Leon County Emergency Medical Services & Tallahassee Fire Department

2016 Medical Protocols

Kim Landry, M.D., FACEP, FAAEM

Revised 2016 – Version II

911 Easterwood Drive
Tallahassee, FL 32311

Date of Implementation: March 15th, 2016

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(INSIDE COVER)

1. Administrative Guidelines
2. Adult Medical Protocols
3. Pediatric Medical Protocols
4. Procedure Protocols
5. Drug Reference
6. Appendix
7. Blank Forms
8. Hazardous Material

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1. Administrative Guidelines

1.1. General Issues for Paramedics and
- 1.1.1. Intent and Use of these protocols
- 1.1.2. Definitions
- 1.1.3. Documentation
- 1.1.4. Paramedic VS. EMT Attendant
- 1.1.5. EMT-B (BLS Crew) Responsibilities

1.2. General Patient Care Issues
- 1.2.1. General Guidelines for Treating Patients
- 1.2.2. Multiple Patients/Traumas
- 1.2.3. Special Considerations (IV, ETT, etc)
- 1.2.4. AMA / REFUSAL (Capacity to refuse) / DRY RUN CASES/
- 1.2.5. DNR / RESUSCITATION CONSIDERATIONS / DOA
- 1.2.6. A patient with a Living Will, Power of Attorney, Guardianship
- 1.2.7. Load and Go Situations
- 1.2.8. Transfers to Lower Acuity Settings
- 1.2.9. Involuntary Transport of Patients

1.3. Scene / Response Guidelines
- 1.3.1. Hospital Diversion / By-Pass
- 1.3.2. Aeromedical Evacuation (HELO)
- 1.3.3. Crime Scene Response
- 1.3.4. Hazardous Material Incidents
- 1.3.5. Orders From Transferring/Receiving Physicians
- 1.3.6. On-Scene Physicians
- 1.3.7. Standard Medical Communication
- 1.3.8. Communication Problems
- 1.3.9. Transportation Safety
- 1.3.10. Critical Care Inter-facility Transport
- 1.3.11. Trauma Transport Protocol for primary 911 service areas
- 1.3.12. TFD Paramedics Riding in with LCEMS (to the hospital)

1.4. Mass Casualty Incident
- 1.4.1. Mass Casualty Incident Response
- 1.4.2. Field Operations Guide

1.4.3. START and JumpSTART TRIAGE
1.5. Equipment Issues
1.5.1. Medical Equipment Failure
1.5.2. Minimum Equipment on Each Unit
_back to top

---

2. Adult Medical Protocols

2.1 Adult Initial Assessment and Management
2.1.1 Initial Assessment Protocol
2.1.2 Airway Management
2.1.3 Medical Supportive Care
2.1.4 Trauma Supportive Care
2.1.5 Pain Management

2.2 Adult Respiratory Emergencies
2.2.1 Airway - Obstruction
2.2.2 Asthma
2.2.3 COPD - Dyspnea
2.2.4 Pulmonary Edema - CHF
2.2.5 Suspected Pneumonia

2.3 Adult Cardiac Dysrhythmias (Cardiac Care: Universal Algorithm)
2.3.1 Asystole
2.3.2 Bradycardia
2.3.3 Narrow Complex Tachycardia (PSVT, Junctional, a-fib, a-flutter)
2.3.3.1.1 Stable A-fib and A-flutter
2.3.3.2 Unstable A-fib and A-flutter (narrow complex tachycardia)
2.3.4 Premature Ventricular Ectopy (PVCs)
2.3.5 Pulseless Electrical Activity (PEA)
2.3.6 Wide Complex Tachycardia with pulse (V-tach with pulse)
2.3.7 V-Fibrillation and Pulseless V-Tach

2.4 Other Adult Cardiac Emergencies
2.4.1 Cardiogenic Shock
2.4.2 Chest Pain Suspected Acute MI/Coronary Syndrome
2.4.3 Hypertensive Emergencies
2.4.4 Hypotension/Shock Unknown Cause
2.4.5 Left Ventricular Assist Devices

2.5 Adult Neurological / Psychological / Behavioral Emergencies
2.5.1 Altered Mental Status – Unknown Etiology
2.5.2 Behavioral/Violent and/or Impaired Patient
2.5.3 Excited Delirium
2.5.4 Seizure Disorders
2.5.5 Suspected CVA
2.5.6 Syncopal Episode

2.6 Adult Toxicology Emergencies
2.6.1 Bites and Stings
2.6.2 Toxicology (Drug Overdose and Poisoning)
2.6.3 Marine Envenomations

2.7 Adult OB/GYN Emergencies
2.7.1 Complications of Labor and Delivery
2.7.2 Normal Labor and Delivery
2.7.3 Non-Traumatic Vaginal Bleeding
2.7.4 Toxemia of Pregnancy (Eclampsia and Pre-Eclampsia)
2.7.5 Pre-Term Labor

2.8 Other Adult Medical Emergencies
2.8.1 Allergic Reactions/Anaphylaxis
2.8.2 Diabetic Emergencies
2.8.3 Non-Traumatic Abdominal Pain
2.8.4 Sickle Cell Anemia
2.8.5 Alcoholic Emergencies
2.8.6 Dehydration
2.8.7 Motion Sickness
2.8.8 Nausea/Vomiting
2.8.9 Hyperkalemia
2.8.10 Dystonic Reaction
2.8.11 Adrenal Insufficiency
2.8.12 Sepsis

2.9 Adult Environmental Emergencies
2.9.1 Barotrauma / Decompression Illness – Dive Injuries
2.9.2 Cold Related Emergencies
2.9.3 Heat Related Emergencies
2.9.4 Near Drowning
2.9.5 Electrical Injuries

2.10 Adult Trauma Emergencies
2.10.1 Head and Spine Injuries
2.10.2 Eye Injuries
2.10.3 Chest Trauma (Blunt and Penetrating)
2.10.4 Abdomino-Pelvic Injuries
2.10.5 Extremity Injuries
2.10.6 Burn Injuries
2.10.7 Dental Trauma
2.10.8 Sexual Assault
2.10.9 Taser / Stun Device Injuries
2.10.10 Crush Injuries

2.11 Adults with Special Health Care Needs
2.11.1 Home Mechanical Ventilators
2.11.2 Tracheostomy
2.11.3 Central Venous Lines
2.11.4 Feeding Tubes

Back to top

---

3. Pediatric Protocols

3.1 Pediatric Initial Assessments and Management
- 3.1.1 Initial Assessment
- 3.1.2 Airway Management
- 3.1.3 Medical Supportive Care
- 3.1.4 Trauma Supportive Care
- 3.1.5 Pain Management

3.2 Pediatric Respiratory Emergencies
- 3.2.1 Airway Obstruction
- 3.2.2 Upper Airway (Stridor/ Croup/Epiglottitis)
- 3.2.3 Lower Airway (Wheezing/ Asthma/ Bronchospasm)

3.3 Pediatric Cardiac Dysrhythmias
- 3.3.1 Asystole
- 3.3.2 Bradycardia
- 3.3.3 Narrow Complex Tachycardia (Unstable Sinus Tach/ Stable SVT, Unstable SVT)
- 3.3.4 Pulseless Electrical Activity (PEA)
- 3.3.5 Wide Complex Tachycardia with a Pulse (V-Tach) Stable and Unstable
- 3.3.6 Wide Complex Tachycardia without a Pulse (V-fib/ pulseless V-Tach)
- *** Peds V-Tach/V-Fib Algorithm

3.4 Newborn/ Infant Cardiopulmonary Arrest
- 3.4.1 Newborn Resuscitation
- 3.4.2 Sudden Infant Death Syndrome (SIDS)

3.5 Pediatric Neurologic Emergencies
- 3.5.1 Altered Level of Consciousness (Altered Mental Status)
- 3.5.2 Seizure Disorder

3.6 Pediatric Toxicology Emergencies
- 3.6.1 Pediatric Ingestion (Overdose)
- 3.6.2 Bites and Stings
- 3.6.3 Carbon Monoxide Poisoning
- 3.6.4 Organophosphate Poisoning

3.7 Pediatric Other Medical Emergencies
- 3.7.1 Allergic Reaction/ Anaphylaxis
- 3.7.2 Diabetic Emergencies
- 3.7.3 Non-Traumatic Abdominal Pain
- 3.7.4 Non-Traumatic Chest Pain
- 3.7.5 Violent and/or Impaired Patient
- 3.7.6 Suspected Child Abuse

3.7.7 Sickle Cell Anemia
3.7.8 Pediatric Fever
3.7.9 Peds Hyperkalemia
3.7.10 Peds Adrenal Insufficiency (see 2.8.11 Adrenal Insufficiency)

3.8 Pediatric Environmental Emergencies
3.8.1 Near Drowning
3.8.2 Heat Related Emergencies
3.8.3 Cold Related Emergencies
3.8.4 Barotraumas / Decompression Illness- Dive Injuries
3.8.5 Electrical Emergencies

3.9 Pediatric Trauma Emergencies
3.9.1 Head and Spine Injuries
3.9.2 Eye Injuries
3.9.3 Chest Injuries
3.9.4 Abdomino-Pelvic Injuries
3.9.5 Extremity Injuries
3.9.6 Traumatic Arrest
3.9.7 Burn Injuries

3.10 Pediatric with Special Healthcare Needs
3.10.1 Home Mechanical Ventilators
3.10.2 Tracheostomy
3.10.3 Central Venous Lines
3.10.4 Feeding Tubes
Back to top

---

4. Procedural Protocols

Perform only those procedures that you have been trained or in-serviced on. Universal precautions should be exercised on all procedures.

4.1 A.E.D. (Automated External Defibrillator)
4.2 Auto Pulse
4.3 Bag Valve Mask
4.4 Blood Alcohol Sampling
4.5 Broselow and Handtevy Tape
4.6 CANA (CONVULSANT ANTIDOTE for NERVE AGENT)
4.7 Cardiac Monitors
4.7.1 Lifepack 12 manual
4.7.2 Lifepack 15 manual
4.8 Cardioversion
4.9 Combitube placement
4.10 CPAP
4.11 CPR

4.12 Cyanokit
4.13 EMT Assisted Administration of Prescribed Medications
4.14 End Tidal CO_2 Monitoring
4.15 Epi-pen auto-injector
4.16 External Cardiac Pacing
4.17 EZ IO insertion
4.18 Fibrinolytic Screening Procedure
4.18.1 Fibrinolytic Inclusion/Exclusion Checklist
4.19 Foreign Body Obstructed Airway Procedure
4.20 Glucometer Procedure
4.21 Hare Traction Splint
4.22 Helmet Removal (Football Helmet and Shoulder Pads, Motorcycle)
4.23 IM and IN Medication Administration
4.24 Induced hypothermia
4.25 Indwelling Vascular Access Catheters
4.26 Intravenous (IV) Procedure
4.27 IV Pump
4.27.1 Alaris 3 Chamber IV Pump
4.28 KED (Kendrick Extrication Device)
4.29 King Airway
4.30 Lucas CPR System
4.31 Left Ventricular Assist Device (LVAD) Field Guide
4.32 Mark I Auto-Injector/ **DuoDote**
4.33 Morgan Therapeutic Lens
4.34 Nasogastric Tube Insertion
4.35 Nasotracheal Intubation
4.36 Nebulizer Treatment
4.37 Needle Cricothyroidotomy
4.38 Needle Decompression
4.39 Orotracheal Intubation via Direct Laryngoscopy
4.39.1 Gum Bougie
4.40 Physical Restraints
4.41 Pulse Oximetry
4.42 Rapid Sequence Induction (RSI)/ Use of Paralytic Agents
4.43 Rectal Medication Administration
4.44 Sager Traction Splint
4.45 SMART Airway Management
4.46 Spinal Immobilization/Spinal Immobilization Clearance
4.46.1 Spinal Clearance Flow Chart
4.47 Suctioning of patients
4.48 Surgical Cricothyroidotomy
4.49 Twelve (12) Lead EKG procedure
4.50 Tetanus Immunization
4.51 Tourniquet Application
4.52 Vagal Maneuvers
4.53 Ventilator Assist procedure
4.54 Ventilator Manuals

4.54.1 Allied 300
4.54.2 Eagle Vent (Univent)
4.54.3 LTV
4.54.4 NewPort
4.54.5 Revel

Back to top

---

5. Quick Drug Reference

5.1 Medical Protocol Drugs

5.1.1 Adenosine / (Adenocard)
5.1.2 Acetaminophen (Tylenol)
5.1.3 Activated Charcoal
5.1.4 Albuterol / (Albuterol, Proventil)
5.1.5 Amiodarone/ (Cordarone)
5.1.6 Aspirin
5.1.7 Atropine Sulfate for cardiac use
5.1.8 Atropine Sulfate as antidote for poisoning
5.1.9 Calcium Chloride
5.1.10 Clonidine/ (Catapress)
5.1.11 D10W/ (Dextrose 10%)
5.1.12 Diazepam/ (Valium)
5.1.13 Dilaudid (Hydromorphone)
5.1.14 Diltiazem/(Cardizem)
5.1.15 Diphenhydramine /(Benadryl)
5.1.16 Dopamine Hydrochloride/ (Intropin)
5.1.17 Epinephrine 1:1,000
5.1.18 Epinephrine 1:10,000
5.1.19 Etomidate / (Amidate)
5.1.20 Fentanyl (Sublimaze)
5.1.21 Furosemide / (Lasix)
5.1.22 Glucagon/(Glucagen)
5.1.23 Haldol (Haloperidol)
5.1.24 Ipratropium Bromide/ (Atrovent)
5.1.25 Ketamine/ (Ketalar)
5.1.26 Ketorolac /(Toradol)
5.1.27 Labetalol /(Trandate, Normodyne)
5.1.28 Lorazepam/(Ativan)
5.1.29 Lidocaine Hydrochloride/ (Xylocaine) Bolus
5.1.30 Lidocaine Hydrochloride /(Xylocaine) Drip
5.1.31 Magnesium Sulfate
5.1.32 Metaclopramide/ (Reglan)
5.1.33 Methylprednisolone Sodium Succinate /(Solu-Medrol)
5.1.34 Midazolam/ (Versed)

5.1.35 Morphine Sulfate
5.1.36 Naloxone Hydrochloride /(Narcan)
5.1.37 Nitroglycerine/ (Nitrostat, Nitrolinqual Spray)
5.1.38 Nitroglycerine/(Nitro-Bid Ointment)
5.1.39 Norepinephrine (Levophed)
5.1.40 Ondansetron/ (Zofran)
5.1.41 Procainamide Hydrochloride/(Pronestyl)
5.1.42 Promethazine/ (Phenergan)
5.1.43 Ranitidine (Zantac)
5.1.44 Rocuronium/ (Zemuron®) For AUTHORIZED SERVICES ONLY
5.1.45 Sodium Bicarbonate 8.4% and 4.2%
5.1.46 Succinylcholine /(Anectine): For AUTHORIZED SERVICES ONLY
5.1.47 Tetracaine Hydrochloride 0.5% Ophthalmic Drops
5.1.48 *Reserved for later use*
5.1.49 Terbutaline (Brethine)
5.1.50 Vasopressin
5.1.51 Vecuronium (Norcuron) For AUTHORIZED SERVICES ONLY
5.1.52 Verapamil
5.1.53

5.2 HAZARDOUS EXPOUSRE/ HAZ-MAT DRUGS:

5.2.1 Amyl Nitrate
5.2.2 CANA KIT (Diazepam) KIT (Hazardous Material-WMD Only)
5.2.3 Cyanokit
5.2.4 MARK 1 KIT (Atropine and 2-PAM)
5.2.5 Methylene Blue
5.2.6 Sodium Nitrite
5.2.7 Sodium Thiosulfate

Back to top

---

6. Appendix

6.1. Abdominal Pain Differential
6.2. Apgar score
6.3 Approved Medical Abbreviations
6.4 Burn Patient: Rule of Nines
6.5 Burn Patient: Severity Categorization
6.6 Conversion Table of Measurements
6.7 Chest Pain Differential
6.8 GLASGOW COMA SCALE
6.9 Pediatric Glasgow Coma Scale
6.10 IV Drip Calculations (Dopamine 400mg, Epi 1:10,000, Lidocaine 1gm, Mg Sulfate 4gm, Nitro 5mg, Procainamide 1gm, Amiodarone 150 mg)
Additional Drip Charts:
Amiodarone IV Drip Chart 450 mg
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
Lidocaine 2 gms
Milrinon-Primacor 20 mg
Natrecor
Nicardipine (Cardene) 25 mg
Nipride 100 mg
Nitroglycerine 50 mg
Phenylepherine_Neosynephrine 10 mg
Procainamide 4 gms
Propofol_Diprovan 10mg/ml
6.11 Pediatric Vital Signs
6.12 Oxygen Cylinder Duration Calculation
6.13 Oxygen Tolerance in COPD
6.14 Report of Abuse
6.15 Signs of Child Abuse
6.16 Sudden Infant Death Syndrome (SIDS)
6.17 Toxidromes
6.18 Recommended Guidelines for Occupational Exposures to Infectious Disease
6.19 Infectious Exposure Reference Sheet
6.20 Trauma Alert Criteria (Adult)
6.20.1 Trauma Alert Criteria (Adult) Florida
6.20.2 CDC Trauma Alert Criteria
6.21 Trauma Alert Criteria (Pediatric)
6.22 Ventilator Setting Support Document
6.23 QA Process Overview

Back to top

---

7. Blank Forms

7.1.1. Chest Pain Protocol Checklist
7.1.2. Dive History/Profile
7.1.3. Dive Accident – Signs and Symptoms
7.1.4. Dive Accident – Rapid Field Neuro Exam Record
7.1.5. FIBRINOLYTIC INCLUSION/EXCLUSION CHECKLIST

7.1.6. Hospital Diversion Form
7.1.7. Stroke Protocol Checklist
7.1.8. QA001 Daily Quality Assurance/ Quality Improvement Checklist
7.1.9. QA002 Quality Management Run Report Follow-up Form
7.1.10. QA004 -Daily Paramedic Skills Sheet (to be completed at end of shift)
7.1.11. QA005 – Monthly Medic Skill Sheet Tracker
7.1.12. QA006 Runs Forwarded to Medical Director
7.1.13. QA007 Medics with Multiple Returned Reports in Two or More Consecutive Months
7.1.14. QA008 Random Sample Documentation Evaluation
7.1.15. REQUEST FOR PROTOCOL UPDATE
7.1.16. INFECTIOUS DISEASE EXPOSURE REPORT FORM
7.1.17. EMPLOYER'S EXPOSURE INFORMATION FORM
7.1.18. Ventilator Management Flow Sheet

Back to top

---

8. Hazardous Material Exposure

8.1 Hazardous Material Exposure (CHEMICALS)

8.1.1 Acids and Acid Mist
8.1.2 Alkaline Compounds
8.1.3 Ammonia (Liquid and Gas)
8.1.4 Aromatic Hydrocarbons (Benzene, Toluene, Xylene), Ketones
8.1.5 Arsenic Compounds (or Heavy Metal Poisoning)
8.1.6 Carbamate Insecticide Poisoning
8.1.7 Carbon Monoxide Poisoning
8.1.8 Chlorinated Hydrocarbons (Methylene Chloride)
8.1.9 Chlorine Gas and Phosgene (CG)
8.1.10 Cyanide- Hydrogen Cyanide, Hydrocyanic Acid (AC), Cyanogen Chloride (CK), Potassium Cyanide, Sodium Cyanide
8.1.11 Dinitrobenzene (D.N.B.)
8.1.12 Ethylene Glycol
8.1.13 Hydrofluoric Acid (HF)
8.1.14 Hydrogen Sulfide, Sulfides and Mercaptans
8.1.15 Methanol
8.1.16 Methylene Biphenyl Isocyanate, Ethyl Isocyanate, Methylene Dilsocyanate (MDI)
8.1.17 Mustard (Sulfur Mustard), Lewisite, Blister Agents (H, HD, HS)
8.1.18 Nitrogen Products and other products causing Methemoglobinemia
8.1.19 Organophosphate Insecticide Poisoning and Nerve Agents (GA, GB, GD, GF, VX)
8.1.20 Phenol (Carbolic Acid)
8.1.21 Phosphine
8.1. G Chemical Treatment Guide Index
8.1. G1 Chemical Treatment Guide 1: YELLOW
8.1. G2 Chemical Treatment Guide 2: BLUE

8.1. G3 Chemical Treatment Guide 3: GRAY
8.1. G4 Chemical Treatment Guide 4: GREEN
8.1. G5 Chemical Treatment Guide 5: RED
8.1. G6 Chemical Treatment Guide 6: PINK
8.1. G7 Chemical Treatment Guide 7: ORANGE
8.1. G8 Chemical Treatment Guide 8: PURPLE
8.1. G9 Chemical Treatment Guide 9 WHITE

8.2 Adult Hazardous Material Exposure (BIOLOGICAL AGENTS)

8.2.1 Anthrax
8.2.2 Botulism
8.2.3 Cholera
8.2.4 Plaque
8.2.5 Q Fever
8.2.6 Ricin
8.2.7 Smallpox
8.2.8 Staphylococcal Enterotoxin B
8.2.9 Trichothecene Mycotoxin (T2)
8.2.10 Tularemia
8.2.11 Venezuelan Equine Encephalitis (VEE)
8.2.12 Viral Hemorrhagic Fevers

8.3 Adult Hazardous Material Exposure (RADIOLOGICAL AGENTS)

8.3.1 Radiation Exposure / Contamination
8.3.2 Acute Radiation Syndrome

8.4 Special/Specific Exposure Situations

8.4.1 Closed Space Fire (Smoke inhalation)
8.4.2 Chemical Burns to he Eyes
8.4.3 Bronchospasm Secondary to Toxic Inhalation
8.4.4 Exposure to Bleach/Ammonia-(Chlorine and Chloramine)
8.4.5 Lacrimators (pepper spray)

Return to: Contents at top Hazardous Material Incident HazMat Drugs Burn Injuries

Chemical Name or Group Name:	Treatment Guide:
Acids & Acid Mist	**Guide 1- Yellow**
Alkaline Compounds	**Guide 1- Yellow**
Ammonia (Liquid & Gas)	**Guide 1- Yellow**
Aromatic Hydrocarbons (Benzene, Toluene, Xylene)	**Guide 2-**
Arsenic Compounds (or Heavy Metal Poisoning)	**Guide 2-**
Blister Agents (H, HD, HS)	**Guide 1- Yellow**
Carbamate-Insecticide Poisoning	**Guide 4- Green**
Carbon Monoxide Poisoning	**Guide 2-**
Chlorinated Hydrocarbons (Methylene Chloride)	**Guide 2-**
Chlorine Gas	**Guide 1- Yellow**

Cyanide	**Guide 5- Red**
Cyanogen Chloride (CK)	**Guide 5- Red**
Methylene Biphenyl Isocyanate	**Guide 1- Yellow**
Dinitrobenzene (D.N.B.)	**Guide 3- Gray**
Ethylene Glycol	**Guide 6- Pink**
Ethyl Isocyanate	**Guide 1- Yellow**
Hydrocyanic Acid (AC)	**Guide 5- Red**
Hydrogen Cyanide	**Guide 5- Red**
Hydrofluoric Acid (HF)	**Guide 7- Orange**
Hydrogen Sulfide, Sulfides	**Guide 5- Red**
Ketones	**Guide 2- Blue**
Lewisite	**Guide 1- Yellow**
Mercaptans	**Guide 5- Red**
Methanol	**Guide 6- Pink**
Methylene Biphenyl Isoyanate	**Guide 1- Yellow**
Methylene Dilsocyanate (MDI)	**Guide 1- Yellow**
Mustard (Sulfur Mustard)	**Guide 1- Yellow**
Nerve Agents (GA, GB, GD, GF, VX)	**Guide 4- Green**
Nitrogen Products and Other Products Causing Methemoglobinemia	**Guide 3- Gray**
Organophosphate Insecticide Poisoning	**Guide 4- Green**
Phenol (Carbolic Acid)	**Guide 9- White**
Phosgene (CG)	**Guide 1- Yellow**
Phosphine	**Guide 8- Purple**
Potassium Cyanide	**Guide 5- Red**
Sodium Cyanide	**Guide 5- Red**
Sulfur Mustard (Mustard)	**Guide 1- Yellow**

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs

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Return to: Contents at top

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 LCEMS protocols and identify any restrictions.

Policy:

1. The following medical protocols are to be used by LCEMS/TFD Medical Personnel including, EMTs and Paramedics
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 LCEMS/TFD 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 LCEMS/TFD
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), EMT-A and 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 who successfully completed an IV course and signed off by a field training officer or supervisor, can start and monitor an unmedicated IV not established in the field.**
    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. 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.

Return to: Contents at top Admin Guidelines

1.1.2 Definitions:

1. **Advanced (Critical Care) Paramedic -** Person currently certified as an EMT-Paramedic by the Department of Health who has completed an approved Critical Care Transport course 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 Critical Care Protocol 1.3.10 which entails the services of critical care trained paramedics or nurses when available. 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 or nurse, the care of a patient during transport. This type of transport may also require additional manpower to manage patient during transit. Additional protocols for the transport of critical care patients are found in the LCEMS Critical Care Transport Protocol Book.
8. **CX/Cancelled Calls**: 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. See AMA / REFUSAL (Capacity to refuse) / DRY RUN CASES protocol for further.

9. **EMT-B** - Person currently certified as an EMT-Basic by the Department of Health and/or the National Registry for EMTs (NREMT).
10. **EMT-P** - Person currently registered as an EMT-Paramedic by the Department of Health and/or the National Registry for EMTs (NREMT).
11. **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.
12. **Healthcare Surrogate**: see power of attorney below
13. **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).
14. **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.
15. **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.
16. **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.
17. **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 and/or nurses in caring for patients on ventilators.
18. **Standing orders** - Advanced life support interventions, which may be undertaken before contacting on line medical control.

Return to: Contents at top Admin Guidelines

1.1.3 Documentation:

Purpose: To establish that all patients' evaluated/treated/transported by LCEMS/TFD 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 thourogh 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 on-going care from subsequent care givers
- If it's not documented, you didn't do it

Policy:

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

2. A thorough and complete chart is to be written or computer generated on all patients transported by LCEMS/TFD.
   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.
         1. 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 injures).

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 as described later in protocol 1.1.4.
n. It is imperative to document well on all patients who refuse transport and/or treatment

3. Other Key Documentation Tips:
   a. Include patient and witnesses statements (when available)
   b. Any unusual occurrences that occurred on scene or while in transit
   c. For patients with extremity injury, neurovascular status must be noted before and after immobilization.
   d. For patients with spinal immobilization, document motor function before/after spinal immobilization.
   e. For IV administration, the catheter size, site, number of attempts, type of fluid, and flow rate should be documented.
   f. Any requested orders, whether approved or denied, should be documented clearly.
   g. Any wasted narcotics should include the quantity wasted, where wasted, and name of the person who witnessed the waste.
   h. A brief description of the reason the the patient is being transported to the skilled nursing facility are 2nd hospital. What specific services or not available at the 1st hospital.

i. 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.

j. Only approved medical abbreviations may be used. See Approved Abbreviations

k. EKGs/monitor strips should be attached to the run report or made available for review with the run report.

l. All run reports are subjected to review by LCEMS/TFD Quality Assurance Personnel and the Medical Director as described later in 1.1.4.

m. It is imperative to document well on all patients who refuse transport and/or treatment

4. 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?

   b. ***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
xiv. Oxygen regulation: **MUST NOTE IF PATIENT IS INCAPABLE OF SELF ADMINISTERING OF O2**. You must document what prevented patient from self monitoring their own oxygen.
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. What medical functionality or benefit does the specialty chair offer the patient? 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 Inter-facilty transfer
iii. EKG Strips
iv. Hospital face sheet.
v. H&P
vi. Physical Therapy report

Return to: Contents at top Admin Guidelines

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, 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 are to provide patient care (in patient compartment of the ambulance) on ALL emergency inter-facility transports. The paramedic on scene shall conduct a detailed physical assessment and subjective interview with the patient to determine, a chief complaint and level of distress.

Return to: Contents at top Admin Guidelines

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**: (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, (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

Return to: Contents at top Admin Guidelines Param vs EMT protocol Chest Pain Proto

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. <u>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.</u>
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 MEDCIAL 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.
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 2010 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 Ox > 94%.
    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.

Return to: Contents at top Admin Guidelines Gen Patient Care Issues index

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 (see MCI Protocol for local service area.)

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

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 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. 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.
   d. All pediatric peripheral IVs should be started with a minidrip administration set.
   e. 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) using the most sterile technique possible is permitted in patients where peripheral IV attempts have been unsuccessful or are impractical 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 (Huber). Do not attempt access if you do not have the special needles that are required and/or if you are unfamiliar with this technique.
   f. 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 accessable, give fluids and/or medication via an I/O which can be placed at the time it is needed.
   g. Dial-a-flows are not to be used in lieu of an IV Pump unless approved by medical director
   h. Each IV bag 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

i. 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.
   ii. If by fixed wing air: All medication drips and IV fluids are to be on an IV pump.
j. For pre-hospital scene calls:
   i. All 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 to control the rate. If time permits, place the Lidocaine drip on a pump.
k. 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.

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

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.
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. That EMS should be requested again if necessary or desired. Encourage them to call again if they should worsen or change their mind about being transported
    d. They should follow up with their primary care MD as soon as possible.
    Have appropriate "Refusal of Care" form signed and witnessed.
9. Cancelled:

    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, No Obvious Injuries, (AOx4, and does not meet definition of a patient).

THE CANCELLATION 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, AN INDIVIDUAL REFUSING CARE THAT WAS REQUESTED BY A THIRD-PARTY CALLER (i.e, family member, law enforcement, etc), WHO HAS NO OBVIOUS INJURIES OR ILLNESS REQUIRING TREATMENT, AND WHO IS FULLY ALERT AND ORIENTED 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.

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index Definitions

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 med 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 any four (4) of the following are present:
      i. Vital signs absent
      ii. Pupils fixed and dilated
      iii. Advanced age and/or general physical condition of the patient would indicate no resuscitative measures should be taken.
      iv. The length of time in arrest with no resuscitative measures is longer than compatible with life
      v. No independent influences are evident such as drugs or cold
      vi. 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 CPR.

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 in the field if:
   a. A patient remains in asystole in three leads after twenty minutes despite being properly intubated, ventilated, and given several rounds of ACLS drugs (epinephrine), discontinue 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.

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index Asystole Proto Newborn Sids Pediatric Traumatic Arrest

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.

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index Definitions

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 you must consider 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

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

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.

Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

1.2.9 Involuntary Transports of Patients

Purpose:

This protocol-administrative guideline describes the legal options that are available to EMS for provision of involuntary care and the issues in safety and resources to utilize in cases of involuntary care. It also discusses specifics regarding intoxicated patients placed under protective custody (Marchman Act).

Background:

Patients contacted by EMS have the ability to refuse evaluation, treatment and transport if:

1) The person is making their decision with clear knowledge of the potential risks of refusing (evaluation, treatment, transport or our recommended destination) and

2) The person is mentally competent to do so.

In those cases where a patient cannot meet the above criteria, it will be necessary to provide care for the patient without their consent.

Legal Options for Involuntary Care:

There are three legal provisions for EMS to care for patients against their wishes:

1) Marchman Act

2) Baker Act

3) Chapter 401

The **Marchman Act** (Ch. 397) serves as a legal tool that allows transport of persons to a hospital or appropriate treatment resource who are impaired in a public place and appear to be incapacitated.

The **Baker Act** (Ch. 394.451) serves as a mechanism to provide care to persons whose behavior poses a potential threat to themselves or others or who are unable to competently make their own healthcare decisions due to mental illnesses. Falling into this category would be cases such as suicide attempts/gestures and severe schizophrenia.

Chapter 401 (Ch. 401.445) is a mechanism to provide care to persons who lack the capacity to make their own healthcare decisions due to situations other than those addressed by the Baker or Marchman Acts. Falling into this category would be situations such as altered levels of mentation from trauma, hypotension, hypoglycemia, CVA, and/or post-ictal seizures. Crews should consult with on-line medical control for questions regarding this option.

Procedure - Safety and Resources for Use in Involuntary Transports:

A fundamental principle in EMS is that the safety of field crews comes first. Law enforcement assistance should be summoned for protection of both the crew and the patient. With their specific training and expertise in restraint techniques, law enforcement is well prepared to deal with such issues. It will be helpful to let them know which legal mechanism appears to EMS to be most applicable to the particular situation at hand (Marchman Act, Baker Act or Chapter 401).

In the event that law enforcement summons EMS in order to assist them in determining the best course of action for the patient following an EMS evaluation, the following guidelines should be followed:

- Evaluate the patient per appropriate protocol, to include a full set of vital signs and blood glucose reading.

- Determine if the patient has any medical complaints that would require on-going care in transit to the hospital, jail, or psychiatric receiving facility. These could include, but are not limited to: vomiting, overdose of medications, AMS, potential for airway compromise, or traumatic injury requiring further evaluation.
- Any patient with a medical complaint should be transported to the hospital by EMS and treated according to the appropriate protocol. Law Enforcement should accompany the patient to the hospital in the ambulance, unless the crew determines the transport can be completed safely with Law Enforcement following the ambulance to the hospital. IF A PATIENT IS HANDCUFFED, AN OFFICER MUST RIDE IN THE BACK WITH THE PAIENT OR A KEY MUST REMAIN WITH THE CREW FOR THE DURATION OF THE TRANSPORT.
- For subjects lacking an apparent medical complaint, particularly those under a Baker or Marchman Act, it is most appropriate for law enforcement to transport the subject to the nearest appropriate facility. A report should be called to the on-duty supervisor and recorded on the radio, as is practice for all non-transports, prior to the subject's departure from the scene.
- If Law Enforcement is not comfortable transporting the subject, EMS will transport the subject to the closest appropriate hospital, however, Law Enforcement will still be required to accompany the subject to the hospital as outlined above.
- EMS personnel should not accept Baker Act or Marchman Act paperwork from law enforcement to transport the subject to the hospital without them. Law enforcement must handle all Baker Act and Marchman Act paperwork with the receiving facility.

BACKGROUND INFO ON FLORIDA MARCHMAN ACT

The Marchman Act (Chapter 397) concerns the detention and treatment of persons found incapacitated and impaired in public places. Impaired or substance abuse impaired means a condition involving the use of alcoholic beverages or any psychoactive or mood altering substance in such a manner as to induce mental, emotional, or physical problems and causes socially dysfunctional behavior.

Special Note: The information presented in this section of the protocol is selected information from Florida Statutes, Chapter 397. Any additional questions to legal reference(s) made in your management of patient care should be through On-Line Medical Control.

Description:

Chapter 397

1 397.675 Criteria for involuntary admissions, including protective custody, emergency admission, and other involuntary assessment, involuntary treatment, and alternative involuntary assessment for minors, for purpose of assessment and stabilization, and for involuntary treatment:

A person meets the criteria for involuntary admission if there is good faith reason to believe the person is substance abuse impaired and because of such impairment:

a) Has lost the power of self-control with respect to substance use; and either:

b) (i) Has inflicted, or threatened or attempted to inflict, or unless admitted is likely to inflict,
physical harm on himself or herself or another;

c) (ii) Is in need of substance abuse services and, by reason of substance abuse impairment,
his or her judgment has been so impaired that the person is incapable of appreciating his or
her need for services and of making a rational decision in regard thereto: however, mere refusal to receive such services does not constitute evidence of lack of judgment with respect to his or her need for such services.

2 397.6759 Parental participation in treatment
A parent, legal guardian, or legal custodian who seeks involuntary admission of a minor pursuant to ss. 397.675-397.6977 is required to participate in all aspects of treatment as determined appropriate by the director of the licensed service provider.

3 397.677 Protective custody, circumstances justifying
A law enforcement officer may implement protective custody as specified in this part when a minor or an adult who appears to meet the involuntary admission criteria in s. 397.675 is:
a) Brought to the attention of law enforcement; or
b) In a public place.

4 397.6771 Protective custody with consent
A person in circumstances which justify protective custody, as described in s. 397.677, may
consent to be assisted by a law enforcement officer to his or her home, to a hospital, or licensed detoxification or addictions receiving facility, whichever the officer determines is most appropriate.

5 397.6772 Protective custody without consent
a) If a person, in circumstances which justify protective custody as described in s. 397.677, fails or refuses to consent to assistance and a law enforcement officer has determined that a hospital or a licensed detoxification or addictions receiving facility is

the most appropriate place for the person, the officer may, after giving due consideration to the expressed wishes of the person:

i) Take the person to a hospital or to a licensed detoxification or addictions receiving facility against the person's will but without using unreasonable force; or

ii) In the case of an adult, detain the person for his or her own protection in any municipal or county jail or other appropriate detention facility.

ii) Such detention is not to be considered an arrest for any purpose, and no entry or other record may be made to indicate that the person has been detained or charged with any crime. The officer in charge of the detention facility must notify the nearest appropriate licensed service provider within the first 8 hours after the person has been detained. It is the duty of the detention facility to arrange, as necessary, for transportation of the person to an appropriate licensed service provider with an available bed. Persons taken into protective custody must be assessed by the attending physician within the 72-hour period and without unnecessary delay to determine the need for further services.

b) The nearest relative of a minor in protective custody must be notified by the law enforcement officer, as must the nearest relative of an adult, unless the adult requests that there be no notification.

6 397.6774 Department to maintain lists of licensed facilities

The department shall provide each municipal and county public safety office with a list of licensed hospitals, detoxification facilities, and addictions receiving facilities, including the name, address, and phone number of, and the services offered by, the licensed service provider.

7 397.6775 Immunity from liability

A law enforcement officer acting in good faith pursuant to this part may not be held criminally or civilly liable for false imprisonment.

8 397.701 Local ordinances affecting impairment and public impairment offenses forbidden

A county, municipality, or other political subdivision of the state may not, except pursuant to the provisions of s. 397.702, adopt a local law, ordinance, resolution, or regulation having the force of law which provides that impairment in public in and of itself, or being found in enumerated places in an impaired condition, is an offense, a violation, or subject of civil or criminal sanctions or penalties of any kind. This section does not affect offenses involving the operation of motor vehicles, machinery, or other hazardous equipment.

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 CATAGORIES

   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.
      3. Unstable Chest pain.
      4. Hypothermia.
      5. Altered mental status unresponsive to Dextrose 50% Water.
      6. Status epilepticus.
      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.

Return to: Contents at top Admin Guidelines Scene response index

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 thrombolytics 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.
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)?
    a. I.E. by history; patient with an abdominal aortic aneurysm having sudden severe abdominal pain (leaking/ruptured aneurysm). A pregnant female with sudden severe lower abdominal pain (ruptured ectopic).
    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 aero medical transport should be utilized (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.
2. 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.
3. 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.
4. 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.
5. 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.

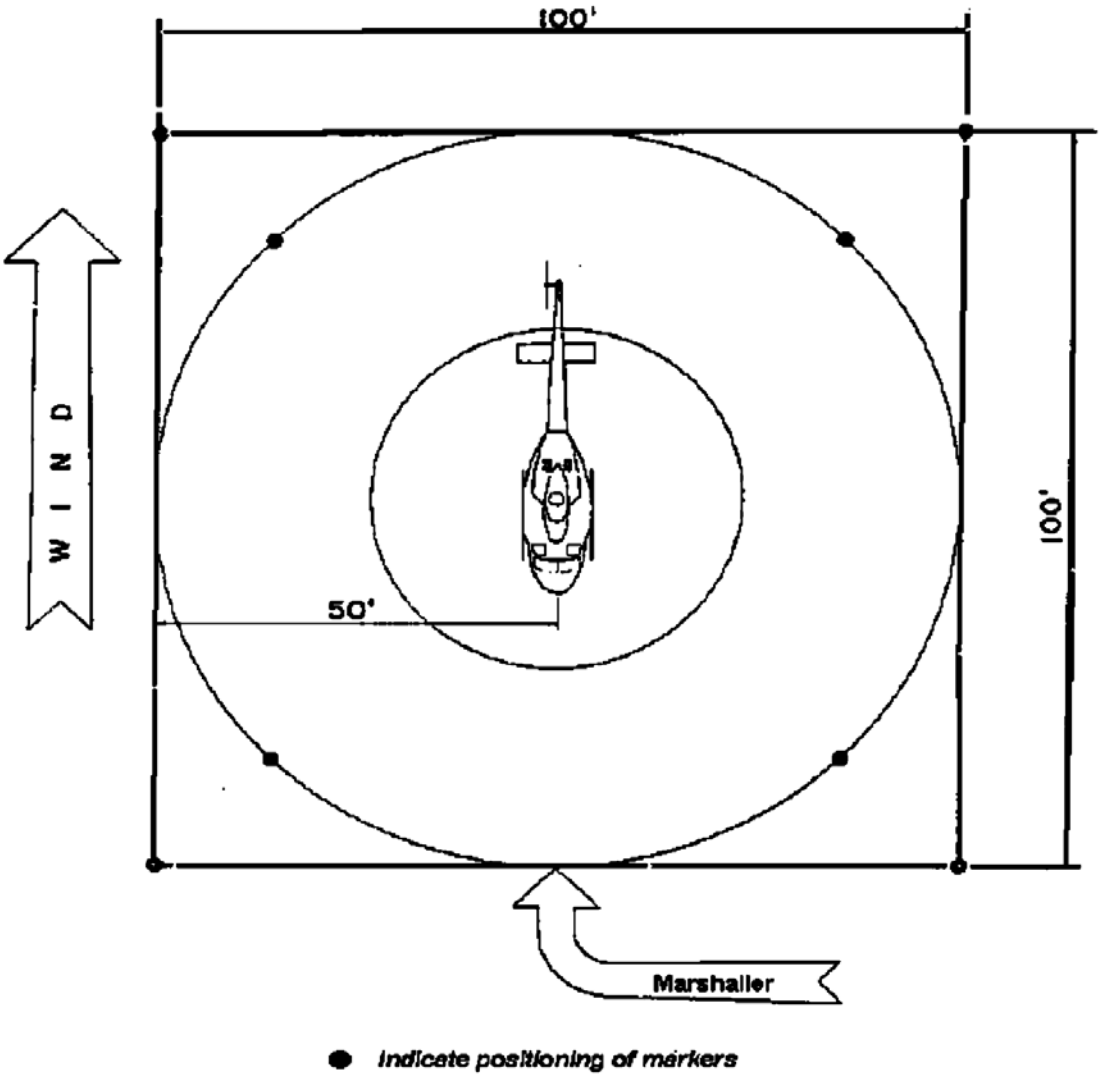
From time of request by field unit:

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

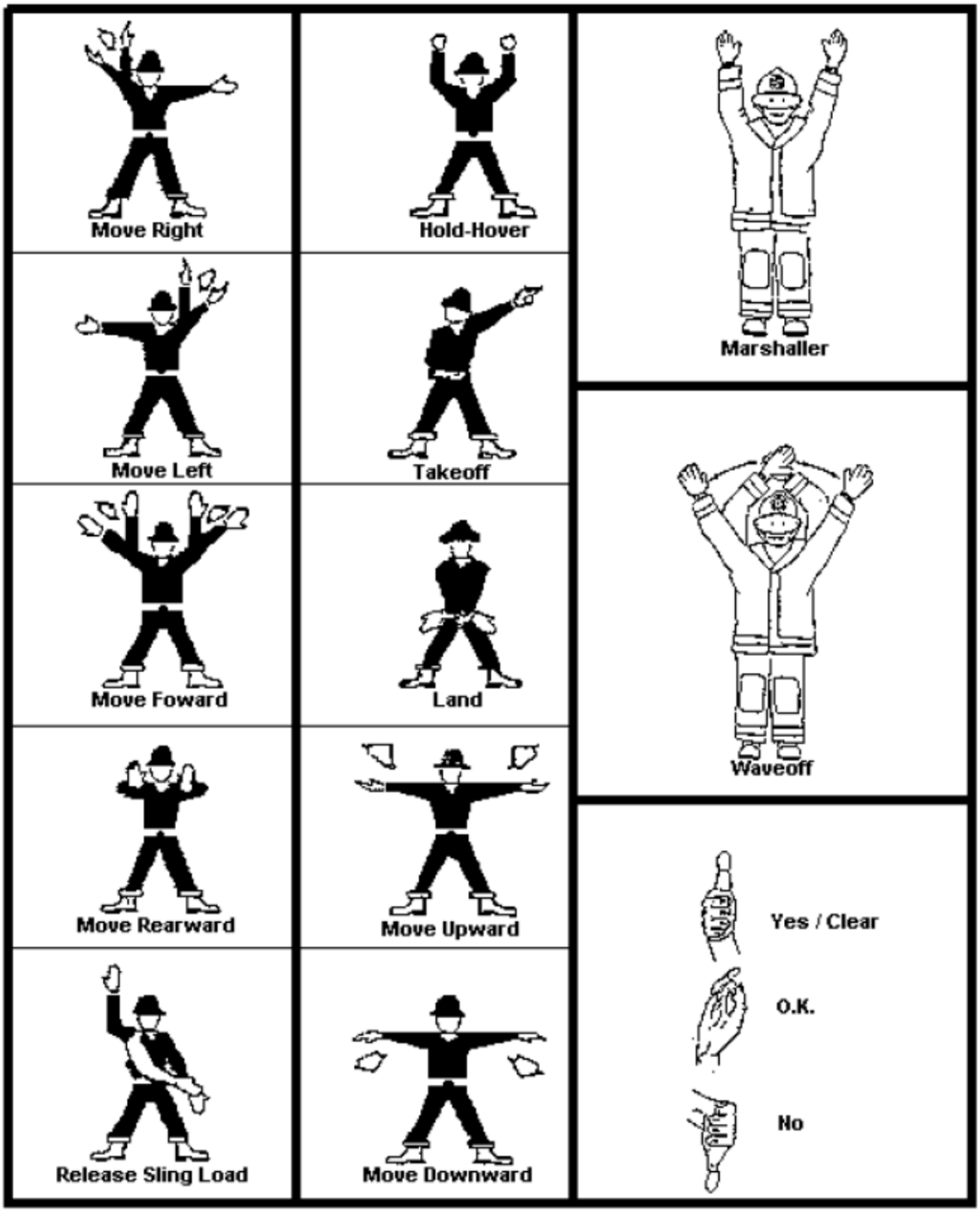
Return to: Contents at top Admin Guidelines Scene response index

Landing Zone Criteria



Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

Review your Marshalling signals:



Return to: Contents at top Admin Guidelines Gen Pt Care Issues index

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.
9. Avoid disturbing possible tire tracks or footprints, and avoid blood on any environmental surfaces.
10. Do not disturb items present on the scene unless absolutely necessary.
11. Do not cut or treat through holes made by projectiles or other objects in clothing. Begin cutting at another part of the garment. Removed clothing should be left with the patient or turned over to law enforcement personnel.
12. Remove any medical items brought into the scene.
13. 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.

14. 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.
15. 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.
16. 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.
17. 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 HIPAA laws.
18. If a scene appears suspicious, then await the arrival of law enforcement personnel before approaching.
19. 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.

Return to: Contents at top Admin Guidelines Scene response index

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.

a. 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.
b. 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):
    a. Utilize a cautionary approach at all times.
    b. The reported location may be inaccurate and response into contaminated area might occur.
    c. 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
    d. Position vehicle well away from problem and headed away from the incident.
    e. Communicate your actions or intended actions with EMS dispatch.
    f. 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:
    a. If first-in responder, confirm that fire and police have been notified.
    b. 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.
    c. If you are the first-in responder, first priority is scene isolation. KEEP OTHERS AWAY! KEEP UNNECESSARY EQUIPMENT FROM BECOMING CONTAMINATED.
    d. If you believe that you or your vehicle is contaminated, stage in an isolated area.
3. Person in Charge (PIC)
    a. 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.
    b. The EMT/P will direct all patient care.
    c. The EMT/P, in concert with the incident commander, will determine the method of transport of the exposed patient(s) (air vs. ground)
    d. 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.

Return to: Contents at top Admin Guidelines Scene response index

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.

Return to: Contents at top Admin Guidelines Scene response index

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.

Return to: Contents at top Admin Guidelines Scene response index

1.3.7 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 LCEMS/TFD, 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 employees or mutual aid attending 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. Location of vehicle, including description of scene (if on site) and estimated time of arrival to the destination facility.

C. Patient data
   1. Patient Acuity Designator (Medical/Trauma: Red, Yellow, Green)
   2. Patient's age, sex, and chief complaint
   3. Brief history of the present illness; include past medical history, medications, and allergies only if relevant to the chief complaint.
   4. Vital signs (to include pulse, respiratory rate and depth, blood pressure, cardiac rhythm, and oxyhemoglobin saturation as appropriate).
   5. General appearance (including level of consciousness) and pertinent physical findings.
   6. Care in progress.
   7. Request for orders (if applicable) 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 On-duty Supervisor will assess the situation and try to resolve the issue with the hospital staff.
   As a last resort, LCEMS/TFD (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.

Return to: Contents at top Admin Guidelines Scene response index

1.3.8 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 will be pulled for review by the medical director. Following review, the medical director indicating retroactive approval will sign the record.

Return to: Contents at top Admin Guidelines Scene response index

1.3.9 Transportation Safety

Purpose: Define the Department's policy/procedure on the safe transportation of crew, patients, and passengers.

Procedure:

A. All persons in a moving ambulance shall be buckled in seat belts or restrained in some other approved fashion. Exception to this rule include the personnel who are attending to patient(s); and the extremely obese patient who exceeds the size or weight limits of our equipment, and is unable to be restrained. All exceptions to this policy/procedure must be thoroughly documented.
B. Always provide optimal care to all patients and make the best use of available resources.
C. Never leave a patient unattended in an ambulance.
D. Follow the Trauma Transport Protocols regarding multiple patients and calling for additional resources.
E. Ensure that all occupants are properly restrained, and all equipment, supplies, and patient belongings are secured prior to putting the ambulance in motion.
F. Personnel should use the "three point" method (e.g. feet on floor and one hand holding a secure point) to move around the ambulance when the ambulance is in motion.
G. The attendant is encouraged to remain in a seat belt as often as possible.
H. EMTs, Paramedic students or any other third riders shall remain in a seat belt unless they are directly attending to the patient(s).
I. Only one person may ride in the cab with the driver as long as they are restrained.

Restraining patients:

A. Stretcher patients shall be secured with a minimum of three straps. In addition, shoulder harness straps must be used when available.
B. Backboard patients transported on the crew bench shall be secured to the crew bench with a minimum of two straps.
C. Patients should be secured to backboards with four straps (minimum of three straps).
D. Patients transported by suspension method shall be secured with a minimum of three straps to the flexi-cot.
E. Patients transported "sitting position" shall be secured to the crew bench or Captain's chair with a seat belt.
F. Pediatric patients not spinally immobilized shall be secured in the following manner:
    1. Patients weighing less than 10 lbs shall be transported in an approved child's seat secured to the stretcher with the back rest in high fowler position or secured to the Captain's chair or in the integrated child's seat in Captain's chair, if available.
    2. Patients weighing at least 10 lbs but not more than 40 lbs shall be secured to the stretcher using the Pedi-mate or in the integrated child's seat in the Captain's chair.
    3. Patients weighing more than 40 lbs shall be secured with a minimal of three straps. In addition, shoulder harness straps should be used when available.

G. Crews may request that the on-duty supervisor bring them a child's seat if there is no other way to safely secure the child and it does not delay treatment of the patient(s).

H. All straps and seat belts should be snuggly secured but not so tight as to restrict circulation or affect any respiratory efforts.

I. The following methods of restraints may be used for securing violent patients (see procedural physical restraint protocol):

1. Stretcher and Backboard straps (to be in place on all devices used for moving patients).
2. Towel or sheet wraps
3. Gauze wraps (minimum width 2")
4. Velcro straps (minimum width 2")
5. Leather restraints
6. Soft restraints

J. LCEMS/TFD (EMS) employees may not use the following methods to restrain patients:

1. Handcuffs
2. Polyethylene cable ties
3. Nylon cuffs
4. Any type of metal restraint

If a law enforcement officer has placed any of these devices on a patient, they may be left in place as long as a law enforcement officer rides with the patient or follows close behind so that the devices can be removed quickly if necessary to treat the patient. When a law enforcement officer places these devices on a patient, document what device was used, where the device(s) were placed, and who places the device on the patient. Patients should NOT be transported in a prone position with hands restrained behind their back. Patients should never be transported in a "hog tied" position (face down with arms and legs restrained behind the patient.

Transportation of two patients

A. On incidents in which two patients are to be transported, it is preferable that one unit transport both patients, unless, both patients are critically injured and additional resources are readily available.

B. One patient should be safely secured to the stretcher with a minimum of three straps and the second patient should be safely secured to bench seat with seatbelt(s).

C. If patients on scene want to be transported to different facilities, call for additional unit to transport 2nd patient to other facility. Only as a last resort (if no other transport unit is available), should more than one patient be transported who is requesting a different facility. The attending paramedic should provide a quick report to the first hospital before transporting to the second hospital. At no time should the 2nd patient be left unattended in the unit while at the first facility.

D. If either of the patients is critically injured, the attending paramedic should request a third rider to assist with patient care, if at all possible.

Transportation of three patients

A. When the patients are not critically injured, it is acceptable to suspend a third patient.
B. Optimum care cannot be rendered to more than two critically injured patients at a time.
C. The attending paramedic should request a third rider to assist with patient care.
D. Crews should avoid transporting three patients without a third rider to assist with patient care, if one of the patients is critical.

Unusual Transportation Situations:

Patients will always be transported in the safest manner possible. However, there may be situations, such as disasters, multiple patient incidents, system overload, etc., where based upon patient(s) condition, it may be in the patients' best interest to be transported in a non-traditional method. (e.g. on the floor of the ambulance) In these situations, the attending paramedic shall request and receive prior approval from a Supervisor, Operations Chief, EMS Manager, or a Training Coordinator. The attending paramedic shall make every effort to restrain the patient and transport the patient in as safe a manner as possible.

Return to: Contents at top Scene response index Admin Guidelines

1.3.10 Critical Care Inter-facility Transport (STAT, SCT, and Critical Patient Transfers)

I. **PURPOSE**:
To make a determination regarding the critical nature of a patient based on information from the transferring hospital in order to meet the needs of the patient in terms of personnel, equipment, and response time.

II. **GUIDELINE**:
When LCEMS is requested to transport a critical patient between hospitals, be sure we are provided sufficient information from the transferring hospital in order to meet the needs of the patient in terms of personnel, equipment, and response time. This is achieved through exchange of vital information (as listed in C and D below) between the transferring hospital and the LCEMS staff. This information will be used to select the appropriate personnel and equipment needed to continue providing high quality critical care while outside of a hospital setting. This information will also be the basis for putting the EMS MD on alert of a critical care transport in progress. The EMS MD can either make contact with the EMS crew to review the case and answer any questions or be available by radio, phone, or video webcam to assist the transport team as needed.

III. **PROCEDURE**:

A. Please understand that when a patient is transferred between hospitals, it is the transferring physician/hospital that is responsible for the orders to care for the patient until arrival and transfer of care at the receiving hospital. The EMS MD will assist you as needed should the transferring MD fail to provide sufficient orders or if there is a change in the patients status during transport.
   1. **This is primarily meant to address patients that are admitted in the hospital (floor or critical care unit) and being transferred to another hospital (especially long distance/out of town transports in excess of one hour travel time)**.
   2. Patients who are being transferred from the emergency department typically will not have a lot of data back and the determination of how critical they are is based on their vital signs, limited lab data and the history/physical findings by the ED MD.
   3. IF AFTER PATIENT CONTACT, ANY PARAMEDIC WHO FEELS THE CRITICAL NATURE OF THE PATIENT IS BEYOND THE SCOPE OF THEIR PRACTICE OR TRAINING, HE/SHE SHOULD NOTIFY THEIR SUPERVISOR IMMEDIATELY BEFORE LEAVING THE TRANSFERRING HOSPITAL. EMS MD SHOULD BE NOTIFIED IF THERE IS ANY CONCERN FOR THE SAFETY OF THE PATIENT DUE TO THE NEED FOR ADDITONAL PERSONNEL OR EQUIPMENT.

B. A Pre-Transfer Data Form for Interfacility Transfer of Critical Patient is to be filled out prior to our arrival at the transferring facility. This form can either be faxed to the facility for a nurse to fill out or the paramedic/EMS supervisor/flight crew can fill out when they call for report. If it was faxed to the hospital, it should be faxed back to the paramedic/EMS supervisor/flight crew ASAP. At some point, this form should be made available to all the hospitals we service as part of their transport request packet. In lieu of filling out parts of the form, the hospital may fax copies of the most recent information (lab reports, ABG results, X-ray reports, EKG, etc) to LCEMS Supervisor, Paramedic or flight crew for

immediate review. This new form will have a place for the transferring nurse or physician to provide the transferring MD's orders. These orders should cover the care for this patient during transport, including management of all IV fluids, medications, ventilator settings and any equipment being used on this patient during the transport. The information gathered by the above process will help us determine:

1. If the transfer can be safely handled by a single paramedic
2. Will additional personnel be required, i.e. Critical Care RN or Respiratory Therapist from the transferring facility, or additional paramedic from our service.
3. Will additional equipment be needed, i.e. additional medication pumps, additional oxygen, etc?
4. Do we have the appropriate ventilator for the patient or will we be able to use the hospital's ventilator (along with their respiratory therapist)?
5. Are the drugs infusing within the scope of practice of the paramedic?
6. Will additional medications be needed?
    a. NOTE: Any medication due to administered while patient is being transferred should be provided by the transferring facility including antibiotics and pain medication. We have had some hospitals that refuse to dispense controlled substances to EMS, prompting us to use our own stock. If the medication ordered is not one of the drugs we carry, the order from the transferring MD MUST be changed to reflect the new drug.
7. Depending on the distance involved, whether air transport would be more appropriate.

