medical director for any questions or concerns.

**NOTE:**

(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
(b) Do not give Albuterol or Ipratropium Bromide if heart rate is >140 (adults), or > 200 (pediatric).
(c) Caution should be used when the patient is older than 40 years of age or has a history of hypertension or heart disease.
(d) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.
(e) Use Diastat® (commercial preparation of rectal diazepam)/ if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam/ remove syringe and tape buttocks closed.
(f) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device
(g) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg
Adult/Pediatric Chemical Treatment Guide 2: BLUE

- AROMATIC HYDROCARBONS (Benzene, Toluene, Xylene)
- ARSENIC COMPOUNDS (or Heavy Metal Poisoning)
- CARBON MONOXIDE POISONING
- CHLORINATED HYDROCARBONS (Methylene Chloride)
- KETONES

**Mild exposure signs and symptoms include:**
Cough, hoarseness, headache, poor concentration, irritability, agitation, anxiety, drowsiness, dizziness, weakness, tremors, transient euphoria, vision and hearing disturbances, nausea/vomiting, salivation, diarrhea, stomach pain and chemical burns with chlorinated hydrocarbons (for Arsenic signs and symptoms see below).

**Moderate to severe exposure signs and symptoms include:**
Cardiovascular collapse, tachydysrhythmias (especially ventricular fibrillation), chest pain, pulmonary edema, dyspnea, tachypnea, respiratory failure, paralysis, altered mental status, seizures, excessive salivation, pale skin, cyanosis, rarely cherry red skin with carbon monoxide, and delayed carcinogenic effects (for Arsenic signs and symptoms see below).

**Signs and symptoms of Arsenic exposure include:**
Severe gastrointestinal fluid loss, burning abdominal pain, watery or bloody diarrhea, muscle spasm, seizures, cardiovascular collapse, tachycardia, hypotension, ventricular dysrhythmias, shock, and coma. There may be respiratory or cardiac arrest and acute renal failure may occur with bronze urine within a few minutes.

**Signs and symptoms of ketone exposure include:**
- **Cardiovascular**—cardiac dysrhythmias and tachycardia.
- **Respiratory**—upper respiratory tract irritation, dyspnea, tachypnea, a burning sensation in the chest and pulmonary edema.
- **CNS**—CNS depression to coma, confusion, tinnitus, disorientation, headache, drowsiness, weakness, and seizures.
- **GI**—pain and irritation of the mucous membranes, nausea/vomiting, and diarrhea.
- **Eye**—chemical conjunctivitis.
- **Skin**—irritation and dermatitis, cyanosis of extremities.

**End-stage symptoms** may resemble organophosphate poisoning. However, patients will have NORMAL OR DILATED PUPILS (patient will not have pinpoint pupils). **These patients should not be given Atropine or 2-PAM.** Products may be FLAMMABLE.

**Procedure:**

Leon County EMS & Tallahassee Fire Department Medical Protocols
Revised April 2018 – Version 1.0 – Live May 15th, 2018
BASIC LEVEL:
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 (adult) or Peds Med Supportive Care Protocol 3.1.3 (peds) (Ipecac & NG tube is contraindicated. Avoid oral airways except for carbon monoxide.
3. If patient was exposed externally, remove clothing and decontaminate as appropriate. Provide ocular irrigation with normal saline. If available, use a Morgan lens (see Medical Procedure 4.21 Morgan Therapeutic Lens).
4. Administer high-flow oxygen (100%) (b).
5. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.
6. If patient has pulmonary edema, maintain adequate ventilation and oxygenation, as well as providing pulmonary suction to remove fluid. Non-cardiogenic pulmonary edema should not be treated with Furosemide (Lasix®), but with positive end expiratory pressure (PEEP) or CPAP mask (see CPAP Procedure Protocol).

ALS LEVEL I:
1. If airway compromised, provide advanced airway (Endotracheal intubation, King Airway, other extra glottis device). Monitor End Tidal CO2
2. If patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3) (c).
3. If patient is seizing, administer one of the following benzodiazepines:
   a. Diazepam (Valium®)
      i. Adult: 5 - 10mg IV. If unable to start IV, administer 10 mg IM (may use Auto injector if available) or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (d)(e)
      ii. Pediatric:
          IV/IO: [1 mo – 5 yr] 0.1 - 0.3 mg/kg IV/IO q 5-10 min. Max 5 mg total.
             [5 yr – 12 yr] 0.1- 0.3 mg/kg IV/IO q 5-10 min. Max 10 mg total.
             [> 12 yr] 5 – 10 mg IV/IO q 10 – 15 min. Max 30 mg total.
          Rectal: Varify dose with Broselow tape
               [up to 5 yrs] 0.5 mg/kg PR x 1
               [6 – 11 yrs] 0.3 mg/kg PR x1
               [> 11 yrs] 0.2 mg/kg PR x 1
               (Maximum 20 mg) rectally (d) (e)
   or
   b. Midazolam (Versed®)
      i. Adult: 2 mg IV. If unable to start IV, administer 2 mg intranasal or 5-10 mg IM. May repeat once PRN (4 mg IV/IN maximum dose) (d).
      ii. Pediatric: 2 mo – 12 yrs;
*IV/IO*: start 0.15 mg/kg x1 (Max 4 mg),
*IM*: 0.2 mg/kg. Maximum 10 mg
*IN* (intranasal): 0.2 mg/kg. Maximum 10 mg (d).

2. If hypotension persists, treat PRN (see Adult Hypotension Protocol 2.4.1)
(c). For Pediatric patients, administer 20 ml/kg Normal Saline IV PRN
(maximum 60 ml/kg total).

**ALS LEVEL 2:**

1. Call Medical Control or Medical Director for any questions or concerns.

**NOTE**

(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to
appropriate Hazmat PPE protocol, as the risk of secondary contamination
is very high.

(b) Document duration of exposure to CO and when oxygen therapy was
started (This information is needed to assist in making HBO decisions).

(c) Administration of Epinephrine to patients in a pre-code status may not be
desirable for this group of patients. A physician and or Poison Information
Center should guide the administration of Epinephrine in these cases.

(d) Intranasal administration of benzodiazepines requires the use of a mucosal
atomization device.

(e) Use Diastat® (commercial preparation of rectal diazepam)/ if available. If
Diastat® is not available/ use a lubricated tuberculin or 3-5 ml syringe
without the needle to administer diazepam (Valium®). Position patient in
a decubitus knee position or supine with legs held apart and insert
lubricated syringe approximately 5 cm (approx. 2 in) into the rectum.
Inject diazepam, remove syringe and tape buttocks closed.

(f) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.
Adult/Pediatric Chemical Treatment Guide 3: GRAY

- ANILINE DYES
- DINITROBENZENE (D.N.B.)
- NITROGEN PRODUCTS AND OTHER PRODUCTS CAUSING METHEMOGLOBINEMIA

**Signs and symptoms include:**
Methemoglobinemia characterized by chocolate-brown-colored blood, CNS depression, headache, dizziness, ataxia, vertigo, tinnitus, dyspnea, tachypnea, violent coughing, choking, possible upper airway obstruction spasm or edema of the glottis, abdominal pain, hypotension, heart blocks, ventricular dysrhythmias, seizures (rare), pallor, cyanosis, and cardiovascular collapse.

*Note: symptoms may be immediate or may be delayed for 5 to 72 hours.*

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 (adult) or 3.1.3 (Pediatric).
3. If patient was exposed externally, remove clothing and decontaminate as appropriate.
4. Administer high-flow oxygen (100%).
5. **Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.**
6. If Nitrogen Product ingestion, administer **Activated Charcoal:**
   a. Adult: 50 gm PO
   b. Pediatric: 1mg/kg (maximum 50 gm) PO

**ALS LEVEL 1:**
1. If the patient is dyspneic, cyanotic, normal SpO2 and has chocolate-brown-colored blood, administer **Methylene Blue (1%)** 1-2 mg/kg slow IV over 5 minutes, followed by a NS 30 ml flush to decrease pain at site.
2. If patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3).
3. If patient is seizing, administer one of the following benzodiazepines:
   a. **Diazepam (Valium®)**
      i. **Adult:** 5 – 10 mg IV. If unable to start IV, administer **Diazepam (Valium) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum.** May repeat PRN up to 20 mg maximum dose (b) (c).
      ii. **Pediatric:** 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer **Diazepam (Valium) 0.2 mg/kg IV (b) (c) (d).**

or
b. **Midazolam (Versed®)**
   
   i. **Adult:** 2 mg IV. If unable to start IV, administer **Midazolam (Versed)** 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (b).
   
   ii. **Pediatric:** 0.1 mg/kg (maximum 2mg) IV (b).

4. If hypotension persists, treat PRN (see Adult Protocol 2.4.1). For Pediatric patients administer 20 ml/kg Normal Saline IV PRN (Maximum 60 ml/kg total).

5. Do not induce vomiting.

**ALS LEVEL 2:**

1. If cyanosis persists, administer **Methylene Blue** (1%) 1-2 mg/kg slow IV over 5 minutes, followed by a NS 30 ml flush to decrease pain at site.

2. Call Medical Control or Medical Director for any questions or concerns.

**NOTE**

(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high

(b) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.

(c) Use Diastat® (commercial preparation of rectal diazepam), if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam, remove syringe and tape buttocks closed.

(d) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.
CARBAMATE - INSECTICIDE POISONING
ORGANOPHOSPHATE - INSECTICIDE POISONING AND NERVE AGENTS (GA, GB, GD, GF, VX)

Signs and symptoms:
The muscarinic effects are described as the classic SLUDGE syndrome (excessive Salivation, Lacrimation, Urination, Diarrhea, Gastrointestinal distress, and Emesis). Additional muscarinic effects include: bronchorrhea, bronchospasm, and bradycardia. The patient will have constricted pupils (miosis, which may last up to two months—despite appropriate ate treatment) with inhalation or skin exposure. Ingestion may or may not cause myosis. However, stimulation of nicotinic receptors will produce tachycardia, muscle paralysis (apnea), muscle twitching/fasciculations, and seizures.

Procedure:
BASIC LEVEL:
1. Remove patient from hazardous area (a).
2. Avoid exposure to patient's sweat, vomit, stool, and vapor emitting from soaked clothes.
3. Medical Supportive Care Protocol 2.1.3 (adult) or 3.1.3 (pediatric), administer high-flow O2.
4. If patient was exposed externally, remove clothing and decontaminate as appropriate (place clothes in sealed bag).
5. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

ALS LEVEL 1:
If treating 1 to 4 patients:
1. If patient is bradycardic (patient is usually tachycardic) or has excessive pulmonary secretions, administer Atropine:
   a. Adult: 0.03 mg/kg IV (2 mg/70 kg). Repeat 5-10 min till atropinization occurs
   b. Pediatric:
      < 2 yr old: 0.05 mg/kg (max. 3 mg) IM or 0.02 mg/kg IV, repeat q 5-10 minutes until atropinization occurs. (If nerve agent, Start 0.05 mg/kg IM x 1 for mild/moderate sx. Start 0.1 mg/kg IM for severe sx).
      2 – 10 yrs: 1 – 2 mg IM/IV q 10 – 30 min prn; Start 1 mg IM/IV x 1. (If nerve agent, Start 1 mg/kg IM x 1 for mild/moderate sx. Start 2 mg/kg IM for severe sx).
> 10 yrs: 1-2 mg IV/IV q 10 – 30 min prn; Start 2 mg IM/IV x 1. (If nerve agent, Start 2 mg/kg IM x 1 for mild/moderate sx. Start 4 mg/kg IM for severe sx).

Note: Give Atropine first if also using Pralidoxime (2 PAM). (b) (c).

2. If Organophosphate:
   a. Consider Pralidoxime (Protopam®, 2-PAM®) 1 -2 gm mixed in 100 ml NS IV drip over 30 minutes. In severe cases, 2-PAM® may be given IV at a maximum rate of 200 mg/minute or 1 gm/5 minutes (used when nicotinic effects are present as evidenced by fasciculation of large muscles). Observe patient for hypertension. (May be needed with high exposure to Carbamates) (c).

3. If patient is seizing, administer one of the following benzodiazepines:
   a. Diazepam (Valium®)
      i. Adult: 5 – 10 mg IV. If unable to start IV, administer Diazepam (Valium) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (d) (e).
      ii. Pediatric: 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer Diazepam (Valium) 0.2 mg/kg IV (d) (e) (g).
   
   or

   b. Midazolam (Versed®)
      i. Adult: 2 mg IV. If unable to start IV, administer Midazolam 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (d).
      ii. Pediatric: 0.1 mg/kg (maximum 2mg) IV (d).

If treating 5 or more patients OVER 8 YEARS OF AGE or self-exposure (with PINPOINT PUPILS):

4. Administer either a Duodote Kit or Mark I kit(s) (two autoinjectors containing Atropine 2mg in one and Pralidoxime 600mg in the other) (see Medical Procedure 4.2) as follows:
   a. For early symptoms (severe rhinorrea or mild to moderate dyspnea), administer one (1) DuoDote or Mark 1 autoinjector kit. If no improvement in patient's status in 10 minutes, administer another DuoDote or Mark I autoinjector kit (c) (f).
   b. For severe respiratory distress, coma, or seizures, administer three (3) DuoDote or Mark I autoinjectors and one (1) CANA autoinjector (Diazepam 10mg IM) (c) (f).

For all patients meeting above criteria:
5. Alert emergency department to prepare for contaminated patient.
6. Do not induce vomiting or give Furosemide (Lasix®) or Morphine.
7. If patient is experiencing eye pain and/or blephrospasm, administer Scopolamine 1 drop in each eye if available.

ALS EVEL 2:
1. Call Medical Control or Medical Director for any questions or concerns

NOTE
(a) Risk of exposure from fumes is high, call HAZMAT team. PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
(b) If advised by Poison Information Center/ every other dose of Atropine can be increased to 0.06 mg/kg IV.
(c) End point for treatment is manifested by patient improvement with clear lung sounds.
(d) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.
(e) Use Diastat® (commercial preparation of rectal diazepam)/ if available. If Diastat® is not available/ use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam/ remove syringe and tape buttocks closed.
(f) When possible, establish IV and administer Atropine, Diazepam, and Midazolam IV and Pralidoxime IV drip.
(g) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.
Adult/Pediatric Chemical Treatment Guide 5: RED

- CYANIDE—HYDROGEN CYANIDE, HYDROCYANIC ACID (AC), CYANOGEN CHLORIDE (CK)
- HYDROGEN SULFIDE, SULFIDES & MERCAPTANS
- AZIDES

**Signs and symptoms include:**

**Cardiovascular** - Initially, pulse decreases and BP rises, in later stages, possible tachycardia, dysrhythmias and cardiovascular collapse can occur, there may also be palpitations and/or chest tightness.

**Respiratory**—can cause immediate respiratory arrest, although initially there is usually an increase in the rate and depth of respirations, and later becoming slow and gasping, possible irritation of the respiratory tract, cough, dyspnea, tachypnea, and pulmonary edema.

**CNS**—can cause immediate coma, although initially there is usually weakness, headache, and confusion; seizures are common.

**GI**—nausea/vomiting, salivation may be profuse, possible garlic taste in mouth.

**Skin**—pale, cyanotic or reddish color, dermatitis, sweating.

Good Medical Supportive Care, including airway management, is paramount and should precede the use of the Cyanide Antidote Kit. However, the rapid administration of the Cyanide Antidote Kit will be the only therapy that will reverse the life-threatening symptoms.