C. A **CRITICAL** patient is one that is being transported to a higher level of care and meets any ONE of the following criteria:

1. Intubated or trached and on a ventilator or being ambu bagged
2. In respiratory distress on BiPAP therapy
3. On one of the following drugs via a pump;
    a. Dopamine,
    b. Dobutamine,
    c. Heparin
    d. Nipride
    e. Nitroglycerin drip
    f. Norepinephrine/Levophed
    g. Any paralytic
    h. Propofol or any drug by continuous drip to keep patient unconscious/sedated (Versed, etc.)
    i. Any drug being given by IV pump to support cardiac output or stabilize cardiac arrhythmias (Cardizem, Amiodarone, Lidocaine, etc.)
    j. Tocolytics to arrest labor
4. Chest tube
5. Ventriculostomy tube
6. Administration of any blood products
7. Arterial Line for monitoring blood pressure or other advanced hemodynamic monitoring lines (i.e. Swan Ganz Cath, CVP monitoring device, etc.)
8. Any one or more abnormal vital signs (Adult), that are also on drugs listed in #2 and/or on a ventilator, or receiving wide open IV fluids to treat shock
    a. BP systolic <80, >200

b. HR <45, > 130
c. RR <10, > 28
d. Pulse ox < 90%

9. Abnormal labs/studies and unstable vital signs
   a. Hgb < 6.5
   b. Hct < 25 Plt < 80
   c. K+ < 2.6, > 6
   d. pH < 7.28, > 7.5
   e. pCO2 <25, >60
   f. pO2 <80
   g. Glu < 60
   h. CXR that shows:
      i. Pneumothorax
      ii. Chest tube placement
      iii. Severe pneumonia (with abnormal blood gas (pO2 < 80 mm Hgb) or O2 sat < 90%)
10. Cardiac monitor showing
   a. Recurrent V-Tach
   b. Recurrent V-Fib
   c. 3rd degree AV block with BP systolic < 90 with or without external or transcutaneous pacer being used.

Return to: Documentation

D. A **STAT TRANSFER** is a patient with one of the following diagnosis AND the destination is another emergency department, intensive care unit, operating room, or cardiac cath lab. A STAT transfer can also be looked at as a condition that is associated with a time sensitive intervention or prolonged disruption of on-going hospital care could result in a deterioration of the patient's condition. Note: a STAT patient may also be a CRITICAL patient IF they meet any of the criteria noted above. **The prime difference is that a critical patient may require additional resources such as equipment and/or advance trained or multiple personnel for the transport. An ALS paramedic crew with our standard equipment can most likely handle a stat transfer.** Examples of STAT transfers include, but are not limited to;

1. Acute myocardial infarction (code STEMI)
2. Acute Stroke (Stroke Alert)
3. Trauma Alert (based on trauma alert criteria)
4. Acute intracranial hemorrhage
5. Post cardiac arrest with return of spontaneous circulation
6. Severe burn patient
7. Risk of losing limb
8. Acute respiratory distress on CPAP
9. Septic patient
10. OB patient as long as EMTALA laws are complied with.
11. Seriously ill child in need of surgical/intensive care pediatric services
12. Dissecting aneurysm
13. Testicular or Ovarian Torsion
14. Acute paralysis from non-traumatic causes.

15. Request of transferring MD for STAT transfer based on potential for rapid deterioration of patient's condition.

E. Both STAT and CRITICAL patients will be transported with lights and sirens between facilities (this also applies if you are picking up a flight crew who is caring for a critical patient and/or is in-bound to an intensive care unit). You should have with you, the name and phone number of the transferring MD as well as the receiving MD. You should contact one or both during your trip if there is a change for the worse in the condition of your patient. You can call your medical director if unable to reach the transferring or receiving MD and you need help. Remember, THE TRANSFERRING MD IS RESPONSIBLE FOR WRITING THE ORDERS TO COVER CARE FOR THE PATIENT WHILE IN TRANSIT TO THE RECEIVING HOSPITAL.

F. If the Pre-transfer Data Form indicates a critical care transport (as described in "C" above or identified by any one of the blocks checked off in #1 of the Pre-Transfer Data Form for Interfacility Transfer of Critical Patient), THE EMS MD MUST BE PUT ON ALERT VIA TEXT MESSAGE, PHONE OR RADIO NOTIFICATION THAT A CRITICAL CARE TRANSPORT IS IN PROGRESS. THE EMS MD WILL BE ON STANDBY TO OFFER ASSISTANCE TO THE TRASFERRING CREW VIA RADIO/PHONE OR VIDEO-WEBCAM SHOULD THE TRANSFERRING CREW NEED ASSISTANCE WITH ANY ASPECT OF PATIENT CARE DURING THE TRANSFER. When the EMS MD is notified via text messaging, the following information should be included:
   1. Lead medic/flight nurse in charge of care
   2. Phone number or radio/unit # for radio contact with medical crew
   3. Diagnosis/criteria making it a critical transport
   4. Estimated time patient will be out of/between hospital(s)
   5. Phone number and name of transferring and receiving MD

G. EMS MD WILL ACKNOWLEDGE THE RECEIPT OF THE REQUEST TO BE ON STANDBY VIA TEXT MESSAGE, PHONE OR RADIO COMMUNICATION WITH DISPATCH AND/OR CRITICAL CARE TEAM.

H. EMS MD AND LEAD CRITICAL CARE TEAM MEMBER SHOULD DISCUSS PRIOR TO EXECUTING THE TRANSPORT, THE FOLLOWING:
   1. Review vent settings
   2. Address need for additional personnel or equipment
   3. Review drugs in use
   4. Review orders of transferring MD
   5. Discuss any equipment that may be in use and not familiar to the crew.

I. Following completion of the transport, the EMS MD will be notified via text messaging that transport is complete and MD can stand down.

J. LCEMS may not always maintain a dedicated SCT truck or team. However, all ALS Ambulances share in SCT duties for out of town transport, STAT, and critical patients involving IV monitoring and medication administration, ventilator dependency, and high acuity patients.

K. Our intent is to have a reasonable response time and to minimize the out of hospital time for the patient. After approval of a transport, a unit will be dispatched to the requesting hospital's location. Examples of varying response time are listed below, but are not limited to the following:
   1. Contracts
   2. Verbal agreements
   3. Location and routing
   4. Call volume

L. Documentation:

Documentation by the paramedic for critical care patients MUST be very detailed and accurate in terms of chronologic events. The flow of the report should make it easy to follow and mentally reproduced the care provided. The report must include but is not limited to:

1. Chief complaint/reason for transport
2. History of present illness (a brief description of what happened and why the patient is in the current condition)
3. Pertinent past medical history and surgical history
4. Current medications
5. Allergies.
6. A detailed physical examination, including ongoing and frequent vital signs (q 10 to 15 minutes), head to toe assessment, location of any external or penetrating appliances/devices, IV sites (type of fluid, rate, inspection of IV site), type and location of any tubes as well as what is draining, size and depth of ET tube.
7. Settings: Ventilators, medication drips (including drug name, concentration, drip rate, amount remaining to infuse at time of pick up), suction (i.e. if on chest tube).
8. Any changes in the patient's status, any treatments provided, and any changes made to baseline or initial settings.
9. Names of staff members who provided you orders or requested changes

Return to: Contents at top Admin Guidelines Scene response index Definitions

1.3.11 Trauma Transport Protocol

Purpose: Some states require EMS services, as part of the state licensure requirements, to file trauma transport protocols. These protocols address the transport of trauma patients to state approved trauma centers (if available) or non-trauma center initial receiving hospitals. These protocols are tailored and specific to each area served. The following service areas in Florida have Trauma Transport Protocols filed with the state:

1. Leon County EMS
2. Tallahassee Fire Department

A copy of the trauma transport protocols specific for each location is kept on file at each local service and can be requested via the operations manager for that location.

Return to: Contents at top Admin Guidelines Scene response index

1.3.12 TFD Paramedics Riding in with LCEMS (to the Hospital)

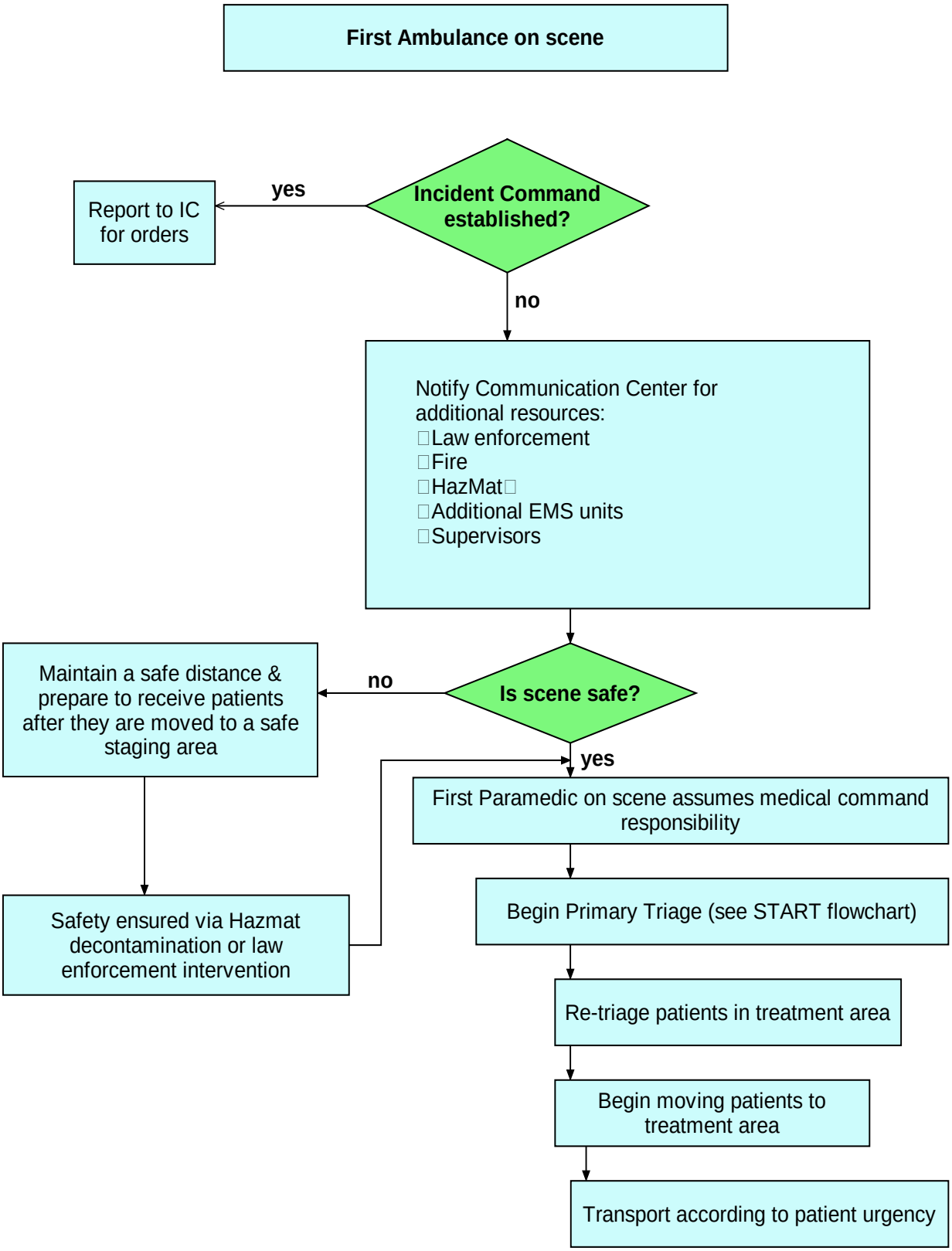
Purpose: This policy defines situations when the TFD Paramedic rides with LCEMS to the hospital to assist with patient care

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



1.4.1 Mass Casualty Incident Response Protocol

I. PURPOSE.

To efficiently triage, treat and transport victims of 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. 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)
4. 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.

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. 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. When announcing an MCI, specify the general category (trauma, HAZMAT, smoke inhalation, heat exhaustion, etc.) of patients.
    e. 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.
    f. All units are to respond to the Staging Area in emergency response mode unless otherwise directed by COMMAND.
    g. Consider air transport for special needs, mass transit resources for multiple "walking wounded," and private BLS transport units.
    h. Consider Mobile Command Vehicles, Medical Supply Trailers and Communication Trailers.
    i. Upon declaration 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.
    j. On a large-scale incident, consider sending a Hospital Coordinator to each hospital to assist with communications.
    k. Request Law Enforcement to set up a safety perimeter

2. Definitions:
    a. **Strike Team** – is a specified combination of the same kind and type of resources with common communications and a leader (e.g. ALS Transport Unit Strike Team would be 5 ALS Transport Units with a leader).
    b. **Task Force** – is a group of resources with common communications and a leader (e.g. MCI Task Force would be 2 ALS Transport Units, 2 BLS Transport Units and 1 Suppression Unit with a leader).
    c. **Litter Bearer** – A team of personnel assigned to TRIAGE to move victims from the incident site to the Treatment Area or Transport Units.
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. Follow Field Operations Guide FOG #1.
4. Remain in a fixed and visible location.
5. Determine the MCI Level (1, 2, 3, 4, or 5).
6. Designate a Staging Area.
7. Assign positions to perform the functions of TRIAGE, TREATMENT, TRANSPORT and STAGING.
8. Advise Communications Center of the number of victims and their categories once triage is complete.
9. During large scale or complex MCIs (e.g. fire with multiple victims), designate a Medical Branch to reduce the span of control.
10. 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.

B. MEDICAL BRANCH.

1. Radio designation: MEDICAL.
2. Follow FOG #2.
3. Work directly with COMMAND.
4. Assure TRIAGE, TREATMENT and TRANSPORT have been established. If established by COMMAND, TRIAGE, TREATMENT and TRANSPORT will report to MEDICAL.

5. Direct and/or supervise on-scene personnel from agencies such as Medical Examiner's Office, Red Cross, ambulance companies and hospital volunteers.
6. Ensure activation of Medical Control (Medcom/MRCC).

C. TRIAGE OFFICER.

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.
8. Maintain security and control of the Triage Area. Request Law Enforcement.
9. Provide periodic status reports to COMMAND or MEDICAL.
10. 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) (a).
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.

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

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

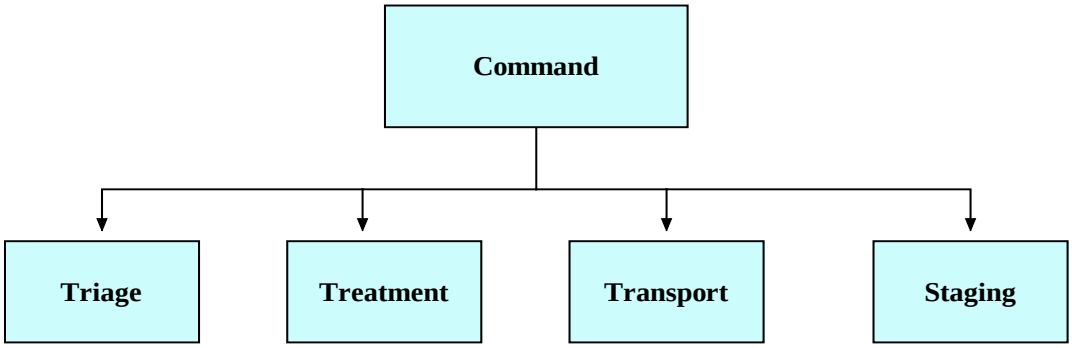
D. Three (3) mechanical pencils and three (3) grease pencils.

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
    12. UNIT STAGING LOG #7A

13. MCI-WDW/TERRORIST EVENT FOG #8

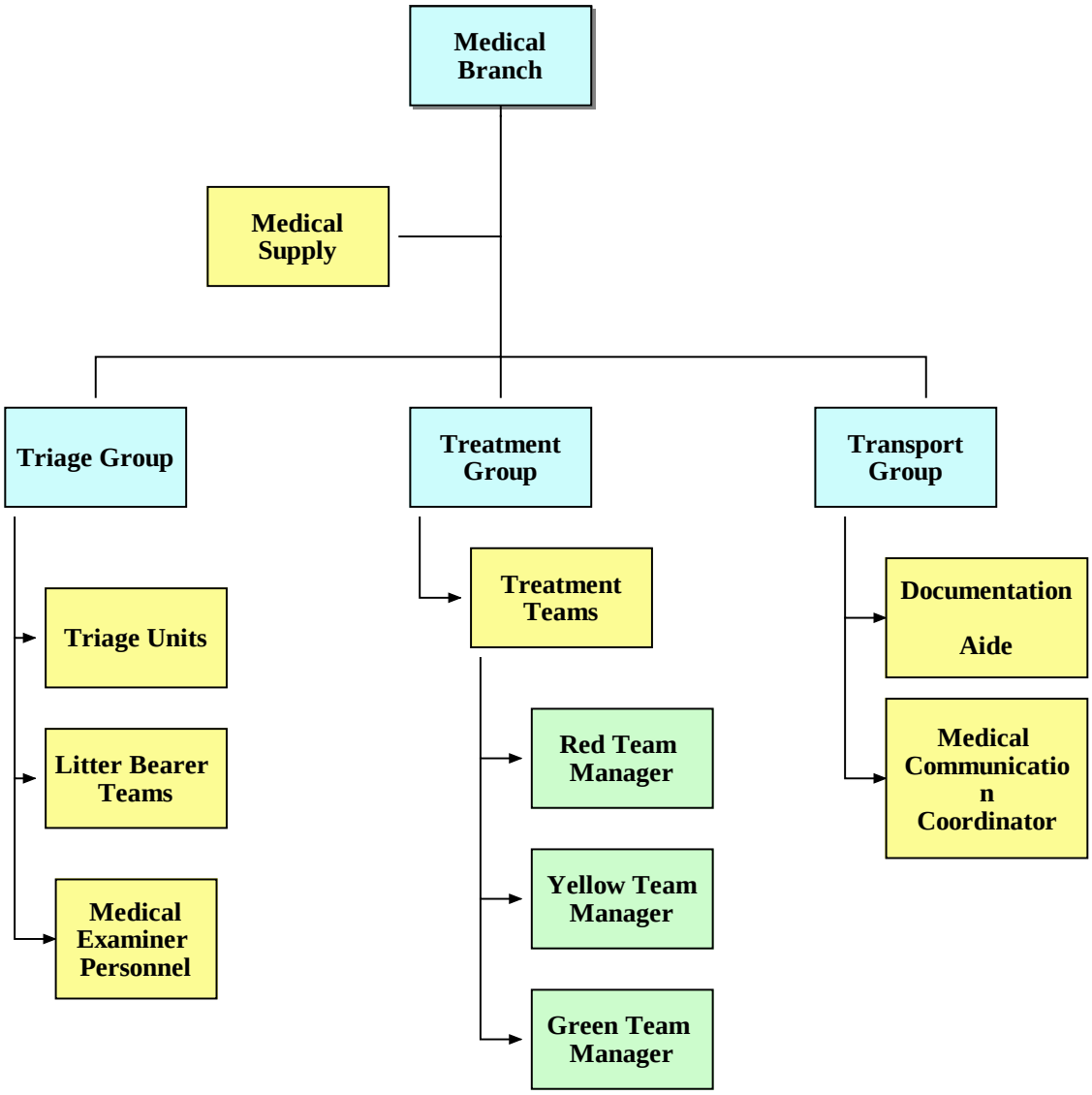
Return to: Contents at top Admin Guidelines Mass casualty incident index Multiple patients/Trauma

1.4.1b BASIC MCI COMMAND STRUCTURE FOR MEDICAL RESPONSES



Return to: Contents at top Admin Guidelines Mass casualty incident

1.4.1b COMPLEX MCI COMMAND STRUCTURE FOR MEDICAL RESPONSES



Return to: Contents at top Admin Guidelines Mass casualty incident index

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.

Return to: Contents at top Admin Guidelines Mass casualty incident index

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.

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.

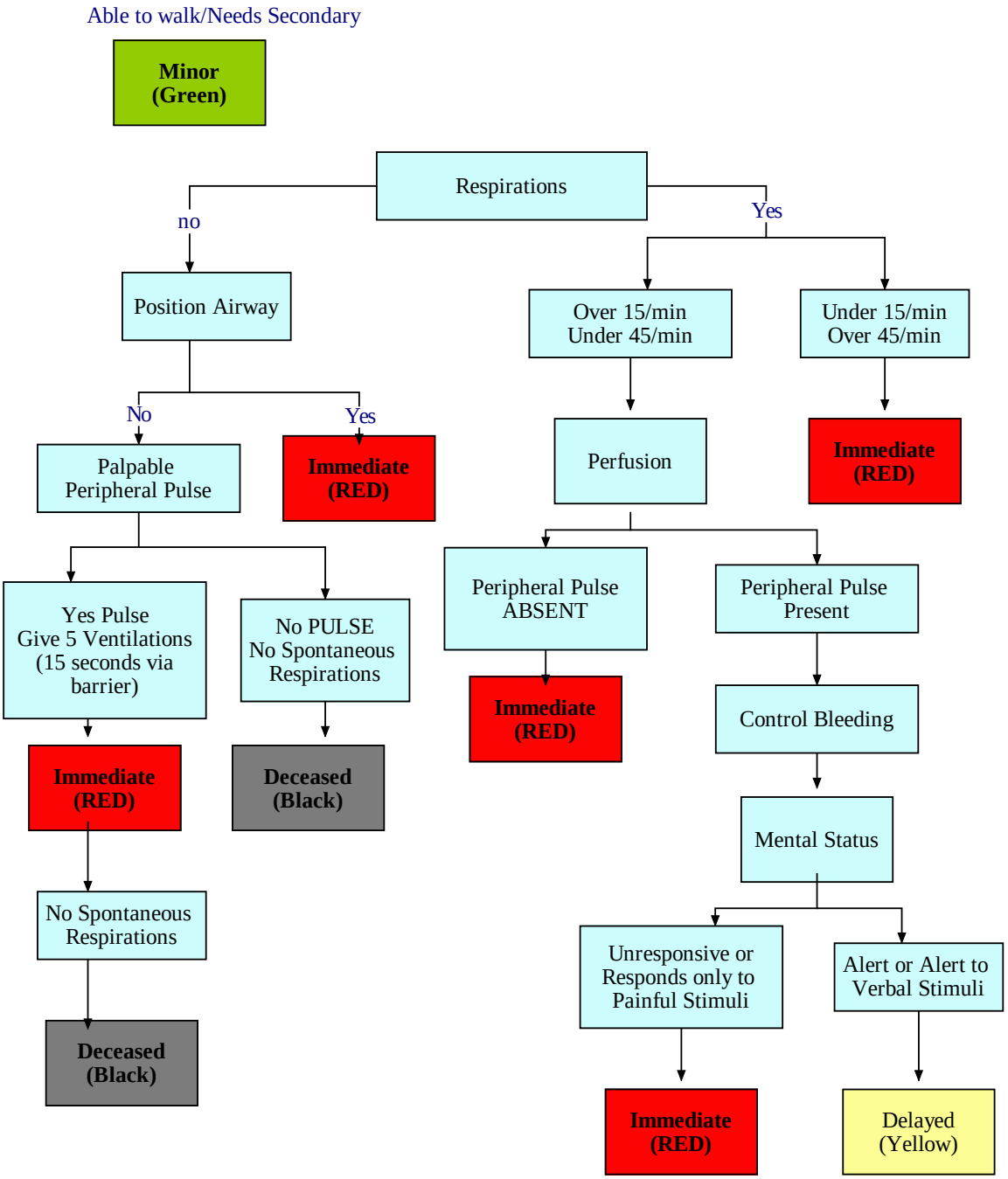
NOTE:

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).

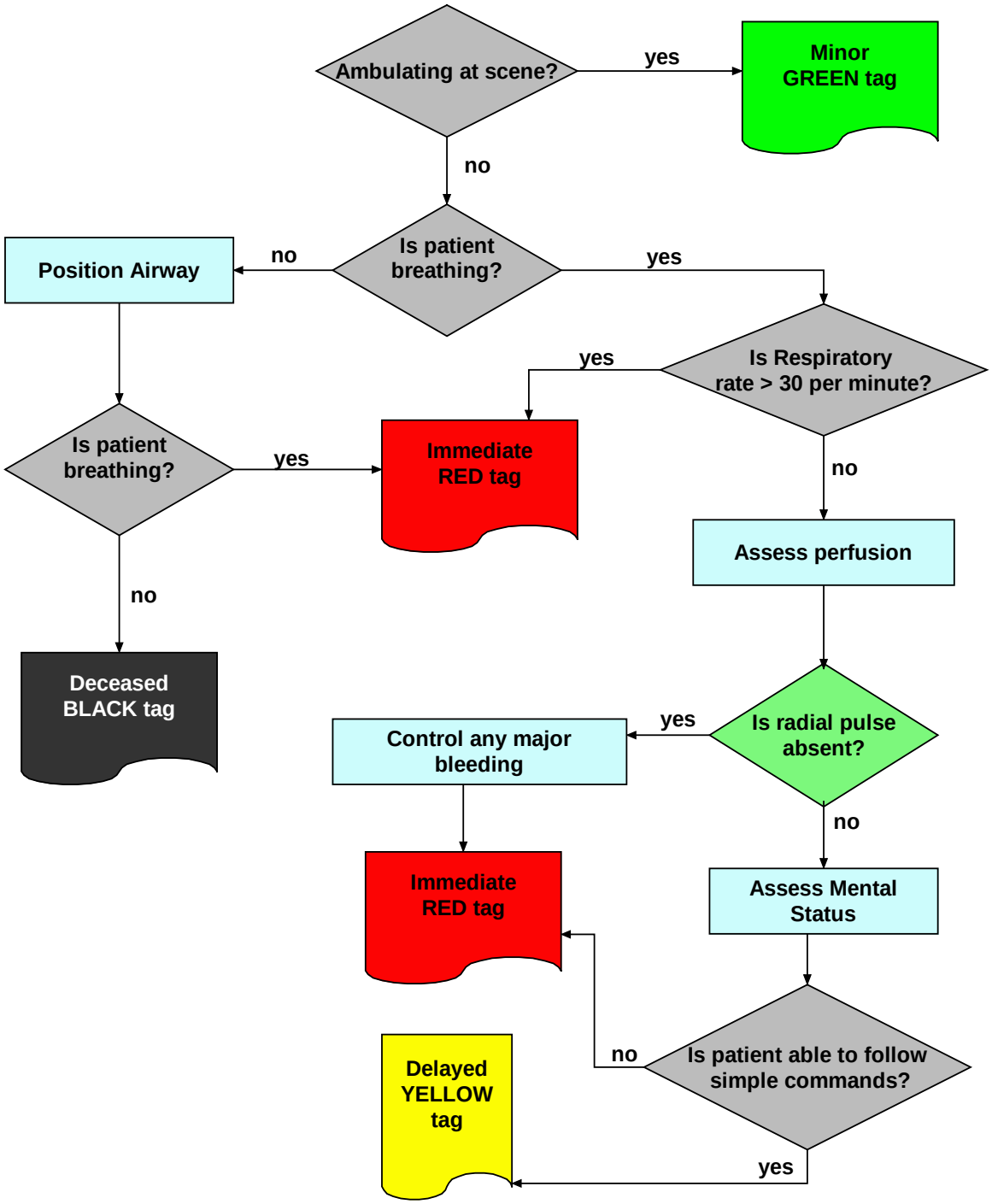
Return to: Contents at top Admin Guidelines Mass casualty incident index

1.4.3a JumpSTART TRIAGE



Return to: Contents at top Admin Guidelines Mass Casualty Incidents

1.4.3b SIMPLE TRIAGE AND RAPID TREATMENT PROTOCOL



Return to: Contents at top Admin Guidelines Mass Casualty Incident Response

1.5 Equipment Issues

1.5.1 Medical Equipment Failure

Purpose: Define the process for reporting and handling medical device, equipment, or product failure/problem. LCEMS/TFD has a legal and ethical responsibility to report all medical devices, equipment, or product failures/problems to either the product manufacturer or the Food and Drug Administration (FDA) based upon the seriousness of the failure and the impact upon the patient.

Procedure:

I. All medical device, equipment, or product failures/malfunctions shall be immediately brought to the attention of the on-duty supervisor.

II. **Employee's Responsibility**

A. Immediately notify the on-duty supervisor of all medical device, equipment, or product failures/malfunctions by providing the following information:

1. Which piece of device, equipment, or product failed?
2. Events and circumstances related to the failure.
3. Impact of the failure on the patient care.
4. Any negative effects on the patient, crew, or bystanders.

B. The employee(s) shall thoroughly document the event on a "Medical Device/Equipment Failure Reporting Form" and submit it to the on-duty supervisor for review, prior to the end of their assigned shift.

III. **Supervisor's Responsibility**

A. Determine the severity of the failure. Any failure, which results in an injury or a negative patient outcome, shall be immediately brought to the attention of the Administrative Staff, Medical Director, Operation Chief, and a Quality Assurance Coordinator.

B. Respond to the crew's location or final destination, when appropriate, to make a determination as to the extent of any injuries or patient detriment.

C. Remove the device, equipment, or product that failed and replace it.

D. Properly tag the device, equipment, or product that failed as being "out of service", and store it in a secure location.

E. Review report(s) submitted by the employee(s).

F. Document on the "Medical Device/Equipment Failure Reporting Form" initial conclusions, any corrective actions, and the status of employee(s) and patient(s), if injured.

G. Attach a copy of the completed "Medical Device/Equipment Failure Reporting Form" to the device, equipment, or product.

H. Immediately forward original documents to the Training Coordinator and copies to the Operations Chief.

I. Contact the appropriate personnel to inspect and repair/replace the device, equipment, or product prior to placing the equipment back in service.

IV. **Training Coordinator**

A. Thoroughly review the incident.

B. Provide remedial training to avoid a similar incident, if needed.

C. Complete the appropriate reporting forms (Med Watch or letter to the Manufacturer), if needed.

D. Advise the Medical Directors and Director of Public Safety of the outcome, if needed.

E. Prepare an information packet for Risk Management, if requested by the Director of Public Safety.

V. Consequences

The FDA requires that ambulance providers report any serious device related incident within 10 days. Incidents, resulting in death, must be reported directly to the FDA and the product manufacturer. Incidents resulting from operator error are required to be reported within 10 days of the employer "gaining knowledge of the failure".

Return to: Contents at top Admin Guidelines Equipment issues index

1.5.2 Minimum Equipment on each Ambulance

FLORIDA SPECIFIC:

I STATEMENT:

This is the minimum equipment list to comply with section 64j – Florida Administrative Code.

II. GUIDELINE:

The following list of equipment is the minimum equipment to be carried on board all LCEMS Ambulances.

III. EQUIPMENT LIST:

1. Bandaging, dressing, and taping supplies:
    a. Adhesive, silk, or plastic tape – assorted sizes.
    b. Sterile 4 × 4 inch gauze pads.
    c. Triangular bandages.
    d. Roller gauze.
    e. ABD (minimum 5 × 9 inch) pads.
2. Bandage shears.
3. Patient restraints, wrist and ankle.
4. Blood pressure cuffs: infant, pediatric, and adult.
5. Stethoscopes: pediatric and adult.
6. Blankets.
7. Sheets (not required for non-transport vehicle.)
8. Pillows with waterproof covers and pillow cases or disposable single use pillows (not required for non-transport vehicle).
9. Disposable blanket or patient rain cover.
10. Long spine board and three straps or equivalent.
11. Short spine board and two straps or equivalent.
12. Adult and Pediatric cervical immobilization devices (CID), approved by the medical director of the service.
13. Padding for lateral lower spine immobilization of pediatric patients or equivalent.
14. Portable oxygen tanks, “D” or “E” cylinders, with one regulator and gauge. Each tank must have a minimum pressure of 1000 psi, and liter flow at 15 liters per minute.
15. Transparent oxygen masks; adult, child and infant sizes, with tubing.
16. Sets of pediatric and adult nasal cannulae with tubing.
17. Hand operated bag-valve mask resuscitators, adult and pediatric accumulator, including adult, child and infant transparent masks capable of use with supplemental oxygen.
18. Portable suction, electric or gas powered, with wide bore tubing and tips which meet the minimum standards as published by the GSA in KKK-A 1822E specifications.
19. Extremity immobilization devices. Pediatric and Adult.
20. Lower extremity traction splint. Pediatric and Adult.
21. Sterile obstetrical kit to include, at minimum, bulb syringe, sterile scissors or

scalpel, and cord clamps or cord-ties.
22. Burn sheets.
23. Flashlight with batteries.
24. Occlusive dressings.
25. Oropharyngeal airways. Pediatric and Adult.
26. Installed oxygen with regulator gauge and wrench, minimum "M" size cylinder (minimum 500 PSI) with oxygen flowmeter to include a 151pm setting, (not required for non-transport vehicles.) (Other installed oxygen delivery systems, such as liquid oxygen, as allowed by medical director.)
27. Gloves – suitable to provide barrier protection for biohazards.
28. Face Masks – both surgical and respiratory protective.
29. Rigid cervical collars as approved in writing by the medical director and available for review by the department.
30. Nasopharyngeal airways, pediatric and adult.
31. Approved biohazardous waste plastic bag or impervious container per Chapter 64E-16, F.A.C.
32. Safety goggles or equivalent meeting A.N.S.I. Z87.1 standard.
33. Bulb syringe separate from obstetrical kit.
34. Thermal absorbent reflective blanket.
35. Multitrauma dressings.
36. Pediatric length based measurement device for equipment selection and drug dosage.

MEDICATION
1. Atropine Sulfate.
2. Dextrose, 50 percent (we will use D10 bags but has the equivalent 25 grams of glucose).
3. Epinephrine HCL 1:1,000.
4. Epinephrine HCL 1:10,000.
5. Ventricular dysrhythmic.
6. Benzodiazepine sedative/anticonvulsant.
7. Naloxone (Narcan).
8. Nitroglycerin.
9. Inhalant beta adrenergic agent with nebulizer apparatus, as approved by the medical director.

I.V. SOLUTIONS
1. Lactated Ringers or Normal Saline.

EQUIPMENT
(a) Laryngoscope handle with batteries.
(b) Laryngoscope blades; adult, child and infant sizes.
(c) Pediatric I.V. arm board or splint appropriate for I.V. stabilization.
(d) Disposable endotracheal tubes; adult, child and infant sizes. Those below 5.5 mm shall be uncuffed. 2.5 mm – 5.0 mm uncuffed; 5.5 mm – 7.0 mm; 7.5 mm – 9.0 mm).
(e) Endotracheal tube stylets pediatric and adult.
(f) Magill forceps, pediatric and adult sizes.
(g) Device for intratracheal meconium suctioning in newborns.
(h) Tourniquets.
(i) I.V. cannulae 14 thru 24 gauge.

(j) Micro drip sets.
(k) Macro drip sets.
(l) I.V. pressure infuser.
(m) Needles 18 thru 25 gauge.
(n) Intraosseous needles and three way stop cocks.
(o) Syringes, from 1 ml. to 20 ml.
(p) D.C. battery powered portable monitor with defibrillation and pacing capabilities, ECG printout and spare battery. The unit shall be capable of delivering pediatric defibrillation (energy below 25 watts/sec and appropriate equipment).
(q) Monitoring electrodes for adults and pediatrics.
(r) Pacing electrodes. Pediatric and Adult.
(s) Glucometer.
(t) Approved sharps container per Chapter 64E-16, F.A.C.
(u) Flexible suction catheters.
(v) Electronic waveform capnography capable of real-time monitoring and printing record of the intubated patient (effective 01/01/2008).

Return to: Contents at top Admin Guidelines Equipment issues index

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

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 location of patients
    f. Determine need for additional resources
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
    c. Assess Airway
    d. Assess Breathing.
    e. Assess Circulation- Pulse, Major Bleeding, Skin color and temperature.
    f. Assess Disability- Movement of extremities/Defibrillate VF/VT without pulse
    g. Expose and Examine Head, Neck, Chest, Abdomen, and Pelvis (check back when patient is rolled on side).
    h. Identify Priority Patients
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
        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

Return to: Contents at top Admin Guidelines Adult Medical Protocols

2.1.2 Airway Assessment/Management Protocol

Adult Medical 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 2010 ACLS guidelines recommend titrating oxygen delivery to maintain pulse ox at >94%.**

Procedure**:**

BASIC LEVEL: EMT and PARAMEDIC

1. Initial Assessment Protocol 2.1.1
2. Monitor breathing during transport
3. Administer oxygen vía nasal cannula (2-6 L/min) to maintain pulse ox ≥ 94%
4. If spontaneous breathing is compromised:
    a. Maintain airway (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, paramedic should consider need for intubation (ALS Level I)
    d. Assist ventilations with BVM PRN
5. Suction PRN
6. Monitor pulse oximetry and capnography, as soon as possible
7. 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 ventilations with BVM
    d. Suction PRN
    e. If unconscious and intubation is not available, insert King Airway (or other approved blind intubation device) (a).
    f. Monitor pulse ox and capnography or $ETCO_2$ monitoring device, as soon as possible

ALS LEVEL 1: PARAMEDIC ONLY

1. Consider CPAP if severe distress and patient able to cooperate with use of CPAP. See CPAP Protocol
2. If indicated, 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.
4. Attach end-tidal CO_2 monitoring device
5. Monitor SpO_2 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.

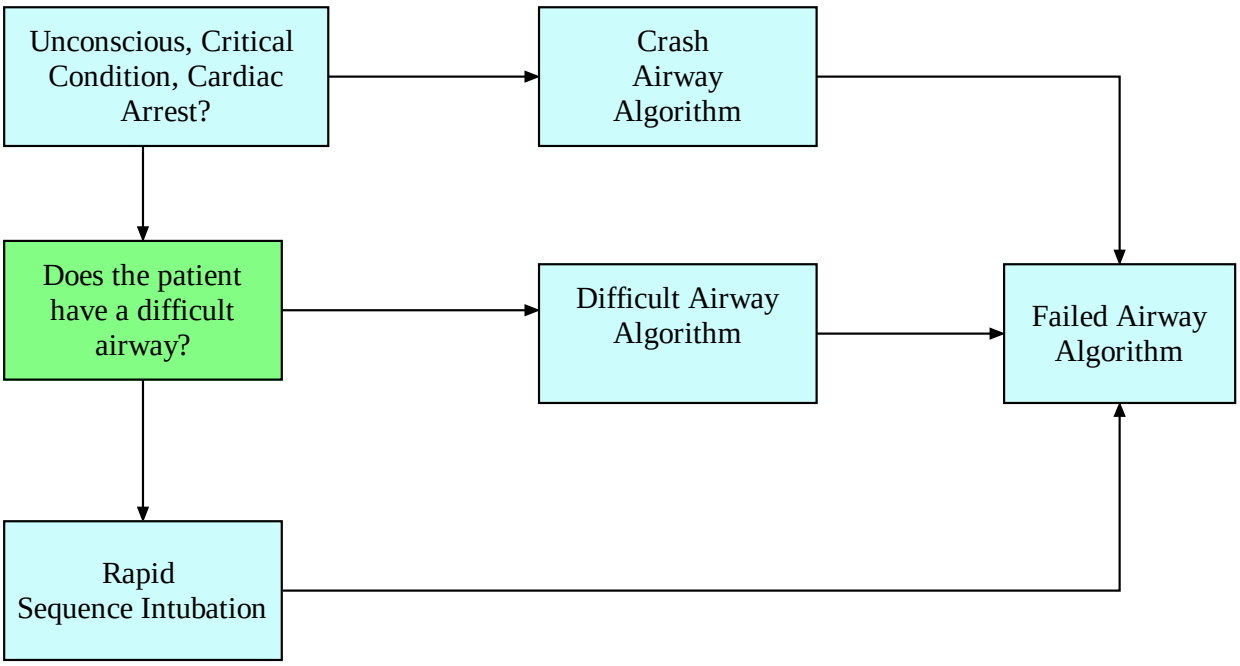
NOTE:

(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)

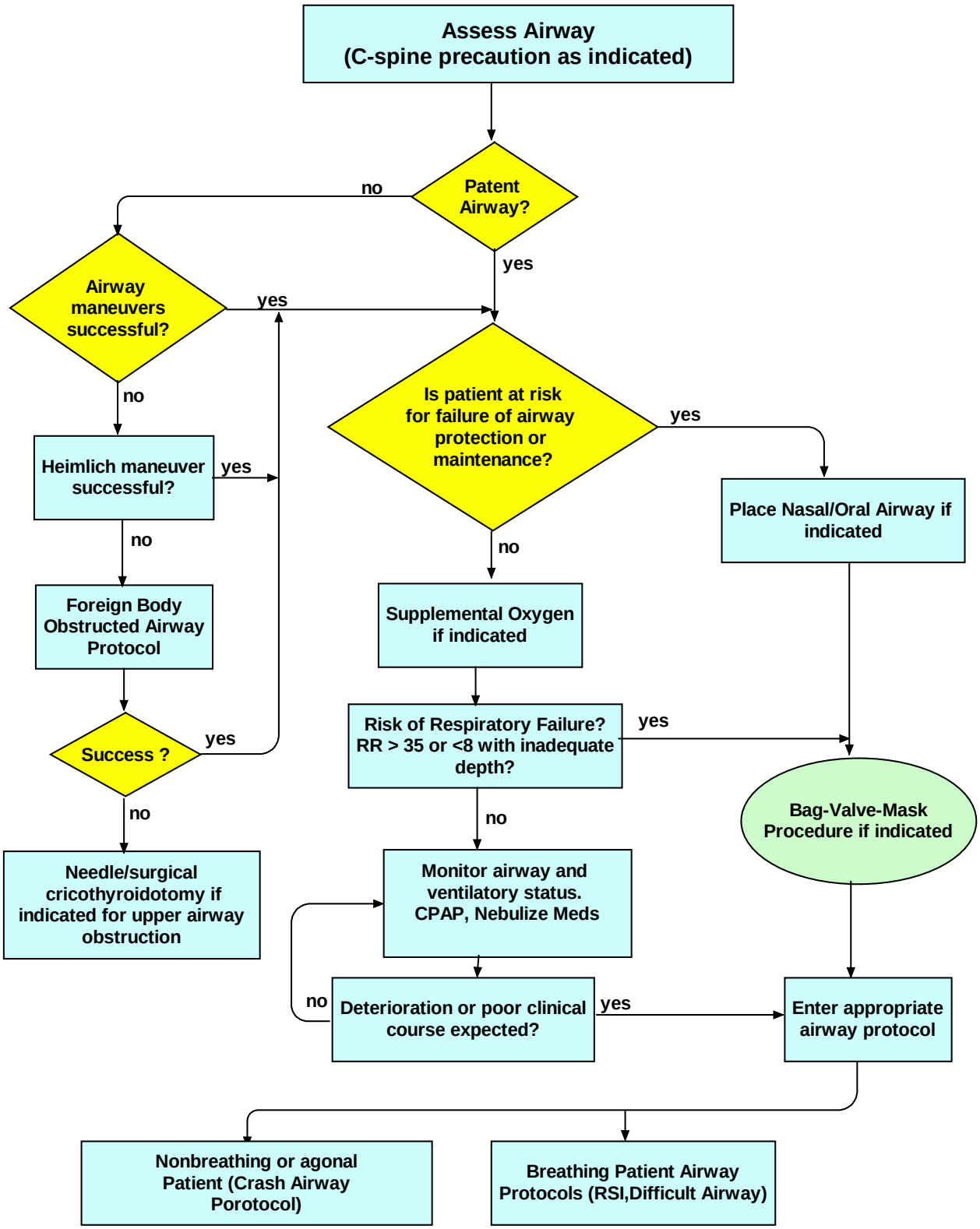
Return to: Contents at top Admin Guidelines Adult Medical Protocols COPD/dyspnea Pneumonia proto

Universal Airway Algorithm

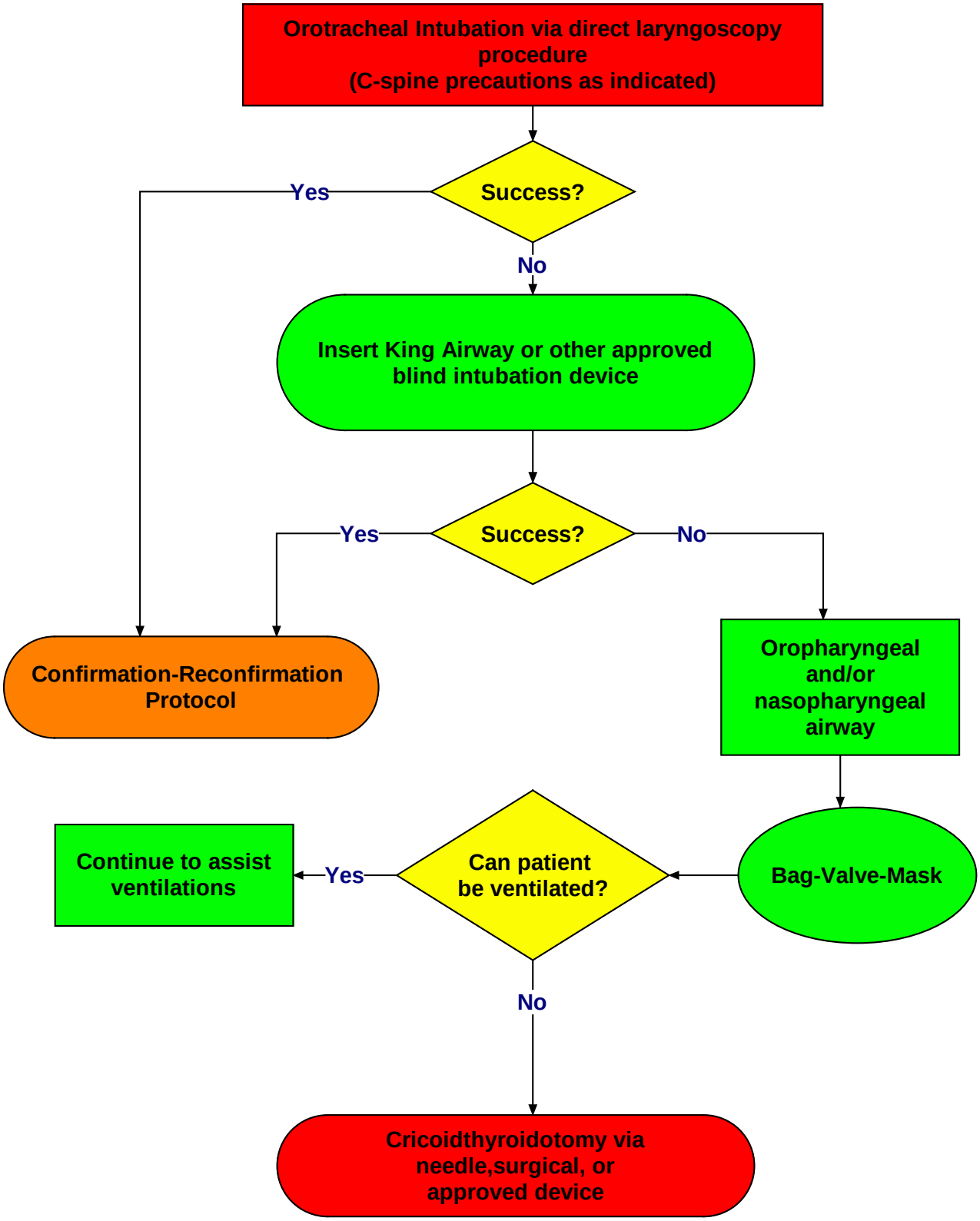


Return to: Contents at top Admin Guidelines Adult Medical Protocols

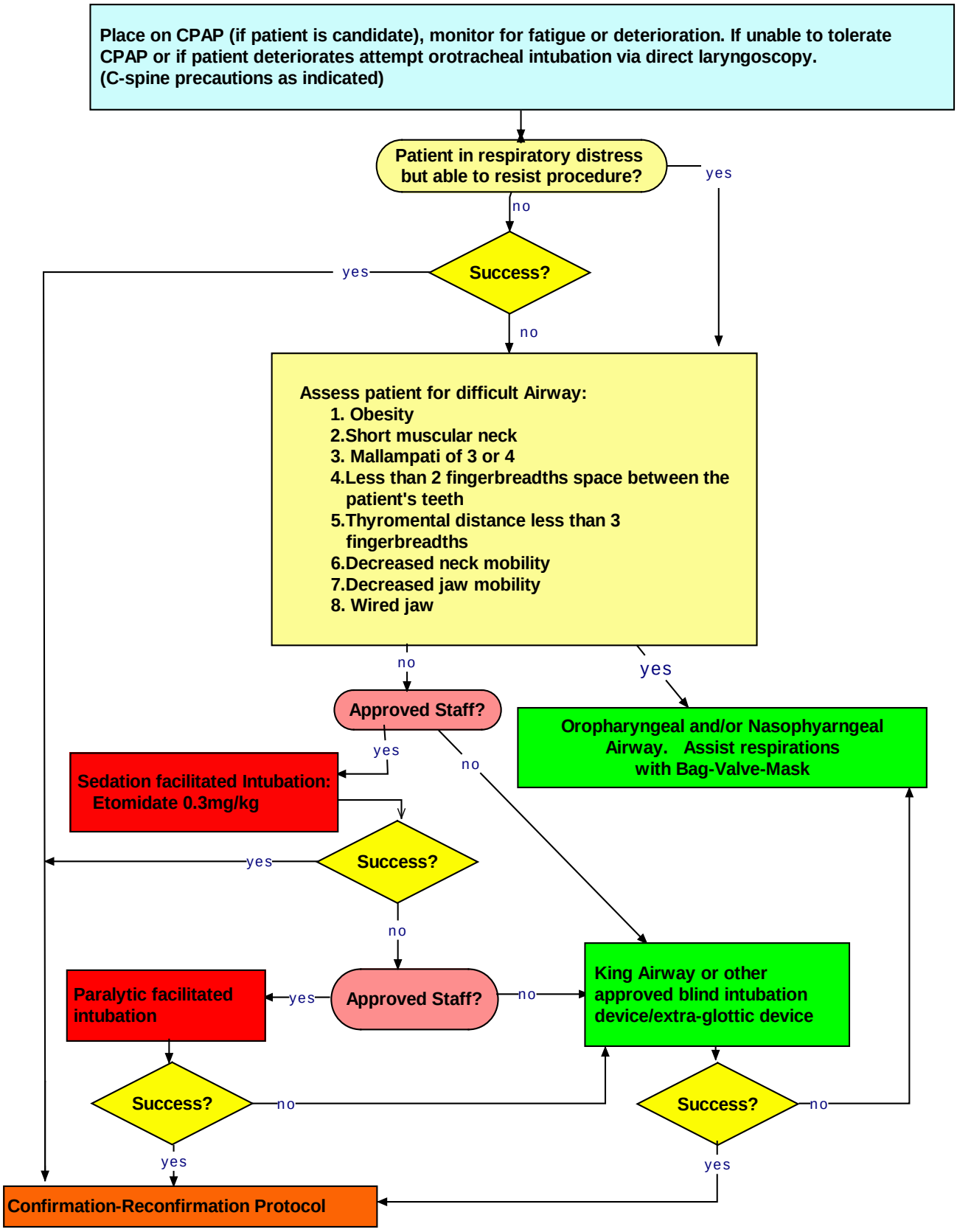
Adult Airway Assessment



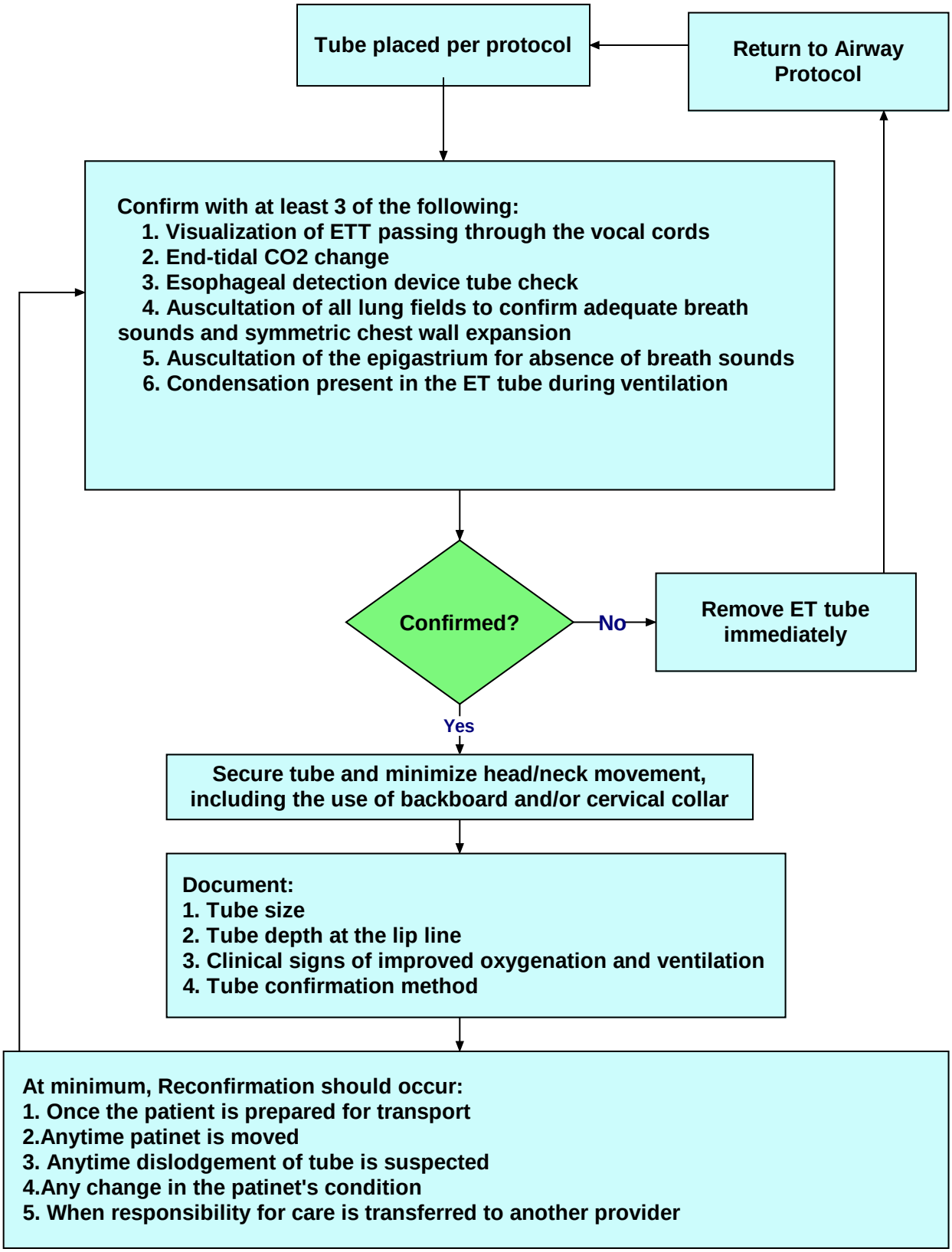
Airway Assessment Protocol: Non-Breathing Patient



Airway Assessment Protocol: Breathing Patient



Airway Confirmation-Reconfirmation Protocol:



Return to: Contents at top Adult Airway Management Peds Airway Management

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.

Procedure:

BASIC LEVEL: EMT and PARAMEDIC

1. **Initial assessment protocol 2.1.1**
2. If spontaneous breathing present without compromise:
   a. Monitor breathing during transport
   b. Administer oxygen vía nasal cannula (2-6 L/min) PRN to maintain pulse ox ≥ 94%.
3. If spontaneous breathing is present with compromise
   a. Maintain airway (e.g. modified jaw thrust)
   b. Administer oxygen via non-rebreather mask (10-15 L/min).
   c. In unconscious, insert oropharyngeal or nasopharyngeal airway PRN.
   d. Assist ventilations with BVM PRN
   e. Suction PRN
   f. Monitor pulse oximetry and capnography, as soon as possible
   g. Paramedic only: If patient accepts orophanyngeal airway, consider need for intubation (see ALS Level 1- advanced airway below)
4. If spontaneous breathing is absent or markedly compromised:
   a. Maintain airway (e.g. modified jaw thrust)
   b. If unconscious, insert oropharyngeal airway
   c. Assist ventilations with BVM
   d. Suction PRN
   e. If unconscious and intubation is not available, insert **King Airway** (or other approved blind intubation device) as per protocol.
   f. Monitor pulse oximetry and capnography or **$ETCO_2$ monitoring** device as soon as possible

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 CO_2 monitoring device
   d. Monitor SpO_2 with pulse oximeter
2. If unable to intubate and patient cannot be adequately ventilated by other means, perform cricothyroidotomy (see **Surgical Cric Protocol 4.37** or **Needle Cric Procedure**)

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols

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
2. **Airway Management Protocol 2.1.2**.
3. Correct any open wound/sucking chest wound (occlusive dressing)
4. Control hemorrhage
5. Immobilize C-spine (if unable to clear in field) and secure patient to backboard per protocol 4.35 **Spinal Immobilization/Spinal Immobilization Clearance**
6. Expedite transport
7. 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 regular infusion set unless overridden by other specific protocol.