**Procedure:**

**BASIC LEVEL:**

1. Remove patient from hazardous area (a).
2. Avoid exposure to vapor emitting from soaked clothes.
3. **Medical Supportive Care Protocol 2.1.3** (adult) or 3.1.3 (Pediatric), administer high-flow O₂.
4. If patient was exposed externally, remove clothing quickly and decontaminate
5. **Contact Poison Information Center (1 -800-222-1222)** for guidance or questions if time permits.
6. For oral ingestion, if conscious, administer Activated Charcoal
   a. Adult: 50 gm PO.
   b. Pediatric: 1gm/kg (maximum 50 gm) PO
7. **Only a physician or the Poison Information Center can authorize treatment beyond Supportive Care for exposure to azides.**

**ALS LEVEL 1:**

1. If unconscious, administer **Sodium Bicarbonate** 1 mEq/kg IV.
2. If patient is exhibiting life-threatening symptoms (severe respiratory compromise or arrest, shock, seizures, coma), administer one of the following
   a. **CynoKit**
      i. Start a dedicated IV line.
      ii. Reconstitute each 2.5 gram vial with 100 ml sodium chloride. The starting dose of CYANOKIT® for adults is 5 g (ie, both 2.5-g vials), administered by IV infusion over a total of 15 minutes (approximately 15 mL/min), **7.5 minutes per vial**
      iii. Depending upon the severity of the poisoning and the clinical response, a second dose of 5 g may be administered by IV infusion up to a total dose of 10 g
      iv. The rate of infusion for a potential second dose may range from 15 minutes (for patients in extremis) to 2 hours, as clinically indicated

   Note for ingested or absorbed cyanide additional doses of hydroxocobalamin may be required and may be infused at a rate of 5 grams over 15 to 120 minutes

   b. **Cyanide Antidote Kit** [Lilly Kit or Pasadena Kit] (3 parts) in the following order (to induce methemoglobinemia). If symptoms are not severe, or if diagnosis is not certain, omit steps 1 & 2 and only give Sodium Thiosulfate (step 3). Non-HAZMAT Paramedics and Non-Rescue Supervisors can only give Sodium Thiosulfate. Do not administer Sodium Nitrite in cases involving smoke inhalation (structure fires) or carbon monoxide poisoning. Administer only Sodium Thiosulfate and 100% oxygen.

   **Rescue Supervisor and HAZMAT Paramedic:**
   (1) **Amyl Nitrite** (break pearls into gauze sponge and hold under patient's nose or BVD intake valve) for 15 to 30 seconds of each minute, until sodium nitrite solution is ready (b).
   (2) **Sodium Nitrite 3%** (300 mg/10ml)
      a. Adult: 10 ml (or 0.35 ml/kg) at 2.5 to 5 ml/minute IV.
      b. Pediatric: 0.33 ml/kg slow IV over 5 minutes

   **All Paramedics:**
   (3) **Sodium Thiosulfate 25%**
      a. Adult: 12.5 gm (50 ml) IV.
      b. Pediatric: 1.65 ml/kg IV.

   *(Contraindicated for Hydrogen Sulfide exposure)*
3. If patient has dysrhythmias, treat PRN (see Adult Protocol 2.3).
4. If hypotension persists, treat PRN (see Adult Protocol 2.4.1).
5. Alert emergency department to prepare for contaminated patient.
6. Do not induce vomiting.
7. If patient is seizing, administer one of the following benzodiazepines:
   a. **Diazepam (Valium®)**
      i. **Adult**: 5 - 10 mg IV if unable to start IV, administer **Diazepam (Valium)** 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (c)(d)
      ii. **Pediatric**: 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer **Diazepam (Valium)** 0.2 mg/kg IV.
   or
   b. **Midazolam (Versed®)**
      i. **Adult**: 2 mg IV. If unable to start IV, administer **Midazolam** 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (c).
      ii. **Pediatric**: 0.1 mg/kg (maximum 2 mg) IV (c).

**ALS LEVEL 2:**
1. If symptoms persist after 20 minutes, repeat Cyanide Antidote Kit at 50% of initial dose.
2. If patient becomes cyanotic after the cyanide antidote kit. **Contact Poison Information Center (1-800-222-1222) for further instructions.**

**NOTE:**
(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
(b) If patient has IV access and received supportive care, step 1 may be by-passed for step 2.
(c) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.
(d) Use Diastat® (commercial preparation of rectal diazepam), if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam, remove syringe and tape buttocks closed.
(e) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.

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- ETHYLENE GLYCOL
- METHANOL

The clinical manifestations of ethylene glycol poisoning are described in three phases:

Phase 1 (30 minutes to 12 hours)—ethanol-like inebriation, metabolic acidosis, seizures, and coma.
Phase 2 (12 to 36 hours)—tachycardia, tachypnea, hypertension, pulmonary edema.
Phase 3 (36 to 48 hours)—crystalluria, acute tubular necrosis with oliguria—renal failure.

Signs and symptoms of methanol exposure include:
- Cardiovascular—dysrhythmias and hypotension.
- Respiratory—respiratory insufficiency or arrest, pulmonary edema, chemical pneumonitis, and bronchitis.
- CNS—CNS depression and coma, seizures, headache, muscle weakness, and delirium.
- GI—GI bleeding, nausea/vomiting, and diarrhea.
- Eye—chemical conjunctivitis.
- Skin—irritation to full thickness burns.

Procedure:

**BASIC LEVEL:**
1. Remove patient from hazardous area.
2. Medical Supportive Care Protocol 2.1.3 (adult) or 3.1.3 (pediatric).
3. I for guidance or questions if time permits.

**ALS LEVEL 1:**
1. If patient is seizures, administer one of the following benzodiazepines:
   a. **Diazepam (Valium®)**
      i. Adult: 5 10 mg IV. If unable to start IV, administer Diazepam (Valium) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (a) (b).
      ii. Pediatric: 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer Diazepam (Valium) 0.2 mg/kg IV (a) (b) (c).
   or
   b. **Midazolam (Versed®)**
i. Adult: 2 mg IV. If unable to start IV, administer **Midazolam** 2 mg intranasal. May repeat once PRN (4 mg maximum dose)
   (a).
ii. Pediatric: 0.1 mg/kg (maximum 2mg) IV (a).

2. If lungs are clear, administer Normal Saline:
   i. Adult: @ 100 ml/hr IV
   ii. Pediatric: 2 ml/kg/hr IV

3. If respiratory rate is twice normal rate, administer **Sodium Bicarbonate** 8.4% 1-2 mEq/kg IV

4. If patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3).

5. Administer **Thiamine** 100 mg IV, if available.

**ALS LEVEL 2:**

1. Contact medical control or medical director for any concerns or questions.

**NOTE:**

(a) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.

(b) Use Diastat® (commercial preparation of rectal diazepam), if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam, remove syringe and tape buttocks closed.

(c) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.
• HYDROFLUORIC ACID (HF)
• VICANE

Signs and symptoms of exposure include:

Hypovolemic shock and collapse, tachycardia with weak pulse, acute pulmonary edema, asphyxia, chemical pneumonitis, upper airway obstruction with stridor, pain and cough, decreased LOC, nausea/vomiting, diarrhea, possible GI bleeding, and possible blindness. HF also causes severe skin burns. The damage may be severe with no outward signs, except that the patient will complain of severe pain.

Procedure:

BASIC LEVEL:

1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 (adult) or 3.1.3 (pediatric) (Ipecac is contraindicated).
3. If patient was exposed externally, remove clothing and jewelry and decontaminate with copious amounts of water.
4. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.
5. If patient has pulmonary edema, maintain adequate ventilation and oxygenation, as well as providing pulmonary suction to remove fluid. Noncardiogenic pulmonary edema should not be treated with Furosemide (Lasix®), but with positive end expiratory pressure (PEEP) or CPAP mask (see Medical Procedure 4.8).

ALS LEVEL 1:

1. If patient has burns to eye(s):
   a. Immediately flush with copious amounts of water or normal saline (may use Morgan Lens).
   b. Prepare an eye wash solution by mixing Calcium Gluconate (10%) 50 ml in NS 500 ml (b).
   c. Apply Calcium Gluconate eye wash using the Morgan Therapeutic Lens (see Medical Procedure 4.22) and continue until arrival at receiving facility (b).

2. If patient has burns to the skin:
   a. Immediately flush with copious amounts of water.
   b. Prepare skin gel by mixing Calcium Gluconate (10%) 10 ml into a 2 oz tube of KY jelly (making a 2.5% gel)(b).
   c. Apply a 2.5% Calcium Gluconate Gel on burned area. For burns to hand(s) place hand in glove filled with this gel (b).
d. If pain continues: calcium gluconate in a 5% solution is injected subcutaneously in a volume of 0.5 ml / cm to every ¼ inch into burned area and is also injected subcutaneously ½ inch around the circumference of the burned area.

3. For inhalation injury:
   a. Immediately support ventilations.
   b. Administer Calcium Gluconate (10%) 1 ml mixed with 3 ml NS via nebulizer (b).
   c. For severe respiratory depression/arrest and/or cardiac toxicity (dysrhythmia—prolonged QT interval, hypotension), administer Calcium Gluconate (10%):
      i. Adult: 1-2 g slow IV over 5 minutes (b).
      ii. Pediatric: 100 mg/kg (maximum 1 gm) slow IV over 5 minutes (b).

4. If patient has dysrhythmias, provide additional treatment PRN (see Adult Protocol 2.3 or Pediatric protocol 3.3).

5. If hypotension persists, treat PRN (see Adult Protocol 2.4.1). For pediatric patient, administer 20 ml/kg IV PRN (maximum 60 ml/kg total).

ALS LEVEL 2:

1. If systemic symptoms persist, repeat Calcium Gluconate (10%)
   i. Adult: 1-2 g slow IV over 5 minutes (b).
   ii. Pediatric: 100 mg/kg (maximum 1 gm) slow IV over 5 minutes (b).

NOTE

   (a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
   (b) DO NOT USE Calcium Carbonate as the outcome can be disastrous.
• PHOSPHINE

Signs and symptoms of phosphine exposure include:

Cardiovascular—cardiovascular collapse with weak and rapid pulse. It can show a reflex bradycardia.

Respiratory—a mild and transient cough is the only symptom at the time of exposure to most agents. A delayed onset of dyspnea, tachypnea, violent coughing and pulmonary edema follows. Some agents work immediately on the upper airway, resulting in pain and choking, spasm of the glottis, temporary reflex arrest of breathing and possible upper airway obstruction spasm or edema of the glottis.

CNS—fatigue, restlessness, and decreased LOC are usually delayed signs.

GI—burning of the mucous membranes, nausea/vomiting, and abdominal pain.

Eye—chemical conjunctivitis.

Skin—irritation of moist skin areas, pallor and cyanosis. Note: symptoms may be immediate or may be delayed for 5 to 72 hours.

Procedure:

BASIC LEVEL:

1. Remove patient from hazardous area (a).
2. Avoid exposure to vapor emitting from soaked clothes.
3. Medical Supportive Care Protocol 2.1.2 (adult) or 3.1.3 (pediatric), administer 100% high-flow oxygen (Pico is contraindicated).
4. If patient was exposed externally, remove clothing and decontaminate as appropriate (do not use water as an initial irrigating solution for Phosphine exposure due to possible reactivity). Provide ocular irrigation with normal saline (see Medical Procedure 4.21 Morgan Therapeutic Lens).
5. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.
6. For Phosphine ingestion, administer Activated Charcoal:
   i. Adult: 50 gm PO.
   ii. Pediatric: 1 gm/kg (maximum 50 gm) PO
7. If patient has pulmonary edema, maintain adequate ventilation and oxygenation, as well as providing pulmonary suction to remove fluid. Noncardiogenic pulmonary edema should not be treated with Furosemide (Lasix®), but with positive end expiratory pressure (PEEP) or CPAP mask (see Medical Procedure-4.8 CPAP).

ALS LEVEL 1:

1. If patient is seizing, administer one of the following benzodiazepines:
   a. Diazepam (Valium®)
      i. Adult: 5 -10 mg IV. If unable to start IV, administer Diazepam (Valium) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (b) (c).
Pediatric: 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer Diazepam (Valium) 0.2 mg/kg IV (b) (c) (d).

b. Midazolam (Versed®)
   i. Adult: 2 mg IV. If unable to start IV, administer Midazolam 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (b).
   ii. Pediatric: 0.1 mg/kg (maximum 2mg) IV (b).

2. If patient has dysrhythmias, treat PRN (see Adult Protocol 2.3 or Pediatric Protocol 3.3).

3. If hypotension persists, treat PRN (see Adult Protocol 2.4.1). For pediatric patients, administer 20 ml/kg Normal Saline IV PRN (maximum 60 ml/kg total).

ALS LEVEL 2:
1. Call medical control or medical director for any concerns or questions.

NOTE
(a) If risk of exposure from fumes is high, call HAZMAT team. PPE (usually Level A) with SCBA must be worn in hazardous area. PPE with minimum of Level C protection must be worn for treatment outside of the hazardous areas.
(b) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.
(c) Use Diastat® (commercial preparation of rectal diazepam), if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam, remove syringe and tape buttocks closed.
(d) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.

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• PHENOL (CARBOLIC ACID)

**Signs and symptoms of exposure include:**

Nausea/vomiting, diarrhea, excessive sweating, headache, dizziness, ringing in the ears, seizures, loss of consciousness, coma, respiratory depression, inflammation of the respiratory tract, shock, and death. Exposure to skin can result in severe burns, which will cause the skin to have a white, red or brown appearance. Failure to decontaminate the skin may allow the Phenol to absorb into the system and result in death.

**Procedure:**

**BASIC LEVEL:**

1. Remove patient from hazardous area (a).
2. Avoid exposure to vapor emitting from soaked clothes.
3. Medical Supportive Care Protocol 2.1.3 (adult) or 3.1.3 (pediatric) (Ipecac is contraindicated).
4. If patient was exposed externally, remove clothing and decontaminate with copious amounts of water.
   a. After thoroughly rinsing skin, apply vegetable oil or mineral oil or Polyethylene glycol (PEG) to exposed areas. (Isopropyl alcohol may be used for very small skin burns only.)
   b. Provide ocular irrigation with normal saline (see Medical Procedure 4.21 Morgan Therapeutic Lens).
5. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**

1. Assess need for intubation (Medical Procedure 4.34 SMART Airway management).
2. If patient is seizing, administer one of the following benzodiazepines:
   a. **Diazepam (Valium®)**
      i. **Adult:** 5 – 10 mg IV. If unable to start IV, administer Diazepam (Valium) 10 mg IM (may use Auto injector if available) or 5 mg intranasal or 10 mg per rectum. May repeat PRN up to 20 mg maximum dose (b) (c).
      ii. **Pediatric:** 0.5 mg/kg (maximum 10 mg) rectally. If IV is available prior to seizure, administer Diazepam (Valium) 0.2 mg/kg IV (b) (c) (d).
   b. **Midazolam (Versed®)**
      i. **Adult:** 2 mg IV. If unable to start IV, administer Midazolam 2 mg intranasal. May repeat once PRN (4 mg maximum dose) (b).
      ii. **Pediatric:** 0.1 mg/kg (maximum 2mg) IV (b).
3. If hypotension persists, treat PRN (see Adult Protocol 2.4.1). For pediatric patients, administer 20 ml/kg Normal Saline IV PRN (maximum 60 ml/kg total)

**ALS LEVEL 2:**
1. Call medical control or medical director for any questions or concerns.

**NOTE**
(a) If risk of exposure from fumes is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
(b) Intranasal administration of benzodiazepines requires the use of a mucosal atomization device.
(c) Use Diastat® (commercial preparation of rectal diazepam), if available. If Diastat® is not available, use a lubricated tuberculin or 3-5 ml syringe without the needle to administer diazepam (Valium®). Position patient in a decubitus knee position or supine with legs held apart and insert lubricated syringe approximately 5 cm (approx. 2 in) into the rectum. Inject diazepam, remove syringe and tape buttocks closed.
(d) If Diastat (rectal diazepam preparation) is used, administer 2.5 mg.