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols

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 SpO_2 < 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 (via atomizer)**. 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
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/IM** (IM start with 0.5 mg/kg)

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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Bites and Stings Proto

2.2
Adult Respiratory Emergencies

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 SpO_2 < 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). 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.
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, perform endotracheal intubation.
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)**

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 SpO_2 < 90%).
3. Attach cardiac monitor and pulse oximeter.
4. 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 first Albuterol neb only.
4. If indicated, start IV of Lactated Ringer's or Normal Saline 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 m**l 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)
7. Consider need for endotracheal intubation.

ALS LEVEL 2: MEDICAL CONTROL

1. Repeat **Epinephrine (1:1000)** 0.4 mg IM
2. If patient still has dyspnea after IM Epi, 3 Albuterol nebs (first with Atrovent), and Solu-Medrol, medical control may order **Magnesium Sulfate** **2 gms** IV (mixed with 50ml of D5W given over 10 – 15 minutes)

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult_Resp_Emerg

2.2.3 COPD / Dyspnea

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 Tolerence 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. Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO_2 < 90%).
3. 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.
3. Repeat **Albuterol** (only) every 15 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 endotracheal intubation
5. Initiate IV lactated Ringer's or normal saline TKO.
6. 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.

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. Oxygen via nasal cannula @2 - 4 LPM to maintain pulse ox at ≥ 94% (non-rebreather @15 LPM if SpO_2 < 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**)
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 endotracheal intubation. 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).
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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult_Resp_Emerg Adult Other Cardiac Emergencies Asthma Protocol

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 SpO_2 < 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
4. Repeat **Albuterol** (only) every 15 minutes as needed x 3 doses total. Discontinue therapy if patient develops marked tachycardia (HR > 140) or chest pain.
5. 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 endotracheal intubation
6. AVOID USE OF DIURETICS!!

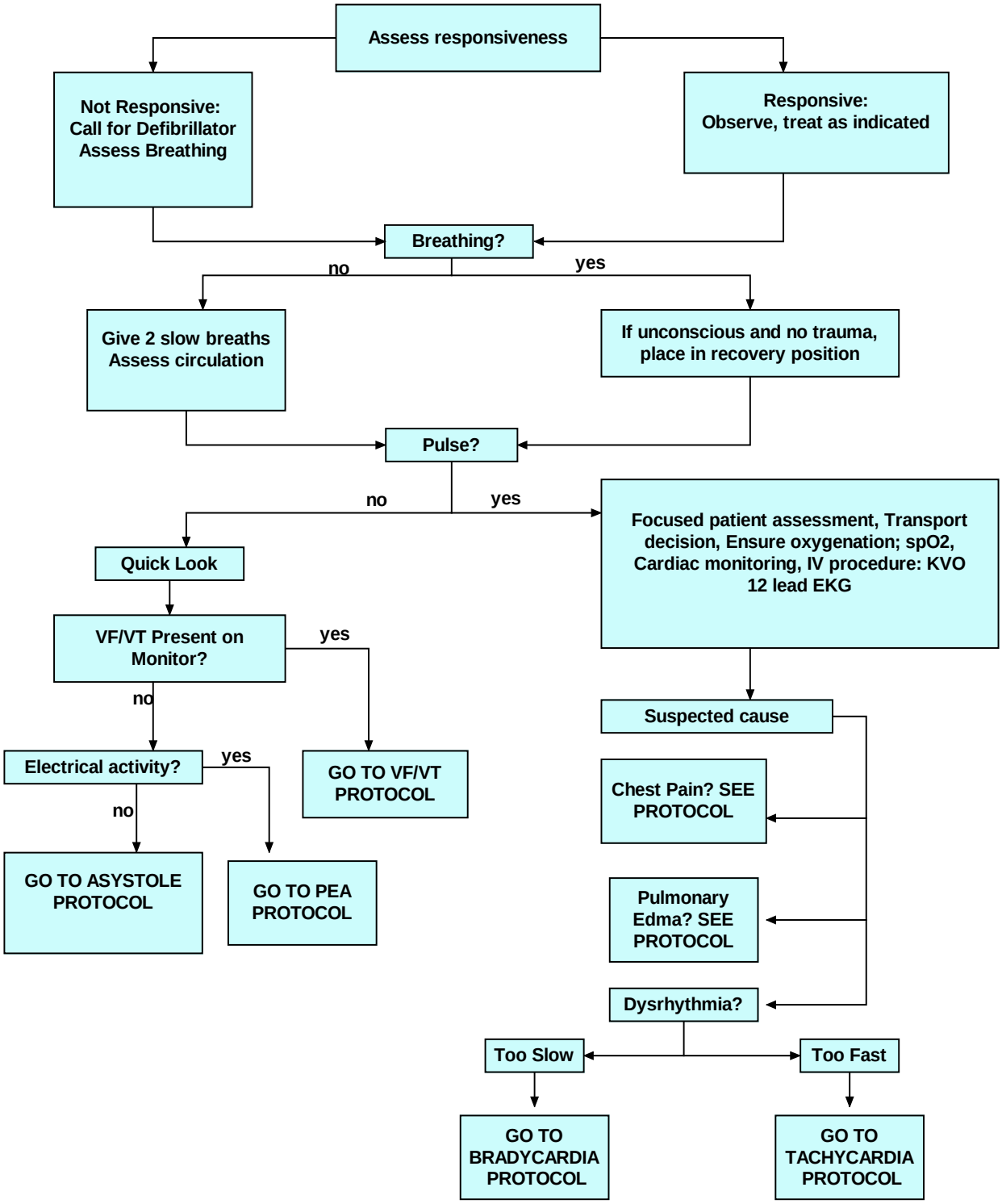
ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult_Resp_Emerg

2.3
Adult Cardiac Dysrhythmias

2.3 CARDIAC CARE: UNIVERSAL ALGORITHM



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. Initial Patient Assessment Protocol. 2.1.1
2. Airway Assessment/Management Protocol 2.1.2.
3. 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.
4. Attach cardiac monitor and pulse oximeter.

ALS LEVEL 1: PARAMEDIC ONLY

1. Intubate or Insert King Airway (or other extra glottic device) at once
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. One dose of **Vasopressin** 40 units IV/IO may be substituted for either the first or second dose of epinephrine
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	IV/IO fluid bolus, 250 ml increments
Hypoxia	Oxygenate and Ventilate
Hyperkalemia (increased potassium)	$NaHCO_3$, CaCl
Hypokalemia (decreased potassium)	ABCs and transport
H+ (Pre-existing **Acidosis)**	$NaHCO_3$
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

8. In the event that a patient who presents in asystole remains in asystole after 20 minutes of ACLS, including an advanced airway, IV/IO access, and at least three doses of Epinephrine, consider **discontinuing** resuscitation efforts. **In intubated patients, failure to achieve an ETCO2 of greater than 10 mm/Hg by waveform capnography after 20 minutes of CPR may be considered as one component of a multimodal approach to decide when to end**

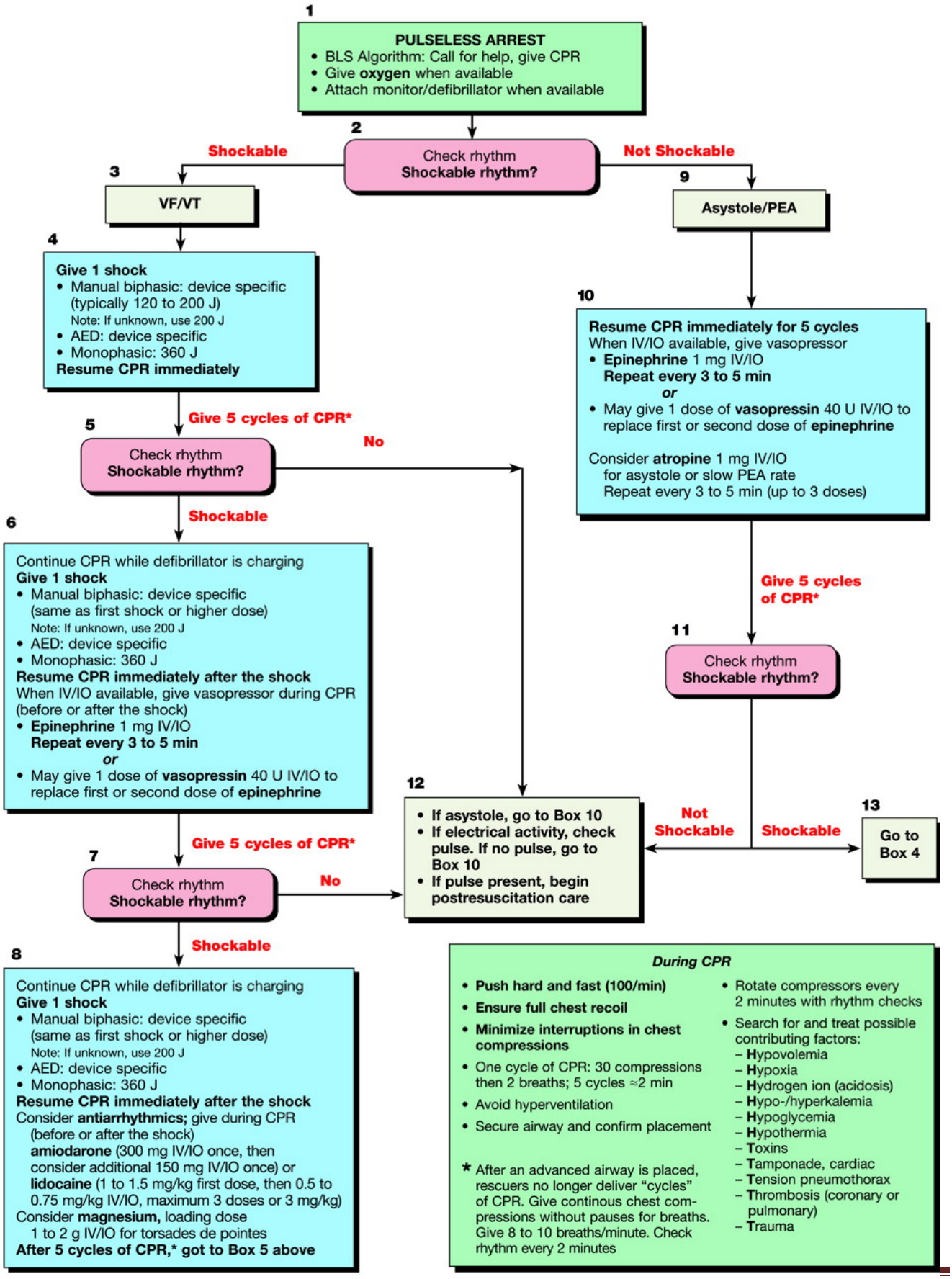
resuscitative efforts but should not be used in isolation. (Refer to administrative section **Resuscitation Considerations** for further information on discontinuation procedures) Be sure to note the time of death in the PCR. Contact Med Control for any questions or assistance.

ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control or medical director for any further directions or questions.

See Asystole Algorithm on next page.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult Card Dysrhythmias DNR Proto External Pacer


1
PULSELESS ARREST
• BLS Algorithm: Call for help, give CPR
• Give oxygen when available
• Attach monitor/defibrillator when available
2
Check rhythm
Shockable rhythm?
Shockable
Not Shockable
3
VF/VT
9
Asystole/PEA
4
Give 1 shock
• Manual biphasic: device specific (typically 120 to 200 J)
Note: If unknown, use 200 J
• AED: device specific
• Monophasic: 360 J
Resume CPR immediately
10
Resume CPR immediately for 5 cycles
When IV/IO available, give vasopressor
• Epinephrine 1 mg IV/IO
Repeat every 3 to 5 min
or
• May give 1 dose of vasopressin 40 U IV/IO to replace first or second dose of epinephrine
Consider atropine 1 mg IV/IO for asystole or slow PEA rate
Repeat every 3 to 5 min (up to 3 doses)
Give 5 cycles of CPR*
5
Check rhythm
Shockable rhythm?
No
Shockable
6
Continue CPR while defibrillator is charging
Give 1 shock
• Manual biphasic: device specific (same as first shock or higher dose)
Note: If unknown, use 200 J
• AED: device specific
• Monophasic: 360 J
Resume CPR immediately after the shock
When IV/IO available, give vasopressor during CPR (before or after the shock)
• Epinephrine 1 mg IV/IO
Repeat every 3 to 5 min
or
• May give 1 dose of vasopressin 40 U IV/IO to replace first or second dose of epinephrine
Give 5 cycles of CPR*
11
Check rhythm
Shockable rhythm?
12
• If asystole, go to Box 10
• If electrical activity, check pulse. If no pulse, go to Box 10
• If pulse present, begin postresuscitation care
Not Shockable
Shockable
13
Go to Box 4
Give 5 cycles of CPR*
7
Check rhythm
Shockable rhythm?
No
Shockable
8
Continue CPR while defibrillator is charging
Give 1 shock
• Manual biphasic: device specific (same as first shock or higher dose)
Note: If unknown, use 200 J
• AED: device specific
• Monophasic: 360 J
Resume CPR immediately after the shock
Consider antiarrhythmics; give during CPR (before or after the shock)
amiodarone (300 mg IV/IO once, then consider additional 150 mg IV/IO once) or
lidocaine (1 to 1.5 mg/kg first dose, then 0.5 to 0.75 mg/kg IV/IO, maximum 3 doses or 3 mg/kg)
Consider magnesium, loading dose 1 to 2 g IV/IO for torsades de pointes
After 5 cycles of CPR,* got to Box 5 above
During CPR
• Push hard and fast (100/min)
• Ensure full chest recoil
• Minimize interruptions in chest compressions
• One cycle of CPR: 30 compressions then 2 breaths; 5 cycles ≈2 min
• Avoid hyperventilation
• Secure airway and confirm placement
* After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR. Give continous chest compressions without pauses for breaths. Give 8 to 10 breaths/minute. Check rhythm every 2 minutes
• Rotate compressors every 2 minutes with rhythm checks
• Search for and treat possible contributing factors:
– Hypovolemia
– Hypoxia
– Hydrogen ion (acidosis)
– Hypo-/hyperkalemia
– Hypoglycemia
– Hypothermia
– Toxins
– Tamponade, cardiac
– Tension pneumothorax
– Thrombosis (coronary or pulmonary)
– Trauma

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 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) Quality review is necessary to ensure appropriate application of the termination protocol, law enforcement notification, medical examiner or coroner involvement, and family counseling.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Adult Card Dysrhythmias DNR Proto External Pacer PEA Protocol V-fib/pulseless v-tach protocol

2.3.2 Cardiac Dysrhythmias: BRADYCARDIA (Algorithm)

Adult Medical Protocol

Purpose: This protocol is to be used for patients with heart rates < 60 per minute and any of the following signs and symptoms:

- Chest pain
- Shortness of breath
- 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.

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. 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:
   - 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:

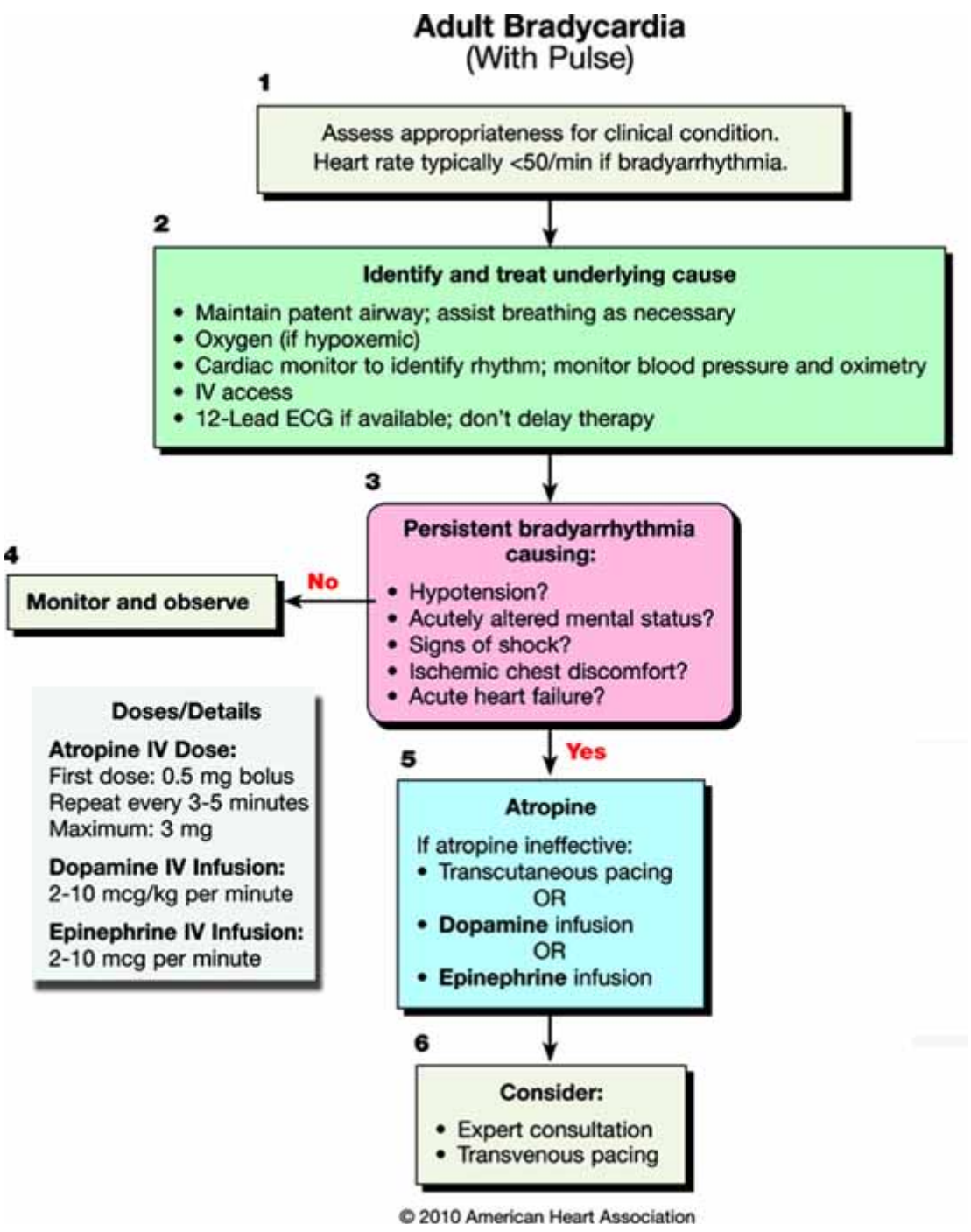
a. **Diazepam (Valium)** 5mg IV or IO, may repeat once PRN (up to max of 10 mg).
b. **Midazolam (Versed)** 2mg IV or IO, may repeat once PRN (up to max. 4 mg).

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult Cardiac Dysrhythmia

See Bradycardia Algorithm next page



Return to: Contents at top Admin Guidelines Adult Medical Protocols
Adult Card Dysrhythmias DNR Proto External Pacer

2.3.3 Cardiac Dysrhythmias: STABLE NARROW COMPLEX TACHYCARDIA- PSVT (JUNCTIONAL OR ATRIAL TACH) (Algorithm)

Adult Medical Protocol

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 ≥ 0.12 seconds) should initially be considered as ventricular in origin, unless proven otherwise (e.g. documented QRS morphology consistent with pre-existing BBB).

Procedure:

PSVT (JUNCTIONAL OR ATRIAL TACHYCARDIA) AND HR ≥ 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.

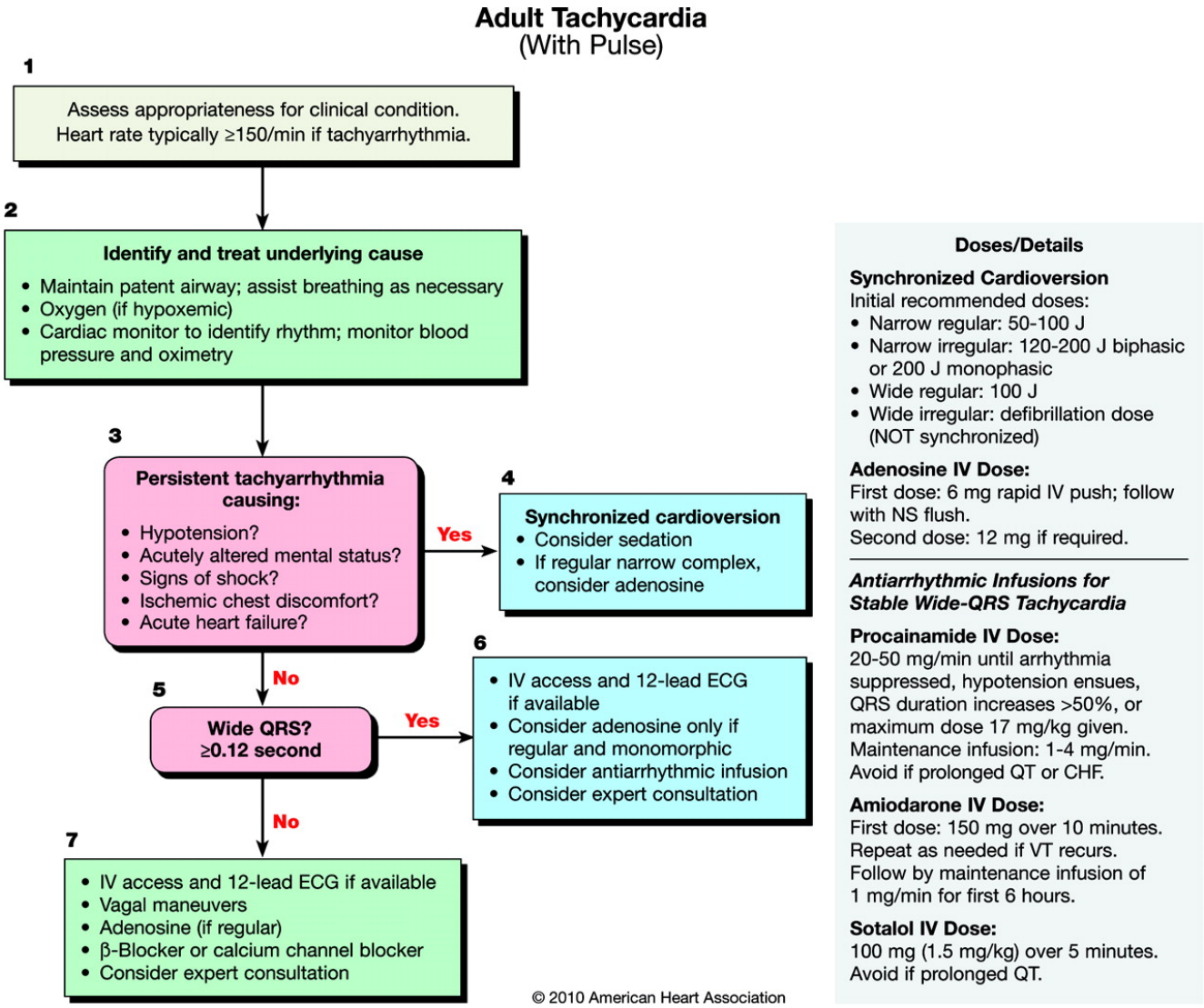
ALS LEVEL 1: PARAMEDIC ONLY

1. Start IV of lactated Ringer's or normal saline TKO.
2. Attempt vagal maneuvers (see procedure: Vagal Maneuver Protocol) if not contraindicated (have patient do a Valsalva maneuver).
3. 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
4. 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 antiarrhymic 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 availa**ble. May repeat x 1 in no response to the first dose.**

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Adult Cardiac Dysrhythmia



Return to: Contents at top Admin Guidelines Adult Medical Protocols Adult Card Dysrhythmias DNR Proto External Pacer Narrow Complex Tachy/Stable Narrow Complex Tachy/Unstable Wide Complex Tachycardia w/pulse

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. Adenocard 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 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Adult Cardiac Dysrhythmia

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

Adult Medial 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
3. If patient is conscious and aware of situation, sedate with one of the following benzodiazepines:
   a. **Midazolam (Versed)** 2mg IV, may repeat once PRN (up to max. 4mg.)
   b. **Diazepam (Valium)** 5mg IV, may repeat once PRN (up to max. of 10 mg).
4. Synchronized cardioversion, start at:
   a. **50 joules for a-flutter** (if no response try 100 then 200 joules)
   b. **100 joules for a-fib and PSVT** (if no response try 200 then 300 joules)

ALS LEVEL 2: MEDICAL CONTROL

1. Overdrive pacing (see procedure: External Cardiac Pacing protocols)
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**. If patient exhibits any of the following signs or symptoms: (Chest pain, Dizziness, Symptoms of acute MI), and premature contractions are malignant (>6/min, multi-focal, occurring in couplets, exhibiting "R on T phenomenon", exhibiting runs of V-tach), follow this protocol. If at all possible, discuss with med control first.

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
2. **Lidocaine** 1.0 – 1.5 mg/kg IV push (reduce dose by 50% if patient over the age of 70 or has known liver disease)
3. If, after 5 minutes, PVCs persist, repeat **Lidocaine** at ½ the initial dose. If PVCs are suppressed, begin **Lidocaine drip** at 2mg/min.
4. If PVCs do not respond to Lidocaine, give **Procainamide** at 30mg/min to a maximum of 17mg/kg.

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 Cardiac Dysrhythmia

2.3.5 Cardiac Dysrhythmias: PULSELESS ECLECTRICAL ACTIVITY (PEA) (Algorithm)

Adult Medical Protocol

Purpose: This protocol is used for pulseless electrical activity.

The most frequent cause of PEA includes:

Hypovolemia	**T**ablets (drug OD, accidents)
Hypoxia	**T**amponade, cardiac
Hydrogen Ion- Acidosis	**T**ension pneumothorax
Hyper-/Hypokalemia	**T**hrombosis, coronary (ACS)
Hypothermia	**T**hrombosis, 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. One dose of **Vasopressin** 40 units IV/IO may be substituted for either the first or second dose of epinephrine.
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.

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 Cardiac Dysrhythmia External Pacing

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

Initial Patient/Assessment Protocol. 2.1.1

Airway Assessment/Management Protocol. 2.1.2

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: 2010 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 50ml of D5W over 10 minutes IV or IO. May repeat every 10 minutes to maximum dose of 2 gm.

   OR if Amiodarone unavailable

   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.

   OR

   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
      - 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)** 2mg IV, may repeat once PRN (up to max. 4mg.)
    b. **Diazepam (Valium)** 5mg IV, 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 50ml of D5W over 10 minutes IV or IO. May repeat every 10 minutes to maximum dose of 2 gm. 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Adult Cardiac Dysrhythmia

2.3.7 **Cardiac Dysrhythmias: V-FIB and/or PULSELESS V-TACH (cardiac arrest algorithm)**

Adult Medical Protocol

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 one of the following drugs (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.
b. **Vasopressin 40 units** IV or IO. After 10 minutes (following administration of **Vasopressin**), administer **Epinephrine** as above.

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)
    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

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Adult Med Protocols Adult Card Dysrhythmias Burn Injuries

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

Initial Patient Assessment Protocol. 2.1.1

Airway Assessment/Management Protocol 2.1.2.

Attach cardiac monitor and pulse oximeter.

ALS LEVEL 1: PARAMEDIC ONLY

1. Initiate IV 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 endotracheal intubation.
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. Treat dysrhythmias per the appropriate protocol.
6. Further treatment based on evidence of fluid overload or no fluid overload.

ALS LEVEL 2: MEDICAL CONTROL

a. If hypotensive **WITH** evidence of fluid overload (peripheral edema and/or lung sounds with rales):
   i. Start **Dopamine** infusion @ 5-20 mcg/kg/min (1600 mcg/ml infusion concentration = 15 – 16 gtt/min). Titrate 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)
b. If hypotensive and **WITHOUT** evidence of fluid overload (lung sounds are clear (no rales) and/or NO peripheral edema):
   i. Administer 250 mL IV fluid bolus prn x 4, reassess vitals between boluses. If patient becomes dyspneic or redevelops pulmonary edema (dyspnea, wheezing, rales), do not give any further boluses
c. Contact medical control or medical director for further orders as needed.

Return to: Contents at top Other Adult Cardiac Emergencies Hypotension Proto

2.4.2 Chest Pain-Suspected Acute MI-Acute Coronary Syndrome

Adult Medical Protocol

Purpose: This protocol is used for patients experiencing chest pain or discomfort **suspicious** for cardiac cause. 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, short of breath, feel a sense of doom, weak, fatigued. Treat patients for possible cardiac cause of pain IF:

- 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, proceed with the following;

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.

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 SpO_2 < 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).
5. Place in position of comfort

ALS LEVEL 1: PARAMEDIC ONLY

1. Obtain (and transmit if capable) 12 lead EKG 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 RECEICVING FACILITY AND CALL A "CODE STEMI". If inferior wall MI is identified, perform additional 12 lead EKG with V4R to confirm/rule out concurrent right ventricular MI. (a).
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.
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 50 – 100 mcg** IV slow over several minutes. May repeat x 1 titrating to effect.
   b. **Morphine Sulfate slow IV in 2mg** increments every 3-5 minutes titrated 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 thrombolytics 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) 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

(b) 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.

Return to: Contents at top Other Adult Cardiac Emergencies LVAD Proto

Chest Pain Protocol Checklist

- ❑ **Assure ABC's.**
- ❑ **Administer oxygen via nasal cannula or non-re-breather if SpO2 <94%**
- ❑ **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 possible.**
- ❑ **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 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.**

Return to: Contents at top Other Adult Cardiac Emergencies

FIBRINOLYTIC INCLUSION/EXCLUSION CHECKLIST:

Patient Name: _____ Date: _____

Inclusion Criteria	**YES**	**NO**
1. Patient ≥ 18 years old		
2. Ischemic discomfort ≥ 30 min. but not > 12 hours		
3. ST segment > 1mm in ≥ 2 contiguous leads or ST elevation ≥ 2mm in ≥ 2 contiguous precardial leads or presumed new LBBB		

Exclusion Criteria	**YES**	**NO**
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.		
1. Any active internal bleeding within the last 4 weeks (e.g. black tarry stools, hematemesis).		
2. History of CVA or TIA.		
3. ANY surgery within the past 4 weeks		
4. Brain tumor, AVM (arterial-venous malformation), Cerebral aneurysm		
5. Hemophilia or any known bleeding disorder		
6. Presenting hypertension, any blood pressure PRIOR to the delivery of thrombolytics that exceeds 180 systolic or 110 diastolic.		
7. Use of cocaine or amphetamines in the past 3 days		
8. Patient in cardiogenic shock (BP < 90), or intubated		
9. Recent trauma, including CPR > 2 minutes		
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.		
11. Being treated for pericarditis, endocarditis		
12. Pregnancy		
13. Patient taking oral anticoagulation meds within the past 3 days		
Paramedic Signature:		

Return to: Contents at top Other Adult Cardiac Emergencies

2.4.3 Hypertensive Emergencies

Adult Medical Protocol

Purpose: 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 SpO_2 < 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 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. 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.

Return to: Contents at top Other Adult Cardiac Emergencies LVAD Proto

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
2. Airway Assessment/Management Protocol.2.1.2.
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, if available. It will depend on the circumstances.

Return to: Contents at top Adult medical protocols Other Adult Cardiac Emergencies LVAD Proto Chem Tx Guide Blue

2.4.5 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.
9. Bring all of the patient's equipment.
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**

Adult Medical Protocol

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.
6. Assess for and document Glascow Coma Scale
7. Transport to designated hospital.

ALS LEVEL 1: PARAMEDIC ONLY

1. Consider need for intubation and always remain vigilant of the patient's respiratory status
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 scretions)**, 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.
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) Consider restraints if necessary for patient and/or personnel's protection per restraint procedure protocol.

Return to: Contents at top Adult Neuro/Psy/Behavior Index

2.5.2 Behavioral / Violent /Psychiatric Emergencies

Adult Medical Protocol

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, restraint 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.

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 SpO_2 < 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. Constantly monitor and observe the patient to prevent injury.
9. Carefully document the rationale for the use of restraints.
10. 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.
11. 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** 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.

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 benzodiazepines:
      i. **Diazepam (Valium)** 5 – 10mg IV or IM. Higher dosing per medical control
      ii. **Midazolam (Versed)** 2 - 2.5 mg IV or IM. May repeat x 1 PRN. Higher dosing per medical control
   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 Benzodiazapines (Versed, Valium) 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)
5. Monitor any physically or chemically restrained patient closely for respiratory compromise and plan to intervene accordingly

ALS LEVEL 2: MEDICAL CONTROL

1. For agitated/violent patient: use one of the following:
   a. **Haldol (haloperidol)** 5 -10 mg IM and **Benadryl** 25 mg IM.
   b. **NOTE: If Haldol unavailable: Ketamine (Ketalar)** 5 mg/kg IM x 1. Watch for increased bronchial secretions. Give **Atropine** 0.5 mg IV/IO every 5 minutes to maximum of 0.04 mg/kg or 3 mg total
   c.
2. Notify medical control or medical director for any problems or concerns.

Return to: Contents at top Adult Neuro/Psy/Behavior Index Peds Violent/impaired

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. DO NOT ATTEMPT TO APPROACH PATIENT UNTIL SCENE IS SCECURED BY LAW-ENFORCEMENT
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 SpO_2 < 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, have law enforcement ride in back of ambulance.** Communicate in a calm and non-threatening manner.
8. Attach cardiac monitor and pulse oximeter as soon as it is feasible (**must** be on any patient restrained, physical or chemical)
9. 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 – 4 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. **NOTE: IF Haldol unavailable OR per Med Control: Ketamine (Ketalar)** 5 mg/kg IM x 1. 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 acidotic.
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 SpO_2 < 90%).
3. Attach cardiac monitor and pulse oximeter
4. Assess for and document the Glascow 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 1 – 2.5mg IV/IN**. May repeat each x 1 PRN
b. **Diazepam (Valium)** 5 – 10mg IV 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.).

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 pulse ox of $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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 of onset of symptoms (time last seen normal). If onset of symptoms is within 5 - 6 hours notify hospital of a possible "stroke alert".**
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
10. If applicable, transport to the appropriate designated Stroke Center.
11. Cincinnati Pre-hospital Stroke Scale:
    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.

ALS LEVEL 1: PARAMEDIC ONLY

1. Endotracheal intubation 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. If CVA is suspected and if time permits, complete the thrombolytic/fibrinolytic screening form (see forms section)
6. Treat seizures with:
    a. **Valium** 5-10 mg IVP or **Versed** 5 mg IM or 1 – 2.5 mg IVP/IN (may repeat x 1). Monitor respiratory efforts and intervene as indicated.

ALS LEVEL 2: MEDICAL CONTROL

1. Contact medical control if seizure did not respond to Valium
2. Contact medical control for treatment of agitation with:
    a. **Valium** 2-5 mg IVP. May repeat every 10 minutes to a maximum of 10 mg. Or
    b. **Versed** 2 mg IV. May repeat x 1 PRN. Maximum dose 4mg.
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.
    - Normal: Both arms move equally or not at all
    - Abnormal: One arm does not move, or one arm drifts down compared with the other side
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%

Return to: Contents at top Adult Neuro/Psy/Behavior Index Adult Med Protocols Hypertension

Stroke Protocol Checklist

- ☐ **Assure ABC's.**
- ☐ **Administer oxygen prn for 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.**

Return to: Contents at top Adult Neuro/Psy/Behavior Index Adult Med Protocols Hypertension

2.5.6 Syncope

Adult Medical Protocol

Purpose: This protocol should be used for patients with a chief complaint of syncopal episode. 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 SpO_2 < 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 **Hyperglycemia 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 SpO_2 < 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.

Return to: Contents at top Adult Med Protocols Adult toxicology index

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 SpO_2 < 90%).
3. Attach cardiac monitor and pulse oximeter if indicated
4. Clean area with soap and water.
5. Advise Dispatch to contact animal control and/or law enforcement for identification and quarantine of animal.

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 SpO_2 < 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 SpO_2 < 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

Opiods, 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)
- Diacetylmorphine (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, Anexsia)
- Hydrocodone bitartrate & acetaminophen (Hydrocet, Loracet, Vicodin)
- Loperamide HCL (Immodium, Immodium A-D)
- Levorphanol tartrate (Levo-Dromoran)
- Meperidine HCl (Demerol) – no miosis
- MeperidineHCl & promethazine HCl (Mepergan) – no miosis
- Methodone HCl(Dolophine)
- Morphine sulfate (Astramorph/PF, Duramorph, Infumorph 200, Infumorph 500, MS Contin, MSIR, Oramorph, Rescudose, Roxanol)
- Nalbuphine HCL(Nubain)
- Napsylate (Darvocet-N)
- Oxymorphone HCl (Numorphan)
- Oxycodone (Percodan, Percocet, Tylox, Roxicodone)
- Pentazocine HCl (Talwin, Talacen)
- Propoxyphene HCl (Darvon-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 Sereotonine 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)
- DET
- MET
- Psilocybin

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)
- Protiptyline 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, lacramation (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, tartive 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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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)** 2mg IV or IM. May repeat x 1 PRN.
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, 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 (> 0.10 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
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 (> 0.10 seconds), give **Sodium Bicarbonate** 1 mEq/kg
13. For symptomatic **TRICYCLIC ANTIDIPRESSANTS OVERDOSE:**
    a. Do 12 lead ECG. If QRS complex is wide (> 0.10 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.

Return to: Contents at top Adult Med Protocols Adult toxicology index Asystole Proto

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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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 or 40-70% isopropyl alcohol.

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 one of the following:
   a. 5% vinegar soaks.
   b. Ammonia/meat tenderizer paste mixture.
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:

1. Copious irrigation with removal of any visible spines.
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 (approximately70 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
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.

Return to: Contents at top Adult Med Protocols Adult toxicology index
Bites and stings

2.7
Adult OB/GYN Emergencies

2.7.1 Childbirth – Complications

Adult Medical Protocol

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.
   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. Oxygen via nasal cannula.
3. Attach cardiac monitor and pulse oximeter.
4. Perineal examination (do not perform internal vaginal examination)
   a. Vaginal bleeding or leakage of fluid.
   b. Presence of meconium.
   c. Crowning during a contraction.
   d. Presenting part (head, face, foot, arm, cord.)

5. IF HEAVY VAGINAL BLEEDING WITH SIGNS OF SHOCK (SYS BP < 90 mm Hg)
   a. Transport with patient in left lateral recumbent position.
   b. Transport immediately, notify labor and delivery
   c. ALS LEVEL 1: Cardiac monitor.
   d. 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:
   a. Place mother on back with hips elevated (pillow under her hips) or place her in knee/chest position.
   b. Do not attempt to push cord back. Wrap cord in sterile saline soaked dressing
   c. With a gloved hand, palpate the cord for pulse.
   d. 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

Return to: Contents at top Adult OB/GYN Emerg

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 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 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. Suction mouth and then nose with bulb suction (if meconium stained fluid, suction baby's airway until clear before stimulating first breath) after head delivers and before torso delivers.
    f. Check for cord around neonate's neck when head is visible and after suctioning. If present, carefully unwrap the cord from the neck. If unable to remove the cord, apply 2 umbilical clamps and cut between

the clamps to release the cord (careful not to injure the newborn). Once airway is clear and cord is free from around neck, instruct mother to push on her next contraction to complete delivery.

g. 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
   - ✓ Clear mouth and nose p.r.n. with gentle suction using bulb syringe
   - ✓ If resuscitation of the newborn is not required, after 60 seconds, clamp cord in two places (if not done as described above to free cord from around neck) approximately 8" and 10" from neonate. Cut cord between clamps
   - ✓ 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

h. Evaluate Newborn:
   - ✓ Note time of delivery and APGAR scores at birth and five minutes
   - ✓ If newborn is not breathing or APGAR < 7 see 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. Delay cord clamping for 60 seconds for both term and preterm infants who do not require resuscitation.
   d. Clamp cord in two places, six inches from infant, and cut cord between clamps.
   e. Suction, warm, dry, and stimulate infant.
   f. Give infant to mother.
   g. Massage uterus gently.
   h. Do not pull on cord or attempt to deliver placenta.
   i. Transport.

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Adult OB/GYN Emerg

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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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.

Return to: Contents at top Adult OB/GYN Emerg

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. Eclamptic seizures can also occur postpartum (≤ 1 week). 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 SpO_2 < 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 <80mg/dl:
      i. If sugar 60 mg/dl - 80 mg/dl; Sublingual **Glucose Paste**, or **Glucagon 1mg 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 glucose is given, give **Thiamine** 100 mg IV or IO~~
4. 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.
5. 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. May repeat once PRN (4 mg maximum dose)
6. Monitor EKG, vital signs, fetal heart tones, level of consciousness, patellar reflexes, respiratory rate, and oxygenation status every 5 minutes.
7. Keep the patient in left lateral recumbent position.

8. Evaluate for pulmonary edema. If present, apply **CPAP** per protocol.
9. 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.**

Return to: Contents at top Adult Medical Protocols Adult OB/GYN Emerg Seizure proto

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 SpO_2 < 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.

Return to: Contents at top Adult Medical Protocols Adult OB/GYN Emerg

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 and 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 > 110 mm Hg without dyspnea)

BASIC LEVEL: EMT and PARAMEDIC

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol (O_2 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. Add **Atrovent (Ipratropium Bromide**) 0.5mg to the first Albuterol nebulizer treatment only

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)
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. Add **Atrovent (Ipratropium Bromide**) 0.5mg to the first Albuterol nebulizer treatment only

9. If the nebulized treatments do not significantly resolve the respiratory distress,
10. Consider need for intubation

ALS LEVEL 2: MEDICAL CONTROL

1. **Epinephrine (1:10,000)** 0.3 mg SLOW IV in 0.1 mg increments over 2 minutes. Caution should be used with administration of Epinephrine when the patient has a history of hypertension or heart disease
2. 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). Titrate 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)

Return to: Contents at top Adult med protocols Other adult medical emerg Bites and stings

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 SpO_2 < 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/d. 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.

Return to: Contents at top Adult Medical protocols Other adult med emerg Seizure proto CVA Proto Toxicology (overdose) LVAD Proto Cold related emerg Near Drowning Electrical/Lightening Adrenal Insufficiency

2.8.3 Abdominal Pain (NON-TRAUMATIC)

Adult Medical Protocol

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, 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 subliqual)
   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.

Return to: Contents at top Adult med protocols Other adult medical emerg

2.8.4 Sickle Cell Anemia

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 SpO_2 < 90%).
3. Attach cardiac monitor and pulse oximeter

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

Return to: Contents at top Adult med protocols Other adult medical emerg

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.
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 history suspicious for alcoholism, administer **Thiamine** 100 mg IV (slow) or IM.~~

ALS LEVEL 2: MEDICAL CONTROL

1. **Contact Medical Control or Medical Director for any questions or problems.**

Return to: Contents at top Adult med protocols Other adult medical emerg

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 2.8.2.
4. ~~If patient has a history of malnutrition or alcohol abuse give **Thiamine** 100mg IV.~~

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Adult med protocols Other adult medical emerg

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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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**

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 Other adult medical emerg

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 SpO_2 < 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.

Return to: Contents at top Adult med protocols Other adult medical emerg LVAD Proto

2.8.9 Hyperkalemia (Elevated Potassium)

Adult Medical Protocols

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 (O_2 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. Kayexcelate PO
   f. Possible dialysis

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at Top Adult Medical Protocols Other Adult Med Emerg

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, anti-psychotic, 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:

Generic Name	Trade Name	General Use
Prochlorperazine	Compazine	Antiemetic, migraine headache
Hydroxyzine	Vistaril, Atarax	Antiemetic, antipruritic
Promethazine	Phenergan	Antiemetic, antipsychotic
Haloperidol	Haldol	Antipsychotic, Tourette's syndrome
Thioridazine	Mellaril	Antipsychotic
Alprazolam	Xanax	Antianxiety
Metoclopramide	Reglan	Antiemetic
Droperidol	Inapsine	Antiemetic, antipsychotic
Fluphenazine	Prolixin	Neuralgia, antipsychotic

Procedure:

BASIC LEVEL: EMT and PARAMEDIC

1. **Initial Patient Assessment Protocol 2.1.1**
2. **Airway Assessment/Management Protocol (O_2 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.**

Return to: Contents at top Adult Medical Protocols Other Adult Medical Emergencies

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.

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. 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
4. Initiate IV of lactated Ringer's or normal saline at TKO. If patient is tachycardia and/or hypotensive, treat according to Hypotension/Shock protocol.
5. 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.

Return to: Contents at top Adult Medical Protocols Other Adult Medical Emergencies

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 $PaCO_2$ 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.[9] 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.[9]

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 SpO_2 < 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.
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.

Return to: Contents at top Adult Medical Protocols Other Adult Medical Emergencies

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.

Return to: Contents at Top Adult Med Protocols Environ Emergencies

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 SpO_2 < 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, for pain control.

Mild to moderate (86 - 96°): 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 < 86^0 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 > 86^0 F. 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 > 86^0 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.

Return to: Contents back at top Adult Med Protocols Adult Environ Emergency

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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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. 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.

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 Environ Emergency index

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.

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 SpO_2 < 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.

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. 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 extra-glottic 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 2.8.2.

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.

Return to: Contents at top Adult Med Protocols Environ Emergency index

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 acidotic 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 $\geq$ 94% (non-rebreather @15 LPM if $SpO_2 < 90\%$.
3. Initialte 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

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 Environ Emergency index

2.10
Adult Trauma Emergencies

2.10.1 Head and Spine Injuries / Trauma

Adult Medical Protocol

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 Immobilization 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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 90%).
3. Determine if C-spine immobilization is needed via Spinal Immobilization 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.
9. Pupillary examination (size, equality).
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 $ETCO_2$ 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.

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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg
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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

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 $\geq$ 94% (use non-rebreather @15 LPM if SpO_2 < 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 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, etc.
    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:
    a. 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

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg General Guidelines for Tx Pt

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
10. Rapid transport.

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-IOs 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

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

2.10.5 Extremity Injuries

Adult Medial 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

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.

ALS LEVEL 1: PARAMEDIC ONLY

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
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

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg
General Guidelines for Tx Pt Peds Pain Management

2.10.6 Burns
Adult Medial 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 orophyarngeal 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.
2. Airway Assessment/Management Protocol 2.1.2.
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 Catagories)
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.

4cc x 70kg x 60 (%burned) = 16,800
16,800 ÷ 2 = 8,400 (amount of fluid need in 8 hours)
8,400 ÷ 8 = 1050 (amount of IV fluid /hour)

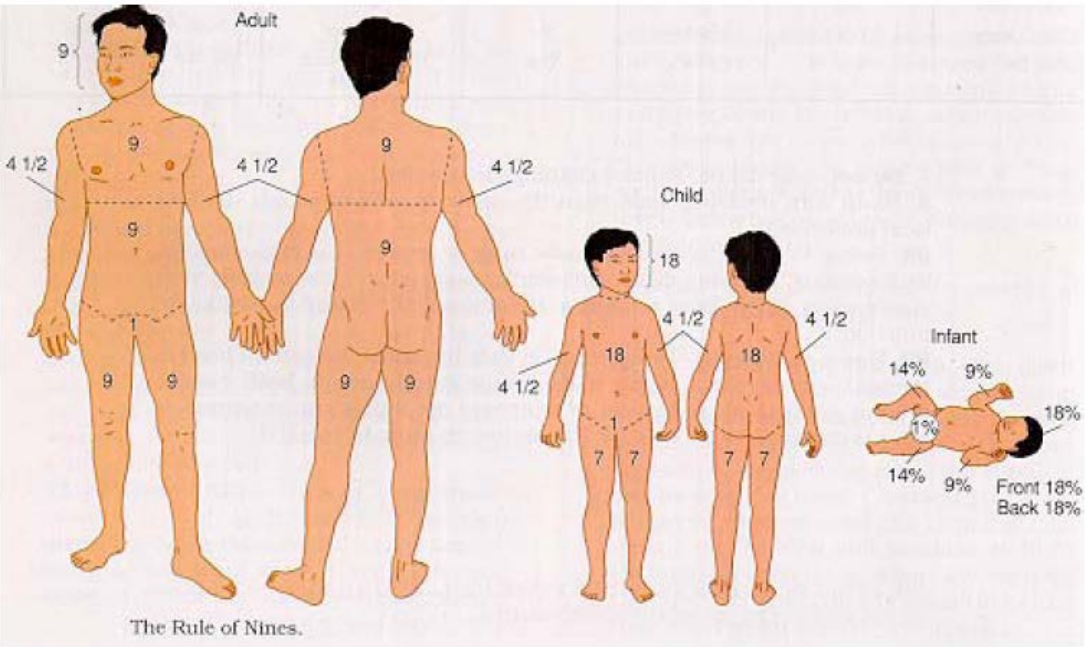
2. If respiratory distress, or airway burns exist, prepare to intubate or support/assist ventilations.
3. If pulseless or apneic, go to Cardiac Arrest Protocol.
4. If additional injuries, go to specific protocol.
5. If patient has isolated burn injuries and no evidence of head injury, altered mental 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
   - 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

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg Electrical/Lightening

Burn Classification	Characteristics
Minor burn injury	◆1°burn ◆2° burn < 15% BSA in adults ◆2° burn < 5% BSA in children/aged ◆3° 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, ear feet, or perineum ◆Most patient with inhalation injury, electric injury, concomitant major trauma, or significant pre-existing diseases



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

ALS LEVEL 2: MEDICAL CONTROL

1. Notify medical control or medical director if any problems and/or questions

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

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 $\geq$ 94% (non-rebreather @15 LPM if SpO_2 < 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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

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 two hours,** 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.

Crush *Syndrome* should be suspected in patients with entrapment/compression of greater than one hour, especially when a large muscle mass/group is involved. 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 SpO_2 < 90%) (environmental considerations, dust)
3. Spinal immobilization 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)
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
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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg

2.11
Adults
With Special Health Care Needs

2.11 Adults with Special Healthcare Needs

Adult Medial 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.

Return to: Contents at top Adult Med Protocols Adults Special Needs Protocols

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.

Return to: Contents at top Adult Med Protocols Adults Special Needs Protocols

2.11.2 Tracheostomy

Adult Medial 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

Return to: Contents at top Adult Med Protocols Adults Special Needs Protocols

2.11.3 Central Venous Lines

Adult Medial 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 $\geq$ equal to 94% (non-rebreather @15 LPM if $SpO_2 < 90\%$).
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

Return to: Contents at top Adult Med Protocols Adults Special Needs Protocols

2.11.4 Feeding Tubes

Adult Medial 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.

Return to: Contents at top Adult Med Protocols Adults Special Needs Protocols

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.

Return to: Contents at top Pediatric Protocols

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.

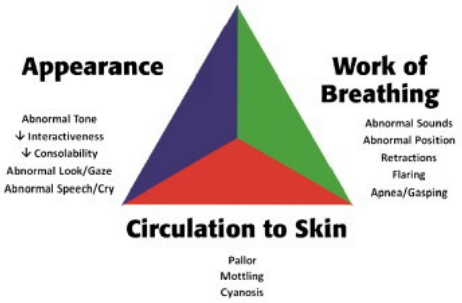
A five-step, systematic approach should be used when assessing the child:

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.
        1. Alertness.
        2. Distractibility.
        3. Consolability.
        4. Eye Contact.
        5. Speech/Cry.
        6. Spontaneous motor activity.
        7. Color.



B. Work of Breathing.
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.

. Circulation to Skin.
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.

4. **Initial Management** (see Pediatric Protocol 3.1.3 - Medical Supportive Care or 3.1.4 -Trauma Supportive Care).

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.
1. S - Symptoms - Assessment of Chief Complaint.
2. A - Allergies.
3. M - Medications.
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

Return to: Contents at top Pediatric Protocols Peds Initial Assessment and Management

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 $SpO_2 \geq 94\%$). 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 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. 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 $ETCO_2$ 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). Documant 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 CO_2 monitoring device.
   (4) Monitor SpO_2 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 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).

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
2. Airway Management Protocol 3.1.2.
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. EMT and Paramedic
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.

Return to: Contents at top Pediatric Protocols Pediatric Initial Assessment and Management

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.
2. Airway Management Protocol 3.1.2. (manually stabilize c-spine PRN).
3. Correct any open wound/sucking chest wound (occlusive dressing).
4. Control hemorrhage
5. Immobilize 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
9. Keep patient warm.

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-IO 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.

Return to: Contents at top Pediatric Protocols Pediatric Initial Assessment and Management

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 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). 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 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), chose 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)**
      Pediatric dosage: 1-3 yrs old: 1 - 2 mcg/kg IV slow or 1.5 mcg/kgIN (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)
      - If hypersalivation/coupious brochial secretions, give **Atropine** 0.02 mg/kg IV/IO.

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Morphine	0.04 mg	0.06mg	0.08 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Fentanyl	8 mcg	12 mcg	16 mcg	20 mcg	24 mcg	30 mcg	38 mcg	48 mcg	60 mcg
Ketamine	2 mg	3 mg	4 mg	5 mg	6 mg	7.5 mg	9.5 mg	12 mg	15 mg
Ketorolac (Toradol)	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	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
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

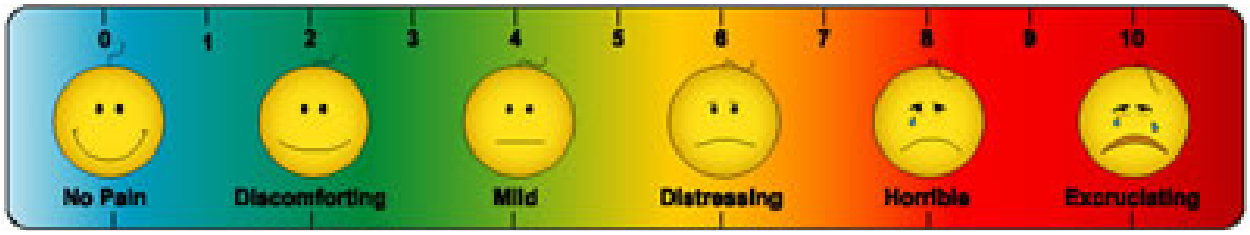
1. If pain persists and systolic BP is adequate (see Appendix Pediatric Vital Signs), give one of the following:
   a. **Morphine Sulfate** may be given intravenously in increments every 3 – 5 minutes, titrated to pain to a maximum of 10 mg. Administer at a rate not to exceed 1 mg/min.
      Pediatric 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**: 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.

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Morphine	0.04 mg	0.06mg	0.08 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Fentanyl	8 mcg	12 mcg	16 mcg	20 mcg	24 mcg	30 mcg	38 mcg	48 mcg	60 mcg
Ketamine	2 mg	3 mg	4 mg	5 mg	6 mg	7.5 mg	9.5 mg	12 mg	15 mg
Ketorolac (Toradol)	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	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
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

Note:

(a) **Wong-Baker Facial Scale**:



(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 $SpO_2 < 95\%$

(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

Return to: Contents at top Pediatric Protocols Pediatric Initial Assessment
Peds Bites and Stings Peds Non-Trauma Abdm Pain Peds Non-Trauma Chest Pn
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** 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.

References: Dieckmann, RA, et al: Pediatric Education for Paramedics, National PEP Task Force, 1995.

American Heart Association/American Academy of Pediatrics: Textbook of Pediatric Advanced Life Support, Dallas, 1994.

American Heart Association: Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: Supplement to Circulation 102: 8, 2000.

Return to: Contents at top Pediatric Protocols Pediatric Respiratory Emergencies

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).
    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
3. If unable to intubate and patient cannot be adequately ventilated by other means, perform needle cricothyroidotomy.

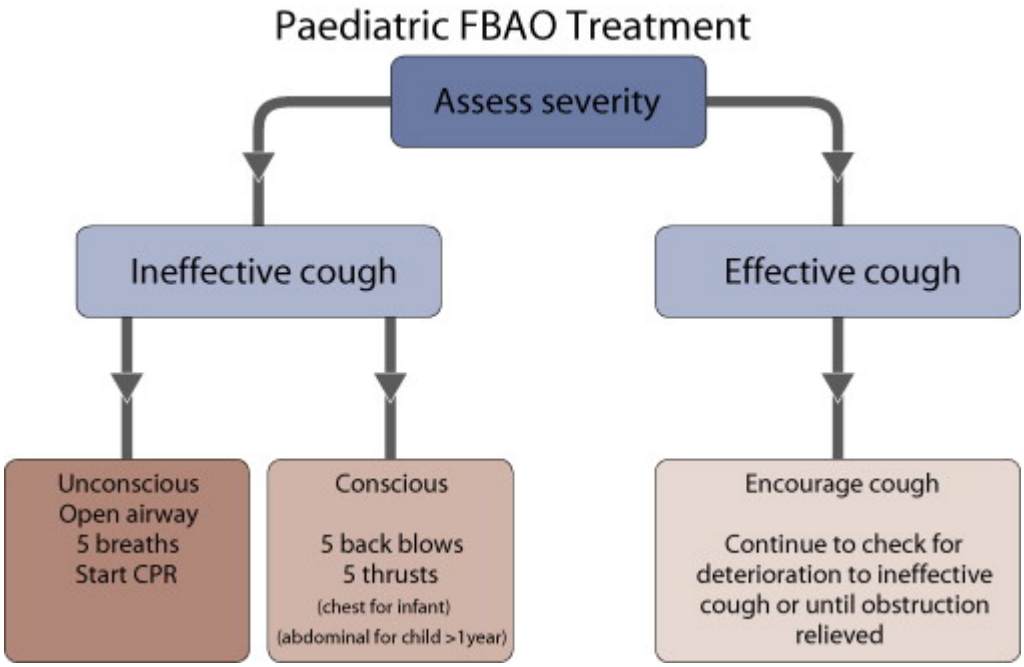
ALS LEVEL 2: MEDICAL CONTROL

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.