8.2 Hazardous Material Exposure (Biological Agents)
8.2 HAZARDOUS MATERIAL EXPOSURE (BIOLOGICAL AGENTS)

Overview: This protocol is to be used for those patients suspected of exposure to biological agents via any route of exposure (e.g. inhalation, absorption, etc.). The protocols will give specific considerations for each type of exposure, as well as general treatment guidelines. Scene safety should be of primary concern, with attention to the need for personal protective equipment. Additional assistance may be necessary (e.g. hazardous materials team, police, etc.). Since many biological agents are spread through an airborne route, scene safety must include use of protective masks by all personnel, and must include containment of the unknown substance to prevent airborne spread. Any victim who has a cough, respiratory symptoms, or a flu-like syndrome should be considered as potentially infectious to others by a respiratory route until proven otherwise. Both patient and healthcare workers should wear protective masks. If the patient needs low-flow oxygen therapy, it may be given by nasal cannula under a protective mask. If the patient needs high-flow oxygen therapy, it may be given by non-rebreather mask which should not be covered by a protective mask; but the healthcare workers must wear protective masks.

Symptoms that would develop after a biological weapon (BW) attack would be delayed and nonspecific, making the initial diagnosis difficult.

A BW attack should be considered if any of the following are present:

• Large epidemic with unprecedented number of ill or dying.
• HIV (+) individuals may have first susceptibility ("canary in a coal mine")
• High volumes of patients complaining primarily of respiratory symptoms that are severe and are associated with an unprecedented mortality rate.
• The cause of infection is unusual or impossible for the particular region (such as the Ebola virus which is rarely seen outside of Africa)
• Multiple, yet simultaneous outbreaks
• The epidemic is caused by a multi-drug-resistant pathogen, previously unknown
• Sick or dead animals of multiple types are encountered
• The delivery vehicle for the agent is identified
• Prior intelligence reports or claims by aggressors of a BW attack

SIGNS AND SYMPTOMS
After a characteristic incubation period following aerosol exposure, most BW agents present as an initial influenza syndrome with:

• Fever
• Chills
• Malaise
• Headache
• Myalgia

Some BW agents rapidly develop into a pulmonary syndrome with:

• Dyspnea
• Cyanosis
• Chest pain
• Radiological abnormalities
• Liver involvement indicated by rising liver enzymes, with or without jaundice
• Encephalitis may occur with some select viral agents, typified by photophobia, confusion, nuchal rigidity (stiff neck)
• Maculopapular, vesicular pustular, or ulcerative skin lesions with or without bleeding abnormalities may occur with some agents
• Unexplained death or flaccid paralysis may indicate a biological toxin

A history should be obtained from the patient and bystanders, to include:
• Duration of symptoms
• Pertinent medical history
• Patient's recent history of travel
• Infectious contacts
• Employment
• Activities over the preceding 3 to 5 days

If a biological agent exposure is suspected, call the HAZMAT team. In this instance, refer to the appropriate Hazmat PPE protocol, to protect against secondary contamination. All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy and then contact the receiving emergency department for confirmation of Level 2 orders.

It is imperative that the emergency department is made aware early that a contaminated patient is being transported in order for proper preparations to be made to receive the patient.
8.2.1 ANTHRAX

Purpose: Bacillus anthracis is a gram-positive, rod shaped organism that becomes infectious when it converts into a spore and enters the host. The spore germinates inside a macrophage, which is then transported to regional lymph nodes where local production of toxins causes edema and necrosis of the tissue leading to bacteremia, toxemia, and death. Symptoms vary with the method of exposure as follows:

Cutaneous Anthrax: skin lesions appear in 1 to 5 days, 1 to 2 cm vesicles with regional edema and lymphadenitis, most patients with small lesions may be afebrile, lesions develop into a painless necrotic ulcer with a black eschar base.

Gastrointestinal Anthrax: fever, nausea/vomiting, abdominal pain, bloody diarrhea, sometimes rapidly developing ascites, possible acute abdomen, and oropharyngeal cases show primary involvement of the tonsils.

Inhalation Anthrax: 6-day incubation period followed by fever, myalgias, cough and fatigue, initial improvement followed by abrupt onset of respiratory distress, shock, and death in 24-36 hours. Physical findings are non-specific, pneumonia is rare and 50% of cases have associated hemorrhagic meningitis.

Procedure:

BASIC LEVEL:

1. Remove patient from hazardous area (a).
2. If patient was exposed externally, remove clothing and decontaminate as appropriate.
3. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3.
4. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

ALS LEVEL 1:

1. None

ALS LEVEL 2:

1. If there is a high suspicion of significant exposure to anthrax, then Medical Control or Poison Information may order preventive treatment for the adult with oral ciprofloxacin (Cipro®) 500 mg p.o. b.i.d or Doxycycline 100 mg p.o. b.i.d.

NOTE:

(a) If risk of exposure is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
8.2.2 BOTULISM

**Purpose:** The botulinum toxins are a group of seven related neurotoxins produced by the bacillus Clostridium botulinum. When inhaled, these toxins produce a clinical picture very similar to foodborne intoxication, although the time to onset of paralytic symptoms may actually be longer than for foodborne cases, and may vary by type and dose of toxin. The clinical syndrome produced by one or more of these toxins is known as "botulism." Botulism toxin is also a licensed medicine that is used for the treatment of dystonias and can be found in some hospital pharmacies.

**Signs and symptoms:** The onset of symptoms of inhalation botulism may vary from 24 to 36 hours, to several days following exposure. These symptoms are:

- Bulbar palsies that produce loss of function in nerve originating in the brainstem causing the following symptoms:
  - Blurred vision
  - Mydriasis (dilated pupils)
  - Diplopia (double vision)
  - Paresis (drooping eyelid)
  - Photophobia (light sensitivity)
  - Dysphagia (difficulty swallowing)
  - Dysphonia (hoarseness, phonation disorder)
- Following bulbar palsies, skeletal muscles become weak, leading to a symmetrical descending paralysis (head-to-toe)
- These symptoms may progress acutely to respiratory failure and death within 24 hours
- Patients usually remain awake and alert

**Procedure:**

**BASIC LEVEL:**
1. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3.
2. Contact Poison Information Center (1-800-222-1222) for guidance and questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Call medical control or medical director if any questions or concerns.
8.2.3 CHOLERA

**Purpose:** Vibrio cholerae is a short, curved, motile, gram-negative non-sporulating rod. Cholera is the prototype toxigenic diarrhea, which is secretory in nature. Transmission is made through direct and indirect fecal contamination of water or foods, and by heavily soiled hands or utensils. It can survive up to 24 hours in sewage, and as long as 6 weeks in certain types of relatively impure water containing organic material. Since cholera does not easily spread from human to human, to be an effective biological weapon, major drinking water supplies would have to be heavily contaminated. Cholera is an acute infectious disease, characterized by sudden onset with nausea, vomiting, profuse diarrhea with 'rice water" appearance, rapid loss of body fluids, toxemia, and frequent collapse. If untreated, mortality may by 50%.

**Signs and symptoms** occur within 12 to 72 hours of exposure and include:
- Intestinal cramping
- Painless diarrhea
- Vomiting
- Malaise
- Headache
- Low-grade fever

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area.
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3. Consider fluid replacement.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Treatment in-hospital for the adult may include the use of tetracycline 500mg q.i.d. for 3 days or doxycycline 300 mg once or 100 mg b.i.d. for 3 days. If tetracycline resistant, use ciprofloxacin 500 mg b.i.d. for 3 days or erythromycin 500 mg q.i.d. for 3 days.
2. Call medical control or medical director if any questions or concerns.
8.2.4 Plague

Purpose: The plague is spread to humans from either the bite of an infected flea or by inhaling the organism. Infection occurs in three forms:

1. Bubonic—involves lymph nodes closest to the bite of infected flea
2. Pneumonic—an infection of the lungs
3. Septicemia—a generalized infection in the blood from the bacteria escaping through the lymph nodes or lungs

Two to three days after inhaling the plague organism, the patient will develop:

- High fever
- Myalgia
- Chills
- Headache
- Cough with bloody sputum
- Signs of overwhelming infection (including pneumonia)
- Chest x-ray may show patchy infiltrates or consolidation, with a rapidly progressing pneumonia causing dyspnea, stridor, and cyanosis
- Eventual respiratory failure, circulatory collapse, and laboratory evidence of disseminated intravascular coagulation (DIC) develop

Procedure:

BASIC LEVEL:

1. Remove patient from hazardous area (a).
2. Respiratory isolation is mandatory for the first 48 hours of treatment.
3. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3
4. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

ALS LEVEL 1:

1. None

ALS LEVEL 2:

1. Antibiotic treatment must be started within 24 hours of the onset of symptoms. Treatment in-hospital for the adult may include the use of streptomycin 15 mg/kg IM b.i.d. for 10 days, doxycycline 200 mg IV initially, followed by 100 mg b.i.d. for 10 days. For plague meningitis administer chloramphenicol 12.5-18.75mg/kg q.i.d.
2. If there is a high suspicion of significant exposure to plague, then Medical Control or Poison Information may order preventive treatment for the adult with oral ciprofloxacin (Cipro®) 500 mg p.o. b.i.d or doxycycline 100 mg p.o. b.i.d.
3. Call medical control or medical director for any questions or concerns.