Return to: Contents at top Pediatric Protocols Pediatric Respiratory Protocols Peds Upper Airway Stridor



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. None

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 ronchodilators. 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 airflow.

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

1. **Albuterol (Ventolin)** 1 nebulizer treatment (if <1 year or <10 kg, mix 1.25 mg in 1.5 ml of Normal Saline {0.083%}; if >1 year or >10 kg, mix 2.5 mg in 3 ml of Normal Saline {0.083%}). May repeat twice PRN (a).
2. Add **Ipratropium Bromide (Atrovent)** If < 8 years, add 0.25 mg (1.25 ml); if > 8 years, add 0.5 mg (2.5 ml) of Atrovent to first **Albuterol** nebulizer treatment (on first nebulizer treatment only) and flow O_2 at 6-8 L/min.
3. Consider need for assisted ventilation and intubation
4. If respiratory distress is severe, **Epinephrine** (1:1000) 0.01mg/kg IM (if < 8 years, 0.15 mg up to maximum dose of 0.3mg; if > 8 years, maximum dose is 0.3 –0.5 mg).
5. If respiratory distress is persistant and severe after several albuterol nebs, give **Methylprednisolone Sodium Succinate (Solu-Medrol)** 2mg/kg IV (Maximum dose 125 mg).

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Albuterol	< 1 yr or < 10 kg mix 1.25 mg in 1.5 ml NS				> 1 yr or > 10 kg mix 2.5 mg in 3 ml NS				

Atrovent	< 8 yrs old mix 0.25 mg (1.25 ml) to 1st Albuterol				If > 8 yrs old mix 0.5 mg (2.5 ml) to first Albuterol				
Methylprednisolone (Solu-Medrol)	8 mg	12 mg	16 mg	20 mg	24 mg	30 mg	38 mg	48 mg	60 mg
Epinephrine 1:1000 IM	0.04 mg	0.06 mg	0.08 mg	0.10 mg	0.12 mg	0.15 mg	0.19 mg	0.24 mg	0.3 mg
Magnesium	160 mg	240 mg	320 mg	400 mg	480 mg	600 mg	760 mg	960 mg	1200 mg

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;** 25 – 40 mg/kg (maximum 2gm) IV (mixed in 50 ml of D5W given over 10 – 20 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.

Return to: Contents at top Pediatric Protocols Pediatric Cardiac Dysrhythmias

3.3.1 ASYSTOLE (Peds Cardiac Arrest Algorithm)

Pediatric Protocol it

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/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 asystole in two leads.
8. Resume 2 minutes of continuous compressions at 100/min; check the heart rhythm.

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. 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.

Weight	*4 kg grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**

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.

Possible Cause:	Treatment:
Hypoxia	Ventilate/oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn
Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hyper/Hypothermia	Cool/Warm the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

ALS LEVEL 2: MEDICAL CONTROL

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

Note

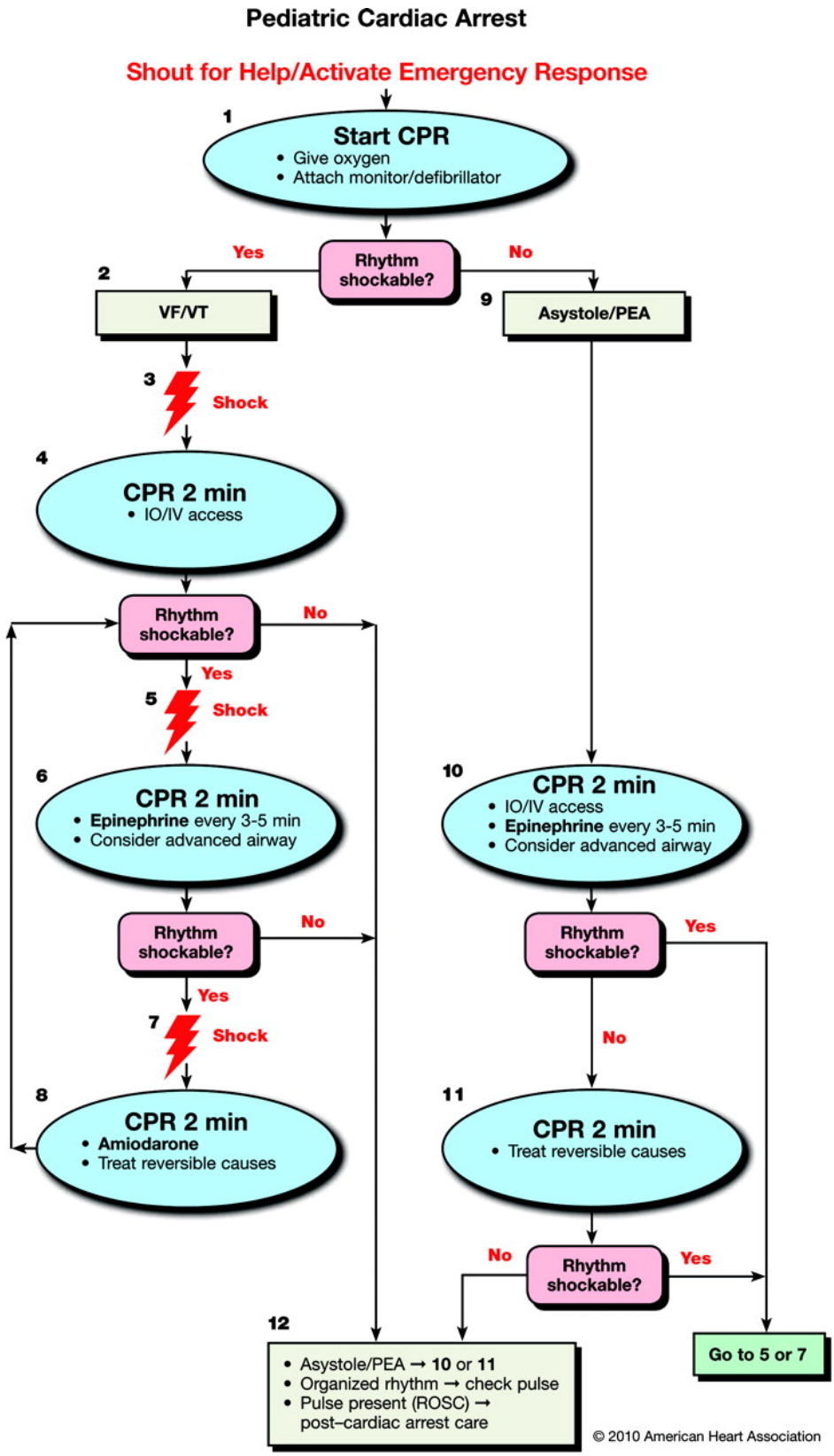
(a) Provide a 15:2 compression to ventilation ratio. Once an advanced airway is in place, provide 1 breath every 6 seconds.

(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 know you can call me direct 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



Doses/Details

CPR Quality
- Push hard (≥1/3 of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths per minute with continuous chest compressions

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.

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 6-8 seconds (8-10 breaths per minute)

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

Return to: Peds Asystole Peds Pulseless Electrical Activity Wide comlex 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

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 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
   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. External pacemaker (see Medical Procedure).

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Atropine	**0.1 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**

ALS LEVEL 2: MEDICAL CONTROL

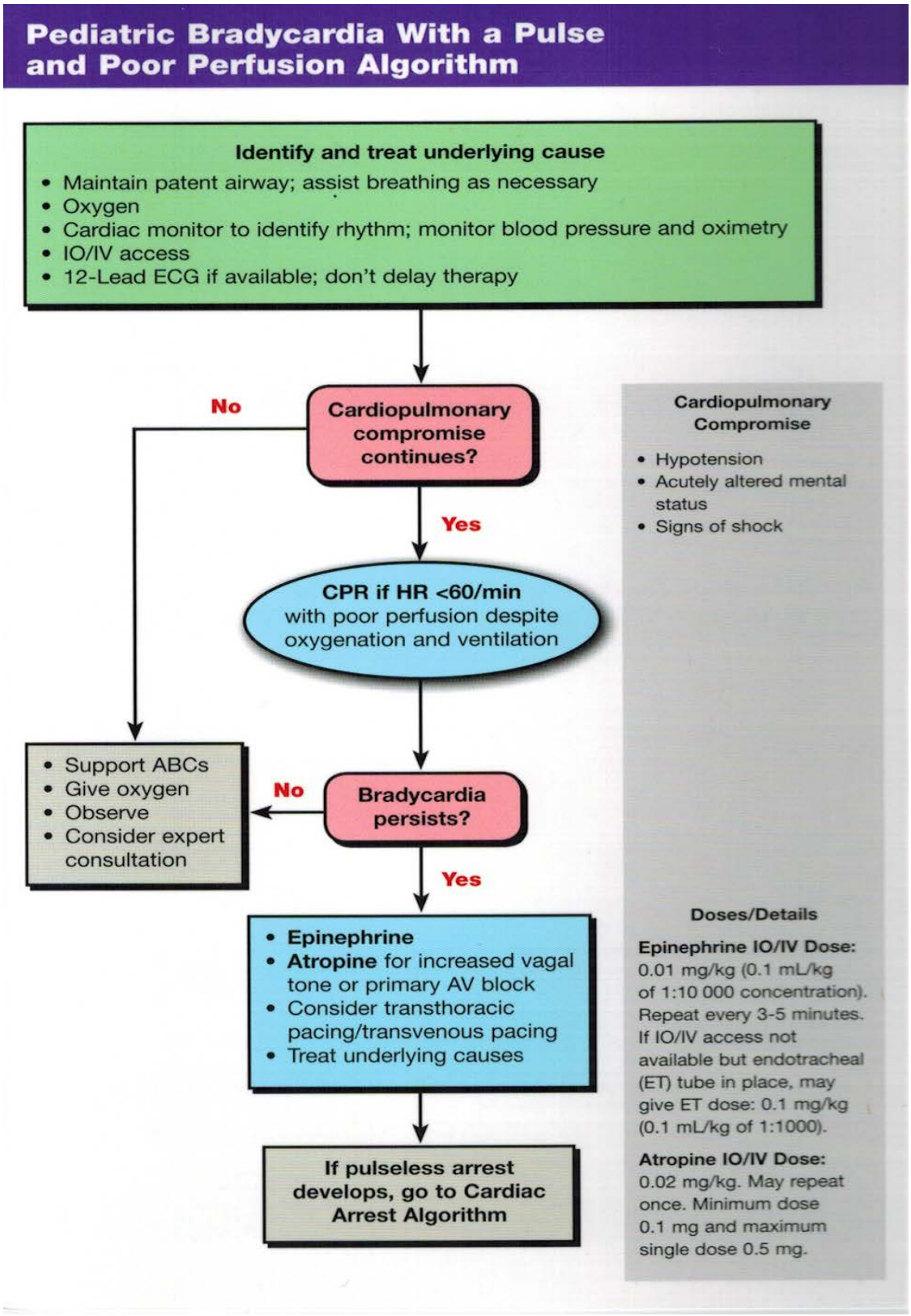
1. Call medical control or medical director if any concerns or questions.

Notes

(a) Administer Atropine before Epinephrine for bradycardia due to suspected increased vagal tone or primary AV block.

Return to: Contents at top Pediatric Protocols Pediatric Cardiac Dysrhythmias

Peds Bradycardia Alogrithm on next page!



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:

H's	T's
Hypoxemia	**T**amponade
Hypovolemia	**T**ension pneumothorax
Hypo/Hyperthermia	**T**oxins
Hyper/Hypokalemia	**T**hromboembolism
Hydrogen Ion (Acidosis)	**T**rauma
Hypoglycemia	**T**ablets

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. Consider other cause (e.g. H's & T's).

Possible Cause:	Treatment:
Hypoxia	Ventilate/oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn
Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hyper/Hypothermia	Cool/Warm the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

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. **Adenosine Triphosphate (Adenocard)** 0.1 mg/kg (6 mg max.) rapid IVP followed by 6 ml NS flush.
4. Repeat in 2 minutes, **Adenosine Triphosphate (Adenocard)** 0.2 mg/kg (12 mg max.) rapid IVP followed by 6 ml NS flush.

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Adenosine 0.1 mg/kg – 1st dose	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Adenosine 0.2 mg/kg – 2nd dose	**0.8 mg**	**1.2 mg**	**1.6 mg**	**2 mg**	**2.4 mg**	**3 mg**	**3.8 mg**	**4.8 mg**	**6 mg**

ALS LEVEL 2: MEDICAL CONTROL

1. Vagal maneuvers; begin with ice water (see Medical Procedure **Vagal maneuvers 4.39**).

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 cause (eg. H's & T's).
2. If patient is responsive, **Adenosine Triphosphate (Adenocard)** 0.1 mg/kg (6 mg max.) rapid IVP or IOP followed by 6 ml NS flush.
3. If patient is responsive, repeat in 2 minutes, **Adenosine Triphosphate (Adenocard)** 0.2 mg/kg (12 mg max.) rapid IVP followed by 6 ml NS flush.
4. If decision to cardiovert and patient is conscious and aware of situation, consider sedation with one of the following benzodiazepines:
   a. **Diazepam (Valium)** 0.1 mg/kg IV/IO.
   b. **Midazolam (Versed)**
      For procedural sedation; ***IV/IO route***;
      6 mo – 5 yr; 0.05 – 0.1 mg/kg IV/IO x 1 repeat q 2 – 3 min prn; max 0.6 mg/kg total
      6 – 12 yr; 0.025 – 0.05 mg/kg IV/IO x 1, repeat q 2 – 2 min prn; max 0.4 mg/kg total
      > 12 yr old: 0.5 – 2 mg IV/IO 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)
5. If patient is poorly responsive, synchronized cardioversion
   a. @ 0.5 joule/kg. (or equivalent biphasic energy level) if no response :
   b. Synchronized cardioversion @ 1 joule/kg (or equivalent biphasic energy level). If no response:
   c. Synchronized cardioversion @ 2 joules/kg (or equivalent biphasic energy level).

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Adenosine 0.1 mg/kg – 1st dose	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Adenosine 0.2 mg/kg – 2nd dose	**0.8 mg**	**1.2 mg**	**1.6 mg**	**2 mg**	**2.4 mg**	**3 mg**	**3.8 mg**	**4.8 mg**	**6 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**

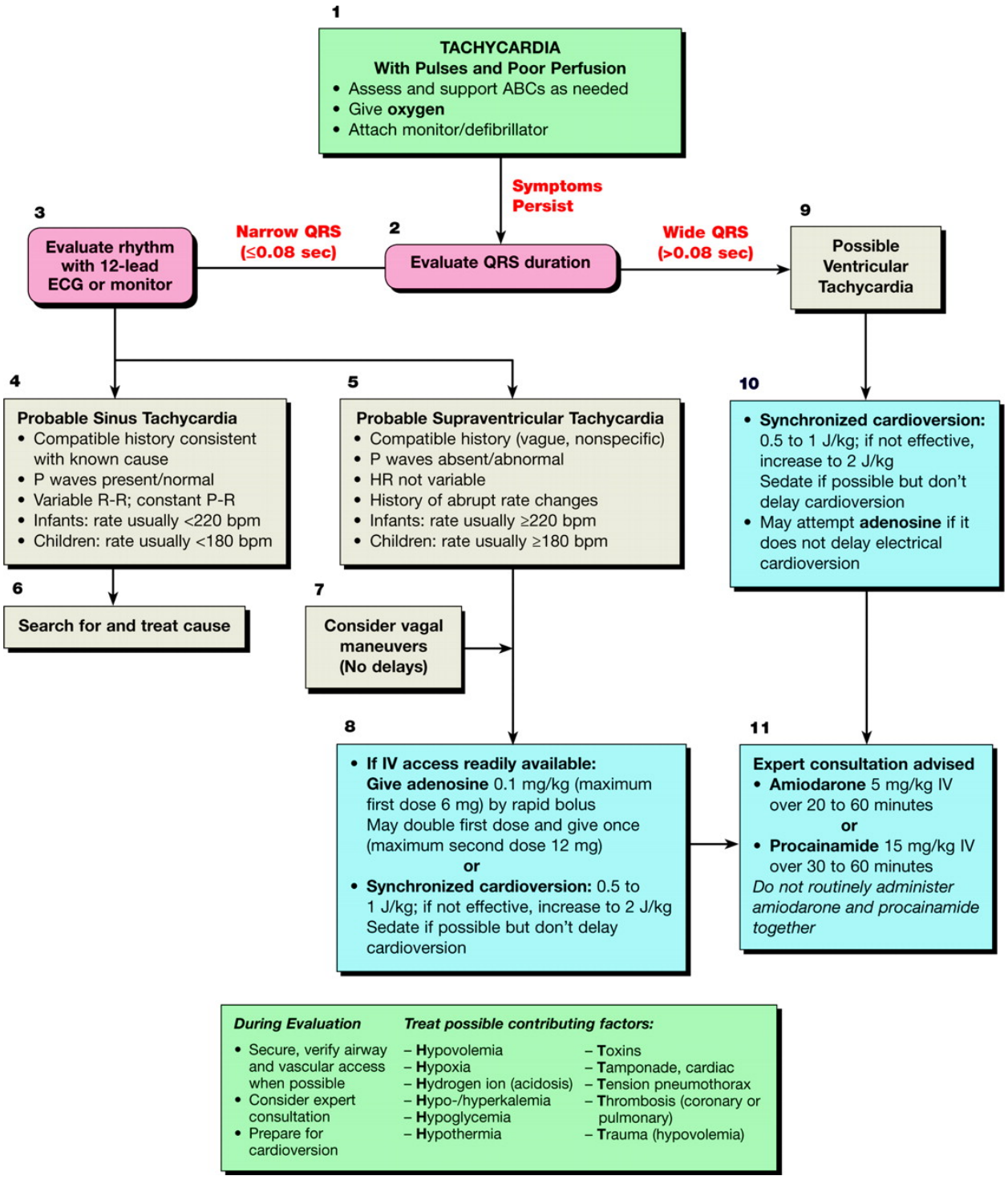
ALS LEVEL 2: MEDICAL CONTROL

1. **Amiodarone** 5 mg/kg IV/IO over 20 minutes.

Amiodarone	20 mg	30 mg	40 mg	50 mg	60 mg	75 mg	95 mg	120 mg	150 mg

Return to: Contents at top Pediatric Protocols Pediatric Cardiac Dysrhythmias

Peds Tachycardia Algorithm on next page.



Return to: Peds Narrow Complex Tachycardia Wide Complex Tachy-Stable Wide Comlext Tachy-Unstable

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:

H's	T's
Hypoxemia	**T**amponade
Hypovolemia	**T**ension pneumothorax
Hypo/Hyperthermia	**T**oxins
Hyper/Hypokalemia	**T**hromboembolism
Hydrogen Ion (Acidosis)	**T**rauma
Hypoglycemia	**T**ablets

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/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/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. 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.

Weight	4 kg grey	6 kg pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**

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).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	**20 ml**	**30 ml**	**40 ml**	**50 ml**	**60 ml**	**75 ml**	**95 ml**	**120 ml**	**150 ml**

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

Possible Cause:	**Treatment:**
Hypoxia	Ventilate/Oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn
Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hypo/Hyperthermia	Warm/Cool the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

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

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:

H's	T's
Hypoxemia	**T**amponade
Hypovolemia	**T**ension pneumothorax
Hypo/Hyperthermia	**T**oxins
Hyper/Hypokalemia	**T**hromboembolism
Hydrogen Ion (Acidosis)	**T**rauma
Hypoglycemia	**T**ablets

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 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.

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Lidocaine	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Amiodarone	**20 mg**	**30 mg**	**40 mg**	**50 mg**	**60 mg**	**75 mg**	**95 mg**	**120 mg**	**150 mg**
Procainamide	60 mg	90 mg	120 mg	150 mg	180 mg	225 mg	285 mg	360 mg	450 mg

2. Consider cause (e.g. H's & T's).

Possible Cause:	**Treatment:**
Hypoxia	Ventilate/Oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn

Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hypo/Hyperthermia	Warm/Cool the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

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:

H's	T's
Hypoxemia	**T**amponade
Hypovolemia	**T**ension pneumothorax
Hypo/Hyperthermia	**T**oxins
Hyper/Hypokalemia	**T**hromboembolism
Hydrogen Ion (Acidosis)	**T**rauma
Hypoglycemia	**T**ablets

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. **Diazepam (Valium)** 0.1 mg/kg IV/IO/IN.
   b. **Midazolam (Versed)**
   IV/IO/IN Route:
   6 mo – 5 yr; 0.05 – 0.1 mg/kg IV/IO/IN x 1 max 0.6 mg/kg total
   6 – 12 yr; 0.025 – 0.05 mg/kg IV//IO/IN x 1, max 0.4 mg/kg total
   > 12 yr old: 0.5 – 2 mg IV/IO/IN x 1; max 10 mg
   IM Route:
   > 6 mo; 0.1 - 0.15 mg/kg IM; max 0.5 mg/kg (use ideal body wt in obese pt)
2. Synchronized cardioversion @ 0.5 joule/kg (or equivalent biphasic energy) (d).
3. Synchronized cardioversion @ 1 joules/kg (or equivalent biphasic energy) (d).
4. Administer one of the following antiarrhythmics:
   c. **Amiodarone** 5 mg/kg IV/IO over 20 minutes.
   d. **Lidocaine** 1% 1 mg/kg IV/IO. Repeat every 5 minutes to a maximum total dose of 3 mg/kg (a)(b)(c).
   e. **Procainamide** 15 mg/kg IV/IO over 30 minutes.

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Lidocaine	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Amiodarone	**20 mg**	**30 mg**	**40 mg**	**50 mg**	**60 mg**	**75 mg**	**95 mg**	**120 mg**	**150 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Procainamide	60 mg	90 mg	120 mg	150 mg	180 mg	225 mg	285 mg	360 mg	450 mg

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:	**Treatment:**

Hypoxia	Ventilate/Oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn
Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hypo/Hyperthermia	Warm/Cool the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

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).

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

6 Hs	6 Ts
Hypoxia	**T**ablets
Hypovolemia	**T**amponade
Hypothermia	**T**ension pneumothorax
Hypoglycemia	**T**oxins – poisons, drugs
Hypo/hyperkalemia	**T**hrombosis – coronary **(AMI)** – pulmonary **(PE)**
Hydrogen ion **(acidosis)**	**T**rauma

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/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/min; check the heart rhythm.

ALS LEVEL 1: PARAMEDIC ONLY

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).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml

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)
5. 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.
6. Administer one of the following antiarrhythmics:
   b. **Amiodarone** 5mg/kg IV/IO (a)
   c. **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)
   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)

Weight	4 kg grey	6 kg pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	0.04 mg	0.06 mg	0.08 mg	0.1 mg	0.12 mg	0.15 mg	0.19 mg	0.24 mg	0.3 mg
Lidocaine 1.5 mg/kg	6 mg	9 mg	12 mg	15 mg	18 mg	22 mg	28 mg	36 mg	45 mg
Lidocaine repeat bolus 0.5-0.75 mg/kg	2-3 mg	3-4 mg	4-6 mg	5-7 mg	6-9 mg	7-11 mg	9-14 mg	12-18 mg	15-22 mg
Amiodarone	20 mg	30 mg	40 mg	50 mg	60 mg	75 mg	95 mg	120 mg	150 mg
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	0.4 mg	0.6 mg	0.8 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Magnesium	160 mg	240 mg	320 mg	400 mg	480 mg	600 mg	760 mg	960 mg	1200 mg

7. Consider and treat possible causes: 6H's and 6T's.

Possible Cause:	Treatment:
Hypoxia	Ventilate/Oxygenate
Hypovolemia	IV Fluid bolus 20ml/kg (10ml/kg neonates), repeat x 1 prn
Hydrogen Ion (Acidosis)	Ventilation; Sodium Bicarb 1 mEq/kg IV/IO
Hypoglycemia	D10W
Hyperkalemia	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.
Hypo/Hyperthermia	Warm/Cool the patient
Tension pneumothorax	Needle decompression
Trauma	Load and go, appropriate protocol
Toxins	Appropriate protocol
Tamponade (cardiac)	Load and go
Thrombosis	Load and go

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).

Return to: Contents at top Pediatric Protocols Newborn/Infant Cardiopulmonary Arrest

3.4.1 NEWBORN RESUSCITATION

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, intubate and suction trachea (see below) (b).
5. Stimulate baby (rub baby's back).
6. 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.
7. Assess skin color, respirations, and heart rate.
8. 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.
9. 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.
10. Perform chest compressions at 120/minute (3:1 ratio, one third of the anterior-posterior diameter of chest in depth), 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.

***NOTE**: For newborns delivered at 35 weeks or less, begin resuscitation using room air and titrate up to 65% FiO2 as needed.

ALS LEVEL 1: PARAMEDIC ONLY

1. Intubate under the following conditions:
    a. Bag-valve-mask ventilation is ineffective after 2 minutes.

b. 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.

Weight	2 kg *grey*	3 kg *grey*	4 kg *grey*	5 kg *grey*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.02 mg**	**0.03 mg**	**0.04 mg**	**0.05 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.2 mg**	**0.3 mg**	**0.4 mg**	**0.5 mg**

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 2 -5 ml/kg IV/IO (dilute D50 1:4 with Sterile Water or Normal Saline = D10).

Weight	**4 kg Grey**	**6 kg Pink**	**8 kg red**	**10 kg purple**	**12 kg yellow**	**15 kg white**	**19 kg blue**	**24 kg orange**	**30 kg green**
D10W	**20 ml**	**30 ml**	**40 ml**	**50 ml**	**60 ml**	**75 ml**	**95 ml**	**120 ml**	**150 ml**

5. Perform Pediatric Assessment Triangle - Rapid Cardiopulmonary Assessment (see Pediatric 3.1.1 - Initial Assessment) frequently.

ALS LEVEL 2: MEDICAL CONTROL

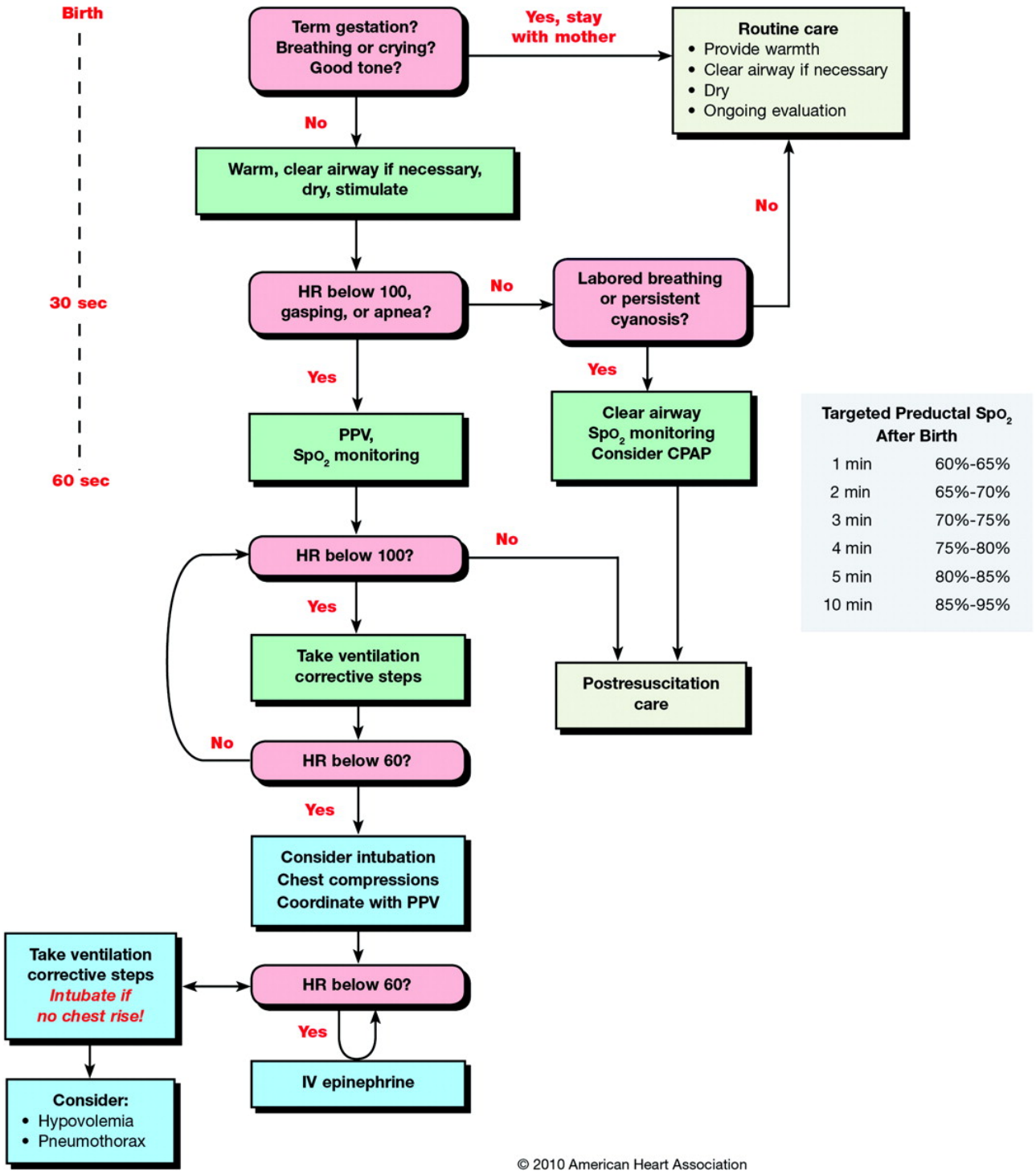
1. If neonate continues to have altered mental status with depressed respirations, consider Narcan 0.1 mg/kg (1 mg/ml concentration) IV/IO/IM/ET (c).

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) 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.

Return to: Contents at top Pediatric Protocols Newborn/Infant Cardiopulmonary Arrest Child Birth Protocols

Newborn Resuscitation



3.4.2 SUDDEN INFANT DEATH SYNDROME (SIDS)

Pediatric Protocol

Purpose: 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 intoxication.

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 intubation (a).
2. 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)
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.
5. If mental status and respiratory effort is depressed, administer **Narcan** 0.1 mg/kg (maximum 2 mg) IV/IO/IM. May repeat every 5 minutes PRN.

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml
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
Glucagon	If < 20 kg give 0.5 mg IM							> 20 kg give 1 mg IM	

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: 0.2mg/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: 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)

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml
Glucagon	If < 20 kg give 0.5 mg IM							> 20 kg give 1 mg IM	
Midazolam (Versed)	0.6 mg	0.9 mg	1.2 mg	1.5 kg	1.8 mg	2.25 mg	2.85 mg	3.6 mg	4 mg
Diazepam (Valium)	1.2 mg	1.8 mg	2.4 mg	3 mg	3.6 mg	4.5 mg	5 mg	5 mg	5 mg
Valium Rectal	2 mg	3 mg	4 mg	5 mg	6 mg	7.5 mg	9.5 mg	12 mg	15 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)
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.

Return to: Contents at top Pediatric Protocols Pediatric Neurological Emergencies Peds Ingestion OD Peds Carbon Monoxide Poison Peds Organophosphate Poisoning Peds Fever Peds Heat Related Emerg Peds Head and Spine Injury

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?
4. Is patient depressed, suicidal? History of previous overdose? (if applicable).
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.

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml
Glucagon	If < 20 kg give 0.5 mg IM							> 20 kg give 1 mg IM	

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)

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
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

6. If suspected tricyclic antidepressant overdose (QRS > 0.10), administer **Sodium Bicarbonate** 1 mEq/kg IV/IO (d).

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Activated Charcoal	**4 gm**	**6 gm**	**8 gm**	**10 gm**	**12 gm**	**15 gm**	**19 gm**	**24 gm**	**30 gm**
Naloxone	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Sodium Bicarbonate	**4 mEq**	**6 mEq**	**8 mEq**	**10 mEq**	**12 mEq**	**15 mEq**	**19 mEq**	**24 mEq**	**30 mEq**
Calcium Chloride	**40 mg**	**60 mg**	**80 mg**	**100 mg**	**120 mg**	**150 mg**	**190 mg**	**240 mg**	**300 mg**
Glucagon	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Atropine	**0.32 mg**	**0.48 mg**	**0.64 mg**	**0.8 mg**	**0.96 mg**	**1.2 mg**	**1.52 mg**	**1.92 mg**	**2.4 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**

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

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

5. Initial Pediatric Assessment Protocol 3.1.1
6. Medical Supportive Care Protocol 3.1.3.
7. Consider need for Pediatric Protocol 3.7.1 – Allergic Reactions/Anaphylaxis.
8. Splint affected area, place patient supine with extremities at a neutral level, keep patient quiet, remove and secure all jewelry.
9. Wash area of bite with copious amounts of water.
10. Attempt to identify snake, if safe to do so.
11. 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.
4. 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.
5. 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. If vinegar is not available, use a paste of baking soda or unseasoned meat tenderizer.
6. Remove large tentacle fragments using forceps (use gloves to avoid contact with bare hands).
7. Apply a lather of shaving cream or a paste of baking soda 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

12. Initial Pediatric Assessment Protocol 3.1.1
13. Medical Supportive Care Protocol 3.1.3
14. Trauma Supportive Care Protocol 3.1.4 if indicated.
15. Wound care - BLS (do not use hydrogen peroxide on deep puncture wounds or wounds exposing fat). Clean area with soap and water.
16. 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.

Return to: Contents at top Pediatric Protocols Pediatric Toxocologic Emergencies

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 Expsure 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

17. Initial Pediatric Assessment Protocol 3.1.1
18. Medical Supportive Care Protocol 3.1.3.
19. Remove patient from hazardous area.
20. 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
5. Airway Management Protocol 3.1.2, administer high-flow oxygen.
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).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Atropine	0.2 mg	0.3 mg	0.4 mg	0.5 mg	0.6 mg	0.75 mg	0.95 mg	1.2 mg	1.5 mg

   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.

Return to: Contents at top Pediatric Protocols Pediatric Toxocologic Emergencies
Peds Ingestion OD Chem Exposure Guideline Green

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).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Diphenhydramine (Benadryl)	4 mg	6 mg	8 mg	10 mg	12 mg	15 mg	19 mg	24 mg	30 mg

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.
3. **Zantac (Ranitadine)** 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 first nebulize treatment only.
8. May repeat **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.15) SQ (a).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Diphenhydramine (Benadryl)	4 mg	6 mg	8 mg	10 mg	12 mg	15 mg	19 mg	24 mg	30 mg
Zantac	Child must be able to swallow. Older children can be given 2 – 5 mg/kg po. ~75 mg – 150 mg								
Methylprednisolone (Solu-Medrol)	8 mg	12 mg	16 mg	20 mg	24 mg	30 mg	38 mg	48 mg	60 mg
Epinephrine 1:1000 IM	0.04 mg	0.06 mg	0.08 mg	0.10 mg	0.12 mg	0.15 mg	0.19 mg	0.24 mg	0.3 mg
Albuterol	< 1 yr or < 10 kg mix 1.25 mg in 1.5 ml NS				> 1 yr or > 10 kg mix 2.5 mg in 3 ml NS				
Atrovent	< 8 yrs old mix 0.25 mg (1.25 ml) to 1st Albuterol				If > 8 yrs old mix 0.5 mg (2.5 ml) to first Albuterol				

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

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.

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) to first nebulized treatment only.
8. May repeat **Epinephrine** (1:1000) 0.01 mg/kg (max. 0.15) SQ (a).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Diphenhydramine (Benadryl)	4 mg	6 mg	8 mg	10 mg	12 mg	15 mg	19 mg	24 mg	30 mg
Zantac	Child must be able to swallow. Older children can be given 2 – 5 mg/kg po. ~75 mg – 150 mg								
Methylprednisolone (Solu-Medrol)	8 mg	12 mg	16 mg	20 mg	24 mg	30 mg	38 mg	48 mg	60 mg
Epinephrine 1:1000 IM	0.04 mg	0.06 mg	0.08 mg	0.10 mg	0.12 mg	0.15 mg	0.19 mg	0.24 mg	0.3 mg
Albuterol	< 1 yr or < 10 kg mix 1.25 mg in 1.5 ml NS				> 1 yr or > 10 kg mix 2.5 mg in 3 ml NS				
Atrovent	< 8 yrs old mix 0.25 mg (1.25 ml) to 1st Albuterol				If > 8 yrs old mix 0.5 mg (2.5 ml) to first Albuterol				
IV NS bolus	80 ml	120 ml	160 ml	200 ml	240 ml	300 ml	380 ml	480 ml	600 ml

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).

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).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml
Glucagon	If < 20 kg give 0.5 mg IM							> 20 kg give 1 mg IM	

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.

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg
Peds Cold Related Emerg

3.7.3 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.
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, intussuception, 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.

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Morphine	**0.04 mg**	**0.06mg**	**0.08 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Fentanyl	**8 mcg**	**12 mcg**	**16 mcg**	**20 mcg**	**24 mcg**	**30 mcg**	**38 mcg**	**48 mcg**	**60 mcg**
Ketamine	**2 mg**	**3 mg**	**4 mg**	**5 mg**	**6 mg**	**7.5 mg**	**9.5 mg**	**12 mg**	**15 mg**
Ketorolac (Toradol)	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	**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**
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**

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.4 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.

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Morphine	0.04 mg	0.06mg	0.08 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Fentanyl	8 mcg	12 mcg	16 mcg	20 mcg	24 mcg	30 mcg	38 mcg	48 mcg	60 mcg
Ketamine	2 mg	3 mg	4 mg	5 mg	6 mg	7.5 mg	9.5 mg	12 mg	15 mg
Ketorolac (Toradol)	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	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
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

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.5 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 or per rectum, may repeat once PRN (up to max. 10 mg) (b).
   b. **Midazolam (Versed)** 0.1mg/kg (maximum 2mg) IM/IV or Intranasal. May repeat once PRN (up to max. 4 mg) (b).
4. **Diphenhydramine HCL (Benadryl)** 1 mg/kg (maximum 50 mg IM or 25 mg IV) IM or IV (a).

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
D10W	20 ml	30 ml	40 ml	50 ml	60 ml	75 ml	95 ml	120 ml	150 ml

Glucagon	If < 20 kg give 0.5 mg IM							> 20 kg give 1 mg IM	
Midazolam (Versed)	0.6 mg	0.9 mg	1.2 mg	1.5 kg	1.8 mg	2.25 mg	2.85 mg	3.6 mg	4 mg
Diazepam (Valium)	1.2 mg	1.8 mg	2.4 mg	3 mg	3.6 mg	4.5 mg	5 mg	5 mg	5 mg
Diphenhydramine (Benadryl)	4 mg	6 mg	8 mg	10 mg	12 mg	15 mg	19 mg	24 mg	30 mg

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).

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.6 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
2. Medical Support Protocol 3.1.3.
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).
9. Report suspected child abuse (Florida Child Abuse Hotline:1-800-342-9152) (b).

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.

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.7 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/kgIN (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

Weight	4kg Grey	6kg Pink	8kg red	10kg purple	12kg yellow	15kg white	19kg blue	24kg orange	30kg green
Morphine	0.04 mg	0.06mg	0.08 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Fentanyl	8 mcg	12 mcg	16 mcg	20 mcg	24 mcg	30 mcg	38 mcg	48 mcg	60 mcg
Ketamine	2 mg	3 mg	4 mg	5 mg	6 mg	7.5 mg	9.5 mg	12 mg	15 mg
Ketorolac (Toradol)	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	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 $SpO_2 \leq 95\%$

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.8 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

21. Initial Pediatric Assessment Protocol 3.1.1
22. Medical Supportive Care Protocol 3.1.3
23. 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.

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Acetaminophen	**60 mg**	**90 mg**	**120 mg**	**150 mg**	**180 mg**	**225 mg**	**285 mg**	**360 mg**	**450 mg**

24. 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.)
25. Consider cooling the child with tepid water applied with a wet cloth to head, axillary, and groin regions.
26. 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.

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

3.7.9 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 apprearence 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 an you are unable to start an IV, place an IO in patient.
5. Give **Albuterol 0.5% solutio**n; 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% solutiuon 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)

Weight	4 kg Grey	6 kg Pink	8 kg red	10 kg purple	12 kg yellow	15 kg white	19 kg blue	24 kg orange	30 kg green
Albuterol	**< 1 yr or < 10 kg mix 1.25 mg in 1.5 ml NS**				**> 1 yr or > 10 kg mix 2.5 mg in 3 ml NS**				
Sodium Bicarb	**4 mEq**	**6 mEq**	**8 mEq**	**10 mEq**	**12 mEq**	**15 mEq**	**19 mEq**	**24 mEq**	**30 mEq**
Calcium Chloride	**80 mg**	**120 mg**	**160 mg**	**200 mg**	**240 mg**	**600 mg**	**380 mg**	**480 mg**	**600 mg**

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Pediatric Protocols Peds Other Medical Emerg

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.

Return to: Contents at top Pediatric Protocols Peds Environ Emerg

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 4.22) (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.

Return to: Contents at top Pediatric Protocols Peds Environ Emerg

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, ecstacy, 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.

Return to: Contents at top Pediatric Protocols Peds Environ Emerg

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), and 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.
6. Maintain horizontal position.
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 ≥ 30°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).

Return to: Contents at top Pediatric Protocols Peds Environ Emerg

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 O_2.
4. Place patient supine. Vomiting patient s 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.

Return to: Contents at top Pediatric Protocols Peds Environ Emerg
Peds Near Drowning

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

2. Initial Pediatric Assessment Protocol 3.1.1
3. Trauma Supportive Care Protocol 3.1.4 (protect C-spine).
4. Treat burns per Pediatric Burn Protocol 3.9.7.
5. Consider need to transport to a trauma center

ALS LEVEL 1: PARAMEDIC ONLY

1. Treat dysrhythmias per specific protocol (see Pediatric Cardiac Dysrhythmida Protocol 3.3).

ALS LEVEL 2: MEDICAL CONTROL

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

Return to: Contents at top Pediatric Protocols Peds Environ Emerg
Pediatric Burn Injuries

3.9
PEDIATRIC
TRAUMA EMERGENCIES

3.9 PEDIATRIC TRAUMA EMERGENCIES

Pediatric Protocol

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.

Return to Peds Protocols
Return to Peds Trauma Emerg

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
2. If not hypotensive (see Appendix 7.10 - Pediatric Vital Signs), elevate head of backboard 30 degrees (12-18 inches).
3. 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 comtinuing with the exam.
4. Perform a through head-to-toe assessment for trauma, including an age-appropriate neurologic exam and musculoskeletal exam.
5. Assess for and document a Glasgow Coma Scale

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.

Return to: Contents at top Peds Protocols Peds Trauma Emerg

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.

Return to: Contents at top Peds Protocols Peds Trauma Emerg

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.
2. 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.
6. For traumatic asphyxia with entrapment > 20 minutes**, Sodium Bicarbonate (8.4%)** 1 mEq/kg IV (a).
7. If a vascular access is obtained (IV or IO) 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.
8. 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%).

Return to: Contents at top Peds Protocols Peds Trauma Emerg
Peds Abdom/Pelvic Injuries

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).

Return to: Contents at top Peds Protocols Peds Trauma Emerg

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

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).

Return to: Contents at top Peds Protocols Peds Trauma Emerg

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) can be established, infuse Normal Saline 20 ml/kg up to 60 ml/kg IV.
2. Avoid use of vasopressors in cases of suspected hypovolemia.
4. Call Trauma Alert if applicable

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 Trauma Emerg

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

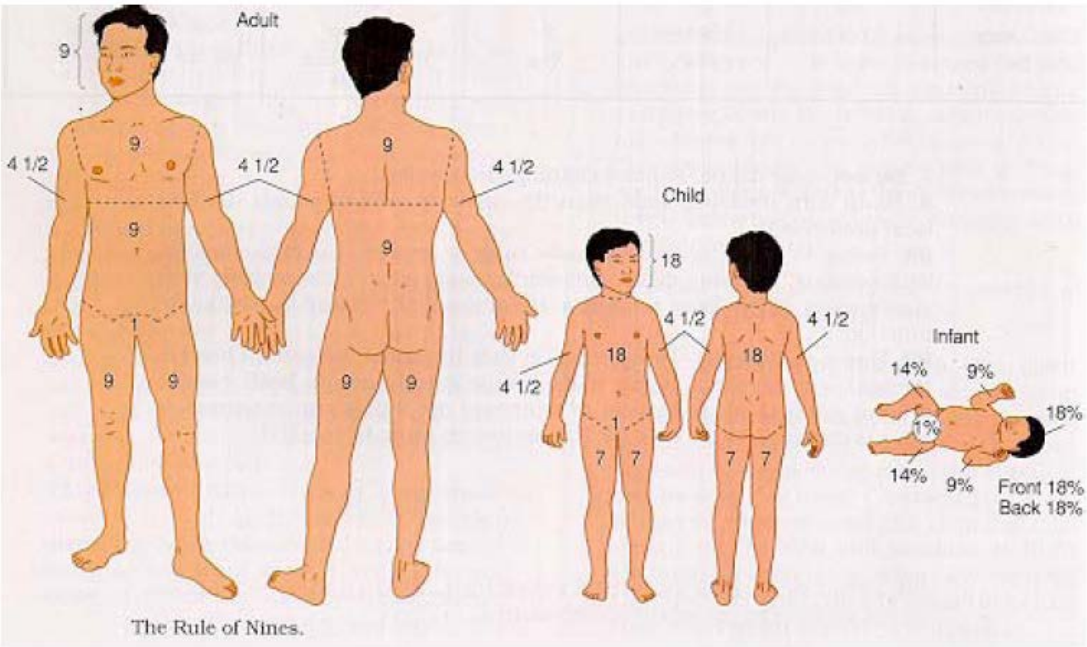
1. If respiratory distress, or airway burns exist, prepare to intubate (**RSI** if indicated) or support/assist ventilations.
2. Establish IV (may start IO for severe burns) of Lactated Ringers or Normal Saline. IV fluid administration based on the
    a. **Parkland formula**: % body surface burned X 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.

Return to: Contents at top Peds Protocols Peds Trauma Emerg
Peds Electrical Injuries

Burn Classification	Characteristics
Minor burn injury	◆1°burn ◆2° burn < 15% BSA in adults ◆2° burn < 5% BSA in children/aged ◆3° 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, ear feet, or perineum ◆Most patient with inhalation injury, electric injury, concomitant major trauma, or significant pre-existing diseases



The Rule of Nines.

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.

American Heart Association: PALS Provider Manual, 2002: p.287.

Return to Peds Protocols
Return to Peds Special Healthcare Needs

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.

Return to: Contents at top Peds Protocols Peds Special Healthcare Needs

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:

1. Chest pain.
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.

Return to: Contents at top Peds Protocols Special Healthcare Needs

4. PROCEDURAL PROTOCOLS

4.1. A.E.D. (AUTOMATED EXTERNAL DEFIBRILLATOR)

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:

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
   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

Return to: Contents at top Procedure Protocol List Adult Med Protocols Peds Med Protocols

4.2. 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 other wise 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 life Band.
- 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 Auto-Pulse 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.3. BAG VALVE MASK

Level of training: EMT-(B,I,A), EMT-P,

Indications:

1. Inadequate respiratory rate:
    - Infant less than 30
    - Toddler less than 20
    - Child less than 16
    - Adolescent less than 12
    - Adult less than 8
2. Inadequate respiratory effort
    a. Absent or diminished breath sounds
    b. Paradoxical breathing (chest and abdomen moving in opposite directions)
    c. Cyanosis on 100% oxygen by non-rebreather mask
3. Bradycardia
    a. Infant heart rate less than 80
    b. Child heart rate less than 60
    c. Adult heart rate less than 60
4. Cardiac arrest
5. Altered mental status

Contraindications: None

Adverse Effects/Complications:

1. Gastric distention
2. Vomiting
3. Increased intracranial pressure as a result of increased vagal stimulation if mask applied over the patient's eyes

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.
5. 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.
6. For single provider BVM use the "E-C clamp" technique to achieve an adequate seal and avoid pressure on the soft tissues of the neck or face: Place the third, fourth, and fifth fingers along the jaw to provide a chin lift (forming an E); use the thumb and index finger to hold the mask on the patient's face (forming a C).
7. Squeeze the bag to achieve chest rise. The delivery of breaths is the same whether you do or do not use supplementary oxygen.
    a. For perfusing rhythm:
        - Adult: 10-12 breaths/min.

- Pediatric: 12-20 breaths/min.

b. When CPR is being performed or if an advanced airway is in place:
   - Adult and pediatric: 8-10 breaths/min.

8. Insert an oral or nasal airway.
9. Avoid aggressive squeezing of the bag. It takes 25 cm of water pressure to open the esophagus.
10. If patient does not have adequate chest rise and breath sounds with BVM, consider the following interventions:
    a. Reposition the head
    b. Check for airway obstruction
    c. Suction the airway
    d. Disable the pressure pop-off valve to increase the delivery of air into the patient
    e. Use a larger bag to increase the volume of air delivered into the patient

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.4. 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.5. BROSELOW or HANDTEVY PEDIATRIC EMERGENCY TAPE

Level of training: EMT-(B-I-A), EMT-P

Purpose: The Broselow Pediatric Emergency Tape is designed to be used as a quick reference drug dosaging 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

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Oral Tracheal Intubation

4.6. CANA (CONVULSANT ANTIDOTE FOR NERVE AGENT) 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:

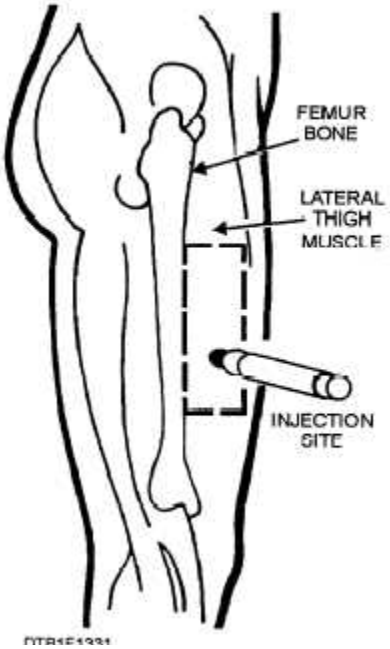
1. **Remove CANA kit from protective pouch.**
2. **Pull off gray safety cap.**
3. **Place Black end on mid outer thigh.**
4. **Push hard until injector functions.**
5. **Withdraw after 10 seconds,**

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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Chem Tx Guideline Green



Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.7. Cardiac Monitor Manuals

Lifepak 12
Lifepak 15
Zoll M Series Operation Manual
Zoll End-Tidal CO2
Zoll M Series Configuration

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Narrow complex tachycard unstable
Wide complex tach w/pulse

4.8. 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, O_2, 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
6. Assure that R wave is being detected by synchronizer circuit: Choose lead II for tall upright R waves, adjust gain if needed
7. Paddles: 25 lbs pressure and conductive medium applied
8. Hands Free: Smooth pad with good contact
9. Monitor shows Atrial Flutter: Start with 50 J DC cardioversion
10. Monitor shows Polymorphic VT: Start with 200 J DC cardioversion
11. All other unstable tachycardia: start with 100 J DC cardioversion
12. Clear patient
13. Hold discharge button down until it fires
14. 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
15. 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

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Narrow complex tachycard unstable
Wide complex tach w/pulse

4.9. COMBITUBE INSERTION

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.
5. The TubeChek is not approved for use on the Combitube.

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
3. Maintain cervical immobilization (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 CO_2, 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 CO_2, 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.

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 endotracheally 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.10. CPAP PROTOCOL

Level: AEMT, EMT-I, EMT-P

Overview: CPAP (Continuous Positive Airway Pressure) can potentially avert the need to intubate a patient in severe respiratory distress. CPAP has been shown to improve dyspnea associated with pneumonia, Chronic Obstructive Pulmonary Disease (Asthma, Bronchitis, Emphysema), and CHF

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. Over the age of 12
    c. Is awake, oriented and able to cooperate
    d. Has ability to maintain an open airway (GCS >10)
    e. Has respiratory rate > 25 breaths per minute
    f. Has a systolic BP > 90 mm Hg
    g. Is using accessory muscles during respirations

Contraindications:

1. Respiratory arrest
2. Agonal breathing
3. Patient is suspected of having a pneumothorax
4. Patient has a tracheostomy
5. Unconscious
6. Shock associated with cardiac insufficiency
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 intubation equipment available for any unexpected problem/deterioration**
5. Place patient in a sitting position
6. Assess vital signs and SpO_2 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' cmH_2O)
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 H_2O) to one of the following levels:
    a. CHF/ ACPE 10 cm H_2O (some patients will improve with a slightly lower pressure, titrate to effect)
    b. All other SOB/Dyspnea 5 cm H_2O
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, notify the receiving hospital in order to have a CPAP unit available on your arrival
22. Documentation should include:
    a. CPAP level (10cm H_2O or 5 cm H_2O)
    b. FiO_2 (100%)
    c. SpO_2 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 H_2O 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Pneumonia Proto Procedure Protocol List Cardiogenic shock Peds Med Protocols
Airway Management COPD protocol Pul Edema/CHF protocol
Chem Expos Tx Guideline

4.11. 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 per minute (place the heel of hand on the sternum between the nipples and compress to a depth of 2 inches).
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 per minute (place the heel of one hand or two hands on the mid sternum and compress at a depth of two inches).
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 compressions per minute, at one-half 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 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Pneumonia Proto Procedure Protocol List Cardiogenic shock Peds Med Protocols
Airway Management COPD protocol Pul Edema/CHF protocol
Chem Expos Tx Guideline

4.12. Cyanokit (Hydroxocobalamin)

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 1: Common signs and Symptoms of Cyanide Poisoning

Symptoms	Signs
• Headache	• Altered Mental Status (e.g., confusion, disorientation)
• Confusion	• Seizures or Coma
• Dyspnea	• Mydriasis
• Chest	• Tachypnea / Hyperpnea (early)
• tightness	• Bradypnea / Apnea (late)
• Nausea	• Hypertension (early) / Hypotension (late)
	• Cardiovascular collapse
	• Vomiting
	• Plasma lactate concentration ≥ 8 mmol/L

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

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. Infuse the first vial: Use vented IV tubing to hang the bag and infuse over 7.5 minutes.
5. 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 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

***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

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Hazardous Chem Tx Guide Red Rx Cyanokit

4.13. EMT ASSISTED ADMINISTRATION OF PRESCRIBED Rx

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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.14. END-TIDAL CO_2 DETECTION AND MONITORING

Level of training: EMT-P,

Color Metric End-Tidal CO_2 Detector Definition: The End-Tidal CO_2 detector attaches to the endotracheal tube and a breathing device (e.g. BVM/Demand Valve) to detect approximate ranges of End-Tidal CO_2 by color comparison for up to two hours.

Color Metric $ETCO_2$ Indications

1. To assist verification of endotracheal tube placement after intubation and during transport
2. To detect approximate ranges of End-Tidal CO_2 when clinically significant.

Color Metric $ETCO_2$ 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 CO_2 levels detectable by the CO_2 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 CO_2 indicator based on patient weight.

Procedure:

For EASY CAP End-Tidal CO_2 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
5. If color of indicator is Tan, ventilate six more times and recheck.
6. If patient is in cardiac arrest and the color indicator is Purple, recheck ETT placement with direct laryngoscopy to confirm placement.
7. Check centimeter marking on ETT at teeth. If ETT is too shallow (in hypopharynx), reading may be inaccurate.

Interpretation of *EASY CAP* Results

Color Range	End-Tidal CO_2 Level	Correlation
"A" (Purple)	0.03%–< 0.5% $ETCO_2$ < 4 mmHg	ETT *not* in trachea. (see #6 above)
"B" (Tan)	0.5%–< 2% $ETCO_2$ 4–< 15 mmHg	After first six breaths: retained CO_2 in esophagus or low perfusion, hypocarbia. After second six breaths: ETT in trachea with low perfusion or hypocarbia. (see #7 above)
"C" (Yellow)	2%–5% $ETCO_2$ 15–38 mmHg	ETT in trachea. (see #7 above)

Electronic End-Tidal CO_2 ($ETCO_2$) Monitor Definition: The End-Tidal CO_2 ($ETCO_2$) Monitor electronically measures the amount of carbon dioxide (CO_2) in the airway at the end of each breath. $ETCO_2$ monitors display this information in the manner (depending on the make and manufacturer):

1. Capnometer = number ($ETCO_2$)
2. Capnogram = tracing (Waveform)
3. Capnograph = Number and tracing

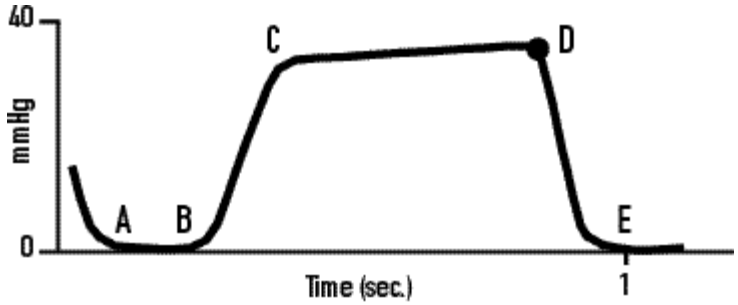
Electronic $ETCO_2$ Monitor Applications: Capnography is an objective monitoring tool for patients in respiratory distress and patients undergoing procedural sedation. It may be used to confirm, monitor and document ET tube intubation. A nasal-oral cannula is used to assess, monitor and document the respiratory status of the non- intubated patient.