NOTE

(a) If risk of exposure is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
8.2.5 Q FEVER

Purpose: Q fever is caused by a rickettsia Coxiella burnetii, which is highly infectious and resistant to heat and drying. Its natural reservoir is sheep, cattle, and goats. Humans acquire the disease by inhalation of aerosols contaminated with the organism. Following a 10 to 20 day incubation, Q fever generally occurs as a self-limiting febrile illness lasting 2 days to 2 weeks with headaches, fatigue, and myalgias. Pneumonia occurs in 50 of all patients with half of these (25 total) presenting with a cough (usually non-productive) or rales.

Signs and symptoms include:
- High-grade fever
- Rigors
- Severe headache
- Photophobia
- Myalgias
- Nausea/vomiting
- Diarrhea

Procedure:

**BASIC LEVEL:**
1. Remove patient from hazardous area.
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3
3. Contact Poison Information Center (1-800-222-1222) for reference or any questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Most cases will resolve even without antibiotic therapy. However, to shorten the duration of the illness, treatment in-hospital for the adult may include the use of tetracycline 500mg q.i.d. or doxycycline 100 mg b.i.d. for 5 to 7 days.
2. Contact medical control or medical director if any questions or concerns.
8.2.6 RICIN

**Purpose:** Ricin is a potent cytotoxin that is derived from the beans of the castor plant and is a by-product in castor oil production. When inhaled as a small particle aerosol, this toxin may produce pathologic changes within 8 hours and severe respiratory symptoms followed by acute hypoxic respiratory failure in 36-72 hours. When ingested, ricin causes severe gastrointestinal symptoms followed as well by vascular collapse and death. This toxin may also cause disseminated intravascular coagulation, microcirculatory failure and multiple organ failure if given intravenously.

**Signs and symptoms:**

*After inhalation:*
  - Fever
  - Chest tightness
  - Cough
  - Shortness of breath
  - Nausea
  - Joint pain within 4 to 8 hours of exposure
  - Necrosis of the lower airway epithelium and severe pulmonary edema
  - Death within 36 to 72 hours

*After ingestion:*
  - Nausea
  - Vomiting
  - Severe diarrhea
  - Gastrointestinal hemorrhage with necrosis of the liver, spleen, and kidneys
  - Shock leading to death within 3 days

*After injection:*
  - Marked death of muscles and lymph nodes near site of injection
  - Multiple organ failure leading to death

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3. Decontaminate as appropriate.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS Level 2**
1. If ingested, aggressive gastric lavage and activated charcoal should be administered in the hospital.
2. Contact medical control or medical director if any questions or concerns.
NOTE

(a) Risk of exposure via airborne route is high. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
8.2.7 SMALLPOX

**Purpose:** Smallpox is caused by the Variola virus. Although the fully-developed cutaneous eruption of smallpox is unique, earlier stages of the rash could be mistaken for varicella. Secondary spread of infection constitutes a nosocomial hazard from the time of onset of a smallpox patient's exanthem (rash) until scabs have separated. Quarantine with respiratory isolation should be applied to secondary contacts for 17 days post-exposure.

**Signs and symptoms include:**
- Fever
- Rigors
- Headache
- Malaise
- Nausea/vomiting
- Back ache
- 15% of patients develop delirium
- 10% of light-skinned patients exhibit an erythematous rash
- 2 to 3 days later, an enanthem appears concomitantly with a discrete rash about the face, hands and forearms
- Following eruptions on the lower extremities, the rash spreads to the trunk over the next week
- Lesions quickly progress from macules to papules, and eventually to pustular vesicles
- With smallpox, lesions are more abundant on the extremities and face, as opposed to varicella (chickenpox), in which lesions on various segments of the body remain generally synchronous in their stage of development and primarily start on the trunk and spread to the extremities

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Immune globulin for variola and the vaccines (vaccinia and VIG) may be obtained through the CDC.
2. Contact medical control or medical director for any questions or concerns.

**NOTE:**
(a) Risk of exposure via airborne route is high. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
8.2.8 STAPHYLOCOCCAL ENTEROTOXIN B

**Purpose:** Staphylococcal Enterotoxin B (SEB) is a fever producing exotoxin produced by the bacteria, Staphylococcus aureus. This toxin commonly causes food poisoning in improperly handled foods that have an overgrowth of the staph organism and then are ingested. SEB symptoms will vary with the route of exposure (inhaled versus ingested).

**Signs and symptoms:**

- From 3 to 12 hours after aerosol exposure, there will be a sudden onset of:
  - Fever (103° to 106° F) lasting 2 to 5 days
  - Chills
  - Headache
  - Myalgia
  - Nonproductive cough which may persist for up to 4 weeks
  - Some patients may develop shortness of breath and retrosternal
  - chest pain
- If ingested, symptoms include:
  - Nausea
  - Vomiting
  - Diarrhea
- High exposure can lead to septic shock and death

**Procedure:**

**BASIC LEVEL:**

1. Remove patient from hazardous area.
2. **Medical Supportive Care Protocol** 2.1.3 or **Pediatric Medical Supportive Care** 3.1.3.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**

1. None

**ALS LEVEL 2:**

1. Contact medical control or medical director for any questions or concerns.
8.2.9 TRICHOTHECENE MYCOTOXIN (T2)

**Purpose:** The trichothecene mycotoxins are nonvolatile compounds produced by filamentous fungi (molds) that are relatively insoluble in water but highly soluble in ethanol, methanol, and propylene glycol. Exposure usually occurs through inhalation, ingestion, and/or absorption. Aerosol attack in the form of "yellow rain" will present as droplets of yellow fluid contaminating clothes and the environment.

**Signs and symptoms:**

- **Exposure to skin:**
  - Skin pain
  - Pruritus
  - Redness
  - Vesicles
  - Necrosis
  - Sloughing of epidermis

- **Exposure to airway:**
  - Nose and throat pain
  - Nasal discharge
  - Itching and sneezing
  - Cough
  - Dyspnea
  - Wheezing
  - Chest pain
  - Hemoptysis

- **Severe poisoning by any route:**
  - Prostration
  - Weakness
  - Ataxia
  - Collapse
  - Shock
  - Death

**Procedure:**

- **BASIC LEVEL:**
  1. Remove patient from hazardous area.
  2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3. Decontaminate as appropriate.
  3. Contact Poison Information Center (1-800-222-1222) for guidance and questions if time permits.

- **ALS LEVEL 1:**
  1. None

- **ALS LEVEL 2:**
  1. If ingested, aggressive gastric lavage and activated charcoal should be administered in the hospital.
  2. Contact medical control or medical director if any questions or concerns.
8.2.10 TULAREMIA

**Purpose:** Francisella tularensis is a non-motile, gram-negative coccobacillus that typically causes disease in animals. Humans can become infected by either handling diseased animal fluids or by being bitten by infected deerflies, mosquitoes, or ticks. The organism can also remain viable for weeks in a number of mediums and easily spread by aerosol. After infection, bacteremia results with a secondary spread to the lungs and other organs.

**Signs and symptoms** will result within 2 to 10 days of inhalational exposure to include:
- Fever
- Chills
- Headache
- Generalized muscle pain
- Nonproductive cough
- Pneumonia

If the organism was ingested or inoculated, symptoms will also include regional lymphadenopathy, with or without cutaneous ulcers.

Clinical diagnosis is both difficult and problematic. Physical findings are usually nonspecific, although chest x-ray may reveal pneumonic process, mediastinal lymphadenopathy or pleural effusion. Routine culture is possible but hazardous to lab personnel. Diagnosis can be established retrospectively by serology.

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Antibiotic therapy for 10 days for the adult includes either streptomycin 1 gm q 12 hours IM; 15 mg/kg IM b.i.d. If not available, administer Gentamicin 3 mg/kg/day.
2. Prophylaxis with tetracycline or doxycycline is effective if warning of BW attack is provided or if there is a high suspicion of significant exposure, as ordered by Medical Control or Poison Information.
3. Contact medical control or medical director if any questions or concerns.

**NOTE**
(a) If risk of exposure is high, call HAZMAT team. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
8.2.11 VENEZUELAN EQUINE ENCEPHALITIS (VEE)

**Purpose:** VEE virus is a mosquito-borne alphavirus that is endemic in certain parts of the world (Central and South America, Mexico, and Florida) infecting horses, mules, and donkeys. If this agent was intentionally released as an aerosol, disease might occur simultaneously in both horses and humans, but this pattern would not be commonly recognized.

**Signs and symptoms:** After exposure, a sudden onset of symptoms begin in 1 to 5 days, which consist of: generalized malaise, spiking fever (up to 104° F), rigors, severe headache, photophobia, myalgias in the legs and lumbosacral area, nausea, vomiting, cough, sore throat, and diarrhea. These symptoms last up to 3 days followed by a period of weakness and lethargy. Most patients recover in 1 to 2 weeks. Some patients, especially children may develop signs of CNS infection, with meningismus, convulsions, coma, and paralysis. There is a 20% mortality rate in children who develop encephalitis.

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a).
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Contact medical control or medical director if any questions or concerns.

**NOTE:**
(a) Risk of exposure via airborne route is low. However, patient should be isolated from mosquitoes for 72 hours to prevent spread by vectors.
8.2.12 VIRAL HEMORRHAGIC FEVERS

**Purpose:** The VHF is a diverse group of illnesses caused by a variety of RNA viruses with a wide range of morbidity and mortality. Each of these viruses has a unique history and is capable of being spread in most cases by an aerosol or formite (except dengue virus). VHF agents especially Marburg and Ebola have allegedly been considered for weaponization. The clinical syndrome which these viruses cause in humans is called VHF.

**These viruses include:**
- Ebola
- Marburg
- Dengue
- Yellow Fever
- Crimean-Congo Fever
- Hantaan Viruses
- Lassa Fever

**Signs and symptoms:**
- Fever
- Easy bleeding
- Petechiae
- Hypotension and shock
- Flushing of the face and chest
- Edema
- Malaise
- Myalgias
- Headache
- Vomiting
- Diarrhea

**Procedure:**

**BASIC LEVEL:**
1. Remove patient from hazardous area (a)(b).
2. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3
3. Contact Poison Information Center (1-800-222-1222).

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Contact medical control or medical director if any questions or concerns.

**NOTE**
(a) Risk of exposure via airborne route is high. Refer to appropriate Hazmat PPE protocol, as the risk of secondary contamination is very high.
(b) Risk of exposure from symptomatic patient via blood or body secretions is high. Full PPE with masks, goggles, sleeves, and gowns are appropriate. If the patient is not severely ill, IV access should be delayed until hospital arrival. If IV access is needed for immediate patient resuscitation, extra care is appropriate to protect the healthcare worker, and IV attempts should not be made on combative patients or in a moving vehicle.

Return to: Contents at top  Appendix  Blank Forms  Drug Reference  Air Ambulance Service  Adult Medical Protocols  Administrative Guidelines
8.3 Hazardous Material Exposure (Radiological Agents)
8.3 HAZARDOUS MATERIAL EXPOSURE (RADIOLOGICAL AGENTS)

**Overview**: This protocol is to be used for those patients suspected of exposure to radiological agents via any route of exposure (e.g. ingestion, absorption, etc.). The protocols will give specific considerations for each type of exposure, as well as general treatment guidelines. **Scene safety should be of primary concern, with attention to the need for personal protective equipment. If a radiological agent exposure is suspected, call the HAZMAT team.** In this instance, refer to the appropriate Hazmat PPE protocol to protect against secondary contamination. All patients who have been exposed to hazardous materials must be properly decontaminated prior to initiation of extensive medical treatment and transportation to the hospital.

**Contact the Poison Information Center (1-800-222-1222) for consultation regarding specific therapy and then contact the receiving emergency department for confirmation of Level 2 orders.**

It is imperative that the emergency department is made aware early that a contaminated patient is being transported in order for proper preparations to be made to receive the patient.

**TYPES OF RADIATION INJURY**

- **External Irradiation** occurs when all or part of the body is exposed to penetrating radiation from an external source. Following external exposure, an individual is not radioactive and can be treated like any other patient.
- **Contamination** means that radioactive materials in the form of gases, liquids, or solids are released into the environment and contaminate people externally, internally, or both. An external surface of the body, such as the skin, can become contaminated, and if radioactive materials get inside the body through the lungs, gut, or wounds, the contaminant can become deposited internally.
- **Incorporation** refers to the uptake of radioactive materials by body cells, tissues, and target organs such as bone, liver, thyroid, or kidney. Incorporation cannot occur unless contamination has occurred. These three types of accidents can happen in combination and can be complicated by physical injury or illness.

Irradiation of the whole body or some specific body part does not constitute a medical emergency even if the amount of radiation received is high. The effects of irradiation usually are not evident for days or weeks and while medical treatment is needed, it is not needed on an emergency basis. However, **contamination accidents must be considered medical emergencies**, since they might lead to internal contamination and subsequent incorporation. Incorporation can result in adverse health effects several years later if the amount of incorporated radioactive material is high. Treatment priorities include:

- Treat life-threatening problems first
- Limit the radiation dose to both victim and personnel (time, distance, shielding)
- Control the spread of radioactive contaminants
Serious medical problems should have priority over concerns about radiation, such as radiation monitoring, contamination control, and decontamination. However, attention should be given to PPE for medical personnel.

Return to:  Contents at top  Appendix  Blank Forms  Drug Reference  Air Ambulance Service  Adult Medical Protocols  Administrative Guidelines  Peds Medical Protocol  Procedure Protocols  Special/specific exposure  Adult Haz Material Exposure  Adult Haz Material Radiological
8.3.1 RADIATION EXPOSURE/CONTAMINATION

Purpose: Radiation exposure/contamination may be a health risk to the patient and the rescuer depending on the type of radiation, time of exposure, distance from the radioactive source and level of shielding from the radioactive source. It should be noted that not all exposures will require medical treatment. In exposures where traumatic injuries are not present, the following steps should be taken.

Procedure:

BASIC LEVEL:
1. Remove patient from hazardous area (a).
2. Decontaminate as appropriate (b).
3. Medical Supportive Care Protocol 2.1.3 or Pediatric Medical Supportive Care 3.1.3 PRN.
4. Contact Poison Information Center (1-800-222-1222) for guidance or questions if time permits.

ALS LEVEL 1:
1. None

ALS LEVEL 2:
1. Additional treatment should be administered in the hospital.
2. Contact medical control or medical director for questions or concerns.

NOTE
(a) Use of radiological monitoring devices is essential as risk of exposure may be high. Call HAZMAT team.
(b) In mild to moderate exposures without traumatic injuries, self-DECON may be recommended for the patient at his/her home. Self-DECON should include removal of clothing and placing clothes into plastic bag and showering with soap and water.
8.3.2 ACUTE RADIATION SYNDROME

**Purpose:** An acute illness, which follows a roughly predictable course over a period of time ranging from a few hours to several weeks after exposure to ionizing radiation. The acute radiation syndrome is produced if enough radiation reaches enough sensitive tissue. Important factors are:

- High dose
- High dose rate
- Whole body exposure
- Penetrating irradiation

Other factors to be considered include: age (young and old), sex, genetics, medical history, etc. Regardless of the source of radiation, if the dose is high enough, it will produce the same effect.