Application on Intubated Patients:

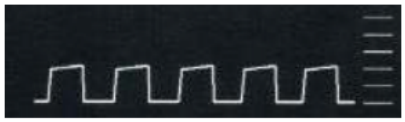
1. Verification of ET tube placement
2. Monitoring and detection of ET tube dislodgement
3. Loss of circulatory function
4. Determination of adequate CPR compression
5. Confirmation of return of spontaneous circulation (ROSC)

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



A: End of inhalation; B: Beginning of exhalation; B–D: Exhalation of alveolar gas; D: End exhalation and point of maximal or highest CO2 concentration {end-tidal CO2 (EtCO2)}; D–E: Inhalation.

NORMAL: "Square box" waveform; baseline CO2 = 0; ETCO2 = 35-45 mm Hg Management: Monitor	
DISLODGED ETT / ESOPHAGEAL INTUBATION: Loss of waveform, Loss of ETCO2 reading Management: Replace ETT	
"SHARKFIN" with/without prolonged expiration = Bronchospasm (asthma, COPD, allergic reaction): Management: Bronchodilators (Albuterol, Atrovent, or epinephrine)	
RISING BASELINE = Patient is rebreathing CO2: Management: Check equipment for adequate oxygen inflow Allow intubated patient more time to exhale	
HYPERVENTILATION: Rapid RR; shortened waveform; baseline ETCO2 = 0; ETCO2 < 35 mm Hg Management: Biofeedback if conscious, decrease assisted ventilation rate if unconscious/intubated	
PATIENT BREATHING AROUND ET TUBE: angled, sloping down stroke on waveform Broken cuff or tube is too small Management: Assess patient, oxygenation, ventilation; may need to re-intubate	

****Important: Severe metabolic acidosis (DKA, sepsis, salicylate poisoning, acute renal failure, methanol ingestion. Tricyclic overdose) will cause tachypnea, but ETCO2 will be HIGH.**

THIS IS NOT NORMAL

Return to: Contents at top Admin Guidelines Adult Medical Protocols Procedure Protocol List Peds Med Protocols Airway Management Medical Supportive Care Chem Expos Tx Guideline Oral Tracheal Intubation

4.15. EPI-PEN 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

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
EMT Assisted Med Admin

4.16. EXTERNAL PACEMAKER

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. 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. **Asystolic or Bradycardic arrest**: Should be treated as per **Asystolic protocol** (CPR, epinephrine and external pacemaker). If applied early during cardiac arrest management, external pacing may help to reestablish a pulse. Atropine is not the drug of choice in bradycardic arrest. Effective CPR, endotracheal intubation, **epinephrine** (via IV, IO, or ETT) are priorities. The focus of treatment should be CPR and epinephrine to increase myocardial perfusion. Thus, several procedures should be done simultaneously in these arrests. Ideally, one paramedic would provide CPR, while another intubates and begins drug therapy, while another checks rhythm an initiates pacing. External pacing should be applied early but should not take the place of initial CPR and drug therapy. NOTE: If bradycardia and no pulse, this should be treated as **Pulseless Electrical Activity.** The lack of pulse in this situation is due to inadequate myocardial perfusion. Epinephrine and CPR is the treatment of choice.
3. The treatment of hemodynamically compromised patients in settings where cardiac output is compromised due either 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)
    c. Patients who experience provider-witnessed cardiopulmonary arrest and who present with asystole, or patients whose ECG converts to asystole while the ECG is being monitored
4. Prompt application of the transcutaneous cardiac pacemaker is appropriate prior to or immediately following the administration of epinephrine and atropine when a patient converts to asystole as a primary rhythm during ECG monitoring.
5. 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. **Set desired heart rate:** usually 70 beats per minute.
3. **Set desired energy level:** Start with 40 mA.
4. **Attach monitoring electrodes and cables.** This is needed for pacers that set demand mode.
5. **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).
6. **Record a strip of the patient's own rhythm.**
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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Bradycardia Proto Procedure Protocol List Narrow complex tachycard unstable
Peds Med Protocols Airway Management

4.17. EZ-IO Protocol

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 (SaO_2 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 obtained 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

Return to: Contents at top Admin Guidelines Procedural Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Abdom/Pelvic Trauma Special Considerations Peds Medical Suupportive Care
Peds Trauma Supportive Care

4.18. FIBRINOLYTIC SCREENING

Level: EMT-(B-I-A), EMT-P

Introduction: The intent of fibrinolytic screening is to determine prehospital whether the patient can or cannot receive fibrinolytics. The fibrinolytic screening includes assessing for criteria for both indications and contraindications to fibrinolytic therapy.

Indications for Fibrinolytic Therapy:

1. Diagnosis of probable acute myocardial infarction.
    a. There is a minimum of 1 mm of ST elevation in two or more related leads on the twelve lead ECG with history suggestive of AMI.
2. Diagnosis of probable stroke or "Stroke Alert".
    a. Patients exhibiting signs consistent with 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, drug overdose, hypoxia, etc.). Other causes should be ruled out (e.g. hypoglycemia, drug overdose, hypoxia, etc.)
        - "Stroke Alert" patients must be ruled out for hemorrhagic causes of stroke (e.g. emergency CT scan) prior to administration of fibrinolytics.

Contraindications to Fibrinolytic Therapy:

1. Active or bleeding problem
    a. Hemophilia
    b. Active ulcer (with or without signs of bleeding).
    c. GI/GU bleeding
        - Signs and symptoms- hematemesis, hemoptysis, melena, hematuria, bleeding from mouth/nose or rectum, rigid and/or tender abdomen
    d. Pregnancy or menses
    e. Other external signs of bleeding
2. Recent Trauma (within 2 weeks)
    a. Trauma
    b. Major Surgery
    c. Organ Biopsy
3. CNS abnormalities
    a. Intracranial or intraspinal surgery or trauma within 2 months.
    b. Brain tumor
    c. History of CVA or TIA (CT scan must confirm absence of hemorrhage).
4. Vascular deficiencies.
    a. History of arteriovenous malformations
    b. History of aneurysm.
    c. Suspected aortic aneurysm or dissection.
5. Severe uncontrolled hypertension (220/110)
6. Diabetic eye problems and/or other hemorrhagic ophthalmic condition.
7. Disoriented and/or uncooperative patient that causes information to be unreliable.

8. Previous administration of, or allergy to Streptokinase (Streptokinase should not be considered as drug of choice- another fibrinolytic should be used).
9. Prolonged (>10 minutes) and traumatic CPR.

Procedure: The fibrinolytic checklist should be completed on all patients that meet criteria for fibrinolytic therapy (as specified above). The checklist should include the indications and contraindications as specified above as a minimum data set. A copy of the fibrinolytic screening checklist should be attached to the EMS run report.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.18.1. FIBRINOLYTIC INCLUSION/EXCLUSION CHECKLIST:

Patient Name: _____ **Date:** _____

Inclusion Criteria	**YES**	**NO**
1. Patient ≥ 18 years old		
2. Ischemic discomfort ≥ 30 min. but not > 12 hours		
3. ST segment > 1mm in ≥ 2 contiguous leads or ST elevation ≥ 2mm in ≥ 2 contiguous precardial leads or presumed new LBBB		

Exclusion Criteria	**YES**	**NO**
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.		
1. Any active internal bleeding within the last 4 weeks (e.g. black tarry stools, hematemesis).		
2. History of CVA or TIA.		
3. ANY surgery within the past 4 weeks		
4. Brain tumor, AVM (arterial-venous malformation), Cerebral aneurysm		
5. Hemophilia or any known bleeding disorder		
6. Presenting hypertension, any blood pressure PRIOR to the delivery of thrombolytics that exceeds 180 systolic or 110 diastolic.		
7. Use of cocaine or amphetamines in the past 3 days		
8. Patient in cardiogenic shock (BP < 90), or intubated		
9. Recent trauma, including CPR > 2 minutes		
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.		
11. Being treated for pericarditis, endocarditis		
12. Pregnancy		
13. Patient taking oral anticoagulation meds within the past 3 days		
Paramedic Signature:		

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols

4.19. FOREIGN BODY OBSTRUCTED AIRWAY PROCEDURE

Level: (EMT-B-I-A), EMT-P

Purpose: To remove foreign bodies via abdominal thrust (chest thrust for infants) and if unsuccessful, by direct visualization utilizing Magill forceps and Laryngoscope (paramedic only). This is done after Heimlich maneuvers have been attempted and failed, and the patient is unconscious

Procedure:

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 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.
6. Give 30 chest compressions.
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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Procedure Protocol List Peds Med Protocols Airway Management
Airway Obstruction Peds Airway Obstruction Peds Near Drowning

4.20. Glucometer Procedure

Level: EMT-(B-I-A), EMT-P,

Purpose: The Glucometer should be utilized to determine blood glucose levels. This information can be used to determine if hyper or hypoglycemia is present.

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
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 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.21. 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.
    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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management Extremity Injury

4.22. HELMET 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:

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.

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. 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.
10. Perform cervical immobilization with a commercial cervical immobilization device.

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

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 immobilization 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 immobilization. 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 immobilization

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.

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.
        - If the helmet prevents immobilization for transport in an appropriate position1,10

To remove other helmets:

Helmets that should be removed include:
1. Motorcycle helmets
2. Bicycle helmets
3. Skateboard/Ski helmets
4. Roller blading helmets

Steps for Helmet Removal

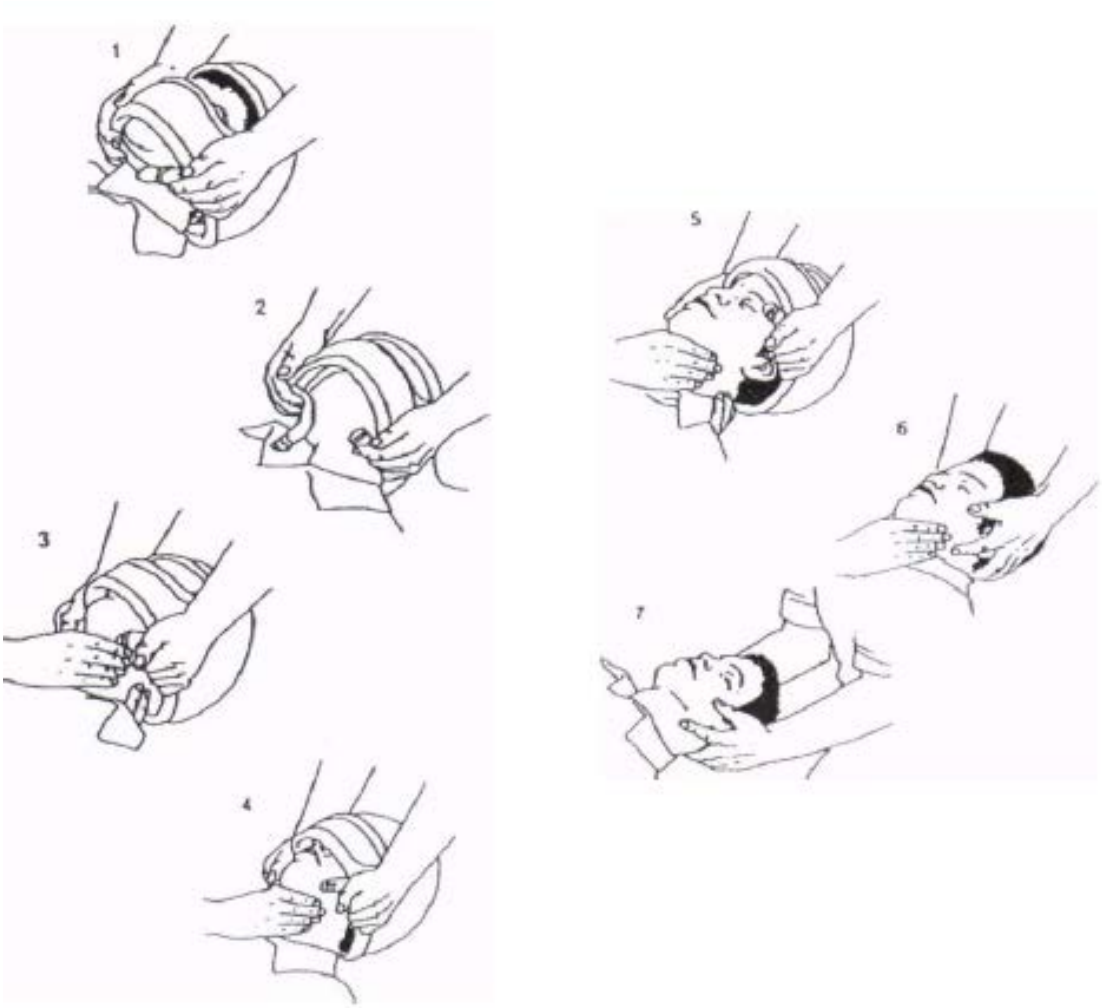
1. Stabilize the helmet in the neutral in-line position and have a second individual remove the chin strap.
2. The individual that removed the chin strap will then support the occiput and mandible while the helmet is gently slipped up and forward.
3. Once the helmet is removed, standard c-spine control 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

Motorcycle Helmet Removal:



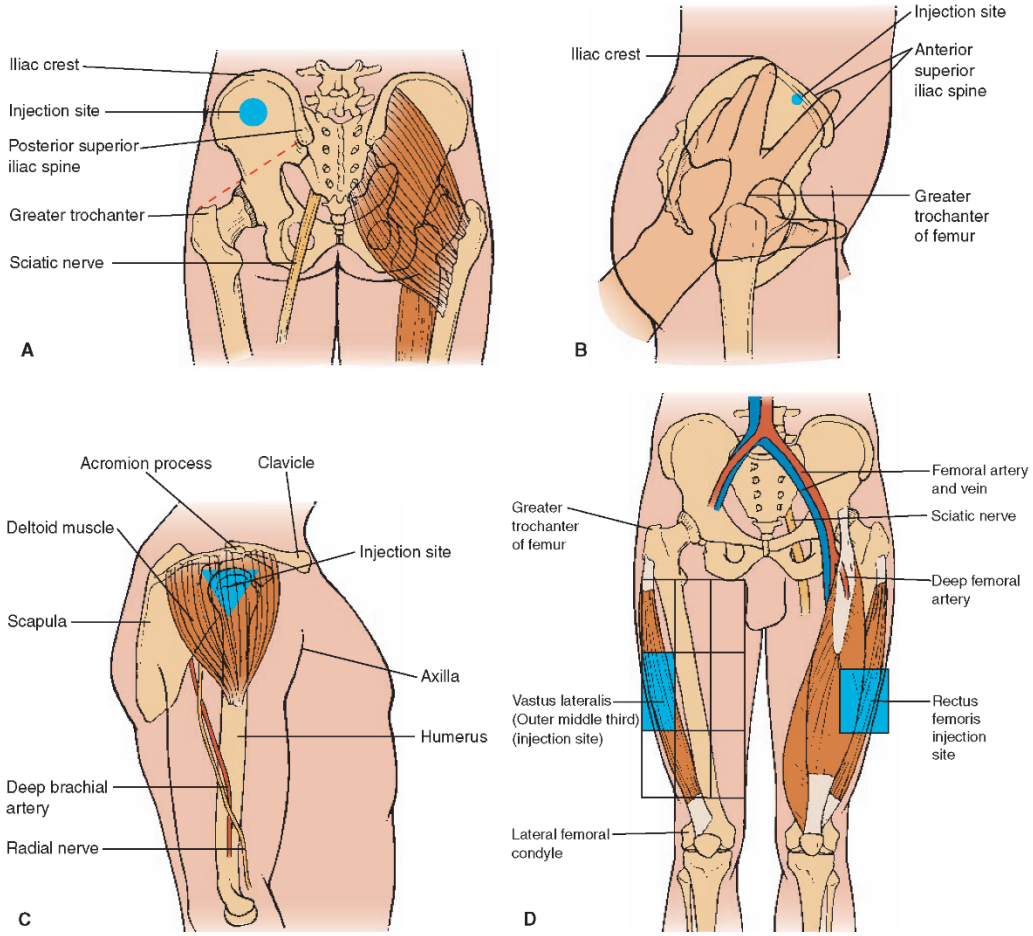
Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.23 IM and IN MEDICATION ADMINISTRATION

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. Check for proper medication, expiration date, vial integrity, and color and clarity. Draw the medication into the syringe.
3. Cleanse the injection site with alcohol or Betadine in an expanding circular pattern using a firm pressure.
4. With one hand, pull the skin taut and insert the needle at a 90-degree angle into the muscle.
5. Aspirate to ensure that a blood vessel has not been entered. If blood is aspirated, remove theneedle and repeat the procedure at a different site.
6. Administer the appropriate dose.
7. Remove the needle from the injection site and dispose of it in a secure sharps container.
8. Monitor the patient.



Intranasal Medication Administration (IN) Mucosal Atomization 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. Exspel 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.

Notes:

Medications which are appropriate for intranasal use include:

- Diazepam (5mg/mL) 2-5mg
- Fentanyl (50mcg/mL) 25-50mcg
- Glucagon (solubilize 2mg vials in 1mL sterile water)1-2 mg
- Ketamine (100mg/mL) 50-100mg
- Lorazepam (2mg/mL) 0.5-4mg
- Midazolam (5mg/mL) 1-10mg
- Naloxone (1mg/mL) 0.4-2mg

Return to: Contents at top Admin Guidelines Adult Medical Protocols PEA Procedure Protocol List V-fib Peds Med Protocols Airway Management Asystole Protocol

4.24 INDUCED HYPOTHERMIA FOR CARDIAC ARREST

Level of training: EMT-P

Purpose: This protocol is to be used on patients with return of spontaneous circulation following successful resuscitation from medical cardiac arrest (not traumatic), who are still unresponsive. The ultimate goal is to cool the patient's core body temperature to approximately 33° +/- 1° ((89.6 – 93.2° F) and maintain that temperature for 12-24 hours.

Inclusion Criteria:

1. Return of spontaneous circulation/ pulse after successful resuscitation efforts of a non-traumatic cardiac arrest
2. Patient is not awake; patient's best motor response (BMR) is less than 4.
3. Patient is not obviously pregnant
4. Age > 16 years
5. Temperature > 34° (93°F)
6. No known bleeding problems, severe infection or recent major surgery (< 14 days)
7. No known DNR orders exists
8. Advanced Airway in place
9. Blood pressure equal to or greater than 90 mm Hg (systolic) with or without pressors to maintain pressure

Exclusion Criteria:

1. Patients who are alert and oriented following the initial arrest
2. Unstable blood pressure or rhythm unresponsive to therapy
3. Temp < 34° C (93.2 F) following cardiac arrest
4. Other, more likely causes for coma such as: overdose, intoxication, trauma, hypoglycemia, infection, or seizure
5. Known or pre-existing coagulopathy or active bleeding
6. Appearance of a gravid abdomen
7. Comatose or vegetative state prior to cardiac arrest
8. DNR order exist
9. Uncontrolled GI bleeding

Procedure:

1. After ROSC assess to see if patient is eligible for induced hypothermia (see inclusion and exclusion criteria)
2. Check initial temperature (Should be > 34° (93°))
3. Perform neuro exam
4. Start one large bore I.V.
5. Patient should be intubated (if not done earlier)

6. Patient should be kept sedated with Versed 2 - 4 mg IV initially then 1-2 mg IV increments prn up to 10 mg.
7. Expose patient and apply ice packs/cold packs to groin and axilla. Undergarments may be left in place to protect modesty
8. Give cold (4° C [39.2° F]) saline bolus of 30 ml/kg, maximum of 2 liters, rapidly/wide open.
9. If patient starts to shiver, give one or combination of any two of the following (one at a time):
    - **a.** Versed 2 – 4 mg initially then 2 mg increments up to 10 mg till shivering controlled.
    - **b.** Etomidate 0.3 mg/kg (20 mg)
    - **c.** Morphine 2 mg initially then 2 mg increments q 5 minutes prn up to 10 mg.
10. If shivering persist, contact med control for order of Vecuronium 0.15 mg/kg to max of 10 mg
11. If needed, use Dopamine 10 – 20 mcg/kg/min IV to keep systolic BP equal to or greater than 90 mm Hg.
12. Check 12 lead EKG: if STEMI present, transport to nearest STEMI Center
13. Contact receiving hospital so they are ready to accept transfer of care and continue patient cooling.
14. Do not hyperventilate: goal is ETCO2 of around 40
15. At any time there is a loss of spontaneous circulation, stop cooling and go to the appropriate protocol**.**
16. Contact medical control for any concerns or issues.

Return to: Contents at top Admin Guidelines Adult Medical Protocols PEA Procedure Protocol List V-fib Peds Med Protocols Airway Management Asystole Protocol

4.25 Accessing an Indwelling Vascular Catheter (aka "Port-a-Cath")

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 is 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 luer-lock transfer device, safely transfer blood from the syringe(s) into the appropriate blood collection tubes.

    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:

- Once a patient's indwelling catheter is accessed in the field, the patient must be transport to the hospital for appropriate de-accessing (ie, administration of heparin flush solution).
- 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.
- 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.
- This procedure should be performed under the cleanest of conditions. Maintaining a sterile/sterile-like environment is desired.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management Special Considerations

4.26 INTRAVENOUS (IV) PROCEDURE

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 reapid 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, remove needle; insert catheter to hub. 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
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

Return to: Contents at top Admin Guidelines Procedure Protocol List

4.27 IV PUMP

Level of training: EMT-P

Alaris 3 Chamber IV Pump Manual

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.28 KED (KENDRICK EXTRICATION DEVICE)

Level of training: EMT-(B-I-A), EMT-P

Purpose: The Kendrick Extrication Device (KED) is designed to immobilize a patient found in a sitting position. It is most commonly used in automobile accidents where the patient is stable.

Procedure:

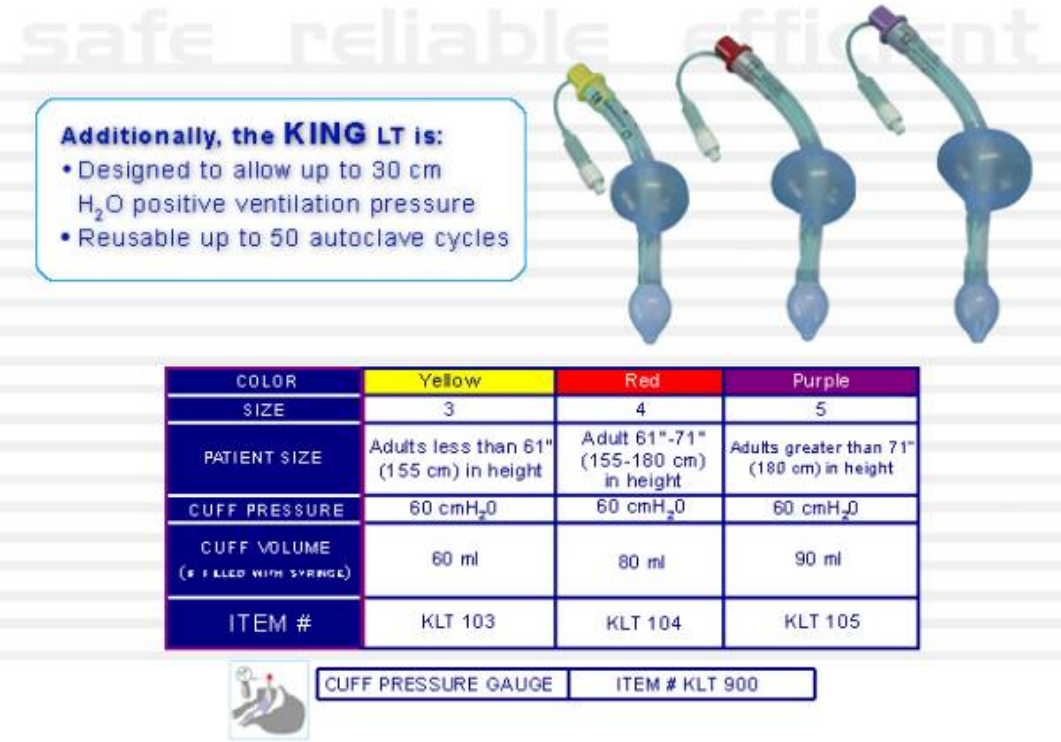
1. Rescuer One should be positioned behind the patient to stabilize the head and neck.
2. Rescuer Two checks neurological and vascular response of all extremities.
3. Rescuer Two measures and applies the cervical collar.
4. The KED is slid into position behind the patient.
5. The KED is wrapped around the patient, and the middle strap is secured. The KED should be snug beneath the patient's armpits.
6. The bottom strap is secured next.
7. Each leg strap is wrapped around the leg and secured.
8. The top strap of the KED is secured.
9. The patient's head is secured into the KED.
10. All of the straps are tightened down.
11. The patient's wrist and legs are secured.
12. A long spine board is placed under the patient's buttocks.
13. The patient is removed from the vehicle and transferred to the long spine board.
14. Disconnect the leg straps, allowing the patient's legs to lay flat on the long spine board.
15. Refer to the Securing a 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

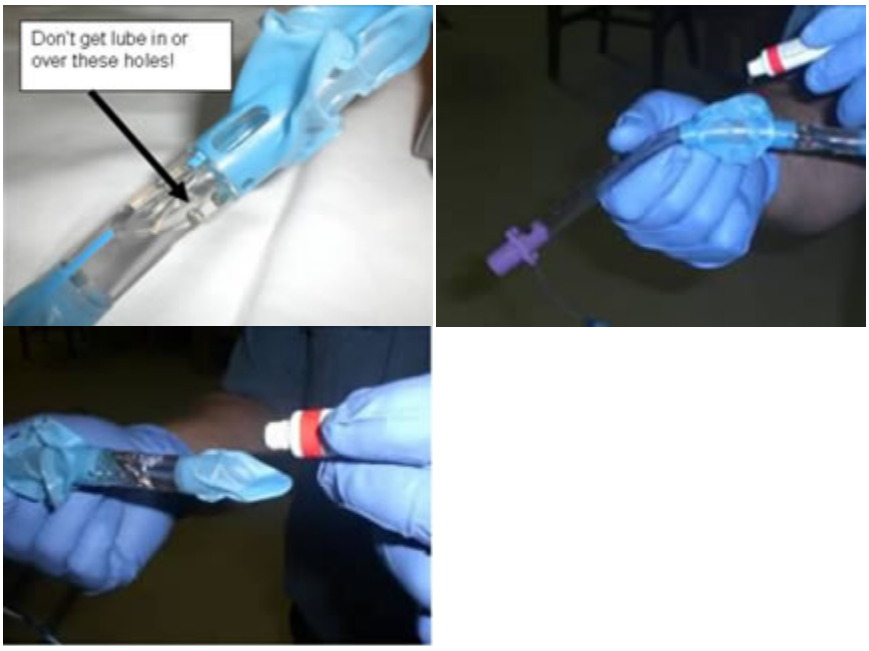
4.29 King Airway

Level of traning: 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 which 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

Return to: Contents at top Admin Guidelines Asystole Proto Procedure Protocol List V-fib Adult Med Protocols Peds Med Protocols Airway Management Medical Supportive Care Asystole Chem Expos Tx Guideline Oral Tracheal Intubation

4.30 Lucas CPR 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)

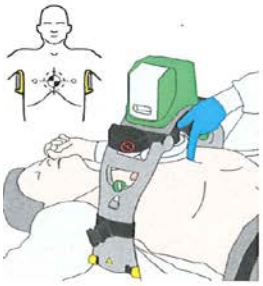
- Push **ON/OFF** for 1 second to start self-test and power up LUCAS

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

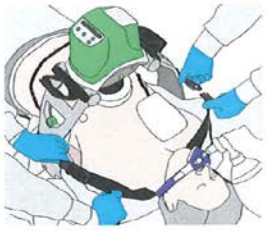
- Push the Suction Cup down with two fingers (make sure it is in the **ADJUST** mode)
- Pressure pad inside Suction Cup should touch patient's chest. If the pad does not touch or fit properly, continue manual compressions
- Push **PAUSE** to lock Start Position – then remove your fingers from the Suction 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List

4.31 Left Ventricular Assist Device (LVAD) Field Guide

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Haza Mater Exposure

4.32 MARK I AUTO-INJECTOR and DuoDote

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.

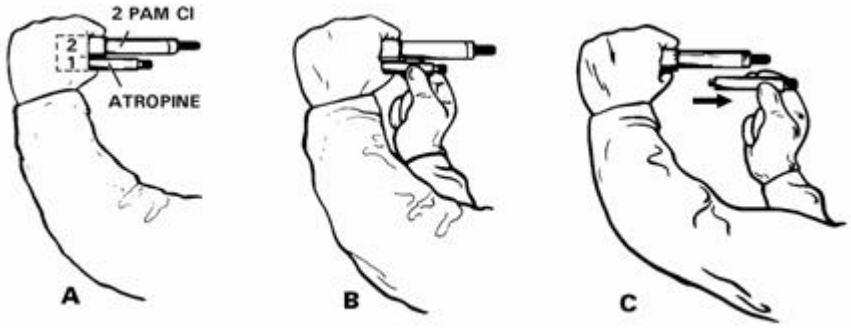
Contraindications:

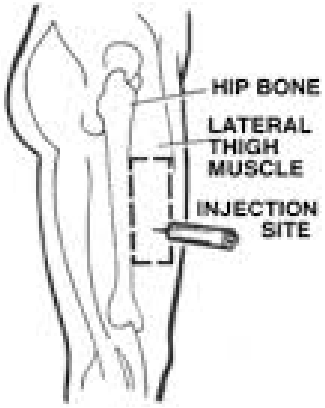
Mark I auto-injector or DuoDote should not be used for pediatric patients less than 8 years of age.

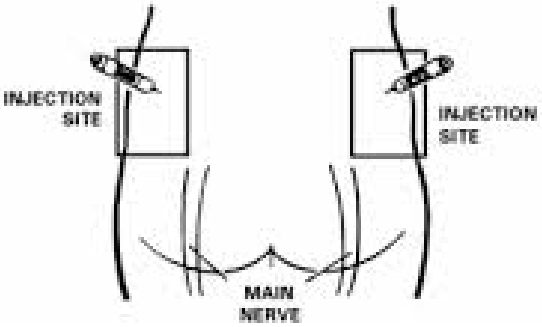
Procedure: Mark I

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.
9. Push firmly until auto-injector fires.
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.







Procedure: for **DuoDote**

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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Haza Mater Exposure

4.33 MORGAN THERAPEUTIC LENS

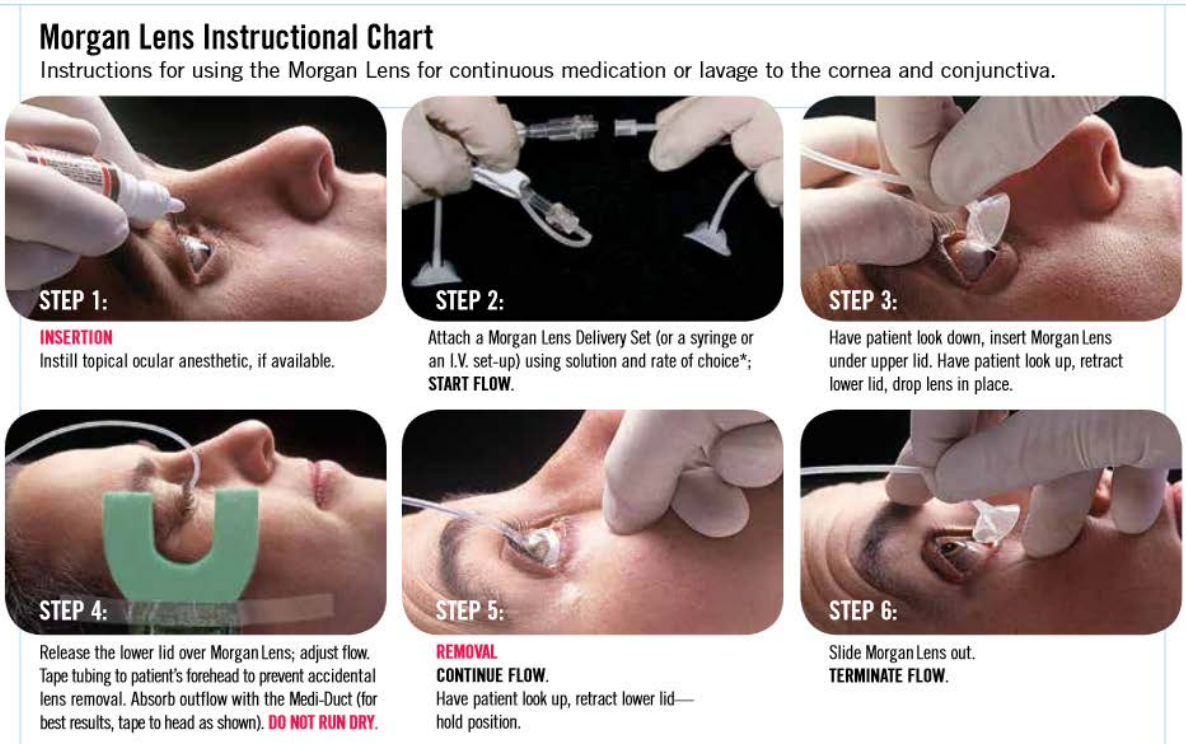
Level of training: EMT-(B-I-A), EMT-P

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.
5. Removal: Have patient look up. Retract lower lid behind interior border of the lens. Hold position. Have patient look down, retract upper lid and slide lens out.



Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Chem Tx Guide Blue Chem burns to eyes

4.34 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:

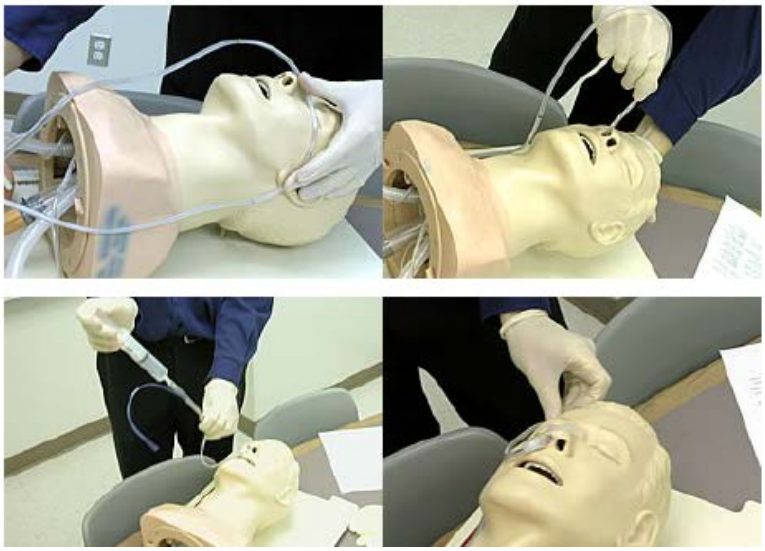
1. The adult patient with noticeable gastric distention that interferes with ventilatory support.
2. Any pediatric patient that is intubated or receives long term (>3 minutes) ventilation by Bag Valve Mask.

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. 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.)
4. Verify placement by auscultating epigastric sounds while inserting 20-30 cc's of air.
5. Tape in place and note depth of tube on the run report.



Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management Peds Near Drowning
Oral Tracheal Intubation

4.35 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 laryngosope 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 CO_2 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 $ETCO_2$ (maintain between 35 – 45 mm Hg (if available), pulse ox, chest rise and fall and breath sounds.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management Peds Near Drowning

4.36 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

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 O_2 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. Albuteral 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.37 NEEDLE CRICOTHYROIDOTOMY
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. Have suction supplies available and ready
2. Place the patient in the supine position.
3. 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.
4. Prep the area.
5. Attach a #14 gauge 2inch IV needle to a 10cc syringe.
6. Puncture the skin midline, directly over the cricothyroid membrane.
7. Direct the needle at a 45°degree angle caudally.
8. Carefully insert the needle through the lower half of the membrane, aspirating as the needle is advanced.
9. Aspiration of air signified entry into the tracheal lumen.
10. Advance the catheter over the needle into the trachea.
11. Attach catheter needle hub to a 3.0 mm pediatric endotracheal tube adapter and oxygenate with 100% oxygen via a B-V-M.
12. Ventilate for 1 second and allow 2 seconds for exhalation
13. Observe lung inflations and auscultate for adequate ventilation.
14. Secure apparatus to neck.
15. Document and record response.
16. Monitor pulse ox.

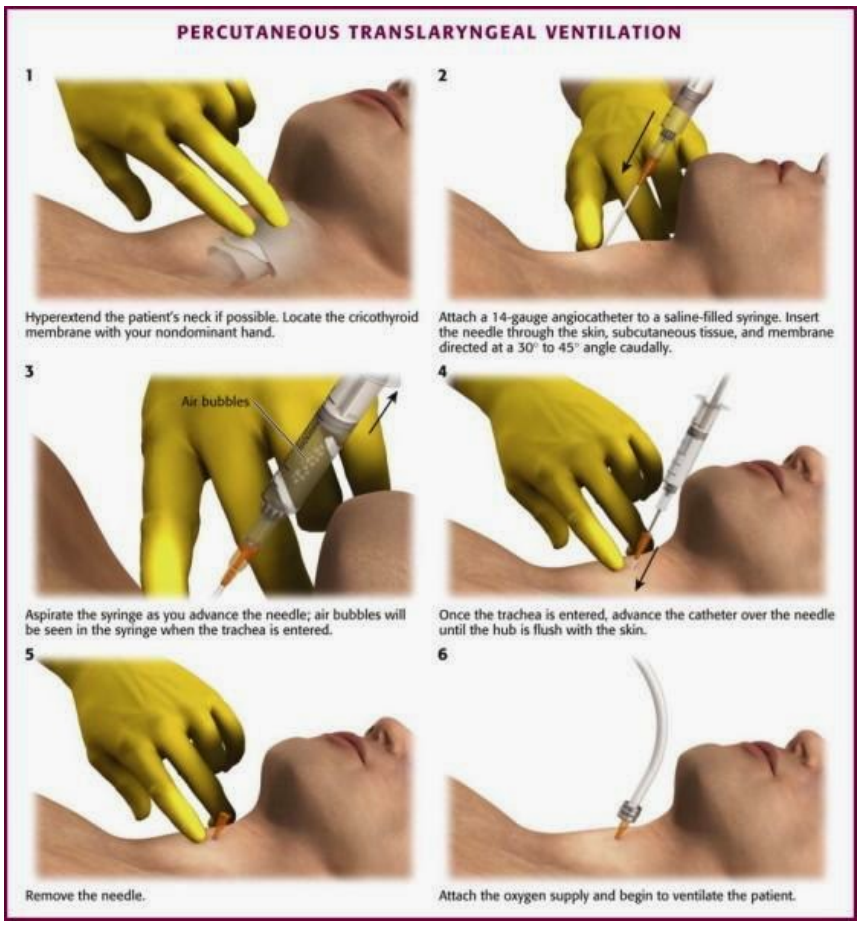
IF a “PERTRACH” KIT is available:

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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Procedure Protocol List Peds Med Protocols Airway Management Medical Supportive Care Airway Obstruction Peds Airway Obstruction

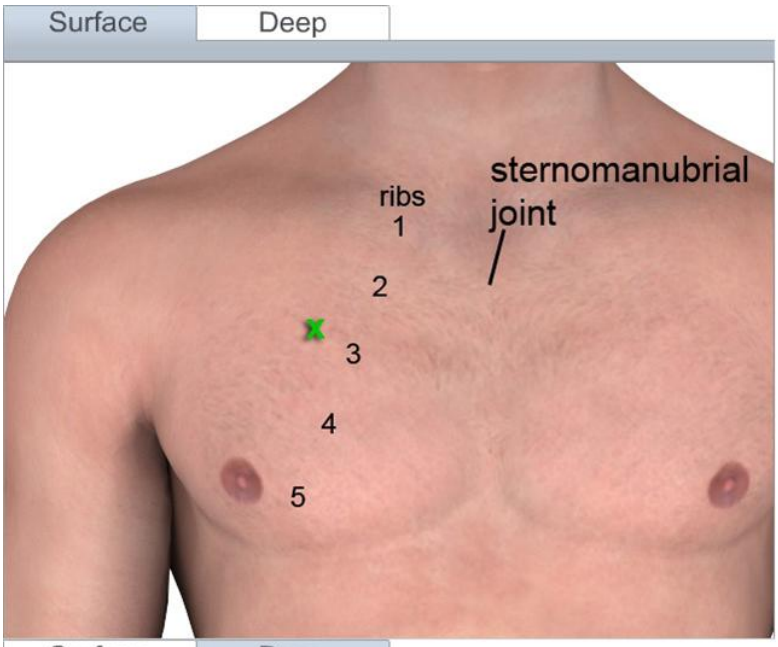
4.38 NEEDLE DECOMPRESSION
Level: EMT-P

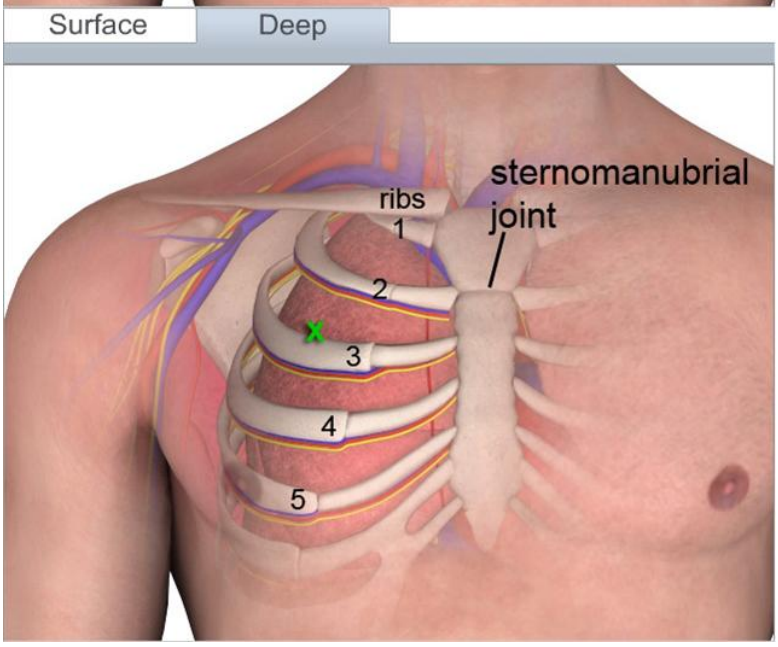
Indications:

1. Tension pneumothorax.
2. Trauma CPR patients may require bilateral chest decompression.

Procedure:

1. Assess chest and respiratory excursion.
2. Apply oxygen per nonrebreather mask or with 100% with B-V-M.
3. Identify second intercostal space, midclavicular line on the affected side.
4. Prep the area. (Locally anesthetize the area if patient conscious or if time permits).
5. Snugly attach a 14 or 16 over the needle IV catheter to a 10 ml syringe (or use arrow kit).
6. 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.
7. Insert the needle into the skin and over the rib into the 2nd or 3rd intercostal space in mid-clavicular line.
8. Puncture the parietal pleura.
9. Aspirate air as necessary to relieve patient's symptoms.
10. Leave the plastic catheter remaining but remove the needle.
11. Secure the catheter to the chest.
12. Connect the catheter to a one-way valve such as a Heimlich Valve or use the Asherman Chest Seal or equivalent.
13. Reassess ventilatory status, jugular veins, tracheal position, pulse, and blood pressure.
14. Document procedure and responses.





Complications:

1. Pneumothorax.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg Admin Guidelines Procedure Protocol List Peds Med Protocols Peds Trauma Supportive Care Airway Management Trauma supportive care Chest Trauma Peds Chest Injury

4.39 OROTRACHEAL INTUBATION VIA DIRECT LARYNGOSCOPY (AND USING GUM BOUGIE)
Level: EMT-P

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 Deivice (Combitube or King Airway)
    e. Cricothyroidotomy equipment
    f. CO_2 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
    a. Apply cricoid pressure if patient is unconscious and continue until intubation complete and ET bulb is inflated.
    b. Assist with BVM as needed
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.
    d. Control the epiglottis: Expose the glottic opening: posterior cartilages of the larynx, interarytenoid 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 interarytenoid 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
    b. End tidal CO_2 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 (tube check)
8. Post-intubation Management
    a. Release cricoid pressure and 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 size of the nares or pinky finger, or the formula 4+ (age in years/4). 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 CO_2 reading (color change) on End-Tidal CO_2 Detector or continuous monitoring of $ETCO_2$ with a reading between 35 -45 mm Hg on monitor (see Medical Procedure 4.10).
   c. Improving and/or normal SaO_2 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 (02 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.)

4.39.1 Airway Intubation with Eschmann Catheter, Tracheal Tube Introducer or Gum Elastic Bougie

Technique

1. Perform direct larygoscopy 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 90^0 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.

Return to: Contents at top Admin Guidelines V-fib Procedure Protocol List Cardiogenic shock Adult Med Protocols Peds Med Protocols Airway Management Special Considerations Peds Airway Management Peds Airway Obstruction Peds PEA Chem Expos Tx Guideline

4.40 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.

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.

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 siderails).
   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 siderails).
   d. Secure ankles on ipsilateral sided of stretcher frame (not siderails).
   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 onthe 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 siderail) 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 siderail).
    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.
4. **Manual restraint (**physically holding patient).
    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. Note the time the patient was restrained for future reference.

Return to: Contents at top Admin Guidelines Adult Med Protocols Peds Med Protocols Behavioral/Violent/Psych Proto Procedure Protocol List Excited delirium Transportation Safety Peds Violent/Impaired Airway Management

4.41 PULSE OXIMETRY
Level: EMT-(B-I-A), EMT-P

Purpose:
SPO_2 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 SPO_2 readings:
- a. Adult: > 95%
- b. Children > 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 SPO_2 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 SPO_2 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.
2. Provide oxygen by whatever means is appropriate.
3. Clean selected probe area with alcohol
4. Connect oximetry sensor to patient
5. Assess the SPO_2 reading and document.
6. Monitor for changes.
7. If SPO_2 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
8. Monitor cardiac rhythm
9. Match SPO_2 monitor with pulse rate
10. Other causes of false readings:
    - a. Anemia
    - b. Carbon monoxide poisoning

c. Sickle Cell
d. Artificial fingernails/ nail polish
e. Bright lights
f. Edema
g. Peripheral vascular disease
h. Do not use any extremity that has an AV fistula (dialysis shunt)

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Oral Tracheal Intubation

4.42 RAPID SEQUENCE INDUCTION (RSI)/ USE OF PARALYTIC AGENTS

Level: Specially trained EMT-P, RN

THIS PROTOCOL IS USED IN CONJUNCTION WITH PROTOCOL: 4.34 SMART AIRWAY MANAGEMENT. USE ONLY IF YOU HAVE COMPLETED MEDICAL DIRECTORS ADVANCED AIRWAY COURSE.

Indications:

1. A critical need for airway control exists, such as:
    - Persons who cannot tolerate awake intubations.
    - Combative patients with compromised airways.
    - Patients with depressed LOC.
    - Patients with hypoxia refractory to oxygen.
    - A multiple trauma patient who needs an airway.
2. At any time risk for potential/actual airway compromise is suspected such as acute burn injury.
3. Uncontrolled seizure activity (to provide airway control).
4. Status asthmaticus nearing respiratory arrest.

Absolute Contraindications:

1. Patients in whom cricothyroidotomy would be difficult or impossible (SHORT).
2. Massive neck swelling/injury.
3. Patients who would be difficult or impossible to intubate/ventilate after paralysis.
    a. LEMON
    b. MOANS
    c. RODS
    d. SHORT
4. Acute epiglottitis.
5. Upper airway obstruction.
6. Known hypersensitivity to the drugs.

Note: the benefit of obtaining airway control must always be weighed against the risk of complications in these patients

Note: Use NON-Fasciculating agent (Vecuronium or Rocuronium) on patients at risk for or having problems related to:

1. Hyperkalemia (elevated potassium).
2. Penetrating eye injuries (do not use depolarizing blocker).
3. History of malignant hyperthermia.
4. Unstable fractures (secondary to muscle fasciculation).

Complications:

1. Increased intragastric pressure (emesis).
2. Bradycardia/asystole (especially in children less than 1 yr not premedicated with Atropine.)

3. Malignant hyperthermia.
4. Prolonged apnea.
5. Inability to intubate/ventilate after paralytic administration.
6. Hypotension.
7. Aspiration.
8. Increased intraocular pressure.
9. Dysrhythmias.
10. Fasciculations.
11. Histamine flush
12. Tachycardia.
13. Hyperkalemia.
14. Inability to recognize decreased neurologic status.
15. Bronchospasm

Preparation:

1. Assemble necessary equipment and personnel (suction, B-V-M with correct sized mask, **working suction equipment**, appropriate sized ET tubes, working laryngoscope, appropriate drugs drawn up in syringes, pulse oximeter, end-tidal CO_2 monitoring device, monitor, extra-glottic airway and/or cricothyroidotomy equipment).
2. Assess patient for possible difficult intubation via LEMON, MOANS, RODS, and SHORT. If there is a potential for a difficult airway, go to the **Difficult Airway Algorithm,** which calls for a sedation look prior to any paralytic administration.
3. Position patient properly in sniffing position or use in-line stabilization if indicated.
4. Assure at least one secure well running IV line.
5. Connect patient to cardiac monitor and pulse oximeter.
6. Assign specific duties to personnel on scene (i.e., assistance with bagging, application of cricoid pressure, pushing of medications.)

Pre-Oxygenation:

1. The goal of rapid sequence induction is to facilitate a controlled intubation. (An adequately preoxygenated patient can remain apneic for 2 to 3 minutes without serious hypoxia).
2. 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.
3. If the patient is not breathing adequately or if unable to wait 4 - 5 minutes, 4 vital capacity breaths (spontaneous or bagged) are adequate, although 1 - 2 minutes of preoxygenation with 100% oxygen via B-V-M is preferred.
4. In addition to number 3 , 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.

Procedure Overview:

1. The crew is responsible for maintaining the patient's airway (always have suction & B-V-M available and endotracheal intubation equipment nearby).
2. Ventilate with 100% oxygen or with a mechanical ventilator at appropriate oxygen percentage.
3. Utilize pulse oximetry and end-tidal CO_2 monitoring on all patients
4. Proper endotracheal tube placement must be documented by at least three different methods. These include:
   a. Presence of bilateral breath sounds.
   b. Absence of breath sounds over the epigastrium.
   c. Presence of condensation on the inside of the endotracheal tube.
   d. End-tidal carbon dioxide monitoring.
   e. Use of an endotracheal esophageal detector (if available).
   f. Visualizing the tube passing through the cords.
   g. Bilateral, symmetrical expansion of the thorax.

At least three verification methods must be documented in the medical record!

5. Maintain spinal immobilization if indicated.
6. Perform baseline neurological exam prior to paralyzing patient.
7. Assess and record vital signs, cardiac rhythm, and pupillary exam at least every 5 minutes.
8. Remain in constant attendance with the patient at all times.
9. Provide emotional support and orientation to the environment.
10. Document all medications and reactions (i.e. paralysis achieved.) also, document reasons for repeat doses (i.e. increased difficulty ventilating or increased movement).

Procedure:

1. Preoxygenate patient as above with 100% nonrebreather mask or B-V-M for 2-3 minutes prior to intubation
2. Pre-medicate as appropriate:
   a. **Lidocaine** **(1.5 mg/kg IVP**) 2 - 3 minutes before intubation:
      i. For possible head injury patients to mitigate increased intracranial pressure (ICP) which may occur during intubation.
      ii. For patients with reactive airway disease, i.e. severe asthma.
      iii. For dysrhythmia control in patients at risk for ventricular dysrhythmias.

      NOTE: Lidocaine is contraindicated if there is known hypersensitivity to the drug.
   b. **Fentanyl** **3 mcg/kg** (~200 mcg IV in average adult) given as the last pre-treatment drug. Give as premedication for suspected head injury or increased intracranial pressure. Give over 30 – 60 seconds
3. Paralysis with induction
   a. Induce with one of the following:
      i. **Amidate (Etomidate**) **0.3 mg/kg IV** push for sedation

ii. **Versed** **(0.10 - 0.15 mg/kg IVP**) for awake patients to achieve amnestic effect. Pediatric dosage is 0.03 mg/kg. Versed is contraindicated if the patient is hypotensive. Alternative drug: Valium 2 - 10 mg IVP

iii. **Ketamine (Ketalar)** 1 – 2 mg/kg IV (last resort 4 mg IM)

b. Paralyze with one of the following:

i. **Anectine (Succinylecholine)** **1.5 mg/kg IV** over 10- 30 sec.

ii. **Rocuronium (Zemuron)** **1mg/kg IVP** in adults. **Children 0.6 mg/kg IV**

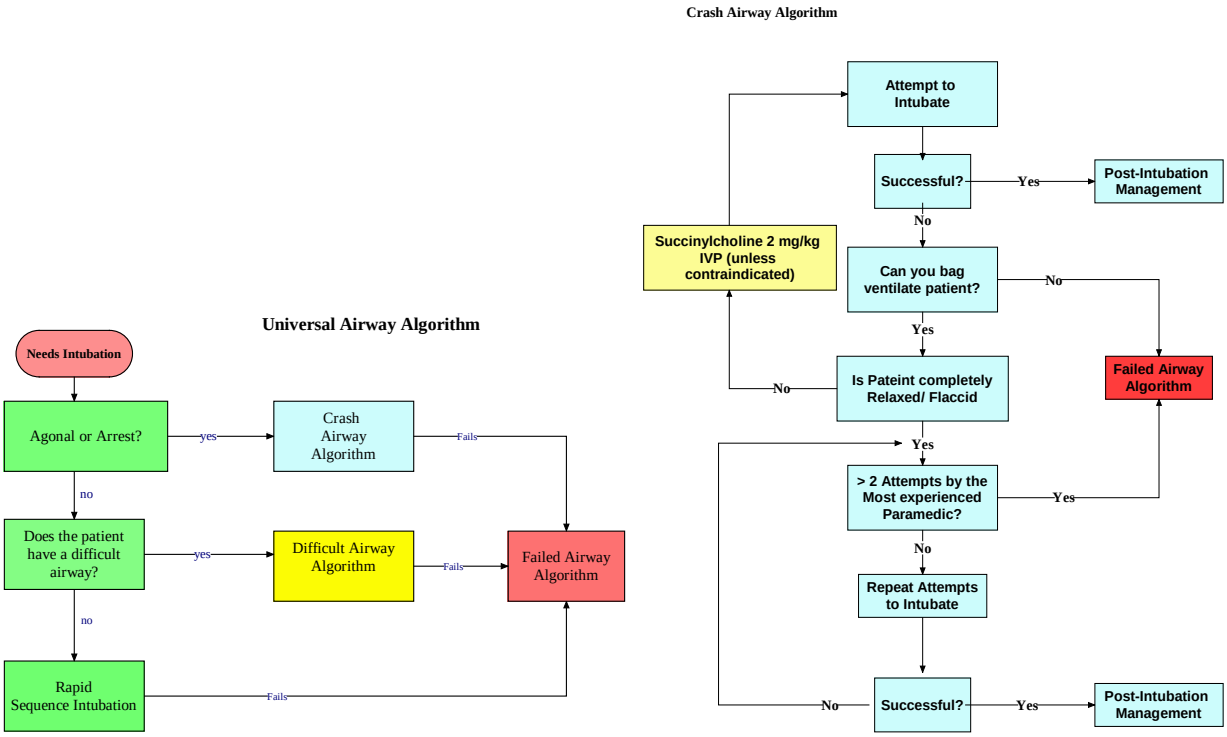
iii. **Vecuronium (Norcuron)** **100 mcg/kg** IVP in adults (For average 70 kg adult = 7 ml [10 or 20 ml vials (1mg/ml)]) and in children greater than 3 years of age. Children less than 3 years of age may require slightly higher doses. NOTE: complete paralysis typically occurs in 2.5 - 3.0 minutes following administration. Complete paralysis lasts approximately 25 - 30 minutes.

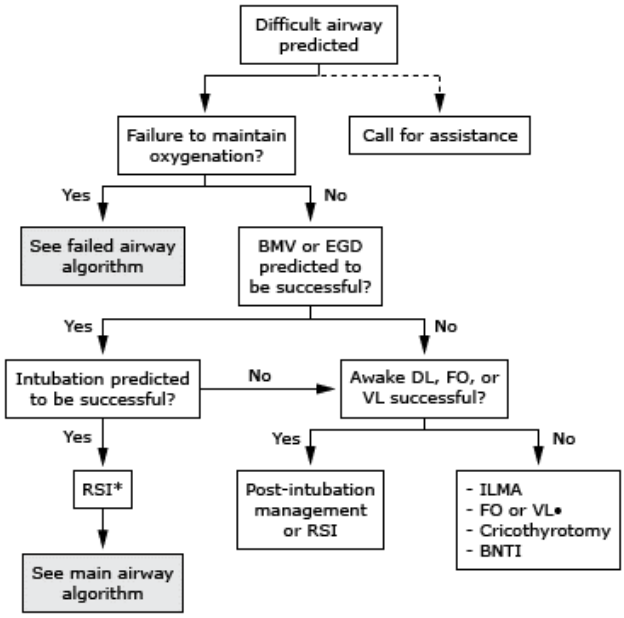
4. Once paralytic has been given IV, discontinue bagging patient with BVM and monitor pulse ox. It is not necessary to resume bagging patient until patient is intubated (at which time you ventilate with ambu bag via the ET tube) or the pulse ox drops below 91%, at which time you re-oxygenate before trying to intubate again. Proper preoxygenation will allow you 4-7 minutes of allowable apnea to intubate.
5. Apply cricoid pressure to occlude esophagus until intubation is successfully completed and the cuff is inflated.
6. Perform controlled endotracheal intubation with in-line stabilization if indicated. Confirm placement by auscultating for bilateral breath sounds, checking oxygen saturations, and by checking for presence of end-tidal carbon dioxide ($ETCO_2$) or any three methods in the confirmation protocol.
7. If inadequate relaxation is present, administer one of the following:
   a. Second dose of **Vecuronium** **at 0.10 mg/kg IV**
   b. **Anectine** **0.6 mg/kg IV**.
8. If intubation is unsuccessful, remove the tube and ventilate the patient with 100% oxygen via a B-V-M until ready to attempt re-intubation. You should be able to successfully use a B-V-M to oxygenate the patient or successfully ventilate until the effects of the vecuronium are gone. Prepare to suction emesis. Maintain cervical immobilization if necessary.
   a. Repeat steps 6 and 7. If after 1-2 repeat intubation attempts fail, go to **failed airway algorithm** (4.34 SMART AIRWAY MANAGEMTN), which calls for using and extra-glottic device or performing a cricothyrotomy. If an extra-glottic device can be inserted or the patient's oxygen saturation can be maintained > 91% with an oral pharyngeal airway and BVM, transport to hospital. Only perform a **cricothyrotomy** if unable to ventilate and unable to maintain pulse ox > 91%
9. Once intubation is completed and tube placement is confirmed, inflate the cuff and continue to ventilate with 100% oxygen via B-V-M.
10. Release cricoid pressure.
11. Secure ET tube in place.

12. Restrain patient if indicated.
13. Keep patient sedated with **Versed** **2 – 4 mg IV** initial then titrate 1 mg increments prn or **Morphine** **2-5 mg IV** then titrate 2 mg increments prn
14. Continued paralysis will only be ordered by medical control

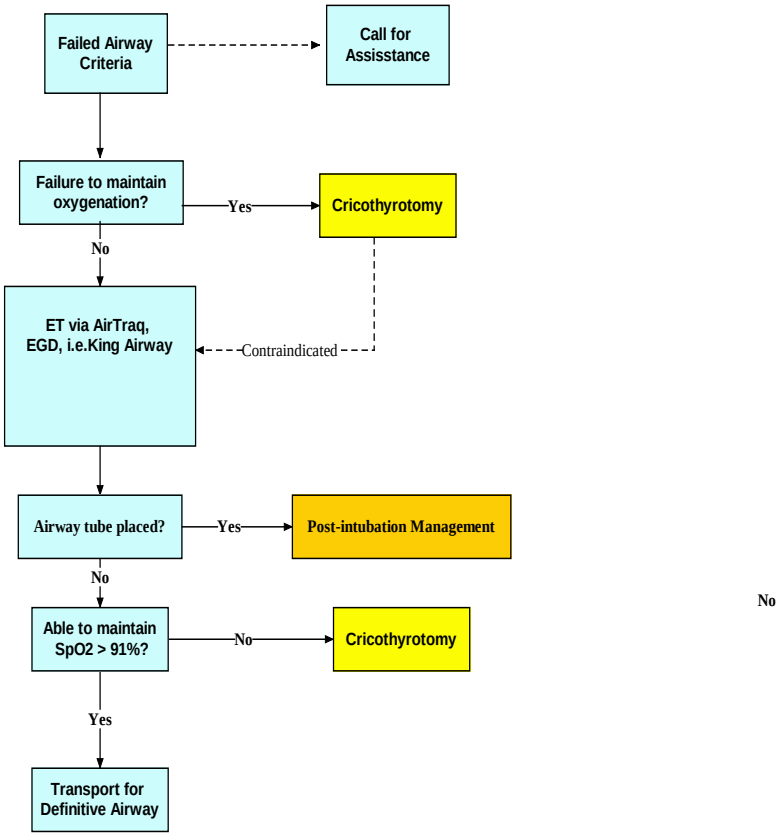
Considerations:

1. Once a neuromuscular blocking agent is given you assume complete responsibility for maintaining an adequate airway and ventilations.
2. Have your backup airway (King Airway) available to use if unable to intubate.
3. Be prepared to perform a surgical airway if intubation cannot be executed and ventilation with a B-V-M is not possible. (This will be rare.)
4. Paralysis can be maintained with **Vecuronium 0.1 mg/kg IVP** per protocol.
5. Monitor oxygen saturations and end-tidal carbon dioxide. You can ventilate with 100% oxygen via B-V-M with cricoid pressure if needed.



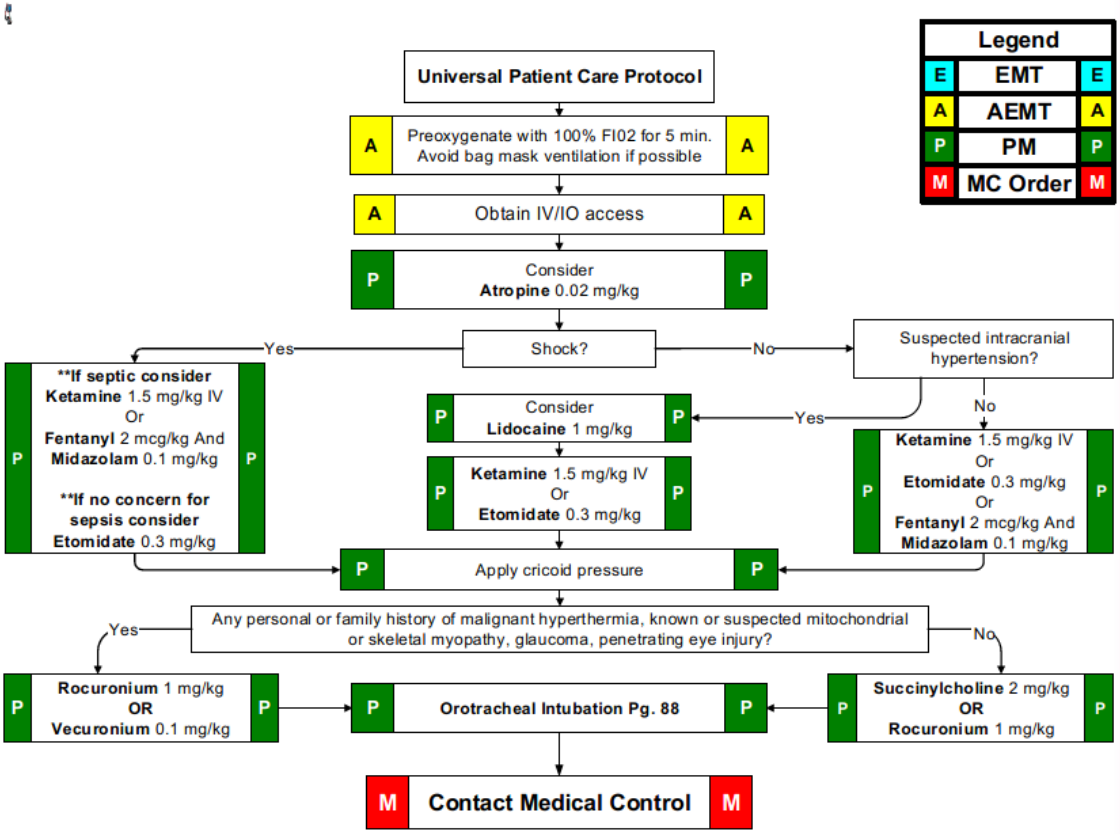


Failed Airway Algorithm



No

Pediatric Rapid Sequence Intubation



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Atropine	**0.1 mg**	**0.12 mg**	**0.16 mg**	**0.2 mg**	**0.24 mg**	**0.30 mg**	**0.38 mg**	**0.48 mg**	**0.60 mg**
Ketamine	**6 mg**	**9 mg**	**12 mg**	**15 mg**	**18 mg**	**22.5 mg**	**28.5 mg**	**36 mg**	**45 mg**
Etomidate	**1.2 mg**	**1.8 mg**	**2.4 mg**	**3 mg**	**3.6 mg**	**4.5 mg**	**5.7 mg**	**7.2 mg**	**9 mg**
Lidocaine	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Fentanyl	**8 mcg**	**12 mcg**	**16 mcg**	**20 mcg**	**24 mcg**	**30 mcg**	**38 mcg**	**48 mcg**	**60 mcg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Succinylcholine	**8 mg**	**12 mg**	**16 mg**	**20 mg**	**24 mg**	**30 mg**	**38 mg**	**48 mg**	**60 mg**
Vecuronium	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Rocuronium	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**

Return to: Contents at top Admin Guidelines Adult Med Protocols
Procedure Protocol List Peds Med Protocols Airway Management
Head and Spine trauma Peds Burn Injuries

4.43 RECTAL MEDICATION 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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.44 SAGER TRACTION SPLINT

Level of training: EMT-(B-I-A), EMT-P

Purpose: To provide a means to splint fractures that will provide anatomical alignment, fracture stability and pain relief in long bone fractures.

Procedure:

i. Assemble two person team
ii. Check distal pulses and sensation (be certain to document the presence/ absence of pulses and sensation).
iii. One team member may maintain slight manual traction on the fractured leg. Check distal pulses and sensation (document again).
iv. Assemble the splint and adjust to the proper length. Adjust the ankle strap to the approximate size of the patient's ankle.
v. 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.
vi. Position the malleolar (ankle) harness beneath the heel(s) and around the ankle(s). Secure these snugly.
vii. Shorten the loop straps on the harness to ensure that the cable ring is secure up against the foot.
viii. 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 Medial Control.
ix. 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.
x. Re-tighten the adductor bridle (thigh strap) at the upper thigh and firmly secure the three elastic cravats.
xi. Apply pedal binding (figure eight strap) to feet.
xii. Check and document pedal pulses and sensation.
xiii. 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).

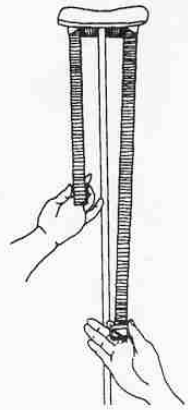
SAGER®
Emergency Traction Splints

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**

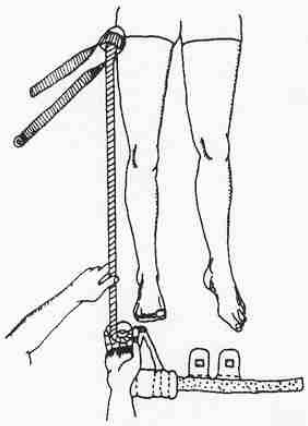
Training Video available in VHS for Super Sager 204.
*Coming Spring 1990—Training Video for Sager 201.

1



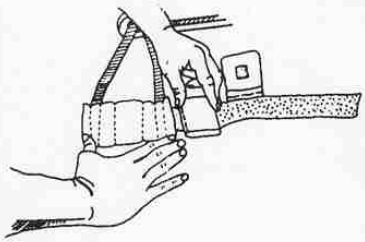
Before applying the splint to the leg, slide the adductor bridle (thigh strap) so that when it is closed, it will be located on the anterior (top) surface of the thigh.

2



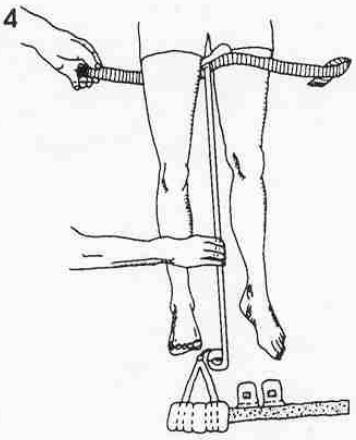
*Prior to application of the splint, get a rough measure of the length of splint needed. Extend it so that **the wheel is at the heel.** NOTE: Patients wearing tight jeans or underclothing, especially males, may not find the splint comfortable to wear unless clothing is removed or cut open, which, of course, should be done as part of patient evaluation prior to application of splint.

3



Roughly estimate the size of the ankle and fold down the number of pads needed to provide padding all around the lower leg.

4



Grasp the adductor bridle and slide it up under the thigh so that the perineal cushion is snug against the perineum and ischial tuberosity.

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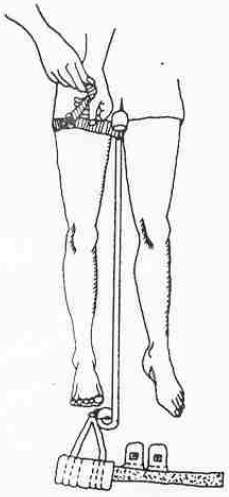
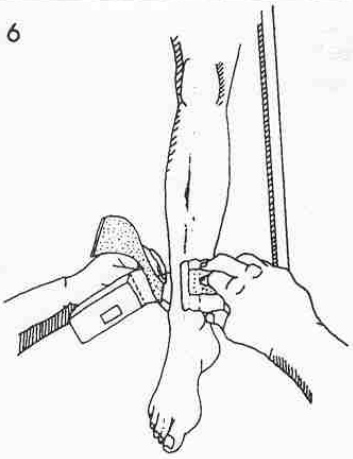


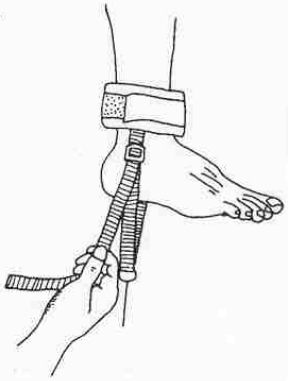
Tighten the adductor bridle (thigh strap), drawing the ischial perineal cushion to the lateral portion of the crotch.

6



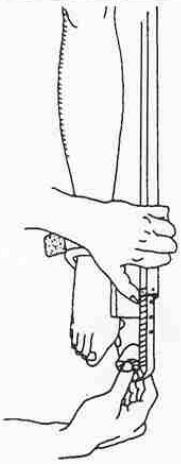
Apply the malleolar (ankle) harness tightly around the ankle above the medial and lateral maleoli of the ankle. ***Check posterior tibial and dorsalis pedis pulses before hitch application and after traction is established.**

7



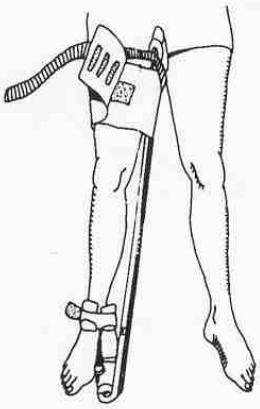
Shorten the loop of the harness connected to the cable ring by pulling on the strap threaded through the square "D" buckle. Do this to ensure that the cable ring is pulled snugly up against the bottom of the foot.

8



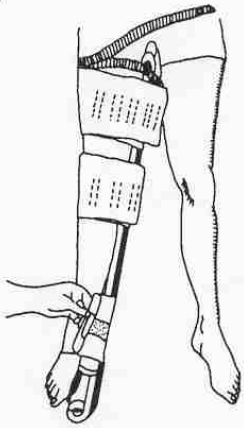
Extend the inner shaft of the splint by pulling it out until the desired amount of traction is noted on the calibrated wheel. Rough guide to determine amount of traction needed: apply 10% of body weight to maximum of 15 pounds (6.8 kgs.) traction.

9



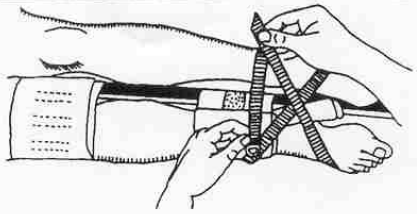
Apply the longest elasticized leg cravat as high up the thigh as possible.

10



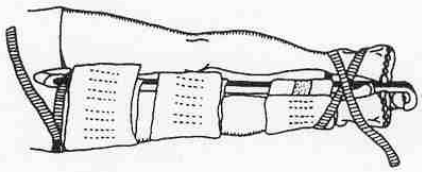
Apply the remaining elasticized leg cravats: a.) Around knee. Use padding if needed. b.) Over the malleolar (ankle) harness and lower leg.

11



Apply pedal pinion (figure eight strap) around both ankles by slipping the strap under the ankles. Cross strap over the feet as noted and secure snugly.

12



Patient's leg is now secured, traction is controlled, fractured distal fragment is prevented from moving or rotating. Patient is ready for strapping to spine board for transport. ***Document absence or presence of distal pulses.**

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.
6. Nothing to assemble, ready for use.
7. Applied in any patient position.
8. Compatible with back boards, stretchers, baskets and gurneys.
9. Stays within the body silhouette (Model S-204 only).
10. Quantifiable Dynamic Traction. (Patented!!)

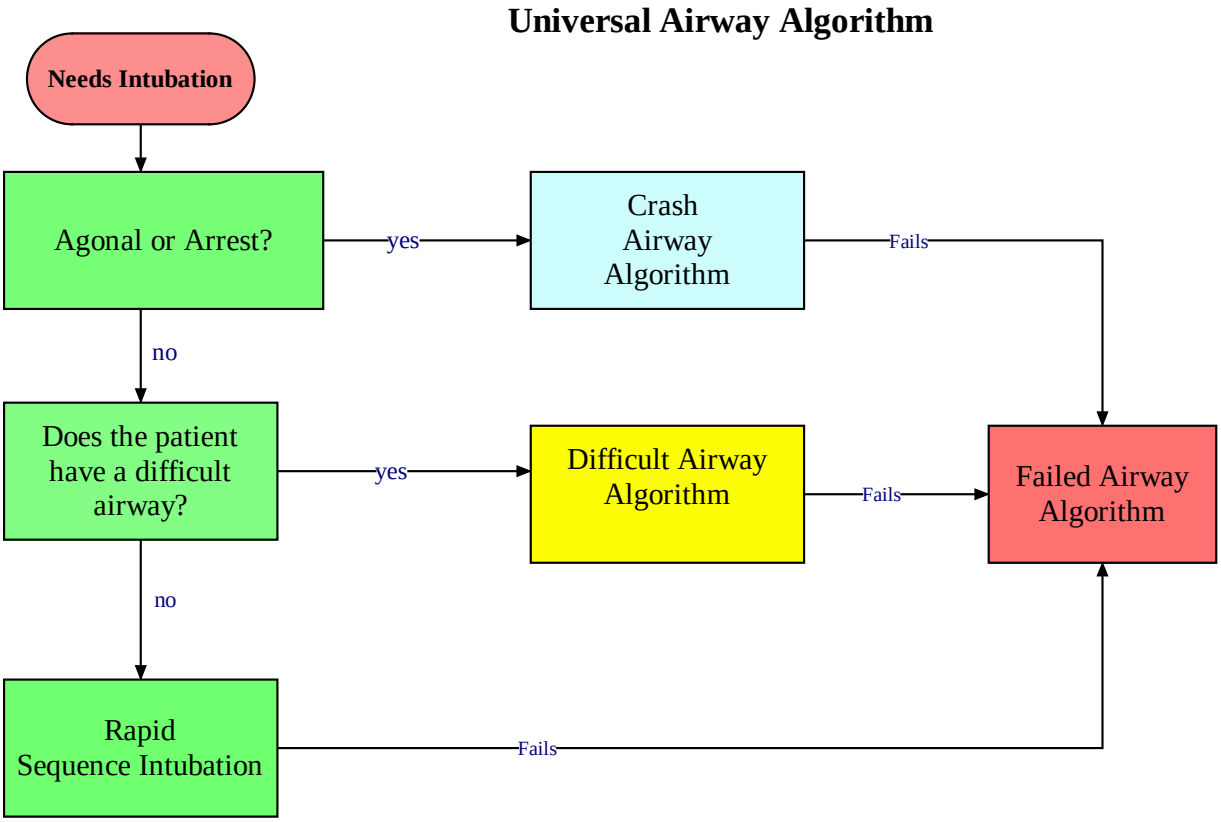
BENEFITS

1. Prevents excessive traction. Traction is "quantifiable", a positive consideration for Medical Legal Purposes.
2. Can be applied in a confined space.
3. No Sciatic Nerve compression (neuropraxia).
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 leg(s).
9. No body weight limitation.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management Extremity Injury

4.45 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.



Return to: Contents at top Admin Guidelines Adult Medical Protocols Airway Management Procedure Protocol List Peds Med Protocols RSI

Procedure:

Crash Airway Algorithm

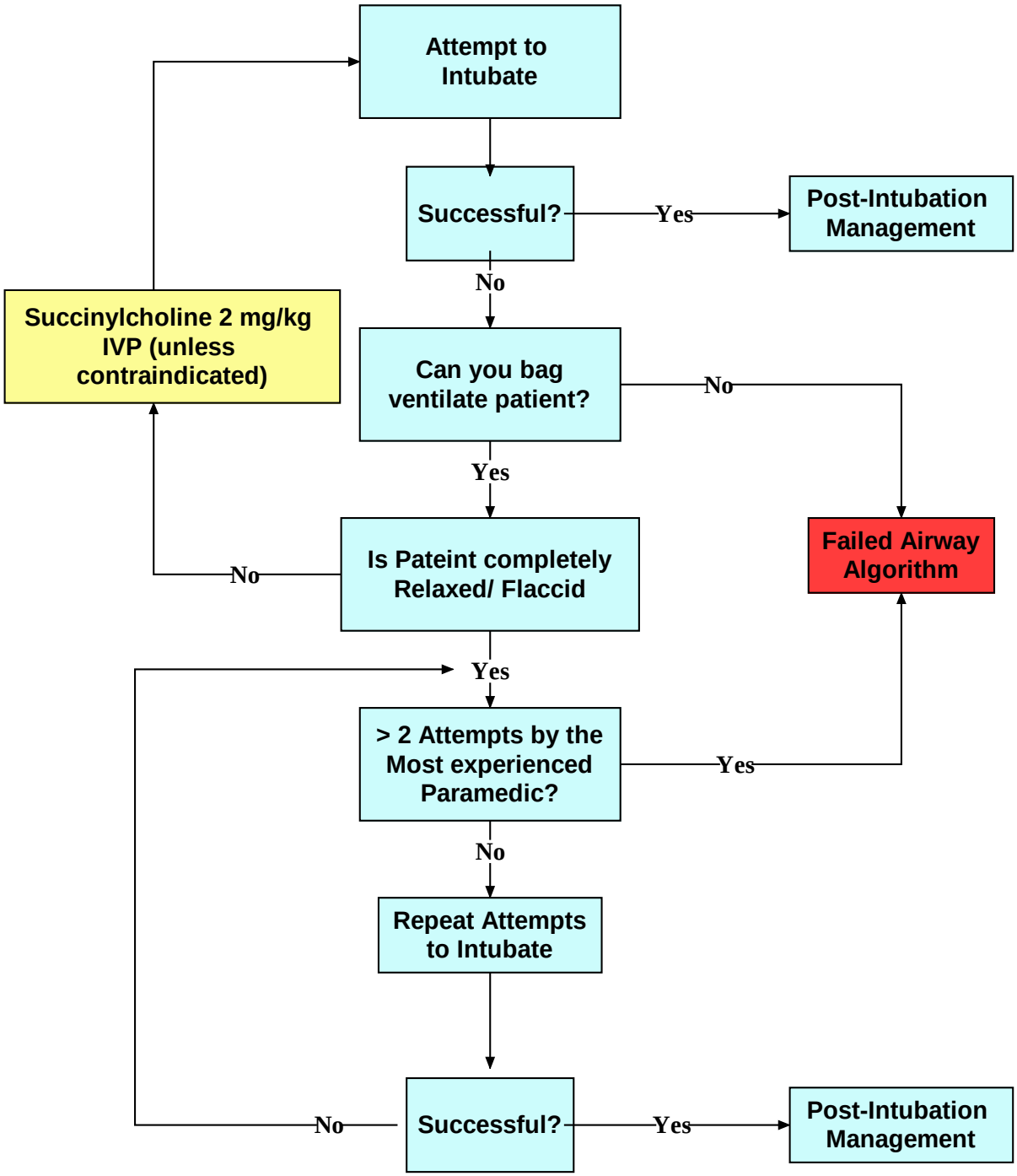
This algorithm is intended for use when faced with a need for a rapid airway in the setting of an uncomplicated clinical condition. Examples include cardiac arrest, respiratory arrest and unconscious patients with agonal respirations in need of active airway assistance.

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 SpO_2 > 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 **Succinylcholine 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

Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

Crash Airway Algorithm

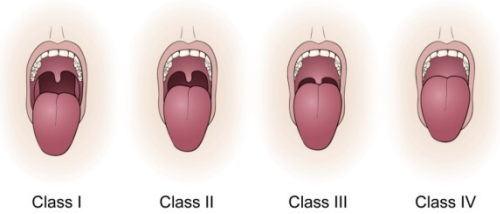


Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

Difficult Airway Algorithm

1. When faced with a predicted or known difficult airway, call for assistance.
2. Assess per:
   A. LEMONS,
      a. **L**ook externally (gastalt)
      b. **E**valuate 3-3-2 rule

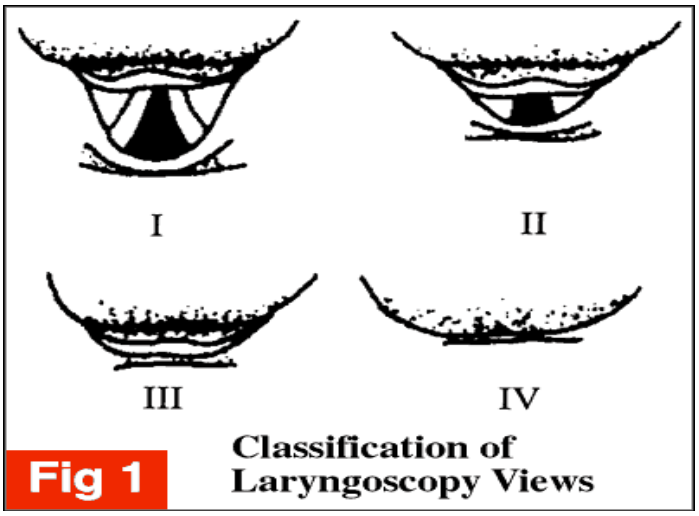
      c. **M**allampati



      d. **O**bstruction/**O**besity
      e. **N**eck mobility
   B. MOANS,
      a. **M**ask Seal
      b. **O**bese
      c. **A**ged (> 55 years old)
      d. **N**o teeth
      e. **S**tiff (increased ventilatory pressures, e.g. asthma, COPD, ARDS, term pregnancy)
   C. RODS,
      a. **R**estricted mouth opening
      b. **O**bese
      c. **D**istorted airway
      d. **S**tiff (as for MOANS)
   D. SHORT
      a. **S**urgery
      b. **H**ematoma or infection
      c. **O**bese
      d. **R**adiation
      e. **T**umor

3. Maintain the SpO_2 > 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.

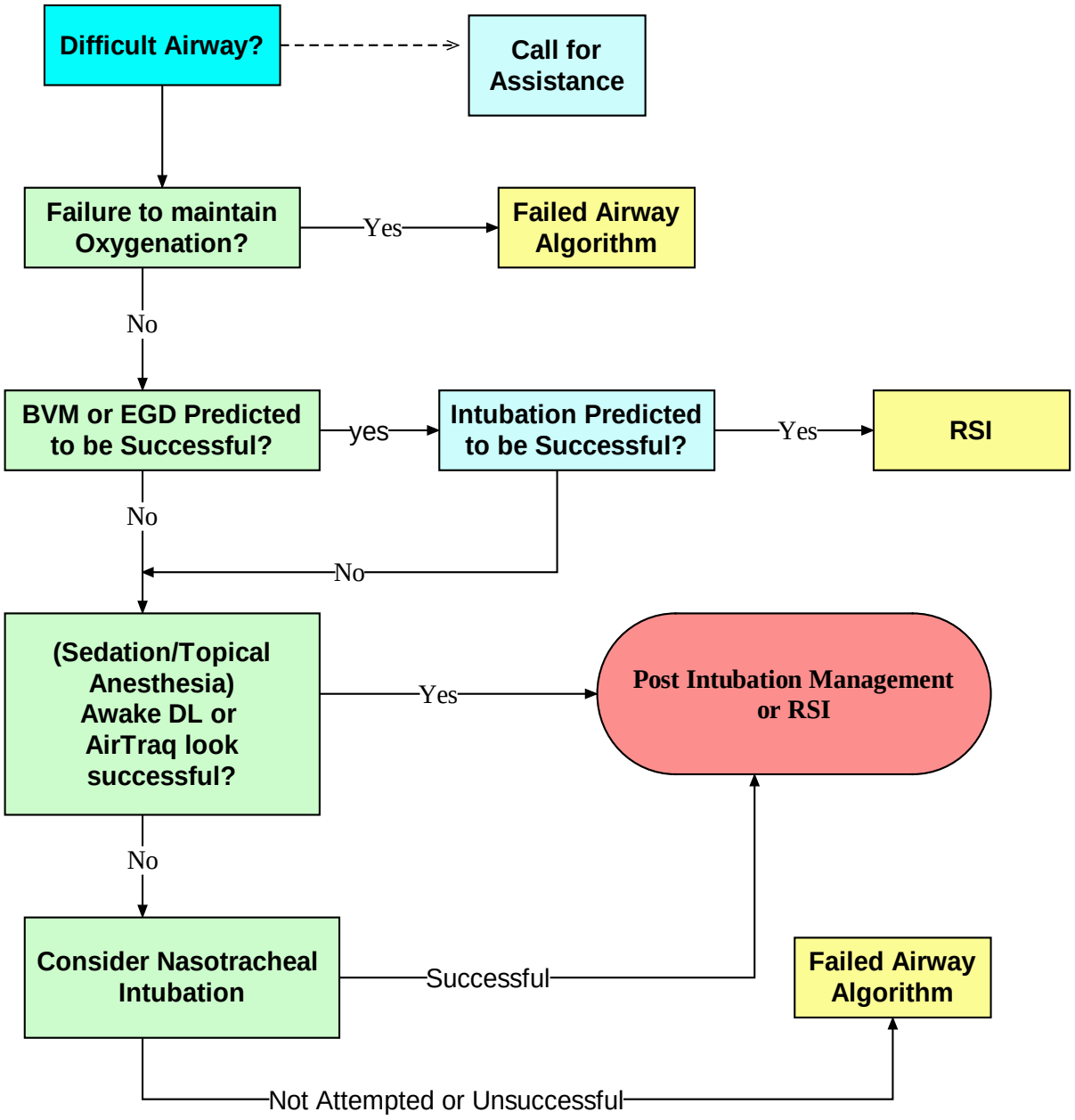
4. If SpO_2 remains > 91%, and patient spontaneously breathing, consider nasotracheal intubation. If successful, perform post-intubation management procedures including:
    a. Verification of proper placement via at least three independent measures (See Adult Medical Protocol 2.1.2)
    b. Note the 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 with ½ 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. Continue paralysis with **rocuronium** only per med control
    C. Apply C-collar
    D. Monitor endtial CO2
10. If unsuccessful, proceed to failed airway algorithm

Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

Difficult Airway Algorithm



Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

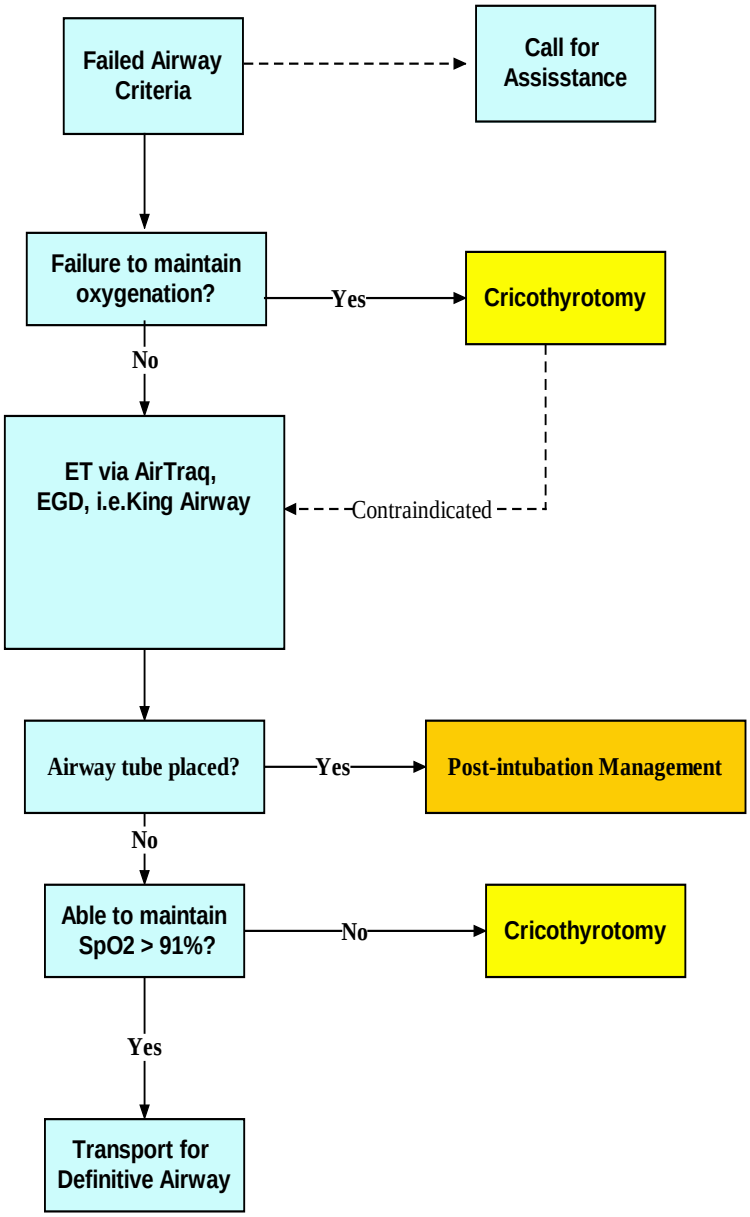
Failed Airway Algorithm

Failed airway criteria include the inability to maintain a pulse oximetry value of > 91% and/or unsuccessful attempts at endotracheal intubation.

1. Call for assistance and if not already done, assign a second rescuer to the airway.
2. Attempt to improve ventilations by using the two-person ventilation method whereby one rescuer firmly seats the mask of the BVM with two hands while opening the airway. The second rescuer ventilates using the BVM or similar apparatus. 2 NPA's and 1 OPA should be in place.
3. If step two fails to maintain a pulse oximetry value of > 91% and providers are trained to do so, perform a surgical airway (cricothyroidotomy) Procedure 4.37 Surgical Cricothyrotomy.
4. If step two is successful, insert an alternative airway. Examples include: CombiTube ®, LMA, King Airway, etc.
5. If an alternative airway is placed, assess the ability to maintain a pulse oximetry value of > 91%. Should the airway fail to maintain an acceptable value, and providers are trained to do so, perform a cricothyroidotomy using department approved cricothyroidotomy kit. When successful, providers should transport for definitive airway placement at the emergency department. If pulse ox can be maintained >91% with BVM, then transport to hospital bagging patient.

Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

Failed Airway Algorithm



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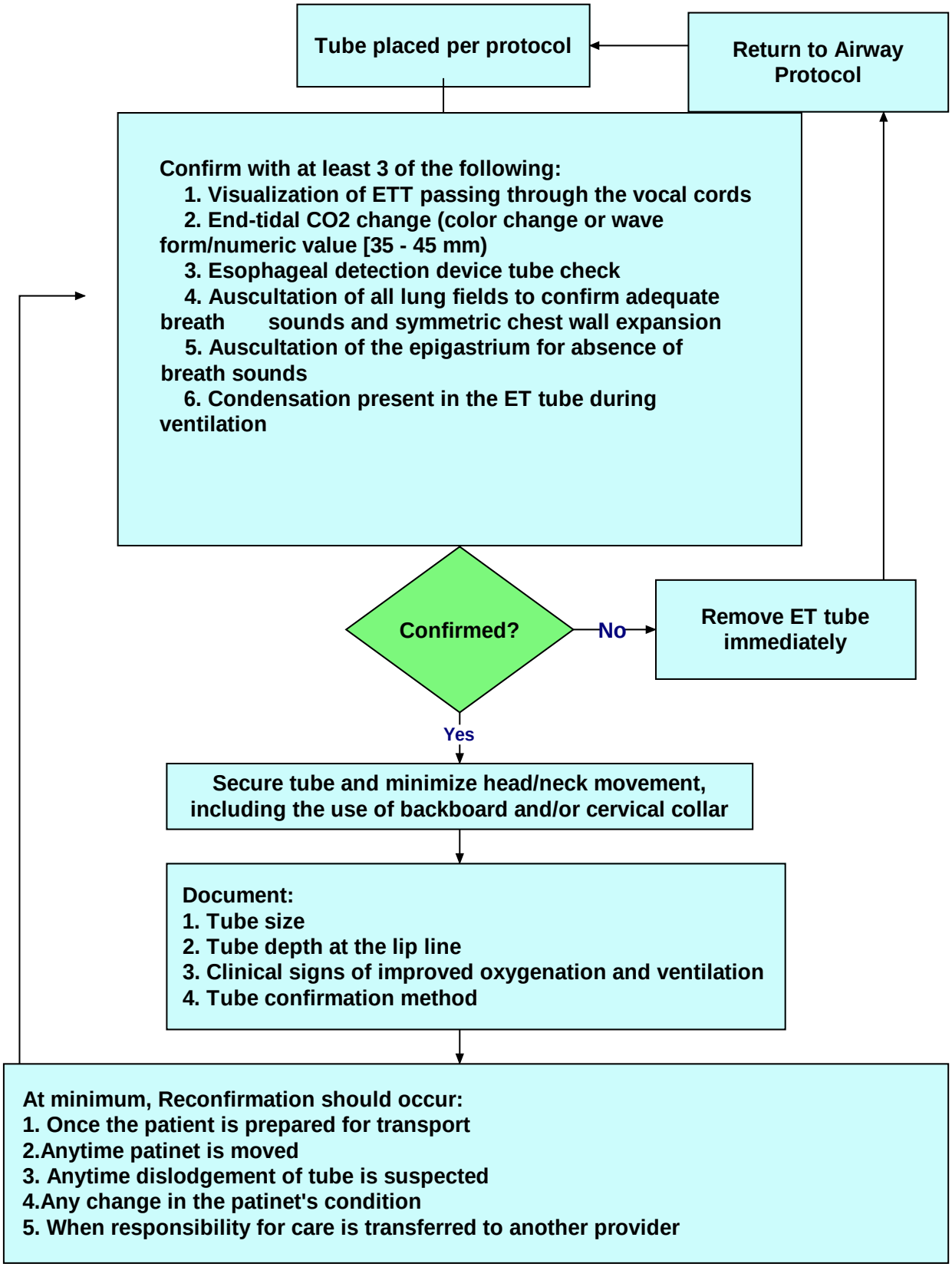
Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

Airway Confirmation-Reconfirmation Protocol:



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 CO_2
E. Keep patient sedated with one of the following
    a. Versed 2.5 – 5 mg IV initial then titrate 1 mg increments prn
    b. Morphine 2-5 mg IV then titrate 2 mg increments prn
    c. Fentanyl 50-100 mcg IV
    d. 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.

Return to: Contents at top Admin Guideline Adult Med Protocols
Airway Management Procedure Protocol List Peds Med Protocols RSI

4.46 SPINAL IMMOBILIZATION/SPINAL IMMOBILIZATION CLEARENCE
Level: EMT-(B-I-A), EMT-P

Spinal Immobilization Decision Assessment (see flow chart)

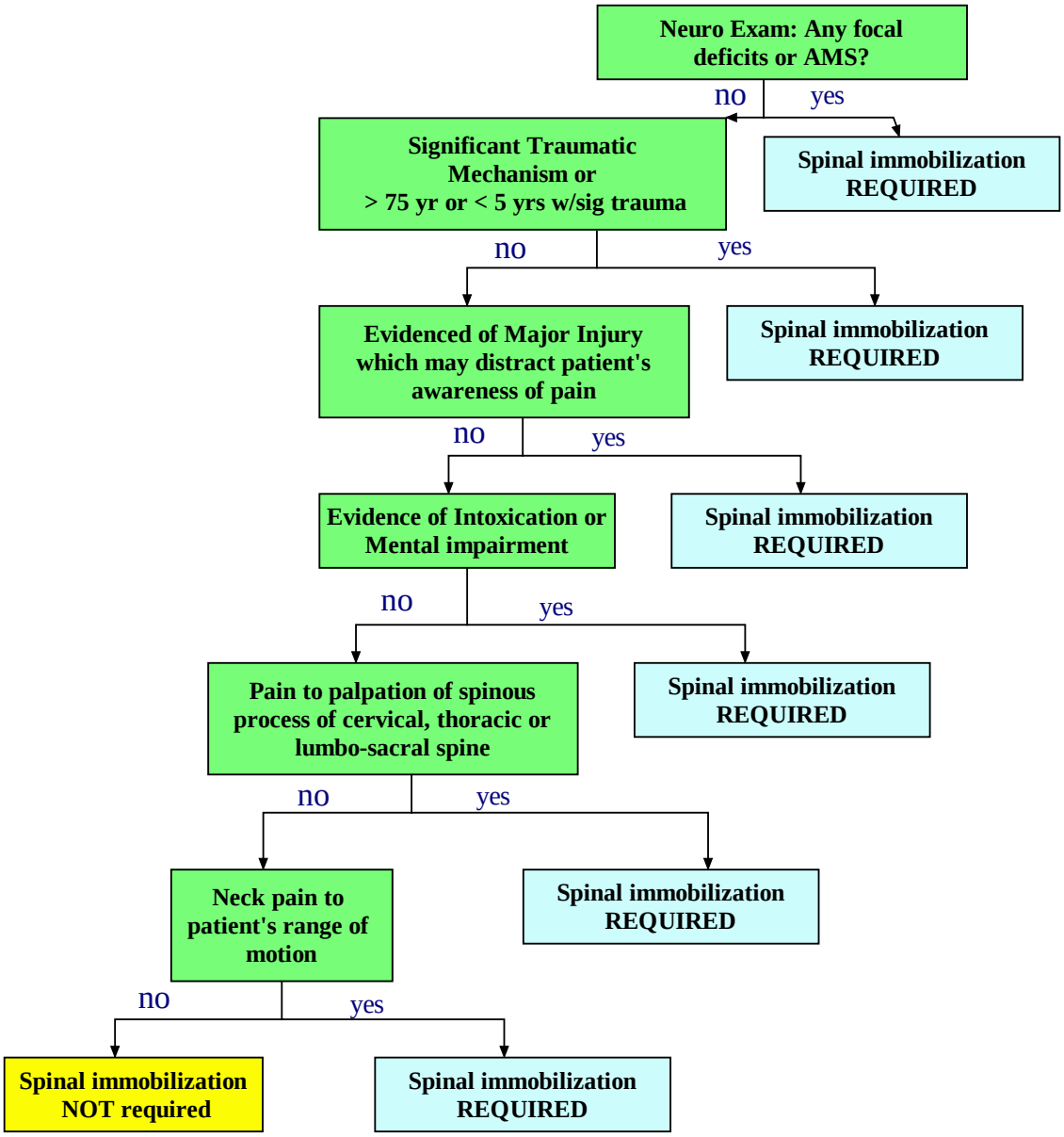
i. Spinal immobilization is required if any of the following is present in the trauma patient (remember NSAIDS):
    1. Neurological Deficit (e.g. focal deficit, tingling, reduced strength, numbness in extremity).
    2. Significant traumatic mechanism and extremes of age (> 75YRS, < 5 YRS).
    3. Altered 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 immobilization is not required

iii. The decision not to implement spinal immobilization is the responsibility of the Paramedic

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Procedure Protocol List Peds Med Protocols Airway Management

Spinal Immobilization Decision Flowchart



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 IMMOBILIZE:**

Spinal Immobilization 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)

Immobilization of the Supine/Prone Patient:

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 immobilization 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 immobilization 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.

Immobilization of the standing patient:

1. Initiate manual immobilization of the head in a neutral in-line position. Approach the patient from the front to eliminate lateral movements.
2. Apply the appropriate cervical collar.
3. Position backboard behind standing patient.
4. Have rescuer holding manual stabilization of the head from the front of the patient pass off the stabilization to a second rescuer that will hold manual stabilization of the head from behind the patient, with arms on either side of the standing backboard. The third rescuer can hold the backboard in place during this switch.
5. Have two rescuers face the patient on either side of the backboard and grasp the board just under each of the patient's arms.
6. With one rescuer at each side of the backboard and the third holding the head, slowly lay the board down. A stop approximately halfway down will be needed to allow the rescuer holding the head to reposition hands.
7. When the patient is supine on the backboard, follow steps in previous section to secure patient to the backboard.

Vest-type Extrication Device (KED)

1. Rescuer One should be positioned behind the patient to stabilize the head and neck.
2. Rescuer Two checks neurological and vascular response of all extremities.
3. Rescuer Two measures and applies the cervical collar.
4. The KED is slide into position behind the patient.
5. The KED is wrapped around the patient, and the middle strap is secured. The KED should be snug beneath the patient's armpits.
6. The bottom strap is secured next.
7. Each leg strap is wrapped around the leg and secured.
8. The top strap of the KED is secured.

9. The patient's head is secured into the KED.
10. All of the straps are tightened down.
11. The patient's wrist and legs are secured.
12. A long spine board is placed under the patient's buttocks.
13. The patient is removed from the vehicle and transferred to the long spine board.
14. Disconnect the leg straps, allowing the patient's legs to lay flat on the long spine board.
15. Refer to the Securing a 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.

Pediatric Immobilizer

1. Begin with manual immobilization of the head in a neutral, in-line position, unless contraindicated (see above). Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.
2. Size and apply the appropriate cervical collar.
3. While maintaining manual stabilization with cervical collar in place:
   a. Log roll patient
   b. 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.
   c. Roll the patient onto the backboard in a supine position.
   d. Reposition patient, in order to center on immobilizer, by sliding patient in an upward motion (axial) on the immobilizer. Do not slide patient in a direct lateral position, as this may manipulate the spine.
4. Pad the space, as needed, between the back of the head and the immobilizer to prevent hyperextension of the cervical vertebrae.
5. Secure the patient's body to the immobilizer with the attached straps.
6. Immobilize the upper torso to prevent upward sliding of patient's body during movement and transportation. This is accomplished by bringing straps over the shoulders and across the chest to make an X. The cross straps velcro into the strap that crosses the abdomen.
7. Apply the attached straps across the chest, abdomen and legs. Take care not to leave any space between the straps and the sides of the patient. If the patient is so small that there is a space left between straps and the sides of the patient, take up space with pads (e.g. blanket, towel, etc.).
8. Arms should be placed at the patient's side to prevent movement of the shoulder girdle.
9. Place cervical immobilization device in place
   f. Adjust the headpiece to snugly fit around the patient's head. Fasten the forehead strap and apply the chin strap over the cervical collar.

NOTE: If a pediatric immobilizer is not available, care should be taken to fill all voids between the patient and the straps with padding.

Immobilization of Patient wearing a Helmet/Helmet Removal:

2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. The second rescuer maintains head and neck immobilization while the first rescuer begins to remove the helmet
8. 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.
9. 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.
10. 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.

11. 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.

1. While one rescuer provides immobilization, the other moves. Both rescuers never move their hands at the same time.
2. The helmet must be rotated in different directions: to first clear the nose, and then the back of the head.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management
Head and Spine Trauma

4.47 SUCTIONING PATIENTS
Level: EMT-(B-I-A), EMT-P

Overview:

1. Suctioning of a patient should be considered part of airway management.
2. Keeping an airway clear of secretions, vomit or other material should be a priority when assessing and managing airway and breathing.
3. IF a patient requires emergency suctioning to clear the airway (oral/pharyngeal or tracheal) any LCEMS or TFD EMT or Paramedic who has been trained/in-serviced on suctioning should do this.

Procedure:

1. Oral/pharyngeal:
    a. Universal precautions
    b. Use Yankar suction tip to suction the oral cavity. Be sure to occlude the hole on the yankar tip with your thumb to create suction at the tip.
    c. Stop suctioning after each 30 seconds and provide oxygen before attempting again.
2. Endotracheal: (requires sterile suction catheter with a sterile gloved hand)
    a. Open suction catheter package and unfold the paper as not to contaminate the contents on the inside.
    b. If you are right handed, carefully grab the cuffed glove with your left hand being careful not to touch the outside part of the glove
    c. Pick up the glove by the cuffed portion that will ultimately be in contact with the skin of your hand/wrist.
    d. While holding the glove by the cuff between your left index finger and thumb (index finger on the outside of cuff, thumb on the inside), place your right hand inside the glove and pull it onto your hand.
    e. Once glove is on right hand, pick up the suction catheter with the gloved hand.
    f. Connect the suction catheter to the suction hose by holding the suction hose with the ungloved hand and the suction catheter with the gloved hand. Be careful not to touch the gloved and ungloved hands together.
    g. Use the sterile gloved hand to insert the catheter into the endotracheal tube (ungloved hand is holding the suction catheter at the end near the suction hose).
    h. Once the suction catheter is advanced down the tube, place ungloved thumb over the hole at the proximal end of the suction catheter to create suction.
    i. Maintain suction while the catheter is pulled out of the endotracheal tube.
    j. Twirl the catheter around the gloved index finger as the catheter is being withdrawn.
    k. Repeat as necessary but oxygenate patient in-between attempts.

3. Trachea/stoma patients:(requires sterile suction catheter with a sterile gloved hand)
    a. Follow steps a-f above for opening and preparing a sterile suction catheter
    b. Put a slight curve at the tip of the suction catheter by twirling the tip around the gloved index finger and stretching the catheter (the ungloved hand is holding the opposite end of the suction catheter where it is connected to the suction hose).
    c. Insert the curved tip into the trachea/stoma with the tip directed toward the chest.
    d. Advance carefully. Do not force the catheter if you meet any resistance. You can expect that many patients will gag and cough when being suctioned. Suctioning will almost always trigger a gag and or cough reflex.
    e. Suction as you withdraw the catheter, twirling the catheter around the gloved index finger as you withdraw.
    f. Repeat as necessary, oxygenating patient in-between attempts.
    g. Some trachea tubes have an inner cannula that can be removed for cleaning purposes. Nursing staff or respiratory therapy usually does this. In an emergency situation, LCEMS/TFD EMS personnel can remove the inner cannula, suction through the larger outer cannula and ventilate via the outer cannula if needed. Keep the inner cannula in sterile gauze and return it with the patient to the care facility. Chances are we will not have sufficient cleaning supplies to clean and replace the inner cannula ourselves.

Complications:

1. Bleeding from over aggressive suctioning
2. Hypoxia from prolonged suctioning

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.48 SURGICAL 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. Use the back end of the scalpel or pair of hemostats to bluntly dissect down to the cricothyroid membrane.
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. Insert the scalpel handle and rotate 90° to the incision, use a curved hemostat, or your index finger to open the airway.
8. Insert an appropriately sized (preferably 5 - 7 mm) cuffed ET tube or tracheostomy tube into the airway, directing the tube distally into the trachea.
9. Inflate cuff and ventilate the patient.
10. Observe lung inflations and auscultate chest for adequate ventilation.
11. Secure tube to prevent inadvertent dislodging.
12. Document and record responses.
13. This procedure is not recommended in children under age 12.

Complications:

1. Creation of false passage.
2. Hemorrhage or hematoma formation.
3. Laceration of the esophagus.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Airway Management Procedure Protocol List Peds Med Protocols
Medical Supportive Care Airway Obstruction RSI Oral Tracheal Intubation

4.49 TWELVE (12) LEAD EKG PROCEDURE

Level: EMT-P, RN

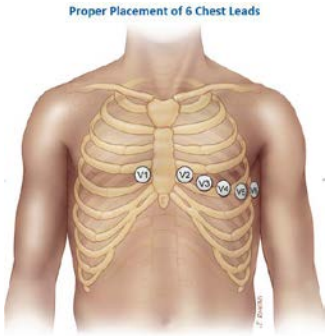
Purpose: Early detection and notification of acute myocardial infraction

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.

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral

Return to: Contents at top Admin Guidelines Adult Medical Protocols Bradycardia Chest Pain suspicious for MI Procedure Protocol List Syncope Proto Peds Med Protocols Airway Management Peds Stable SVT

4.50 Tetanus Toxoid Immunization as part of Disaster Response

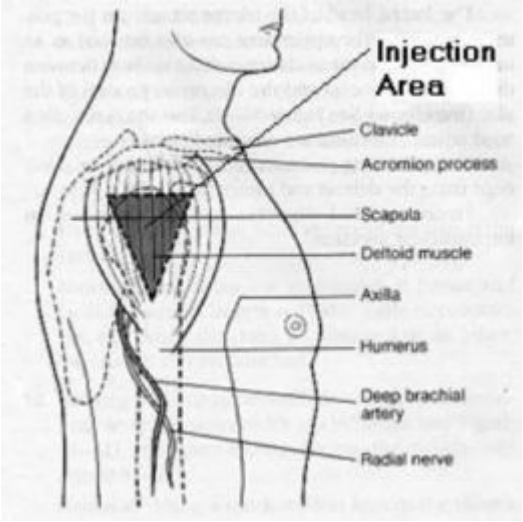
Level of training: EMT-P,

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 Toxiod (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.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.51 Tourniquet Protocol
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.

Procedure: Application of Combat Application Tourniquet (CAT)

1. Placement
    a. Expose the extremity by removing clothing in proximity to the injury.
    b. Place 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.
    f. Twist the rod until bright red bleeding stops.
    g. Lock the rod in place with the 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.

Return to: Contents at top Adult Med Protocols Adult Trauma Emerg
Admin Guidelines Procedure Protocol List Peds Med Protocols
Airway Management General Crush Injury Extremity Injury

4.52 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 tachycardias (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.

Methods:

Valsalva Maneuver - This is the least dangerous method and should be used before others are attempted. The patient is instructed to take a deep breathe and bear down, trying to turn their face red. The breath and pressure should be held as long as possible. The procedure may be repeated.

Ice water immersion of the face - This technique should be attempted if the Valsalva was ineffective. Fill a large basin or sink with ice water, it must be very cold. Ask the patient to hold their breath and put their entire face into the water for several seconds. An alternate method is to fill a large latex exam glove with ice water and place on patient's face for several seconds. 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.).

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Narrow complex tachycardia proto Procedure Protocol List Peds Med Protocols
Airway Management Peds Stable SVT

4.53 VENTILATOR ASSIST PROCEDURE
Level: EMT-P,

Purpose: From time to time EMS will be called upon to transport patients whose ventilations are being assisted by a mechanical ventilator. Ventilators are used to provide respiratory support for patients who are unable to effectively breathe on their own. This protocol will guide the caregiver in maintaining proper settings involved in providing adequate ventilatory assistance to the patient. See Ventilator Setting Support Document

Indication:
1. Continuation of ventilator controlled respirations on chronic ventilator dependant patients
2. Assist/Control ventilations on any intubated patient in respiratory failure/arrest that is being transported to a care facility.

Adverse Effects/Complications:
1. Increased intra-thoracic pressure
2. Decrease venous return to the heart and decrease cardiac output (hypotension, tachycardia)
3. Increased V/Q ratio (ventilation/perfusion ratio)
4. Decrease blood flow to the kidney with resultant fluid retention (edema)
5. Air trapping and intrinsic PEEP (auto PEEP)
6. Barotrauma
7. Nosocomial infections of the lungs and sinuses
8. Respiratory alkalosis
9. Agitation and increased respiratory distress
10. Increased work of breathing

General Comment: There are many commercial ventilators on the market. Most of the ventilators used in the pre-hospital settings are fairly simple to use. Most if not all have built-in safety features, which prevent over inflating the lungs and causing barotrauma. Everyone must be familiar and in-serviced on the particular ventilator being used. For the most part, there are a few settings that are common/standard to all ventilators (see Ventilator Setting Support Document):
1. FIO_2 (Percent of inspired oxygen (room air is 21%): 21% - 100%
2. Tidal Volume: 6-7 ml/kg body weight (IBW)
3. Respiratory rate: selection varies on ventilators to accommodate a range of patient ages and conditions.
    a. NOTE: On some ventilators, inspiratory flow rate (usually 40 – 60 L/second) is determined by tidal volume, respiratory rate, and in the inspiratory: expiratory (I: E) ratio. (The I: E ratio is generally 1:2 to allow for complete exhalation and prevent air trapping). On other ventilators, flow rate is independently set, which allows adjustment of air-flow to the flow wave pattern that is most comfortable for the patient. If the patient is having difficulty with spontaneous breathing, increasing the flow rate may be indicated. However, a higher flow rate means a shorter inspiratory time and

usually a higher respiratory pressure secondary to increased resistance, with a lower flow rate requiring a longer inspiratory time with a decreased inspiratory pressure. The paramedic should always consult with medical control before changing the flow rate on any ventilator device.