**Signs and symptoms** that develop in the ARS occur through four distinct phases:

- **Prodromal phase.** Depending on the total amount of radiation absorbed, patients may experience a variety of symptoms including:
  - Loss of appetite
  - Nausea
  - Vomiting
  - Fatigue
  - Diarrhea

After high radiation doses, additional symptoms which may develop include:

- Prostration
- Fever
- Respiratory difficulties
- Increases excitability

This is the stage at which most victims seek medical care.

- **Latent phase.** This is the transitional period in which many of the initial symptoms resolve, and may last for up to three weeks depending on the original dose. This time interval decreases as the initial dose increases.

- **Illness phase.** The period of time when overt illness develops, often characterized by:
  - Infection
  - Bleeding
  - Electrolyte imbalance
  - Diarrhea
  - Changes in mental status
  - Shock

- **Recovery or death phase.** This follows the period of overt illness, which may take weeks or months to resolve.

**Procedure:**

**BASIC LEVEL:**

1. Remove patient from hazardous area.
2. [Medical Supportive Care Protocol 2.1.3](#) or [Pediatric Medical Supportive Care 3.1.3](#). Decontaminate as appropriate.
3. Contact Poison Information Center (1-800-222-1222) for guidance or questions.

**ALS LEVEL 1:**
1. None

**ALS LEVEL 2:**
1. Additional treatment should be administered in the hospital.
2. Contact medical control or medical director for any questions or concerns
8.4 Special/Specific Exposure Situations
8.4.1 Closed Space Fire (Smoke Inhalation)

**Purpose:** These protocols are designed to guide the medics in caring for patients/victims in specific exposure settings such as a closed space fire. This type of setting can expose patients and fire/rescue personnel to harmful gases and chemicals and can be life threatening.

**Description:** Closed space fires produce many toxic substances, including cyanide, carbon monoxide, and numerous respiratory irritating gases. CYANIDE is one of the most rapidly acting poisons which can be found in the productions of combustion. Increasingly, cyanide has been recognized as a threat at the scene of a closed space fire and hazardous materials incidents. CO in combination with Cyanide rapidly removes the ability of the blood to transport oxygen. This combined with the severe swelling of the bronchioles and bronchospasms related to the exposure to respiratory irritants creates a patient that will rapidly decompensate. The mechanism of injury during a fire is three fold, Thermal damage, pulmonary irritation, and chemical asphyxiation (HCN, CO). Anyone exposed from a close space fire should be considered to have inhalation chemical asphyxiation.

**Criteria for use of this protocol:**

1. Patient pulled from a closed space fire that is unresponsive with evidence of smoke inhalation (soot in oral cavity, burns to face).

**Treatment:**

2. Remove patient/victim from dangerous environment
3. Immediately administer 100% oxygen if conscious, if unconscious secure airway to deliver 100% oxygen.
4. If airway compromised, preferably, perform endotracheal intubation and monitor end tidal CO2 (ETCO2).
5. Start IV of 1000 cc normal saline, age appropriate maintenance rate.
6. Treat unconscious patients per the [Altered Mental Status 2.5.1 Protocol in the Standing Medical Protocols](#) by evaluating glucose levels, correcting hypoglycemia, administering naloxone (Narcan®) and administering thiamine. As called for by local medical protocols.
7. **Hydroxocobalamin (CyanoKit)** 5 grams
   a. Start a dedicated IV line
   b. Reconstitute each 2.5 gram vial with 100 ml sodium chloride
   c. Invert or rock the vial. Do not shake.
   d. Administer 5 grams (both vials in the kit) at 15 ml/min.
   e. Repeat doses can be administered over 15 – 120 minutes
7. If hydroxocobalamin is not available, then give sodium thiosulfate 50ml of a 25% solution. Monitor BP.
Adult Haz Material Exposure
Chemical Burns to the Eyes

**Purpose:** This protocol will guide the medic in caring for a patient with an exposure of chemicals or other material to the eye(s)

**Protocol:**

**Note:** Watch water run-off so other parts of the body do not become contaminated (especially other parts of the face, ears, and back of neck). Eye burns are almost always associated with contamination of other parts of the face or body.

1. Immediately start eye irrigation by whatever means possible
2. Insure all particulate matter or contact lenses are out of the eyes by digitally opening the lids and pouring irrigation fluid across the globe
3. Prepare the Morgan Lens by attaching an IV solution of normal saline, insure that fluid continues to flow at steady rate
   a. Morgan Lens is not to used when trauma is observed to the eye (or if the eye has visible solid debris present that is not removed during the initial irrigation process) Foreign materials must be irrigated out of the eye before inserting a Morgan Lens)
   b. Contact lens that may have been adhered to the eye must remain without removal and Morgan Lens cannot be used.
4. Apply 1 to 2 drops of ponticaine, opthalmicaine or tetracaine Ophthalmic drops into the injured eye
5. Morgan lens cannot be used if trauma to the globe is observed or a contact lens is adhered to the eye.
6. If Morgan Lens cannot be used a nasal cannula can be used to irrigate the eyes. (If a nasal cannula is used the eyes must be held open digitally to effectively irrigate the eyes).
7. Adjust the flow so that a continuous solution is flowing from the eye
8. Continue irrigation until arrival at the emergency department.
9. Consider sedation to reduce anxiety
Bronchospasm Secondary to Toxic Inhalation

**DESCRIPTION:** Wheezing due to exposure of the respiratory system to an irritant. The condition of wheezing may be caused by both bronchospasms and bronchial swelling because of the inhalation of an irritating gas or vapor. To adequately treat this condition both bronchodilation and antiinflammation pharmaceuticals must be considered.

**TREATMENT:**
- a) Immediately give 100% humidified oxygen
- b) Initiate an updraft of either Atrovent or Proventil/Albuterol, 1 dose
- c) Consider high levels of steroids (Solu-medrol 125 mg IV) to decrease respiratory swelling.
- d) Wheezing due to exposure to fluorine or fluorine containing product follow Hydrofluoric Acid exposure protocol.
- e) Wheezing due to exposure to chlorine or chloramines follow chlorine and chloramine protocol.
8.4.2 Exposure to Bleach/Ammonia-(Chlorine and Chloramine)

**DESCRIPTION:** Chloramine gas is produced by the mixture of household bleach and household ammonia. Chloramine and Chlorine is an irritant that converts to hydrochloric acid in the lining of upper airway. Chloramine is toxic and flammable. The patient will typically complain of a burning sensation to the upper respiratory system, coughing, wheezing and hoarseness.

**TREATMENT:**
After the patient is removed from the atmosphere and appropriate decontamination is completed, give:

a) 100% oxygen via NRB mask

b) Assemble a nebulizer and administer 5 ml of sterile water

c) If burning persists, mix 2.5 ml pediatric strength bicarbonate solution (adult strength sodium bicarbonate can be use in half strength) with 2.5 ml of normal saline and administer the mixture (5 ml) through a nebulizer.

d) Consider high levels of steroids ([Solu-medrol 125 mg IV](#)) to decrease respiratory swelling
8.4.3 **Lacrimators (pepper spray)**

**DESCRIPTION:** The patient will usually present with severe burning of the eyes and nose, as well as congestion due to increased mucous production. Exam will find the patient suffering from increased tear production and blephrospasm.

**TREATMENT:**
Since the agent does not cause significant tissue damage the treatment is aimed at relieving the pain caused by nerve stimulation.

a) Initially determine the history of the injury. If a determination can be established that the pain is caused secondary to Capsicum Spray, the eyes should be immediately anesthetized.

b) Once it has been determined that the patient is not allergic to local anesthetics (“caine” derivatives), apply Tetracaine, Alcaine, or Opthalmacaine drops

c) When the blephrospasm is relieved, a visual exam is performed to evaluate for eye trauma

d) Consider and be prepared for anaphylactic reactions related to an exposure to lacrimators.

e) Assess for clear lung sounds and BP changes to insure that sensitivity has not occurred.