4. Pressure support: Usually set at 10 cm H_2O
5. PEEP (Positive End Expiratory Pressure): Usual setting is 5 cm H_2O

Procedure:

Patients already on Ventilator

1. As part of your initial patient assessment inquire if patient has any spontaneous respiratory effort or is 100% dependant on the ventilator
2. Make note of patient's vital signs before any change over occurs. This includes the pulse ox.
3. Assess the ET tube or Trachea tube placement to assure they are properly secured
4. Acquire the patient's current ventilator settings from the nurse or RT caring for the patient. Try to match these settings on the transport ventilator to be used (do this before patient is switched to transport ventilator).
    a. IF unable to match the settings and there is a significant discrepancy, contact medical control for assistance.

5. Patient should already be on cardiac monitor and pulse ox prior to switching ventilators.
6. Depending on reason for transport and patients condition, IV access should be considered.
7. Have an Ambu-Bag and suction available for unexpected emergencies
8. Switch patient over to the transport ventilator and observe for any distress. It may take a minute or so for the patient to become accustomed to the new ventilator. If necessary, ventilate with an ambu bag for several minutes.
9. Closely monitor pulse ox, signs of labored respirations, chest rise for any signs of hypoxia/distress. Remove patient from ventilator and assist respirations with an Ambu-bag if there are ANY concerns or problems with ventilation after patient was switched to transport ventilator.
10. Once patient has been switched to the transport ventilator and is tolerating this well, then move patient over to the EMS stretcher for transport.
11. If alarm on ventilator sounds, immediately check patient. Reasons for alarm:
    a. Kinks in ET tube (unkink tube)
    b. Secretions in airway that increased the resistance/pressure in airway (suction airway)
    c. Disconnected ventilator tubing or poor connections (reconnect or tighten connections)
    d. Water in the ventilator tubing (disconnect the tubing, empty water, reconnect tubing)
    e. Pneumothorax (notify hospital to set up for this if you are en route. If tension pneumothorax, go to that protocol)
    f. Patient anxiety (contact medical control for sedation order)

g. Improper ventilator settings (High or low tidal volumes, excessive rate causing stacking and auto PEEP) (Consult medical control for change)
h. Check O_2 supply (self explanatory)

12. IF unable to identify the cause of the ventilator alarm and/or patient's condition deteriorates, disconnect from ventilator and assist respirations via the Ambu-bag.
13. Upon arrival at the care facility, follow above steps when transferring from EMS stretcher to care facility stretcher. Report any problems to the accepting staff.
14. Document vent settings used, vital signs, pulse ox, any changes in the patient's condition during transport. See Ventilator Management Flow Sheet in the Forms Section
15. Contact medical control during any of the above steps for assistance as needed.

Intubated patients not on ventilator

1. Ventilate patient with ambu-bag till ventilator can be set up
2. Patient should: be on Monitor, pulse ox, IV access, have suction available
3. Initial vent settings: (Call medical control as soon as possible to verify or assist with settings)
   i. FIO_2: 100%
   ii. Tidal Volume: 6-7 ml/kg
   iii. Be aware: If patient is a tight asthmatic, has severe COPD or has had prior lung surgery (partial lung removed), use smaller tidal volume (6-7 ml/ kg) and faster rate to maintain pulse ox.
   iv. Rate: Adult 12 – 18 bpm, Children 12 – 24, pre-school 20 - 30
   v. Pressure support: 10 cm H_2O (if available on ventilator)
   vi. Peep: 5 cm H_20 (if available on ventilator)
4. Monitor patient/vital signs/pulse ox for signs of adequate ventilations
5. If any distress or concerns, remove from ventilator and assist respirations with ambu-bag.
6. If ventilator alarm sounds, see step 11 above
7. En-route to hospital; notify the staff so they can have a ventilator set up on your arrival.
8. Document vents settings, vitals, pulse ox, patient response.

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

4.54 **Ventilator Manuals**

4.54.1 Allied 300
4.54.2 Eagle Vent (Univent)
4.54.3 LTV
4.54.4 NewPort
4.54.5 Revel

Return to: Contents at top Admin Guidelines Procedure Protocol List
Adult Med Protocols Peds Med Protocols Airway Management

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.

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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Wide complex tach w/pulse Drug Reference Narrow complex tachycardia proto
Peds Stable SVT Peds Unstable SVT

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Pediatric Fever

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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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Tox OD Protocol

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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 β**2**-agonist that is believed to exert a hypokalemic effect by binding to a β**2**-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: Strenght 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 b reathed 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

Return to: Contents at Top Drug Reference Pneumonia Proto Asthma Protocol
Allergic Rxn Hyperkalemia COPD/dyspnea Gen Crush Injury
Peds Lower Airway/Asthma/Wheezing Peds Allergic Rxn Peds Hyperkalemia

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5.1.5 Amiodarone (Cordarone ®)

Class: Class III Antiarrhythmic
Actions: Prolongs action potential phase 3
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 Tachycarda; 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Narrow compl tachycar stable proto Drug Reference Narrow complex tachycardia proto Wide complex tach w/pulse V-fib Peds Unstable SVT Peds V-Tach w/pulse Stable Peds V-Tach w/pulse unstable Peds V-fib/V-tach no pulse Appendix Cardioversion Procedure

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5.1.6 Aspirin (Bufferin)

Class: Platelet inhibitor/anti-inflammatory, analgesic, anti-pyretic.
Actions: Blocks platelet aggregation. It appears to cause an inhibition of synthesis and release of prostaglandins. Aspirin also blocks formation of Thromboxane A - 2. (Thromboxane A - 2 causes platelets to aggregate and arteries to constrict). Reduces 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Chest Pain suspicious for MI

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
Maximum single dose (child 0.5 mg) (adolescent 1.0 mg)
Maximum total dose (child 1.0 mg) (adolescent 2.0 mg)

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Bradycardia Proto Peds Bradycardia RSI Oral Tracheal Intubation Excited Delirium

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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).

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Drug Reference Tox OD protocol Peds Organophosphate Poison

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 prn
***Calcium Channel Blocker OD*:** 20mg/kg IV over 10 min q 20 min x5

Return to: Contents at Top Drug Reference Bradycardia Proto PEA Hyperkalemia Gen Crush Injury Peds Hyperkalemia

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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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Hypertension Proto

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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)

Return to: Contents at top Drug Reference Behavioral/Violent/Psych Proto
Diabetic Emerg Altered Ment Stat Excited delirium Seizure proto CVA Tox OD Proto
Eclampsia Protocol Alcohol Emerg Cold related emerg Heat related emerg Near Drowning
Dystonic Reaction Electrical/Lightening Peds seizure Peds Asystole Peds PEA
Peds V-fib/V-tach no pulse Newborn Resuscitation Peds AMS Peds Ingestion OD
Peds Diabetic Syncope

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 caustion 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, dysarthria, headache, tremor, dystonia, amnesia, urinary retention, constipation, nausea, incontinence, diplopia, dizziness, irritability, disinhibition, libido changes, rash, xerostomia, sialorrhea, menstral 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.

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] 5 – 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 x1
[> 11 yrs] 0.2 mg/kg PR x 1

Procedure Sedation: 0.1 mg/kg IV/IO

Anxiety: [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: [6mo-12yr] 0.04 – 0.2 mg/kg IM/IV q 2-4 hrs. Max: 0.6 mg/kg/8hr

Return to: Content at top Adult Medical Proto Drug Reference Bradycardia Proto Motion sickness Wide complex tach w/pulse Behavioral/Violent/Psych Proto COPD protocol Narrow complex tachycard unstable Excited delirium CVA External Pacemaker Tox OD proto Heat related emerg Head and Spine trauma Peds seizure Cardioversion Peds Unstable SVT Peds V-Tach w/pulse unstable Chem Tx Guide Blue Peds Violent/Impaired

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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, uretheral 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
Routes: IM/IV/SubQ
Pediatric Dosage: (< 6mo) 0.005 mg/kg SC/IV q 2-6 hr
(> 6mo, < 50kg) 0.015-0.02 mg/kg SC/IV
(> 6mo, > 50kg) 1mg SQ; 0.2- 0.6 IV

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Drug Reference Seizure proto Pain Managment

5.1.14 Diltiazem (Cardizem)

Class: Calcium channel blocker.
Actions: Inhibits the influx of calcium ($Ca2^{+}$) 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 exanthematous pustulosis.

Common: Peripheral edema, headache, dizziness, asthenia, orthostatic hypotension, dyspepsia, constipation, rash, bradycardia, 1st 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Narrow compl tachycar stable proto (a-fib/flutter) Drug Reference Narrow complex tachycardia proto(PSVT) Appendix

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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, GI 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).

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Chest Pain suspicious for MI Dystonic Reaction Pain Management Behavioral/Violent/Psych
Excited delirium Tox OD proto Marine enven proto Allerg Rx Proto Motion sickness
Nausea and Vomiting Extremity Injuries Peds Allergic Rxn Peds Violent/Impaired

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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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Bradycardia Proto Cardiogenic shock Hypotension proto Allerg Rxn Proto
Near Drowning Appendix Sepsis

5.1.17 Epinephrine 1:1,000

Class: Sympathomimetic.
Actions: Stimulates alpha and beta adrenergic receptors. Bronchodilation. A hormone produced by the adrenal gland (attached to the kidneys) and synthesized commercially. It is employed therapeutically as a vasoconstrictor, as a cardiac stimulant, and to relax bronchioles. It is also used to treat asthmatic attacks and treat anaphylactic shock.
Indications: Bronchial asthma, exacerbation of COPD, allergic reactions, Pediatric Bradycardia.
Contraindications: Hypersensitivity to drug. Patients with underlying cardiovascular

disease, pregnancy, labor and delivery, patients with tachyarrhythmias, angle closure glaucoma, organic brain syndrome.

Precautions: Should be protected from light. Blood pressure, pulse, and EKG must be constantly monitored. Use with caution on patients with: HTN, elderly patients, hypersensitive to sulfites, CVA, hyperparathyroidism, diabetes, Parkinson's disease, psychiatric disorder.

Side Effects:

Serious: respiratory difficulty, pulmonary edema, arrhythmias, HTN, cerebral hemorrhage, tissue necrosis

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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Marine Enven Proto Drug Reference Allergic Rxn Proto Asthma Protocol Peds Bradycardia Peds Lower Airway/Asthma/Wheezing Peds PEA Peds V-fib/V-tach no pulse Peds Allergic Rxn External Pacer

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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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Asystole Proto Allergic Rxn Proto Drug Reference PEA Asthma Protocol V-fib Peds Bradycardia Peds PEA Peds V-fib/V-tach no pulse Peds Asystole Newborn Resuscitation

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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)

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference

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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 pain: 50 – 100 mcg IV/ IO, IM, or IN initial dose,
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.
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

Return to: Contents at top Marine enven proto Sickle Cell Proto Drug Reference Pain Management Cold related emerg Electrical/Lightening Extremity Injuries Burns Dental Trauma Gen Crush Injury Peds Pain Management Peds Sickle Cell RSI Oral Tracheal Intubation Chest Pain

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5.1.21 Furosemide/(Lasix)

Class: Loop Diuretic
Action: A sulfonamide derivative and potent diuretic, which inhibits the reabsorption of sodium and chloride in the proximal and distal renal tubules as well as in the Loop of Henle. Has a direct venodilating effect in acute pulmonary edema. With IV administration, onset of venodilation is generally within 5-10 minutes; diuresis will usually occur in 20-30 minutes.
Indications:
1. Pulmonary edema.
2. Hypertension.
3. Cerebral edema.

Contraindications: Anuria. - Should be used in pregnancy only when benefits clearly outweigh risks. Sulfa – 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, exfollative 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 triglycedrides.

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

Return to: Contents at Top Drug Reference Pul Edema/CHF Proto

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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 administration.

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

Return to: Contents at Top Drug Reference Bradycardia Proto Behavioral/Violent/Psych Proto Altered Mental Status Excited Delirium Seizure proto CVA Tox OD Proto Allergic Rxn Eclampsia Proto Diabetic Emerg Alcohol Emerg Cold related emerg Heat related emerg Near Drowning Dystonic reaction Electrical/Lightening Peds Ingestion OD Peds Diabetic Syncope

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, tartive 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.

Return to: Contents at Top Drug Reference Behavioral/Violent/Psych Proto Excited delirium

5.1.24 Ipratropium (Atrovent)

Class: Anticholinergic.
Actions: Causes bronchodilation by antagonizing acetylcholine receptors, dries respiratory tract secretions.
Indications: Bronchial asthma, reversible bronchospasm associated with chronic bronchitis and

emphysema.
Contraindications: Patients with history of hypersensitivity to the drug should not be used as primary agent in acute treatment of bronchospasm. Use with caution if prostatic hypertrophy, or if bladder neck obstruction or if history of angle-closure glaucoma.
Precautions: Blood pressure, pulse, and EKG must be constantly monitored.
Side Effects: **Serious**: Bronchospasm (paradoxical), anaphylaxis, hypersensitivity rxn, Glaucoma (angle-closure).
Common: Cough, nervousness, nausea, xerostomia (dry mouth), dyspepsia, dizziness, headache, COPD exacerbation, oral irritation, rash/urticarial, palpitations, anxiety, tremors,
Dosage: Small-volume nebulizer: 500 µg (add 0.5 mg [2.5 ml] of Atrovent to nebulizer) should be placed in small volume nebulizer (typically administered with a ß agonist). Use only once in conjunction with the first albuterol nebulized treatment. Subsequent albuterol nebulized treatments, when given back to back, should be not contain Atrovent.
Routes: Inhalation only.
Pediatric Dosage: If < 8 years, add 0.25 mg (1.25 ml); if > 8 years, add 0.5 mg (2.5 ml) of Atrovent to nebulizer (in addition to pediatric dose of Albuterol) and flow O_2 at 6-8 L/min

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Pneumonia Proto Allergic Rxn Proto Asthma Protocol COPD protocol
Peds Lower Airway/Asthma/Wheezing Peds Allergic Rxn

5.1.25 Ketamine (Ketalar)

Class: Anesthetics**,** General; Sedation
Actions: Exact mechanism of action unknown; acts on cortex and limbic receptors, producing dissociative analgesia and sedation
Indicatons: As an induction agent for RSI when etomidate or vered unavailable, as a sedative for emergent treatment of violent and excited delirium patients, 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 alchololism, chronic alcohol use, substance abuse.
Side Effects: Serious: respiratory depression, laryngoscope, 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, hypotenstion, cystitis
Dosage: *Sedation* (excited delirium/violent pt): 5 mg/kg IM x 1
Pain: 0.1 – 0.5 mg/kg IV/IO. (IM dose 5mg/kg). May repeat x 1 prn then contact med control.
Induction for RSI: 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 for pain
IV/IO/IM for RSI
Pediatric Doseage: *RSI induction* - IV: 2 mg/kg; (IM: 4 mg/kg)

Pain - IV/IO: 0.1 – 0.5mg/kg; (IM: 5mg/kg)

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)
1 – 2 mg/kg/hr (analgesia). Begin with 1mg/kg/hr and titrate to 2 mg/kg/hr

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Drug Reference Adult Excited Delerium Behavioral / Violent /Psychiatric Emergencies
Adult Neuro/Psy/Behavior Index Rapid Sequence Intubation Adult Pain Management
Peds Pain Management Electrical Emergencies/Lightning Strikes

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, hepatoxicity, 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Drug Reference Marine Enven Proto Sickle Cell Proto Pain Management Burns
Peds Pain Management

5.1.27 Labetalol (Trandate) (Normodyne)

Class: Sympathetic blocker.
Actions: Selectively blocks ÿ1 receptors and nonselectively blocks ß receptors.

Indications: Hypertensive crisis.
Contraindications: Bronchial asthma, congestive heart failure, heart block, 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, elvated 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Hypertension Proto Eclampsia/Pre-eclampsia

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5.1.28 Lorazepam (Ativan)

Class: Schedule IV narcotic, anti-anxiety
Action: Binds to benzodiazepine receptors: enhances GABA effects
Indications: Seizures, Anxiety, procedural sedation
Contraindications: Acute narrow-angle glaucoma, sleep apnea syndrome, severe respiratory insufficiency. Not for intra-arterial injection. Neonates or infants (benzyl alcohol containing INJ forms).
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

Routes: IV, IM, IO
Pediatric dose: 0.05 – 0.1 mg/kg IV over 2 – 5 minutes repeat 0.05 mg/kg prn q 10 – 15 min

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference

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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

Return to: Contents at top Admin Guidelines Adult Medical Protocols PVC protocol V-fib Drug Reference Wide complex tach w/pulse Peds V-Tach w/pulse Stable Peds V-Tach w/pulse unstable Peds V-fib/V-tach no pulse RSI Cardioversion Oral-Tracheal Intubation

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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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Wide complex tach w/pulse Drug Reference PVC protocol V-fib Appendix
Peds V-Tach w/pulse Stable Peds V-Tach w/pulse unstable Cardioversion

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5.1.31 Magnesium Sulfate

Class: Anticonvulsant/Antiarrhythmic.
Actions: CNS depressant, anticonvulsant, antiarrhythmic, labor 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 maintanence drip, see IV Drip Calculaion
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).

Return to: Contents at top Drug Reference V-fib Seizure proto Eclampsia Proto
Asthma Protocol Preterm Labor Peds Lower Airway/Asthma/Wheezing

Peds V-fib/V-tach no pulse

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 Phenergen.
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, tartive dyskinesia, neuroleptic malignant syndrome, seizures, depression, suicidality, hallucinations, blood dyscrasias, CHF, AV block, SVT
Dosage: Adult: 5 – 10 mg IV or IM

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference

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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: anaphylaxsis rxn, HPA axis suppression, hyperglycemia, IOP incr, glaucoma, catatracts, 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/Anaphylaxsis: 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Allerg Rxn Proto Asthma Protocol COPD protocol Peds Lower Airway/Asthma/Wheezing Peds Allergic Rxn Exposure to Bleach/Ammonia Adrenal Insufficiency

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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, or IM.

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, dose is 5 – 10 mg IM (as alternative, can give 1 – 2.5 mg IV or I/O but IM shown to work better). May repeat x1 prn

For RSI induction; 0.3mg/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, 0.2mg/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 Head and Spine trauma Peds Seizure Peds Unstable SVT Peds V-Tach w/pulse Stable Peds V-Tach w/pulse unstable Chem Tx Guide Blue Peds Violent/Impaired RSI Cardioversion External Pacer

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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 pain, pulmonary edema, unstable angina, acute MI.
Contraindications: Head injury, volume depletion undiagnosed abdominal pain, patients with history of hypersensitivity to the drug, respiratory depression, asthma, paralytic ileus, hypercarbia.
Precautions: hypersensitivity to the drug, 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 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, 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 Narrow Complex Tachycard Unstable Pain Management Chest Pain suspicious for MI Pul Edema/CHF Marine Enven Sickle Cell Cold related emerg Electrical/Lightening Extremity Injuries Burns Dental Trauma Gen Crush Injury Peds Pain Management Peds Sickle Cell Cardioversion

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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/cardiotoxic 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
1 mo - < 5 yrs old and < 20 kg: 0.1 mg/kg IV q 2-3 min or 0.1 mg/kg IO/IM/SQ/ETT/IN q 3-8 min
> 5 yrs old or > 20 kg: Titrate 0.4 mg up to 2.0 mg IV/IO/IM/SQ/ETT/IN q 2-3 min prn

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Alter Ment Stat Alcohol Emerg Pul Edema/CHF Proto Tox OD Proto Dystonic Reaction Newborn Resuscitation Peds AMS Peds Asystole

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5.1.37 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: Hypersensitivey to drug, hypotension, Anemia, elevated ICP, Methemoglobinemia. Sildenafil (Viagra) use (or other erectile dysfunction rx). NOTE: IV use contraindicated if: pericardial tamponade, restrictive cardiomyopathy, contrictive 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.
Sublinqual: 0.4 sublinqual q 5 min x 3
IV Drip: (Critical Care Transport) see IV Drip Calculation. 5 – 200 mcg/min
Routes: Sublinqual, IV, Sprayed under tongue on mucous membrane.
Pediatric Dosage: (Critical Care Transport only):
HTN: 1-5 mcg/kg/min IV (Start 0.25-0.5 mcg/kg/min, incr 0.5-1 mcg/kg/min q 3-5min until response. Max: 20 mcg/kg/min
CHF: 1 – 5 mcg/kg/min IV. (Start 0.25-0.5 mcg/kg/min, incr 0.5-1 mcg/kg/min q 3-5 min until response; Max: 20 mcg/kg/min)

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Chest Pain suspicious for MI Hypertension Proto Pul Edema/CHF Proto

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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: Hypersensitivey to drug, hypotension, Anemia, elevated ICP, Methemoglobinemia. Sildenafil (Viagra) use (or other erectile dysfunction rx). NOTE: IV use contraindicated if: pericardial tamponade, restrictive cardiomyopathy, contrictive 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, 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: 1/2 to 2 inches.
Routes: Topical.
Pediatric Dosage: Not indicated.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Chest Pain suspicious for MI Pul Edema/CHF Proto Hypertension Proto

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5.1.39 Norepinephrine (Levophed)

Class: Inotropes/Pressors

Action: Stimulates Alpha and Beta 1 adrogenic receptors. Produces inotropic and vasopressor effects

Indications: Shock, Septic Shock, Post resuscitation care. Likely to be used on patients during inter-facility transports of hypotensive patients

Contraindications: Hypersensivity to drug, severe volume depletion, vascular thrombosis, cycloproane anesthetic use, halothane anesthetic use, profound hypoxia,

Precautions: Use with caution on patients with sensitivity to sulfites, on MAO inhibitors or have hyperthyroidism.

Side Effects:

Serious: Bradycardia, hypertension, arrhythmias, ischemic injury, asthma exacerbation, anaphylaxis, extravasation necrosis

Common: Headache, anxiety, bradycardia, dyspnea

Dosing: Mix 8 mg in 250 ml D54 (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/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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Sepsis Protocol

5.1.40 Ondansetron (Zofran)

Class: Antiemetic,

Action: Selectively antagonizes serotonin 5-HT3 receptors

Indications: Nausea and Vomiting

Contraindications: Hypersensivity to drug, congenital long QT syndrome

Precautions: Impaired liver function, Caution if abdominal surgery, caution if prolonged Qt interval risk

Side Effects:

Serious: Severe **a**llergic 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.

Return to: Contents at top Drug Reference Chest Pain suspicious for MI Motion Sickness Pain Management Marine Enven Proto Contents at top Nausea and Vomiting Extremity Injuries

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5.1.41 Procainamide (Pronestyl)

Class: Antiarrhythmic.
Actions: 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
Maintanence drip: 20-80 mcg/kg/min

Return to: Contents at top Admin Guidelines Adult Medical Protocols PVC protocol V-fib Drug Reference Wide complex tach w/pulse Peds V-Tach w/pulse Stable Peds V-Tach w/pulse unstable Appendix

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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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference

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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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Allergic Rxn Proto Peds Allergic Rxn

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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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference RSI

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

Return to: Contents at Top Drug Index Asystole Proto PEA V-fib Excited Delirium Tox OD Proto Hyperkalemia Gen Crush Injury Peds Asystole Peds PEA Peds V-fib/V-tach no pulse Peds Ingestion OD Peds Chest Injuries Peds Hyperkalemia

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), myoglobenemia,
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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference RSI

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 last 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 warn 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)

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Eye Injuries

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~~**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~~

~~Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Alter Ment Stat Diabetic Emerg Contents at top Behavioral/Violent/Psych Proto Eclampsia proto Alcohol Emerg~~

5.1.49 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 maintaenance 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, palpatations, 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference Preterm Labor Proto

5.1.50 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols
Drug Reference Asystole Proto PEA V-fib

5.1.51 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.

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
RSI

5.1.52 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

Return to: Contents at top Admin Guidelines Adult Medical Protocols Drug Reference
Narrow compl tachycar stable proto (a-fib/a-flutter) Narrow complex tachycardia proto(PSVT)

5.2 HAZARDOUS EXPOUSRE/ HAZ-MAT DRUGS:

5.1.53 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 (Fe_2^+) into methemoglobin (Fe_3^+), which binds with the cyanide.
Indications: Used initially in management of cyanide toxicity
Contraindications: Hypersensivity 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.

Return to: Contents at top Drug Reference Hazardous Material Exposure

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5.1.54 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

5.1.55 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 1: Common signs and Symptoms of Cyanide Poisoning

Symptoms	Signs
• Headache • Confusion • Dyspnea • Chest • tightness • Nausea	• Altered Mental Status (e.g., confusion, disorientation) • Seizures or Coma • Mydriasis • Tachypnea / Hyperpnea (early) • Bradypnea / Apnea (late) • Hypertension (early) / Hypotension (late) • Cardiovascular collapse • Vomiting • Plasma lactate concentration ≥ 8 mmol/L

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 2.5g 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 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

Return to: Contents at top Drug Reference Hazardous Material Exposure
Haz/Mat Drugs Haz Chem Tx Guide Red Cyanokit(procedure)

5.1.56 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 Cl 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.)
9. Push firmly until auto-injector fires.
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

Meridian Medical Technologies, http://www.meridianmeds.com/how.html

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs

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5.1.57 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

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs

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5.1.58 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.

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs

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5.1.59 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.

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs

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6 Appendix

6.1 ABDOMINAL PAIN DIFFERENTIAL

Upper GI Bleed	Lower GI Bleed	Gynecological
Hx of peptic ulcer disease; can cause massive hemorrhage	May be occult or bright red; a common cause of orthostatic hypotension and undetected anemia	Think ectopic!! if patient still having menses; diagnosis includes: 1. lower abdominal pain 2. hypotension 3. shoulder pain 4. vaginal bleeding +/- 5. syncope
Common causes associated with the different types of presenting pain		
Upper GI Bleed	**Lower GI Bleed**	**Gynecological**
Esophageal Varices (Hx of cirrhosis, hepatitis)	Diverticulitis	Ectopic Pregnancy
Peptic Ulcer Disease	Hemorrhoids	Pelvic Inflammatory Disease / STD's
Aspirin, NSAID's	Cancer	Ovarian Cyst
Alcohol	Inflammatory Bowel Disease	Kidney / Urinary Tract Infection
Ingestion of caustic substances	Chronic Diarrhea, overuse of laxatives	Endometriosis

Back Pain	Colicky Pain	Peritoneal Pain	Vomiting
Every pain presenting with new onset back pain (>60 yrs.) should have an abdominal exam R/O AAA	Spasmotic - usually results from smooth muscle contracting against obstruction of hollow organ	Rigid board-like abdomen, resulting from infection or long standing rupture	Non-specific syndrome, can be caused by a wide variety of underlying problems some of which are serious
Common causes associated with the different types of presenting pain			
Back Pain	**Colicky Pain**	**Peritoneal Pain**	**Vomiting**
Abdominal Aortic Aneurysm	Bowel Obstruction	Ruptured Appendix	Infection of GI Tract
Cholelithiasis	Renal Obstruction "Kidney Stones"	Ruptured Ovarian Cyst	Ulcers
Pancreatitis	Gallbladder	Pelvic Inflammatory	Toxic Ingestions

	Obstruction	Disease (PID)	
Perforated Ulcer	Ulcerative Colitis	Perforated Ulcer	Bowel Obstruction
	Crohn's Disease	Peritonitis Advanced	Stones of the Gallbladder or Kidney

Reference: "The 60 second EMT."

Return to: Contents at top Drug Reference Hazardous Material Exposure Haz/Mat Drugs Appendix Peds Non-Trauma Abdm Pain Non-traumatic Abdom Pain

6.2 APGAR SCORE:

The APGAR Scoring Chart

Sign	0	1	2	1 Min	5 Min
Appearance (Skin Color)	Blue, Pale	Body Pink, Hand and Feet Blue	Completely Pink		
Pulse Rate (Heart Rate)	Absent	Below 100	Above 100		
Grimace (Irritability- Response to Flick on sole	No Response	Some Motion, Weak Cry	Vigorous Cry		
Activity (Muscle Tone)	Flaccid, Limp	Some Flexion of Extremities	Active Motion		
Respiratory (Effort)	Absent	Slow, Irregular	Good, Crying		

Return to: Contents at top Drug Reference Appendix Childbirth proto

6.3 APPROVED MEDICAL ABBREVIATIONS.

A

ā = before
@ = at
ABC = airway, breathing, circulation
abd. = abdomen
A/C = antecubital fossa
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
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
b.i.d. = twice a day
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
CO_2 = carbon dioxide
COPD = chronic obstructive pulmonary disease
CP = chest pain
CPR = cardiopulmonary resuscitation
CSF = cerebrospinal fluid
C-spine = cervical spine
CVA = cerebrovascular accident

==========

D

DC = discontinue
DCAP- BLS = deformity, contusions, abrasions, penetrations, burns, lacerations, and swelling
D & C = dilation and curettage
diff. = differential
DOA = dead on arrival
DNR = do not resuscitate
DNRO = do not resuscitate order
D5W = 5% Dextrose in water
D25 = Dextrose 25%
D50 = Dextrose 50%
DX. = diagnosis
==========

E

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

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
fl. = fluid
flex. = flexion
ft. = foot
FROM = full range of motion
fx = fracture
==========

G

g = gauge (diameter)
GCS = Glasgow Coma Scale
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
==========
K

kg. = kilogram
KCl = potassium chloride
==========

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
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

mEq = milliequivalent
MI = myocardial infarction
min. = minute
mg. = milligram
mkd. = marked
ml. = milliliter
mod. = moderate
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
NPO = nothing by mouth
NS = normal saline
NSR = normal sinus rhythm
NTG = nitroglycerin
N & V = nausea and vomiting

==========

O

O_2 = oxygen
OB = obstetrics
OBS = organic brain syndrome
OD = overdose - also means right eye
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
$PaCO_2$ = partial pressure of CO_2 in arterial blood
PaO_2 = partial pressure of O_2 in arterial blood
PAT = paroxysmal atrial tachycardia
PDR = physician's desk reference

PE = pulmonary edema
per = by
PERL = pupils equal and reactive to light
PERLA = pupils equal and reactive to light, and accommodation
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
RLQ = right lower quadrant
R/O = rule out
ROM = range of motion
RUQ = right upper quadrant

==========

S

⌡ = without
SAMPLE = signs/symptoms, allergies, medications, past Hx, last oral intake, events prior
SaO_2 = 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
SpO_2 = percentage of oxygen in the blood via pulse oximeter (equal to SaO_2)

==========

T

tab. = tablet
TB = tuberculosis
temp. = temperature
TIA = transient ischemic attack
t.i.d. = three times daily
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
==========
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

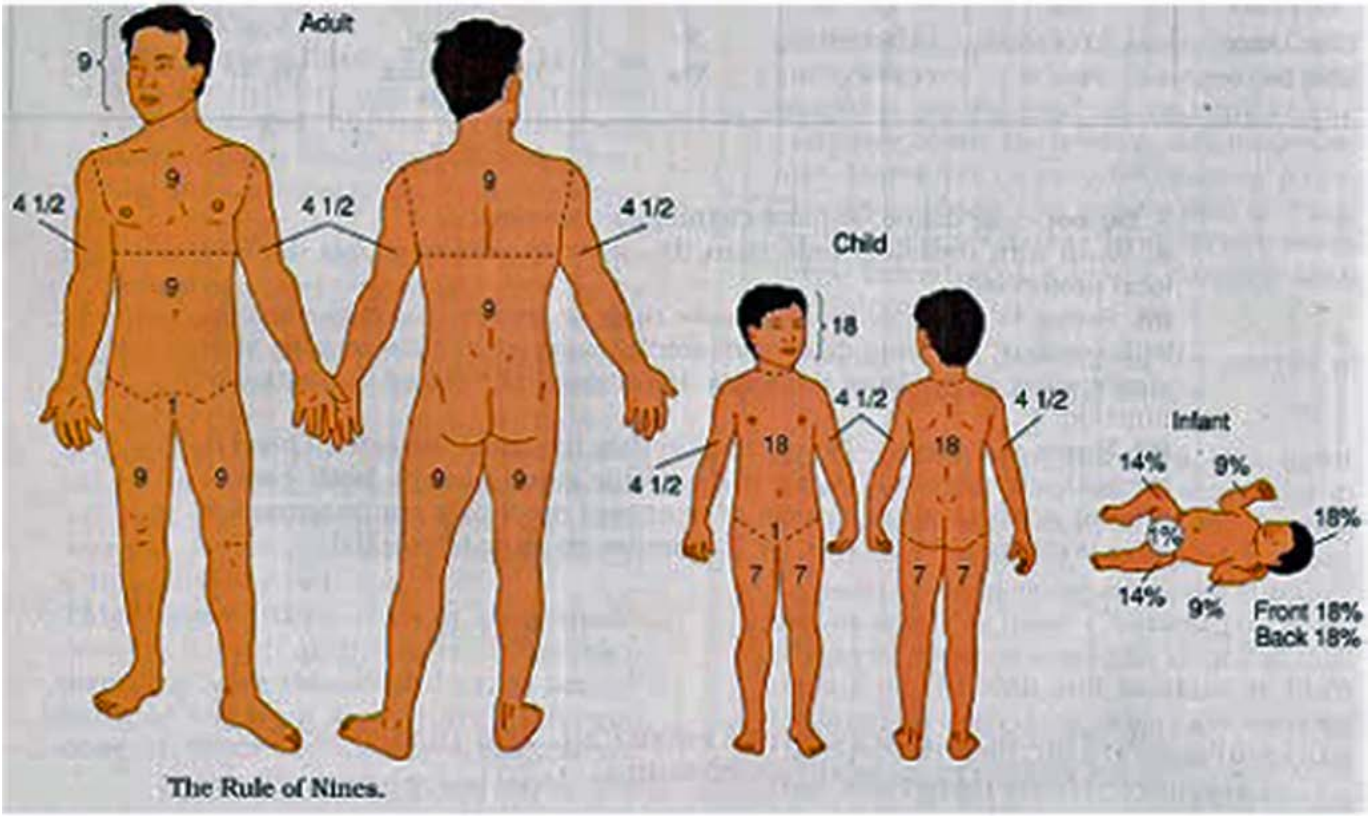
~	= approximately
<	= less than
>	= more than
-	= negative
+	= plus/positive

#	= number
%	= percent

@	= at
Δ	= change
♂	= male
♀	= female
↑	= increase
↓	= decrease
(R)	= right
(L)	= left

Return to: Contents at top Drug Reference Appendix Documentation

6.4 BURN PATIENT: RULE OF NINES



The Rule of Nines.

Return to: Contents at top Drug Reference Hazardous Material Exposure Appendix Burn Injuries Peds Burn Injuries

6.5 BURN PATIENT: SEVERITY CATEGORIZATION

Burn Classification	Characteristics
Minor Burn Injury	**1º Burn** **2º Burn < 15% BSA in Adults** **2º Burn < 5% BSA in Children / aged** **3º Burn < 2% BSA**
Moderate Burn Injury	**2º Burn 16-25% BSA in adults** **2º Burn 5-20% BSA in Children / aged** **3º Burn 2-10% BSA**
Major Burn Injury	**2º Burn > 25% BSA in Adults** **2º Burn > 20% BSA in Children/Aged** **3º 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.**

Return to: Contents at top Drug Reference Hazardous Material Exposure Appendix Burn Injuries Peds Burn Injuries

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		
1:100	= 1g/100ml [10mg/ml]	= **1%**
1:200	= 500mg/100ml [5mg/ml]	= **0.5%**
1:1,000	= 100mg/100ml [1mg/ml]	= **0.1%**
1:5,000	= 20mg/100ml [200mcg/ml]	= **0.02%**
1:10,000	= 10mg/100ml [100mcg/ml]	= **0.01%**

Solid Metric Conversions			
1 pound (avoirdupois)	= 453.592 g	1/2 grain	= 30 mg
1 pound (apothecary)	= 373.242 g	1/4 grain	= 15 mg
1 ounce (avoirdupois)	= 28.35 g	1/8 grain	= 8 mg
1 ounce (apothecary)	= 31.10 g	1/12 grain	= 5 mg
15 grains	= 1 g	1/100 grain	= 600 mcg
10 grains	= 600 mg	1/150 grain	= 400 mcg
7 1/2 grains	= 500 mg	1/200 grain	= 300 mcg
5 grains	= 300 mg	1/250 grain	= 250 mcg
1 1/2 grains	= 100 mg	1/300 grain	= 200 mcg
1 grain	= 64.79891 mg	1 kilogram	= 2.2 pounds
1 pound	= 0.45 kilograms (kg)	1 stone	= 6.35 kg
1000 mcg	= 300 to 7000 iu (below)	1000 mcg	= 1 mg
1 scruple	= 1.2 g	1 drachm	= 28.8 g

Return to: Contents at top Drug Reference Appendix

6.7 CHEST PAIN DIFFERENTIAL

	MYOCARDIAL INFARCTION	ANGINA PECTORIS	DISSECTING ANEURYSM	PERICARDITIS	PEPTIC ULCER
ONSET	Usually sudden	Exertional / Emotional	Acute	Subacute	Acute / Subacute
QUALITY	Crushing, Heaviness, Dull, Pressure, Band-like, Constricting, Squeezing, Burning, Bursting	Discomfort, Choking, Pressing, Squeezing, Strangling, Constricting, Bursting, Burning	Deep tearing, Shearing, "Knife-like"	Sharp	Burning
LOCATION	Substernal, may vary	Substernal	Substernal	Substernal, more left sided	Epigastric, Substernal
RADIATION	Across, mid-thorax, anterior, arms, shoulder, neck, jaw, teeth, fingers	Same as MI	Back lumbar region	Usually none, occasionally tip of shoulder, neck, flank	Occasionally back
DURATION	Usually > 30 minutes	5-15 minutes	Hours	Hours	Hours
PROVOCATION	Usually none, see comments	Exercise, Excitement, Stress, Cold, Meals	None	Worsened: lying, down, breathing, swallowing, coughing, twisting	Alcohol, lack of food, acid foods
ALLEVIATION	None	Rest, NTG	None	Tripod position, shallow respirations	Antacids, Food
COMMENTS	After heavy meals, severe emotional stress, S/S: SOB, N&V, pallor, diaphoresis, impending doom, elderly - atypical	May be nocturnal	Sudden onset, may subside spontaneously or be associated with paralysis	May be associated with URI, flu, Pronestyl, Hydralazine, lupus; MAY BE FEBRILE	ASA, NSAID's, e.g. Voltaren, Feldene, Naprosyn, Motrin, Advil, may trigger

(Continued on Next Page)

Return to: Contents at top Drug Reference Appendix Peds Non-Trauma Chest Pn

	PANCREATITIS	ESOPHAGEAL RUPTURE	PULMONARY EMBOLISM	ESOPHAGEAL SPASM	COSTO-CHONDRITIS
ONSET	Acute / Subacute	Acute	Sudden or Gradual	Subacute	Sudden or Gradual
QUALITY	Severe or Dull	Severe	Sharp or Dull	Dull, Pressure, Colicky	Sharp, Superficial
LOCATION	Epigastric	Retrosternal	Multiple	Substernal, Epigastric	Anterior / lateral costochondral junction
RADIATION	Back	Lateral	None	Jaw, Either arm	None
DURATION	Hours	Hours	Variable	5 – 60 Minutes	Variable
PROVOCA-TION	Alcohol, trauma, gall bladder disease	Swallowing	Respirations, Cough	Spontaneous, Cold liquids, Recumbency	Movement, Palpation, Cough, Respirations
ALLEVIATION	Time	None	None	Antacids, Occasionally NTG	Time, Heat, Analgesia
COMMENTS	May be viral – e.g. Mumps	Alcoholics with forceful vomiting; associated with pleural effusion, shock and hydro-pneumothorax	May have hemoptysis, signs of peripheral phlebitis, cough and fever	Mimics angina, may occur after meals, at night with an acid taste, sensation-linear	Signs and symptoms: Fever, Cough, URI

(Continued on Next Page)

Return to: Contents at top Drug Reference Appendix Peds Non-Trauma Chest Pn

	CERVICAL DISK	ANXIETY	PNEUMONIA	PNEUMO-THORAX	PLEURISY	GALL BLADDER
QUALITY	Superficial	Occasionally sharp, may be heavy or pressure-like	Sharp or Dull Ache	Sharp	Sharp	Spasms, Colicky, may wax and wane
ONSET	Subacute / Acute	Subacute	Slow	Sudden	Subacute	Acute / Subacute
LOCATION	Arm / Neck	Varies in chest, Substernal	Frequently lateral or substernal	Lateral	Lateral	Right upper quadrant
RADIATION	Along course of nerve being irritated	Usually none	None	None	None	Epigastric, Substernal, Right thoracic, Interscapular
DURATION	Variable	2 - 3 Minutes	Variable	Variable	Variable	Hours
PROVOCA-TION	Motion of head, neck palpation, bending	Emotions, Tachypnea	Respirations, Cough	Respirations, Cough	Respirations, Cough	Spontaneous or with food
ALLEVATION	Time, Analgesics	Stimulus removal, Relaxation	None	None (shallow breathing)	Shallow breathing	Time Analgesics
COMMENTS	Not relieved by rest	Paraesthesia-Facial, Circumoral, Finger or Toe, Spasms	Signs and Symptoms: Fever, Cough, URI	More common in tall, thin people	Usually associated with flu-like symptoms	1 - 2 hours after meals, Usually nausea and vomiting

Reference: **The University of Miami** School of Medicine.

Return to: Contents at top Drug Reference Appendix Peds Non-Trauma Chest Pn

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**

Return to: Contents at top Drug Reference Appendix Altered Mental Status
Seizure CVA/Stroke Syncope Tox/OD Head/Spine Injuries

6.9 PEDIATRIC GLASGOW COMA SCALE

	> 1 year	< 1 year
Eye Opening	4 Spontaneously 3 To verbal command 2 To pain 1 No response	Spontaneously To verbal command To pain No response

	> 1 year	< 1 year
Best Motor Response	6 Obeys 5 Localizes pain 4 Flexion - withdrawal 3 Flexion - abnormal (decorticate rigidity) 2 Extension (decerebrate rigidity) 1 No response	 Localizes pain Flexion - normal Flexion – abnormal (decorticate rigidity) Extension (decerebrate rigidity) No response

	> 5 years	<2-5 years	0-23 months
Best Verbal Response	5 Oriented and converses 4 Disoriented and converses 3 Inappropriate words 2 In-comprehensible 1 No response	Appropriate words and phrases Inappropriate words Cried and/or screams Grunts No response	Smiles, coos, cries appropriately Cries Inappropriate crying and/or screaming Grunts No response

Return to: Contents at top Drug Reference Appendix Peds Altered Ment Status Peds Seizure Peds Ingestion/OD Peds Head/Spine Injury

6.10 IV DRIP CALCULATIONS

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 gtts/min
6 mcg/kg/min = 15 + 3 = 18 gtts/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 (60gtt/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

Return to: Contents at top Drug Reference Adult Medical Protocols
Appendix Dopamine Epinephrine 1:10,000 Lidocaine Nitroglycerin Allergic Rx

MAGNESIUM SULFATE

Eclamptic Seizures:
Mix 4 gm in 50 ml of D5W
Concentration = 80 mg/ml
Dosage: 4 gm over 5-10 minutes

Using a macrodrip (10 gtt/min):

Run at 58-116 gtt/min

Torsades de pointes and VF:
Mix 1-2 gm in 50 ml of D5W
Concentration = 20-40 mg/ml
Dosage: 1-2 gm over 1-2 minutes

Using a macrodrip (10 gtt/min):

Run at 270 gtt/min

Maintenance:
Mix 1 gm in 250 ml of D5W
Concentration = 4 mg/ml
Dosage: 2-4 mg/min

Using a microdrip (60 gtt/ml):
30 gtt/min = 2 mg/min
45 gtt/min = 3 mg/min
60 gtt/min = 4 mg/min

Return: Magnesium Rx

NITROGLYCERIN

Mix 5 mg in 100 ml of D5W (glass bottle)
Concentration = 50 mcg/ml
Dosage: 5-20 mcg/min

Using a microdrip (60 gtt/ml):
6 gtt/min = 5 mcg/min
7 gtt/min = 6 mcg/min
8 gtt/min = 7 mcg/min
10 gtt/min = 8 mcg/min
11 gtt/min = 9 mcg/min
12 gtt/min = 10 mcg/min
13 gtt/min = 11 mcg/min
14 gtt/min = 12 mcg/min
16 gtt/min = 13 mcg/min
17 gtt/min = 14 mcg/min
18 gtt/min = 15 mcg/min
19 gtt/min = 16 mcg/min
20 gtt/min = 17 mcg/min
22 gtt/min = 18 mcg/min
23 gtt/min = 19 mcg/min
24 gtt/min = 20 mcg/min

Return: Nitroglycerine Rx

PROCAINAMIDE	AMIODARONE
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	**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**

Return to: Contents at top Appendix Pul Edema/CHF Rx Amiodarone

Additional IV Drug Drip Charts used on patients transported by EMS

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

Dose (mcg/min)																
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20
3.8	6	8	9	11	13	15	17	19	21	23	24	26	28	30	34	38
Rate (ml/hr)																

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

Dose (mcg/min)															
1	2	3	4	5	6	7	8	9	10	40	50	60	70	80	90
1.5	3	4.5	6	8	9	11	12	14	15	60	75	90	105	120	135
Rate (ml/hr)															

Dose (mcg/min)								
100	110	120	130	140	150	160	170	180
150	165	180	195	210	225	240	255	270
Rate (ml/hr)								

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

Dose (mg/min)														
1	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**2**	**2.5**	**3**	**3.5**	**4**
8	**8**	**9**	**10**	**11**	**11**	**12**	**13**	**14**	**14**	**15**	**19**	**23**	**26**	**30**
Rate (ml/hr)														

Drug Name: **Propofol (Diprivan)**

Indications: **Intiation and maintenance of ICU sedation in intubated, mechanically ventilated patient**

Concentraion: **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**

Wt (kg)	Wt (lbs)	Dose (mcg/kg/min) 5	10	15	20	25	30	35	40	45	50
40	88	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
45	99	1.4	2.7	4.1	5.4	6.8	8.1	9.5	10.8	12.2	13.5
50	110	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
55	121	1.7	3.3	5.0	6.6	8.3	9.9	11.6	13.2	14.9	16.5
60	132	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0
65	143	2.0	3.9	5.9	7.8	9.8	11.7	13.7	15.6	17.6	19.5
70	154	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0
75	165	2.3	4.5	6.8	9.0	11.3	13.5	15.8	18.0	20.3	22.5
80	176	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0
85	187	2.6	5.1	7.7	10.2	12.8	15.3	17.9	20.4	23.0	25.5
90	198	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27.0
95	209	2.9	5.7	8.6	11.4	14.3	17.1	20.0	22.8	25.7	28.5
100	220	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0
105	231	3.2	6.3	9.5	12.6	15.8	18.9	22.1	25.2	28.4	31.5
110	242	3.3	6.6	9.9	13.2	16.5	19.8	23.1	26.4	29.7	33.0
115	253	3.5	6.9	10.4	13.8	17.3	20.7	24.2	27.6	31.1	34.5
120	264	3.6	7.2	10.8	14.4	18.0	21.6	25.2	28.8	32.4	36.0
125	275	3.8	7.5	11.3	15.0	18.8	22.5	26.3	30.0	33.8	37.5
130	286	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1	39.0
135	297	4.1	8.1	12.2	16.2	20.3	24.3	28.4	32.4	36.5	40.5
140	308	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8	42.0
145	319	4.4	8.7	13.1	17.4	21.8	26.1	30.5	34.8	39.2	43.5
150	330	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0
155	341	4.7	9.3	14.0	18.6	23.3	27.9	32.6	37.2	41.9	46.5
160	352	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2	48.0
165	363	5.0	9.9	14.9	19.8	24.8	29.7	34.7	39.6	44.6	49.5
170	374	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9	51.0

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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**

mg/min	0.25	0.5	0.75	1
Rate ml/hr	8	17	25	33

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**

Mg/min	0.25	0.5	0.75	1
Rate ML/HR	8	17	25	33

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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

MG/HR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ML/HR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

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**

Wt. (kg)	Dose (µg/kg/min) 1	2	3	4	5	6	7	8	9	10	11	13	15	20	30
40	1.2	2.4	3.6	4.8	6	7	8	10	11	12	13	16	18	24	36
45	1.4	2.7	4.1	5	7	8	9	11	12	14	15	18	20	27	41
50	1.5	3	4.5	6	8	9	11	12	14	15	17	20	23	30	45
55	1.7	3.3	5	7	8	10	12	13	15	17	18	21	25	33	50
60	1.8	3.6	5	7	9	11	13	14	16	18	20	23	27	36	54
65	2	3.9	6	8	10	12	14	16	18	20	21	25	29	39	59
70	2.1	4.2	6	8	11	13	15	17	19	21	23	27	32	42	63
75	2.3	4.5	7	9	11	14	16	18	20	23	25	29	34	45	58
80	2.4	4.8	7	10	12	14	17	19	22	24	26	31	36	48	72
85	2.6	5	8	10	13	15	18	20	23	26	28	33	38	51	77
90	2.7	5	8	11	14	16	19	22	24	27	30	35	41	54	81
95	2.9	6	9	11	14	17	20	23	26	29	31	37	43	57	86
100	3	6	9	12	15	18	21	24	27	30	33	39	45	60	90
105	3.2	6	9	13	16	19	22	25	28	32	35	41	47	63	95
110	3.3	7	10	13	17	20	23	26	30	33	36	43	50	66	99
115	3.5	7	10	14	17	21	24	28	31	35	38	45	52	69	104
120	3.6	7	11	14	18	22	25	29	32	36	40	47	54	72	108
125	3.8	8	11	15	19	23	26	30	34	38	41	49	56	75	113
130	3.9	8	12	16	20	23	27	31	35	39	43	51	59	78	117
135	4.1	8	12	16	20	24	28	32	36	41	45	53	61	81	122
	ML/HR														

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.**

Wt. (kg)	Dose (µg/kg/min) 1	2	3	4	5	6	7	8	9	10	11	13	15	20	30
40	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8	5	6	7	8	9	12	18
45	0.7	1.4	2	2.7	3.4	4.1	4.7	5	6	7	7	9	10	14	20
50	0.8	1.5	2.3	3	3.8	4.5	5	6	7	8	8	10	11	15	23
55	0.8	1.7	2.5	3.3	4.1	5	6	7	7	8	9	11	12	17	25
60	0.9	1.8	2.7	3.6	4.5	5	6	7	8	9	10	12	14	18	27
65	1	2	2.9	3.9	4.9	6	7	8	9	10	11	13	15	20	29
70	1.1	2.1	3.2	4.2	5	6	7	8	9	11	12	14	16	21	32
75	1.1	2.3	3.4	4.5	6	7	8	9	10	11	12	15	17	23	34
80	1.2	2.4	3.6	4.8	6	7	8	10	11	12	13	16	18	24	36
85	1.3	2.6	3.8	5	6	8	9	10	11	13	14	17	19	26	38
90	1.4	2.7	4.1	5	7	8	9	11	12	14	15	18	20	27	41
95	1.4	2.9	4.3	6	7	9	10	11	13	14	16	19	21	29	43
100	1.5	3	4.5	6	8	9	11	12	14	15	17	20	23	30	45
105	1.6	3.2	4.7	6	8	9	11	13	14	16	17	20	24	32	47
110	1.7	3.3	5	7	8	10	12	13	15	17	18	21	25	33	50
115	1.7	3.5	5	7	9	10	12	14	16	17	19	22	26	35	52
120	1.8	3.6	5	7	9	11	13	14	16	18	20	23	27	36	54
125	1.9	3.8	6	8	9	11	13	15	17	19	21	24	28	38	56
130	2	3.9	6	8	10	12	14	16	18	20	21	25	29	39	59
135	2	4.1	6	8	10	12	14	16	18	20	22	26	30	41	61
	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 dosge in mcg/kg/min

3. Locate the rate in ml/hr where the row and column meet.

Wt (kg)	Dose: mcg/kg/min																
	1	2	3	4	5	6	7	8	9	10	11	13	15	17	19	20	30
40	0.8	1.5	2.3	3	3.8	4.5	5	6	7	8	8	10	11	13	14	15	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)																

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

Dose mcg/min	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Rate ml/hr	**3.8**	**8**	**11**	**15**	**19**	**23**	**26**	**30**	**38**	**45**	**53**	**60**	**68**	**75**

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

WT (kg)	**Dose (mcg/kg/min)**							**Loading Dose** 0.5 mg/kg over 1 min (From 10 mg/ml vial)
	50	**75**	**100**	**125**	**150**	**175**	**200**	
l 40	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**2.0**
45	**14**	**20**	**27**	**34**	**41**	**47**	**54**	**2.3**
50	**15**	**23**	**30**	**38**	**45**	**53**	**60**	**2.5**
55	**17**	**25**	**33**	**41**	**50**	**58**	**66**	**2.8**
60	**18**	**27**	**36**	**45**	**54**	**63**	**72**	**3.0**
65	**20**	**29**	**39**	**49**	**59**	**68**	**78**	**3.3**
70	**21**	**32**	**42**	**53**	**63**	**74**	**84**	**3.5**
75	**23**	**34**	**45**	**56**	**68**	**79**	**90**	**3.8**
80	**24**	**36**	**48**	**60**	**72**	**84**	**96**	**4.0**
85	**26**	**38**	**51**	**64**	**77**	**89**	**102**	**4.3**
90	**27**	**41**	**54**	**68**	**81**	**95**	**108**	**4.5**
95	**29**	**43**	**57**	**71**	**86**	**100**	**114**	**4.8**
100	**30**	**45**	**60**	**75**	**90**	**105**	**120**	**5.0**
105	**32**	**47**	**63**	**79**	**95**	**110**	**126**	**5.3**
110	**33**	**50**	**66**	**83**	**99**	**116**	**132**	**5.5**
115	**35**	**52**	**69**	**86**	**104**	**121**	**138**	**5.8**
120	**36**	**54**	**72**	**90**	**108**	**126**	**144**	**6.0**
125	**38**	**56**	**75**	**94**	**113**	**131**	**150**	**6.3**
130	**39**	**59**	**78**	**98**	**117**	**137**	**156**	**6.5**
135	**41**	**61**	**81**	**101**	**122**	**142**	**162**	**6.8**
	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

Dose (units/hr)																	
300	**400**	**500**	**600**	**700**	**800**	**900**	**1000**	**1100**	**1200**	**1300**	**1400**	**1500**	**1600**	**1700**	**1800**	**1900**	**2000**
3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Rate (ml/hr)																	

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

Wt (Kg)	Dose (units/kg/hr) 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
40	2	2.4	2.8	3.2	3.6	4	4.4	4.8	5	6	6	6	7	7	8	8	8	9	9	10	10
45	2.3	2.7	3.2	3.6	4.1	4.5	5	5	6	6	7	7	8	8	9	9	9	10	10	11	11
50	2.5	3	3.5	4	4.5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13
55	2.8	3.3	3.9	4.4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14
60	3	3.6	4.2	4.8	5	6	7	7	8	8	9	10	10	11	11	12	13	13	14	14	15
65	3.3	3.9	4.6	5	6	7	7	8	8	9	10	10	11	12	12	13	14	14	15	16	16
70	3.5	4.2	4.9	6	6	7	8	8	9	10	11	11	12	13	13	14	15	15	16	17	18
75	3.8	4.5	5	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19
80	4	4.8	6	6	7	8	9	10	10	11	12	13	14	14	15	16	17	18	18	19	20
85	4.3	5	6	7	8	9	9	10	11	12	13	14	14	15	16	17	18	19	20	20	21
90	4.5	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	19	20	21	22	23
95	4.8	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
100	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
105	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
110	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24	25	26	28
115	6	7	8	9	10	12	13	14	15	16	17	18	20	21	22	23	24	25	26	28	29
120	6	7	8	10	11	12	13	14	16	17	18	19	20	22	23	24	25	26	28	29	30
125	6	8	9	10	11	13	14	15	16	18	19	20	21	23	24	25	26	28	29	30	31
130	7	8	9	10	12	13	14	16	17	18	20	21	22	23	25	26	27	29	30	31	33
135	7	8	9	11	12	14	15	16	18	19	20	22	23	24	26	27	28	30	31	32	34
	Rate (ml/hr)																				

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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

Dose (units/hour)																		
1	**2**	**3**	**4**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**
1	**2**	**3**	**4**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**
Rate (ml/hr)																		

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

Drug name: **Integrilin (eptifibatide)**
Indications: **Percutaneous coronary intervention (PC I) 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.

Weight (kg)	**Loading Dose From 2 mg/ml Vial**	**Maintenance Infusion from 0.75 gm/ml Bottle**	
		2 mcg/kg/min for Cr Cl ≥ 50 ml/min or Serum Cr ≤ 2 mg/dl	**1 mcg/kg/min** for Cr Cl < 50 ml/min or Serum Cr >2 mg/dl
40	**3.6**	**6.4**	**3.2**
45	**4.1**	**7.2**	**3.6**
50	**4.5**	**8**	**4**
55	**5.0**	**8.8**	**4.4**
60	**5.4**	**9.6**	**4.8**
65	**5.9**	**10.4**	**5.2**
70	**6.3**	**11.2**	**5.6**
75	**6.8**	**12**	**6**
80	**7.2**	**12.8**	**6.4**
85	**7.7**	**13.6**	**6.8**
90	**8.1**	**14.4**	**7.2**
95	**8.6**	**15.2**	**7.6**
100	**9.0**	**16**	**8**
105	**9.5**	**16.8**	**8.4**
110	**9.9**	**17.6**	**8.8**
115	**10.4**	**18.4**	**9.2**
120	**10.8**	**19.2**	**9.6**
121	**11.3**	**20**	**10**
>121	**11.3**	**20**	**10**
	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

Dose (mg/min)													
0.25	**0.5**	**0.75**	**1**	**1.25**	**1.5**	**1.75**	**2**	**2.25**	**2.5**	**2.75**	**3**	**3.25**	**3.5**
8	**15**	**23**	**30**	**38**	**45**	**53**	**60**	**68**	**75**	**83**	**90**	**98**	**105**
Rate (ml/hr)													

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

Dose (mg/min)							
0.5	1	1.5	2	2.5	3	3.5	4
3.8	8	11	15	19	23	26	30
Rate (ml/hr)							

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

Wt (Kg)	Dose (mcg/kg/min) 0.38	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	Loading Dose (from bag) 50 mcg/kg over 10 min
40	4.5	4.8	5	6	7	7	8	8	9	10.0
45	5	5	6	7	7	8	9	9	10	11.3
50	6	6	7	8	8	9	10	11	11	12.5
55	6	7	7	8	9	10	11	12	12	13.8
60	7	7	8	9	10	11	12	13	14	15.0
65	7	8	9	10	11	12	13	14	15	16.3
70	8	8	9	11	12	13	14	15	16	17.5
75	8	9	10	11	12	14	15	16	17	18.8
80	9	10	11	12	13	14	16	17	18	20.0
85	9	10	11	13	14	15	17	18	19	21.3
90	10	11	12	14	15	16	18	19	20	22.5
95	10	11	13	14	16	17	19	20	21	23.8
100	11	12	14	15	17	18	20	21	23	25.0
105	12	13	14	16	17	19	20	22	24	26.3
110	12	13	15	17	18	20	21	23	25	27.5
115	13	14	16	17	19	21	22	24	26	28.8
120	14	14	16	18	20	22	23	25	27	30.0
125	14	15	17	19	21	23	24	26	28	31.3
130	15	16	18	20	21	23	25	27	29	32.5
136	15	16	18	20	22	24	27	29	31	34.0
	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

Dose (mcg/min)														
1	2	3	4	5	6	7	8	9	10	15	20	30	40	50
0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3	4.5	6	9	12	15
Rate (ml/hr)														

Dose (mcg/min)														
60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
Rate (ml/hr)														

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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 administrating 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/mg/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

Wt (kg)	Dose (mcg/kg/min)						Loading Dose (mcg/kg)	
	0.005	0.01	0.015	0.02	0.025	0.03	1	2
40	2	4	6	8	10	12	7	13
45	2.3	4.5	7	9	11	14	8	15
50	2.5	5	8	10	13	15	8	17
55	2.8	6	8	11	14	147	9	18
60	3	6	9	12	15	18	10	20
65	3.3	7	10	13	16	20	11	22
70	3.5	7	11	14	18	21	12	23
75	3.8	8	11	15	19	23	13	25
80	4	8	12	16	20	24	13	27
85	4.3	9	13	17	21	26	14	28
90	4.5	9	14	18	23	27	15	30
95	4.8	10	14	19	24	29	16	32
100	5	10	15	20	25	30	17	33
105	5	11	16	21	26	32	18	35
110	6	11	17	22	28	33	18	37
115	6	12	17	23	29	35	19	38
120	6	12	18	24	30	36	20	40
125	6	13	19	25	31	38	21	42
130	7	13	20	26	33	39	22	43
135	7	14	20	27	34	41	23	45
	Rate (ml/hr)						ml from bag over 1 min	

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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.

Dose (mg/hr)	Infusion Rate (ml/hr)
2.5	25
5	50
7.5	75
10	100
12.5	125
15	150

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

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 diesired dosage in mcg/kg/min
3. Locate the rate in ml/hr where the row and column meet

Wt (Kg)	Dose (mcg/kg/min) 0.25	0.5	0.6	0.7	0.8	0.9	1	1.5	2	2.5	3	3.5	4	4.5	5
40	1.5	3	3.6	4.2	4.8	5	6	9	12	15	18	21	24	27	30
45	1.7	3.4	4.1	4.7	5	6	7	10	14	17	20	24	27	30	34
50	1.9	3.8	4.5	5	6	7	8	11	15	19	23	26	30	34	38
55	2.1	4.1	5	6	7	7	8	12	17	21	25	29	33	37	41
60	2.3	4.5	5	6	7	8	9	14	18	23	27	32	36	41	45
65	2.4	4.9	6	7	8	9	10	15	20	24	29	34	39	44	49
70	2.6	5	6	7	8	9	11	16	21	26	32	37	42	47	53
75	2.8	6	7	8	9	10	11	17	23	28	34	39	45	51	56
80	3	6	7	8	10	11	12	18	24	30	36	42	48	54	60
85	3.2	6	8	9	10	11	13	19	26	32	38	45	51	57	64
90	3.4	7	8	9	11	12	14	20	27	34	41	47	54	61	68
95	3.6	7	9	10	11	13	14	21	29	36	43	50	57	64	71
100	3.8	8	9	11	12	14	15	23	30	38	45	53	60	68	75
105	3.9	8	9	11	13	14	16	24	32	39	47	55	63	71	79
110	4.1	8	10	12	13	15	17	25	33	41	50	58	66	74	83
115	4.3	9	10	12	14	16	17	26	35	43	52	60	69	78	86
120	4.5	9	11	13	14	16	18	27	36	45	54	63	72	81	90
125	4.7	9	11	13	15	17	19	28	38	47	56	66	75	84	94
130	4.9	10	12	14	16	18	20	29	39	49	59	68	78	88	98
135	5	10	12	14	16	18	20	30	41	51	61	71	81	91	101
	Rate (ml/hr)														

Return to: Contents at top Drug Reference Adult Medical Protocols Appendix

6.11 PEDIATRIC VITAL SIGNS

Age	Weight in kg	Minimum Systolic BP	Normal Heart Rate	Normal Respiratory Rate
Premature	< 2.5	40	120-170	40-60
Term	3.5	60	100-170	40-60
3 months	6	60	100-170	30-50
6 months	8	60	100-170	30-50
1 year	10	72	100-170	30-40
2 years	13	74	100-160	20-30
4 years	15	78	80-130	20
6 years	20	82	70-115	16
8 years	25	86	70-110	16
10 years	30	90	60-105	16
12 years	40	94	60-100	16

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 mHg + (child's age in years x 2)

Return to: Contents at top Pediatric Protocols Peds Pain Management Appendix Peds Narrow Complex Tachycardia Peds Non-Trauma Abdm Pain Peds Sickle Cell Peds Head and Spine Injuries

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**

$$\frac{\text{cu.ft.} \times 28.3 \times (\text{PSI} \div 2200)}{\text{liter flow}}$$

= 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)**

Return to: Contents at top Appendix

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 CO_2 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.

Return to: Contents at top Adult Resp Emerg Appendix COPD

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...

Return to: Contents at top Appendix Peds Suspected Child Abuse

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.

Return to: Contents at top Appendix Newborn Sids Peds NonTrauma Abdm
Peds Non-Trauma Chest Pn Peds Suspected Child Abuse Peds Abdom/Pelvic Injuries

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%) 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 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.

Return to: Contents at top Pediatic Medical Protocols
Appendix

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)).

Return to: Contents at top Appendix Personal exposure to infectious disease

6.20 INFECTIOUS EXPOSURE REFERENCE SHEET

AIRBORNE	TRANSMISSION	PREVENTION	POST-EXPOSURE	FOLLOW UP
Tuberculosis (TB)	Droplets: coughing, sneezing, intubation, suctioning.	Initial 2 step test, then annual PPD. Wear HEPA masks.	Source = PPD, Employee = PPD, unless PPD tested within prior 12 weeks or previously PPD reactive.	PPD at week 12 post-exposure. If new positive: chest x-ray and Rx with Isoniazid for 6 months.
Meningitis (bacterial/viral)	Droplets: coughing, sneezing, intubation, suctioning.	HEPA mask.	Antibiotic: Cipro, Rocephin, Rifampin.	Seek medical care if symptoms of meningitis develop: fever, stiff neck, severe headache.
Influenza	Close contact, droplets: coughing, sneezing, intubation, suctioning. Also direct contact with vesicle fluid.	Flu shot.	Treatment: analgesics, Rimantadine, Tamiflu, Relenza.	As determined by medical professional.
Varicella Zoster (Chicken Pox)	Close contact, droplets: coughing, sneezing, intubation, suctioning. Also direct contact with vesicle fluid.	Vaccine = 1 shot (Varivax). HEPA mask	Treatment: Varicella Zoster Immune Globulin (VZIG) within 96 hours of exposure.	As determined by medical professional.
OTHER	TRANSMISSION	PREVENTION	POST-EXPOSURE	FOLLOW UP
Tetanus	Soiled object causing open wound.	Vaccine good for 10 years.	If no vaccine, administer at this time. If over 7 years from last vaccination and sustained open wound, booster dose.	Seek medical care if symptoms of tetanus develop: lockjaw, rigid muscles.
Lyme Disease	Tick-borne: tick attached 24 hours.	Avoid tick infested areas. Vaccine = 3 shot series for prone areas.	Antibiotics: Amoxicillin, Doxycycline	As determined by medical professional
Scabies	Direct contact: mite infested areas, bedding/clothing,	Avoid infected areas.	Lindane and Kwell applied to the whole body for 24 hours.	Close supervision of treatment including bathing.

	nursing homes.			
Rabies	Virus laden saliva of infected animal: animal bites.	Avoid animal bites.	Wash infected areas. Administer rabies anti-serum injection and first dose of rabies vaccine. Contact animal control, monitor animal for presence of infection.	If animal is positive, continue to treat employee with vaccine.
HAB	Fecal/Oral.	Vaccine = 2 shot series.	Source = Acute Hep Panel. Employee = Acute Hep Panel. If source positive, employee not immune: administer immune globulin and consider HAB vaccine series.	Periodic screening: 12 weeks after exposure or if symptoms occur.
BLOOD-BORNE	TRANSMISSION	PREVENTION	POST-EXPOSURE	FOLLOW UP
HIV	Blood to blood, to non-intact skin and mucous membranes.	No Vaccine.	See Post Exposure Management (Administrative Protocol 1.1.11)	Periodic screening: 6, 12, 26 weeks after exposure.
Syphilis	Blood and/or open sores/lesions.	No Vaccine.	Source = RPR, Employee = RPR. Penicillin. Repeat test at 3 and 6 months, if positive refer to FTA	As determined by medical professional.
HBV	Blood to blood, to non-intact skin and mucous membranes.	Vaccine = 3 shot series. Titer and reimmunize if necessary.	Source = Acute Hep Panel. Employee = Acute Hep Panel. If source positive, employee not immune: administer immune globulin and consider HBV vaccine series.	Periodic screening: 6, 12, 26 weeks after exposure.
HCV	Blood to blood, to	No Vaccine.	Source = Acute	Periodic

	non-intact skin and mucous membranes.		Hep Panel. Employee = Acute Hep Panel.	screening: 6, 12, 26 weeks after exposure. If source positive, consider employee qualitative HCV RNA & ALT testing 6 weeks after exposure. If employee becomes HCV RNA positive, treat with interferon / Ribavirin x 6 months.

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.

Return to: Contents at top Appendix Personal exposure to infectious disease

6.21 TRAUMA ALERT CRITERIA (ADULT)

The following criteria are to be used to call trauma alerts on traumatized patients:

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:

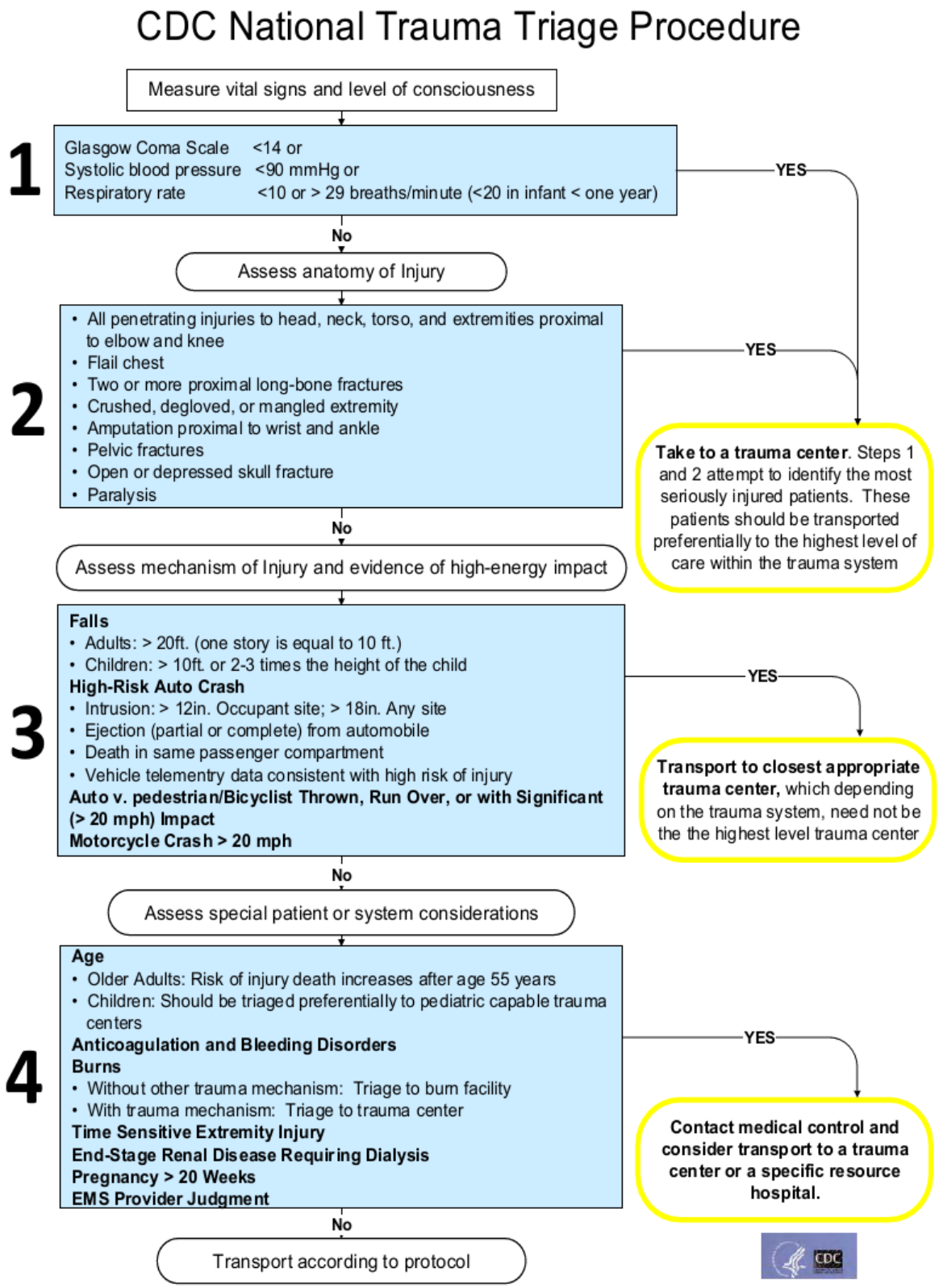
- ☐ Meets color-coded triage system (see below)
- ☐ GCS ≤ 12 (Patient must be evaluated via GCS if not identified as a trauma alert after application of criterion 1.)
- ☐ Meets local criteria (specify):
- ☐ Patient does not meet any of the trauma criteria listed above but, in the judgment of the EMT or paramedic, should be transported as a trauma alert (document)

Component	B= Any two (2) – Transport as a Trauma alert	R= Any one (1) – transport as a Trauma alert
Airway	☐ Respiratory rate of 30 or greater	☐ Active airway assistance[1]
Circulation	☐ Sustained HR of 120 beats per minute or greater	☐ Lack of radial pulse with sustained heart rate (>120) or BP < 90 mm Hg
Best Motor Response	☐ BMR = 5	☐ BMR = 4 or less **or** Presence of paralysis, **or** suspicion of spinal cord injury **or** loss of sensation
Cutaneous	☐ Soft Tissue Loss[2] or GSW to the extremities	☐ 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 torso[3]
Long bone Fracture	☐ Single Fx site due to MVA **or** Fall ≥ 10 ft.	☐ Fracture of two or more long bones[4]
Age	☐ ≥ 55 years old	
Mechanism of injury	☐ Ejection from vehicle[5] or deformed steering wheel[6]	

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

Return to: Contents at top Abdominal Trauma Appendix Extremtiy Trauma

6.21.2 CDC Trauma Alert Criteria:



Return to: **Contents at top** **Appendix**
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Return to: Contents at top Appendix

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:

Component			
Size	> 20 kg (44+ lbs.) G	> 11 – 20 kg (24 – 44 lbs.) G	Wt ≤ 11 kg or length ≤ 33 inches on a pediatric length and weight emergency tape B
Airway	Normal G	Supplemented O_2 G	Assisted or Intubated [1] R
Consciousness	Awake G	Amnesia or Loss of consciousness B	Altered Mental Status[2] or Coma or Presence of paralysis R
Circulation	Good peripheral pulses: SBP > 90 mm Hg G	Carotid or Femoral pulses palpable, but the radial or pedal pulse not palpable or SBP < 90 mm Hg B	Faint or Non-palpable carotid or femoral pulse or SBP < 50 mm Hg R
Fracture	None seen or suspected G	Single closed long bone[3] fracture[4] B	Open long bone[3] fracture[5] or multiple fracture sites or multiple dislocations[5] R
Cutaneous	No visible injury G	Contusion or Abrasion G	Major soft tissue disruption[6] or Major flap avulsion or 2nd or 3rd degree burns to ≥ 10% TBSA or Amputation[7] or any penetrating injury to head, neck, or torso[8] R

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.)

---

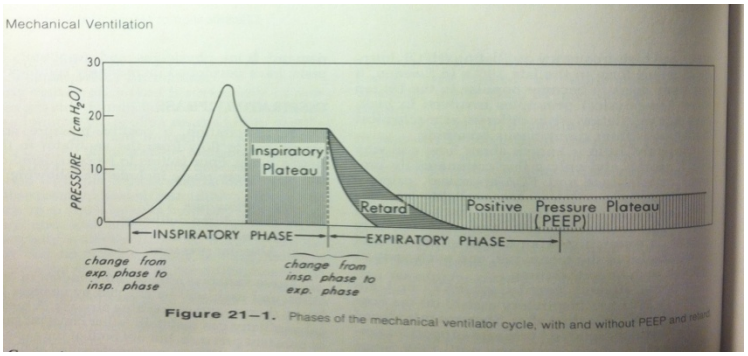
1. Airway assistance includes manual jaw thrust, continuous suctioning, or use of other adjuncts to assist ventilatory efforts.
2. Altered mental status includes drowsiness, lethargy, inability to follow commands, unresponsiveness to voice, totally unresponsive.
3. Long bones include the humerus, (radius, 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

Return to: Contents at top Appendix Peds Abdom/Pelvic Injuries Peds Traumatic Arrest

6.23 Ventilator Assist Support Document

ABBR:	Definition:
VCV	Volume Controlled Ventilation
PCV	Pressure Controlled Ventilation
PSV	Pressure Support Ventilation
A/C	Assist / Controlled
SIMV	Synchronized Intermittent Mandatory Ventilation
SIMV+PS	SIMV+ Pressure Support
CPAP	Continuous Positive Airway Pressure
NPPV	Noninvasive Positive Pressure Ventilation
V_T	Tidal Volume
PIP	Peak Inspiratory Pressure
F	Frequency = Rate
FiO2	Fraction of Inspired Oxygen
PEEP	Positive End Expiatory Pressure
PS	Pressure Support
I-Time	Inspiratory Time
pPlat	Plateau Pressure
V_{TE}	Exhaled Tidal Volume
V_E	Minute Ventilation
MV	Minute Volume
I:E	Inspiratory : Expiatory
EtCO2	End Tidal Carbon Dioxide
IBW	Ideal Body Weight

Minute Ventilation Calculation	
Exhaled Tidal Volume X Total Respiratory Rate = VE	
Tidal Volume 6-8 ml/kg of IBW	
Age	Respirations
Preterm	<40
Newborn-1 month	24-35
1 month-6 years	20-30
6 years -12 years	12-25
Over 12 years old	12-18
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.)

Height	Small Frame	Medium Frame	Large Frame
5' 2"	128-134	131-141	138-150
5' 3"	130-136	133-143	140-153
5" 4"	132-138	135-145	142-156
5' 5"	134-140	137-148	144-160
5' 6"	136-142	139-151	146-164
5' 7"	138-145	142-154	149-168
5' 8"	140-148	145-157	152-172
5' 9"	142-151	148-160	155-176
5' 10"	144-154	151-163	158-180
5' 11"	146-157	154-166	161-184
6' 0"	149-160	157-170	164-188
6' 1"	152-164	160-174	168-192

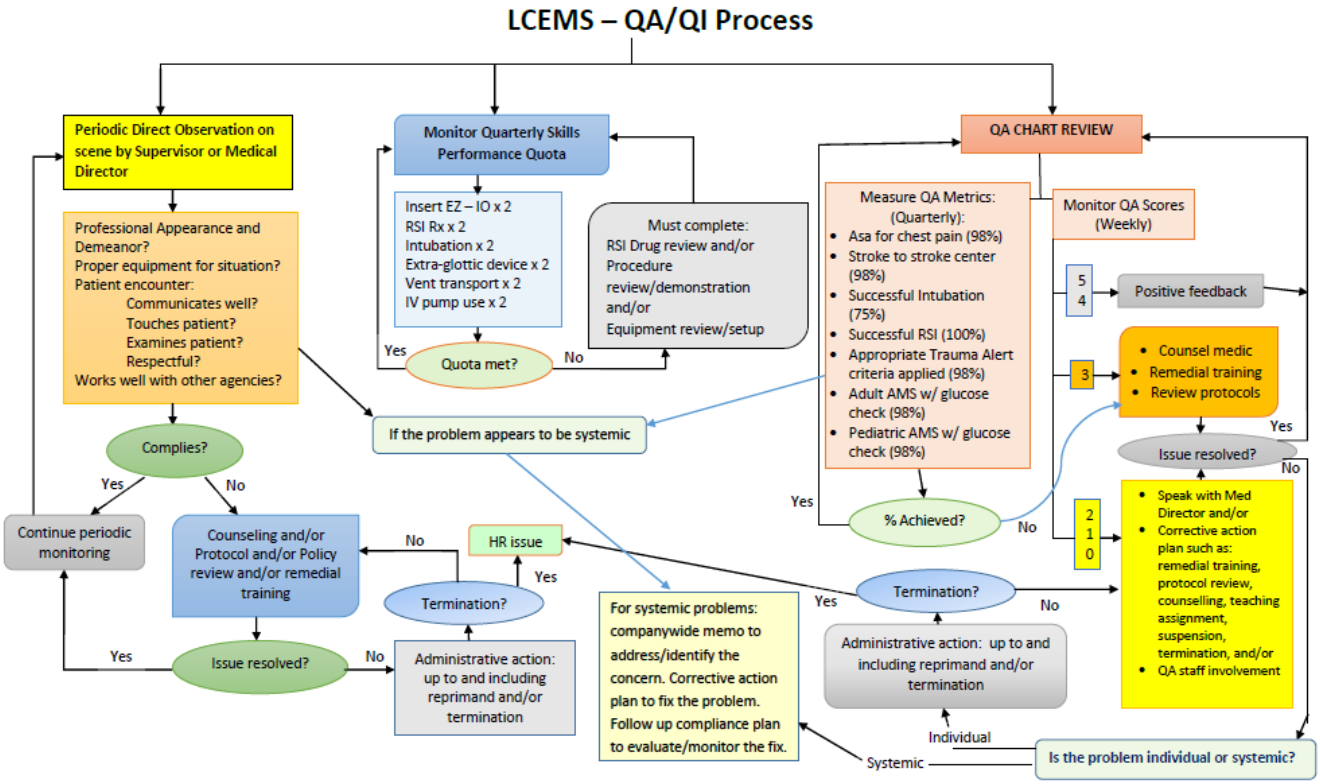
6' 2"	155-168	164-178	172-197
6' 3"	158-172	167-182	176-202
6' 4"	162-176	171-187	181-207

Ideal Body Weight Chart for Women

Height	Small Frame	Medium Frame	Large Frame
4' 10"	102-111	109-121	118-131
4' 11"	103-113	111-123	120-134
5' 0"	104-115	113-126	122-137
5' 1"	106-118	115-129	125-140
5' 2"	108-121	118-132	128-143
5' 3"	111-124	121-135	131-147
5' 4"	114-127	124-138	134-151
5' 5"	117-130	127-141	137-155
5' 6"	120-133	130-144	140-159
5' 7"	123-136	133-147	143-163
5' 8"	126-139	136-150	146-167
5' 9"	129-142	139-153	149-170
5' 10"	132-145	142-156	152-173
5' 11"	135-148	145-159	155-176
6' 0"	138-151	148-162	158-179

Return to: Contents at top Appendix Med Adult Protocols Pediatric Protocols Procedure Protocols VentilatorAssist Procedure

6.24 Overview of QA process



Return to: Contents at top QA/QI Appendix Med Adult Protocols Pediatric Protocols Procedure Protocols VentilatorAssist Procedure

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Chest Pain Protocol Checklist

- ❑ **Assure ABC's.**
- ❑ **Administer oxygen via nasal cannula or non-re-breather prn SpO2 <94%**
- ❑ **Obtain symptom duration, time of onset or last time patient was seen normal.**
- ❑ **Obtain 12 lead EKG as soon as possible.**
- ❑ **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 possible.**
- ❑ **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 mmHg. (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 mmHg.**
- ❑ **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 50-100 mcg slow IVP; may repeat x1 prn.**
- ❑ **Consider Zofran 4 – 8 mg IVP for nausea.**
- ❑ **Transport. Document all items on run report.**

Return to: Contents at top Blank Forms Appendix

Dive History/Profile

Complete as much as possible.

1. Type of Dive: Rescue_____ Commercial_____ Recreational_____
2. Type of gas used: Compressed air____ Nitrox_____ Heliox_____ Other_____
3. Water type: Contaminated_____ Fresh_____ Salt_____
4. Water temperature: _____
5. Number of Dives in the past several days: _____
   List each Dive with:

Maximum Depth	Bottom Time	Surface Interval
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6. Time of last ascent: _____
7. Did Diver: Panic_____ Emergency ascend_____ Run out of air_____
   Hold breath upon ascent_____ Miss a decompression stop(s)_____
8. Problems during dive: (e.g. buoyancy, clearing ears, equipment)
   _____
   _____
   _____
9. Possible contact with dangerous marine life:_____
10. Fly after diving:_____ How long after:_____
11. Alcohol ingestion:_____ When:_____
    Quantity:_____
12. Dive workload: (e.g. Currents, hard work, over weighted)
    _____
    _____
    _____
13. Any post dive physical activity:_____
14. Dive Buddy: _____ Is he present_____ Name and Phone number:
    _____
    _____
15. Other witnesses (Names and Phone numbers):
    _____
    _____
    _____
16. Statements and other information:
    _____
    _____

Return to: Blank Forms Diving Emergencies Peds Barotrauma/Decompression

Dive Accident – Signs and Symptoms

Enter "Y" (yes) or "N" (no), Explain where needed.

1a) Joint pain_____ 1b) Location_____
2a) Head pain_____ 2b) Location_____
3a) Chest Pain_____ 3b) Location_____
3c) Increase with inspiration or cough_____ 3d) Radiates_____
3e) Location_____
4a) Abdominal pain_____ 4b) Location_____
5a) Unconsciousness_____5b) When_____
6a) Difficulty Breathing_____ 6b) Rapid respirations_____
7) Convulsions_____
8) Confused/Disoriented_____
9) Extremity Edema_____
10a) Rash_____ 10b) Blotching_____ 10c) Itching_____
11) Shock_____
12) Weakness/Fatigue_____
13a) Numbness_____ 13b) Tingling_____ 13c) Decreased sensation_____
13d) Location_____
14a) Faintness_____ 14b) Dizziness_____
15a) Difficulty urinating_____
15b) Difficulty moving bowels_____
16a) Difficulty Hearing_____ 16b) Which ear_____
17a) Difficulty speaking_____17b) Facial Droop_____ 17c) Which side_____
18a) Staggering_____ 18b) Paralysis_____ 18c) Location_____
19) Visual disturbance_____
20a) Apnea_____ 20b) Bloody froth from mouth_____20c) Cough_____
21a) Cyanosis_____ 21b) Location_____
22a) Feeling of Blow to Chest during dive_____ 22b) When_____

Return to: Blank Forms Diving Emergencies Peds Barotrauma/Decompression

Dive Accident – Rapid Field Neuro Exam Record

Answer yes or no

Mental Status: Does he/she know

1a) His/her name? _____ 1b) Where he/she is?_____
1c) Time of day? _____ 1d) Most recent activity?_____
1e) Speech is clear, correct? _____
Sight:
2a) Correctly counts fingers?_____
2b) Vision clear?_____
Eye Movement:
3a) Move all four directions?_____
3b) Nystagmus absent?_____
Facial Movement:
4a) Teeth clench OK?_____ 4b) Able to wrinkle forehead?_____
4c) Tongue moves all directions?_____ 4d) Smile symmetrical?_____
Head/Shoulder Movements:
5a) Adam's Apple Moves?_____
5b) Shoulder shrug normal, equal?_____
5c) Head movements normal, equal?_____
Hearing:
6a) Normal for that diver?_____
6b) Equal both ears?_____
Sensation: Present, normal and symmetrical across:
7a) Face_____ 7b) Chest_____ 7c) Abdomen_____
7d) Arms (front) _____ 7e) Hands _____ 7f) Legs (front)_____
7g) Feet_____ 7h) Back_____ 7i) Arms (back)_____
7j) Buttocks_____ 7k) Legs (back)_____

Muscle Tone: Present, normal and symmetrical for:
8a) Arms_____ 8b) Legs_____ 8c) Hand grips_____ 8d) Feet_____
Balance and Coordination:
9a) Romberg OK?_____ 9b) If supine: Heel-shin slide OK?_____
9c) Alternating hand movements OK?_____

Return to: Blank Forms Dive Emergencies Peds Barotrauma/Decompression

FIBRINOLYTIC INCLUSION/EXCLUSION CHECKLIST:

Patient Name:_____ Date:_____

Inclusion Criteria	**YES**	**NO**
1. Patient ≥ 18 years old		
2. Ischemic discomfort ≥ 30 min. but not > 12 hours		
3. ST segment > 1mm in ≥ 2 contiguous leads or ST elevation ≥ 2mm in ≥ 2 contiguous precardial leads or presumed new LBBB		

Exclusion Criteria	**YES**	**NO**
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.		
1. Any active internal bleeding within the last 4 weeks (e.g. black tarry stools, hematemesis).		
2. History of CVA or TIA.		
3. ANY surgery within the past 4 weeks		
4. Brain tumor, AVM (arterial-venous malformation), Cerebral aneurysm		
5. Hemophilia or any known bleeding disorder		
6. Presenting hypertension, any blood pressure PRIOR to the delivery of thrombolytics that exceeds 180 systolic or 110 diastolic.		
7. Use of cocaine or amphetamines in the past 3 days		
8. Patient in cardiogenic shock (BP < 90), or intubated		
9. Recent trauma, including CPR > 2 minutes		
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.		
11. Being treated for pericarditis, endocarditis		
12. Pregnancy		
13. Patient taking oral anticoagulation meds within the past 3 days		
Paramedic Signature:		

Return to: Contents at top Blank Forms Chest Pain suspicious for MI CVA

LCEMS

Hospital Diversion Notification

I, _____, have been advised by my attendants with LCEMS that the hospital of my choice:_____ is currently on **diversion/compromise/by-pass.** It has been explained to me that a representative of this hospital has determined the Emergency Department is currently unable to provide timely care due to unavailability of beds, services and/or staffing. If I choose to go to the hospital of my choice, I may be subject to the following conditions, each of which may result in worsening of my condition. Such worsening could lead to permanent disability and/or death:

1. Delay in diagnosis;
2. Delay in treatment; and
3. Need for transfer to another medical facility.

I fully understand the situation that has been explained above and refuse transport to the following facilities, which have been offered as an alternative and are not on divert/compromise/by-pass status:

_____

_____

_____

_____

I FULLY UNDERSTAND AND ACKNOWLEDGE THAT THE HOSPITAL OF MY CHOICE IS UNABLE TO PROVIDE TIMELY AND APPROPRIATE EMERGENCY MEDICAL CARE TO ME. WITH FULL KNOWLEDGE AND UNDERSTANDING OF ALL OF THE ABOVE, I AM CHOOSING TRANSPORTATION TO THE HOSPITAL OF MY CHOICE:_____ AND IN SO DOING DO HEREBY FULLY RELEASE AND FOREVER DISCHARGE LCEMS, THE HOSPITAL OF MY CHOICE AND ITS EMERGENCY AND STAFF PHYSICIANS FROM ANY AND ALL LIABILITY RESULTING FROM ANY DELAY IN PROVIDING TIMELY AND APPROPRIATE EMERGENCY MEDICAL CARE TO ME.

_____ _____ _____

Patient Name (print) Patient Signature Date

If patient unable to sign, state reason (i.e. minor, unconscious, incapacitated)

_____ _____

Authorized Signature Relationship to patient

_____ _____

Witness EMS personnel

Return to: Contents at top Blank Forms

Stroke Protocol Checklist

- ☐ **Assure ABC's.**
- ☐ **Administer oxygen if SpO2 is <94%**
- ☐ **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.**
- ☐ **Lie patient flat for transport if possible.**
- ☐ **If symptoms are within 3 hours (or 6 hours if interventional radiology available) 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 patient's condition.**

Return to: Contents at top Blank Forms CVA/Stroke

QA001 - LCEMS

Daily Quality Assurance/ Quality Improvement Checklist

Date of Run: _____ Run/Case Number: _____

Paramedic/EMT: _____

Reviewer:_____

The following items checked are missing from run report and/or require attention as specified.

I. General Inspection of Run Report (return to medic for completion/correction):

☐ Handwritten chart illegible (if applicable)

☐ Inappropriate Abbreviations

☐ Incomplete Paperwork:

- ☐ Missing face sheet
- ☐ Billing information incomplete/incomplete
- ☐ Missing signature of:_____

☐ Other problem with Run Report:_____

_____

☐ Times Missing: (☐ Dispatch/on scene/transport/etc, ☐ Treatments, ☐ Vital Signs)

☐ > 25 minute Scene Time:

- ☐ However, justified in content of run report (extrication from vehicle or building, ample amount of treatment to justify time)
- ☐ No explanation identified in run report, explanation required! Crew must follow up with reviewer.

II. Content of Run Report: Go to HealthEMS Scoring Sheet to assist in scoring reports

☐ Chief Complaint Missing (ALL reports MUST list the Chief Complaint(s))

☐ History of Present Illness incomplete and/or missing (a brief description of the problem that led to the call should be clearly stated in the report)

☐ Medications missing; (Need to write; the list of drugs, "see list"[attach copy of list], unknown or not available).

☐ Allergies Missing: (write: none, the drugs involved, unknown)

☐ Pertinent past medical history missing

☐ Did not go through supervisor or med control for AMA/refusal (Council medic)

☐ Physical Exam Lacking:

- ☐ Missing Vital Signs
- ☐ Repeat vital signs lacking for the amount of time spent with patient
- ☐ Lacking sufficient/specific exam to address Chief Complaint***

☐ Treatment inadequate for Chief Complaint/ Protocol not followed: Specifically***_____

_____

☐ Patient with Chest Pain did not have:___EKG, ___Aspirin***

☐ EKG suggest acute MI and no Code STEMI Called***

☐ Patient with stroke <5 hours and no Stroke Alert Called***

☐ Patient with Trauma did not have Trauma Alert Called***

☐ Wrong Drug and/or Wrong Dose for patient and situation***

☐ Wrong EKG interpretation***

☐ Paramedic needed to tech patient (mechanism/presentation suggest serious problem or potential for decline)***

***= Forward to Medical Director for review

Chart: ___ Returned to Paramedic/EMT Crew, ___ Forwarded to Medical Director

Return to: Contents at top Blank Forms QA Protocol

LCEMS HealthEMS QA Scoring System (T)

Kim Landry, M.D., FACEP, FAAEM
Medical Director

Score:	Description:
5	a. Thorough documentation b. Followed protocol(s) without deviation c. Performed procedures appropriate for pt's presenting problem d. Appropriate use/interpretation of clinical tools (BS, EKG, GCS, cardiac monitor, Broselow tape, etc.) e. Appropriately monitored pt during transport and noted/reacted to changes in condition f. More than one set of vital signs documented in flowchart g. Documented response of or lack of response to treatment provided h. Documented pain level, end title CO2, pulse ox, and glucose when applicable i. Delays, if any were adequately explained in document j. Physical exam and/or treatment sufficient to address the chief complaint
4	a. Delayed on scene ((30 minutes) with no explanation given or found in report (NOTE: will not apply if inter-facility transport or patient in medical facility) *b.* Lacks appropriate descriptive terminology and/or lacks sufficient/specific exam for problem(s) identified (complaint addressed but poorly documented or a physical finding noted but no details/poorly documented). **Example***, patient complaining of not feeling well and in the course of your evaluation you comment that the skin is very hot to touch but you failed to take and documented a temperature.* **Example**, *patient noted to have a bedsore in the sacral area and all you wrote was "patient has a bedsore on buttocks area" as opposed to "patient has about a ~4 cm stage III decubitus lesion, draining purulent fowl smelling material, with erythematous margins surrounding the wound".* *c. Lacks sufficient/specific evaluation of Chief Complaint*. **Example**, *patient's chief complaint is "injury to right elbow from a fall" and all you wrote for an evaluation is "patient complaining of pain in right elbow". You did not comment on is there swelling? Deformity? Tenderness? Limited range of motion? Crepitus? Distal pulses? Distal sensation? All of which would have been a specific/detailed components of an exam to address the chief complaint.* d. Failed to identify/document external tubes/devices (catheter, feeding tube, colostomy bag, cast, splints, dressings) as well as the current condition of such external tubes/device. **Example** *patient with a Foley catheter that currently has 600 mL of dark cloudy urine.* **Example,** *patient with a right lower leg cast which is currently dry and intact. Digits distal to the cast or warm pink and good capillary refill.* **Example,** *patient has a colostomy bag in the right lower quadrant of abdomen with soft fecal material present in bag.* e. Failed to submit monitor strip/12 lead EKG for attachment (if applicable) although interpretation provided in narrative or flowchart f. Failed to log all procedures in the flowchart that are included in the narrative. **Example**, IV or cardiac monitor noted in the narrative but was not added to the flowchart. **g.** Failed to document response of treatment provided. **Example**, patient with a severe allergic reaction that you treated with Epi 1:1000 IM, Solu-Medrol 125 mg IV, Benadryl 25

Con't 4	mg IV, Zantac 150 mg po, and you never commented if the patient responded to the treatment by the time you arrived at the receiving facility. **h.** Only one set of vital signs documented in flowchart but short time of possession of patient. Still required 2 sets of vitals documented i. No vital signs documented in flowchart but noted in narrative. j. Abnormality noted/acknowledged, no treatment provided but good explanation offered. **Example**, patient with a 2nd degree burn to left leg from boiling water, is in severe pain and "no pain medication given due to patient is allergic to Morphine and Fentanyl". k. Relatively low O2 sat, no apparent symptoms but lacks documentation about oxygen being applied or if this is related to a chronic condition that causes low O2 sat levels (coincidental finding) l. Minor deviation from protocols – no harm done to patient. **Example,** patient with sub-sternal chest pain and elevated BP who was treated with 6 mg of morphine for the pain then given nitro when pain persisted. m. Used inappropriate/unacceptable abbreviations n. Slight contradiction in the report on a given finding, i.e. skin normal in initial assessment but documented temp of 102.5. o. Approach and management of patient was good, thought process good, but the documentation had a few minor issues: misspellings, grammar, accidental/careless selection of wrong drop-down choice (i.e. medication administration- auto injector selected for aspirin administration).
3 Con't 3	a. Treatment given (partial tx) but not clearly documented as to know if it was sufficient to address the chief complaint. **Example**, Patient found to be hypotensive and you started an IV but only gave 150 cc bolus which may not have been enough to address the problem. **Example**, patient with an severe allergic reaction and you treated with a 25 mg dose of Benadryl IV which may be just short of what the patient needed (also needed Zantac po and +/- Solu-Medrol or Epi 1:1000 IM)….You were a little short of the full treatment necessary b. Treatment of Chief Complaint/identified problem was only partially treated such that giving more of same Rx or O2 or continuing further down the protocol might have benefited the patient better than what was provided. c. Failed to document pain level (patient complaining of pain), glucose (altered mental status, diabetic), or pulse ox (for any respiratory related problems) if applicable….. d. Failed to notify trauma alert when appropriate. Could result in a delay getting the trauma team set up in the OR. e. Failed to timely notify STEMI alert for patient with possible acute MI (EKG suggest) f. Failed to timely notify stroke alert for patient with patient with obvious stroke symptoms g. Lacks appropriate documentation due to Chief Complaint not addressed. **Example***, patient complains of being bitten by a dog on left foot. Your exam reports: AAOx3, PERRL, BS clear bilat, Abdm soft, non-tender, extremities with PMS x 4…and you failed to mention or document: "4 deep puncture wounds to the top of the left foot with localized swelling, tenderness and small amount of bleeding. Pt had good ROM distal to the bite wounds and good sensation".* **Example**, *Patient being transported to a physician's appointment for evaluation (or follow up visit) for a decubitus ulcer on her right buttock (therefore CC = right buttock wound or appointment for wound check). Your documentation states: "Patient is alert, oriented to person only, appears weak, has contractures in her arms and legs, PERRL, Lung sounds with rales bilateral, non-labored breathing, skin warm and dry, abdm soft and non-tender"…..and never once mention "patient has a stage II decubitus*

	ulcer, moist, drainging foul smelling discharge, surrounding tissue moist, pink"…. etc. *h.* <u>You are in possession of a relatively stable patient and there is poorly or an inadequately documented physical exam and/or treatment.</u> **Example**, *patient being transported from a nursing facility to dialysis who is very frail, on oxygen, and otherwise pleasant with no complaints. You document: "Arrived on scene to find patient lying in bed, patient states no complaint today. Patient transferred to EMS stretcher with assistance, secured x 5 straps, monitored en-route to dialysis, no complaints, vitals as above (there are two sets of vitals noted in the vital sign section), transferred to dialysis chair with assistance, turned over to dialysis staff".* i. Lacks important parts of the history and physical examination in appropriate areas of the record. **Example***, medication list, allergies or PMH not filled out, missing the initial patient assessment*. j. Lacks documentation of repeat vital signs that are appropriate for the amount of time spent with patient k. Deviation from protocols – no harm done to patient. l. Treatment excessive or unnecessary [started 14 ga IV on elderly patient just to KVO or you only needed to a dose of Zofran for nausea] or patient requested to participate in activity that is potentially discomforting for patient [walk on broken leg, walk down stairs with chest pain, etc.], m. Chief Complaint missing or inappropriate n. Failed to go through supervisor or med control for AMA/refusal of care o. Failed to submit monitor strip/12 lead EKG for attachment (if applicable) and interpretation is not provided in narrative or flowchart (but you reported one was done). p. Failed to attach patient to cardiac monitor and/or obtain EKG when history, physical exam, or chief complaint warranted q. > 10 minute to obtaining EKG on chest pain patient (unless well explained in document) r. Abnormality noted/acknowledged, no treatment provided and no explanation offered. **Example,** *patient with a 2nd degree burn to left leg from boiling water, is in severe pain, and no treatment offered, no medication given. Patient would have welcomed a dose of pain medication had you offered it*. s. Wrong EKG or Monitor strip interpretation but not harmful to patient (eg. Rhythm was Norm sinus and interpreted as sinus tach or sinus brady, or was sinus tach and interpreted as atrial fib)
2 Con't 2	a. You are in possession of a very sick or injured patient and there are multiple deficiencies in care and/or documentation identified, with overall performance and/or documentation suggesting inappropriate or poor care for patient's presenting (or known) problem and the presenting problem/chief complaint/change in condition are of a serious enough nature that more detail to exam/treatment/documentation would have been expected. b. Failed to document end title CO2 on intubated/trached/ventilated pt c. Failed to obtain 12 lead EKG for patient complaining of chest pain d. Failed to give aspirin for patient complaining of chest pain or reason for not giving aspirin is missing e. Failed to follow med control orders (MD gave you a verbal/written order and you did not comply) f. Deviation from protocol(s) – potential harm to patient g. Treatment well documented but inadequate (or lacking) for Chief Complaint/ Protocol not followed: h. Symptoms/chief complaint/abnormal findings only partially treated and clearly more

	should have been done while in your possession. If you arrived at the destination prior to completion of your care, this was not documented. i. Failed to document vital signs in flowchart or narrative j. Delay in treatment of an emergent condition (i.e. delay in defibrillating v-fib, delay in treating a severe asthmatic with decreasing mental status/pulse ox, <u>or failed to take down necessary equipment and/or unprepared on arrival to address emergent situation)</u> k. Selection of medication not appropriate for presenting problem or for the reason medication was given. l. Medication or procedure required approval from medical control or medical director prior to administration or performance.
1	a. Concerns about your care raised by physician or staff at healthcare facility b. Paramedic level care was indicated but not used to evaluate and/or treat the patient where the symptoms/presentation suggest serious problem or potential for decline (unless pre-approved by supervisor or medical director) c. Medication error with potential harm to patient d. Wrong EKG interpretation with potential harm to patient
0	a. Failed to initiate critical skill commensurate to pt's condition: failed to clear and/or establish an airway, failed to treat a potentially lethal arrhythmia (v-fib, v-tach, PEA, symptomatic severe brady, symptomatic severe SVT), failure to treat severe anaphylactic reaction, failure to treat tension pneumothorax, failure to recognize patient in cardiac arrest, failure to treat external life-threatening hemorrhaging, b. Wrong EKG interpretation of a potentially life-threatening arrhythmia (v-fib, v-tach), missed AMI c. Medication error with likely harm to patient Failure to recognize and treat patient's worsening symptoms with resultant deterioration or potential for deterioration in patient's condition. **Example**, gave 15 mg of morphine to a 94 yr old frail nursing home patient with a broken hip and the resultant change in mentation and respiratory depression caused the patient to de-sat to 89% and have arrhythmias and you failed to recognize and react to this. d. Falsification of the document e. Use the wrong protocol resulting in harm or potential harm. **Example***, patient with severe trauma found to be hypotensive and tachycardia due to hypovolemic shock and you tx with adenocard to slow the heart rate.*

Return to: Contents at top Blank Forms QA Protocol

QA003 -Quality Management Run Report Follow-up Form:

Run/Item Number: _____ RN/Paramedic:_____
Date of Call: _____ Partner:_____

Reviewer Comments: __*SEE Daily Quality Assurance/ Quality Improvement Checklist*

_____
_____
_____
_____Review
er:_____

Medical Director Comments:

_____
_____
_____
_____
_____
_____
_____
_____ Medical Director: _____

Medic/Nurse Follow-up Comments:

_____
_____
_____
_____
_____
_____
_____
_____
_____ Medic/Nurse:_____

Disposition/Actions:

_____
_____
_____
_____
_____
_____
_____

Return to: Contents at top Blank Forms QA Protocol

QA004 – Weekly QA Summary Report

Operation: _____

POC: _____ Dates covered:_____

Reviewer	Total # reviewed	# of charts with score of:						Comments for Dr. Landry
		5	4	3	2	1	0	

Return to: Contents at top Blank Forms QA Protocol

LCEMS

QA005 - Procedures, Skills, & Drugs

Name:_____ Date:_____ Shift:_____
Med unit:_____ Partner:_____

1. Number of patients transported: _____
2. Number of cancelations with no patient contact: _____
3. Number of AMA/Refusals: _____
4. Number of patient s allowed EMT to Tech: _____
5. Number of 12 lead EKGs performed: _____
6. Number of IVs attempted/started: _____/_____
7. Number of ETT Intubations attempted/successful: _____/_____
8. Number of patients you used CPAP on: _____
9. Number of King Airway attempted/successful: _____/_____
10. Number of IO attempts/successful: _____/_____
11. Number of Chest Needlings attempt/successful: _____/_____
12. Number of patients transported with IV PUMP: _____
13. Number of patients transported on ventilator: _____

Number of times you used:

14. Adenacard----------_____
15. Albuterol----------_____
16. Amiodarone----------_____
17. Aspirin----------_____
18. Atropine----------_____
19. Atrovent----------_____
20. Benadryl----------_____
21. Cardiazem----------_____
22. D50W----------_____
23. Dilaudid----------_____
24. Dopamine----------_____
25. Epinephrine 1:1000----------_____
26. Epinephrine 1:10,000----------_____
27. Etomidate----------_____
28. Fentanyl----------_____
29. Lidocaine----------_____
30. Morphine----------_____
31. Nitro spray or sublingual----------_____
32. Nitro paste----------_____
33. Solu-medrol----------_____
34. Valium----------_____
35. Versed----------_____
36. Zofran----------_____

Return to: Contents at top Blank Forms QA Protocol

NOTE: QA005 – Monthly Medic Skill Sheet Tracker is on a legal page saved separately. See section 09c.

Return to: Contents at top Blank Forms QA Protocol

QA006: Runs Forwarded to Medical Director

For Month of:_____

The below list of medics had run reports forwarded to Medical Director **for questionable actions/inactions:**

1. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauma (circle one); Pediatric/Adult (circle one)
    b. Concern involved:
    _____
    _____
    _____
    _____
    _____
2. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauma (circle one); Pediatric/Adult (circle one)
    b. Concern involved:
    _____
    _____
    _____
    _____
    _____
3. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauma (circle one); Pediatric/Adult (circle one)
    b. Concern involved:
    _____
    _____
    _____
    _____
    _____
4. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauma (circle one); Pediatric/Adult (circle one)
    b. Concern involved:
    _____
    _____
    _____
    _____
    _____
5. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)

b. Concern involved:

_____
_____
_____
_____
_____

6. Medic:_____ Run #:_____ Date:_____
   a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)
   b. Concern involved:

_____
_____
_____
_____
_____

7. Medic:_____ Run #:_____ Date:_____
   a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)
   b. Concern involved:

_____
_____
_____
_____
_____

8. Medic:_____ Run #:_____ Date:_____
   a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)
   b. Concern involved:

_____
_____
_____
_____
_____

9. Medic:_____ Run #:_____ Date:_____
   a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)
   b. Concern involved:

_____
_____
_____
_____
_____

10. Medic:_____ Run #:_____ Date:_____
    a. Type of call: Medical/Trauama (circle one); Pediatric/Adult (circle one)
    b. Concern involved:

_____
_____
_____
_____
_____

Return to: Contents at top Blank Forms QA Protocol

QA007: Medics with Multiple Returned Reports in Two or More Consecutive Months

For month of:_____

The below list of medics had multiple run reports returned for completion in two or more consecutive months;

1._____ # of Reports_____

2. _____ # of Reports_____

3. _____ # of Reports_____

4. _____ # of Reports_____

5._____ # of Reports_____

6. _____ # of Reports_____

7._____ # of Reports_____

8._____ # of Reports_____

9._____ # of Reports_____

10._____ # of Reports_____

11._____ # of Reports_____

12._____ # of Reports_____

13._____ # of Reports_____

14._____ # of Reports_____

15._____ # of Reports_____

16._____ # of Reports_____

Return to: Contents at top Blank Forms QA Protocol

LCEMS

QA008 - Random Sample Documentation Evaluation

Run #_____ Date of Review____/____/_____ Reviewer_____
EMT/P_____

CQI indicators:	Documented	Not Documented	N/A
Patient information			
Name----------	---☐---	---☐---	---☐---
Response Times----------	---☐---	---☐---	---☐---
Mileage----------	---☐---	---☐---	---☐---
Codes (emergency/non-emergency)------	---☐---	---☐---	---☐---
Date of birth----------	---☐---	---☐---	---☐---
SSAN----------	---☐---	---☐---	---☐---
Mailing address----------	---☐---	---☐---	---☐---
Insurance Information----------	---☐---	---☐---	---☐---
Physician name(or unk/not avail)----------	---☐---	---☐---	---☐---
Assessment – History			
Chief Complaint----------	---☐---	---☐---	---☐---
Past medical history----------	---☐---	---☐---	---☐---
Current medications----------	---☐---	---☐---	---☐---
Allergies----------	---☐---	---☐---	---☐---
Focused Physical Exam----------	---☐---	---☐---	---☐---
Patient position during transport----------	---☐---	---☐---	---☐---
Assessment- Neurological			
Level of Consciousness----------	---☐---	---☐---	---☐---
PMS X 4 ----------	---☐---	---☐---	---☐---
Pupils----------	---☐---	---☐---	---☐---
GCS----------	---☐---	---☐---	---☐---
Finger-stick Blood Glucose----------	---☐---	---☐---	---☐---
Time of onset of stroke symptoms---------	---☐---	---☐---	---☐---
Stroke alert called----------	---☐---	---☐---	---☐---
C-Spine immobilized----------	---☐---	---☐---	---☐---
Assessment- Respiratory			
Respiratory rate and effort----------	---☐---	---☐---	---☐---
Pulse Oximeter----------	---☐---	---☐---	---☐---
End Tidal CO2 (if intubated)----------	---☐---	---☐---	---☐---
Breath sounds----------	---☐---	---☐---	---☐---
Tracheal Deviation----------	---☐---	---☐---	---☐---
Suction----------	---☐---	---☐---	---☐---
Oxygen: Device and rate----------	---☐---	---☐---	---☐---
Support/Assist ventilations (BVM)--------	---☐---	---☐---	---☐---
Airway Adjunct used (ET, King, Oral)------	---☐---	---☐---	---☐---
Confirmation of tube placement x 3------	---☐---	---☐---	---☐---
Assessment – Cardiovascular			
Pulse rate and quality----------	---☐---	---☐---	---☐---
Blood Pressure----------	---☐---	---☐---	---☐---
Skin: color/temp/moisture----------	---☐---	---☐---	---☐---
EKG/Monitor: Interpretation----------	---☐---	---☐---	---☐---
Code STEMI called----------	---☐---	---☐---	---☐---
Aspirin given or taken PTA----------	---☐---	---☐---	---☐---
IV: # Unsuccessful attempts----------	---☐---	---☐---	---☐---
successful IV(s) location----------	---☐---	---☐---	---☐---
Size needle used----------	---☐---	---☐---	---☐---

Type of fluid---------- Rate or saline lock---------- Amount bolused----------	---☐--- ---☐--- ---☐---	---☐--- ---☐--- ---☐---	---☐--- ---☐--- ---☐---
Pharmacological Intervention Drug selection appropriate for situation-- Appropriate dosage of medication--------- Route given: IV/IO/IM/PO/Topical/SL-----	 ---☐--- ---☐--- ---☐---	 ---☐--- ---☐--- ---☐---	 ---☐--- ---☐--- ---☐---
Additional Documentation: Response to interventions---------- Interventions timed---------- Vital Signs timed---------- Refusals discussed with supervisor---------	 ---☐--- ---☐--- ---☐--- ---☐---	 ---☐--- ---☐--- ---☐--- ---☐---	 ---☐--- ---☐--- ---☐--- ---☐---

Legible documentation: _____Acceptable _____Please Improve

Undocumented items: _____

Applicable items (documented + undocumented):_____

% complete: _____%

Number of undocumented items ÷ the total number of applicable items (documented and undocumented items) x 100 = % complete

Results: _____Exemplary: >90%: _____ Satisfactory: 75 – 89%: _____Needs improvement: < 75%

Recommended action: _____ To MD: _____To File: _____To File with counsel

CQC Comments:	EMT/Paramedic Comments: Signature:_____

Return to: Contents at top Blank Forms QA Protocol

REQUEST FOR PROTOCOL UPDATE
(CHANGE, ADDITION, DELETION)

Date: Facility: _____

Requested By: _____

CHECK ONE AND LIST ITEM..PAGE, ETC.
–CHANGE: _____
–ADDITION:_____
–DELETION:

Describe Rationale for Request: _____
_____
_____
_____

Supporting Documentation: _____
_____
_____

What are the Fiscal Implications?_____
_____
_____
_____

Other Fire/EMS Department Participation:_____
_____
_____

What Would Be the Educational Requirements for Implementation?_____
_____
_____
_____

Please Fax to Dr. Landry at: 850-934-0711 or email request to: klandry@mchsi.com

Return to: Contents at top Blank Forms QA Protocol

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

Toxidrome	**NFPA 473 A.5.4.1(2) Correlation**	**Hazardous Materials Protocol**
Irritant Gas	(j) Irritants	Bronchospasm OC Pepper spray & lacrimants
Asphyxiant	(c) Chemical asphyxiants (d) Simple asphyxiants (h) Blood Agents (n) Nitrogen Compounds	Carbon Monoxide Aniline dyes, Nitrites, Nitrates Cyanide & Hydrogen Sulfide Closed Space Fires Simple Asphyxiants
Corrosive	(a) Corrosives (g) Vesicants	Hydrofluoric Acid Chemical burns to the eye Chloramines and Chlorine
Hydrocarbon and Halogenated Hydrocarbons	(e) Organic solvents (q) Phenolic Compounds	Phenol Halogenated Hydrocarbons
Cholinergic	(b) Pesticides (f) Nerve Agents	Organophosphate & Carbamate
Opioids	(o) Opiate Compounds	

Return to: Contents at top Hazardous Material Exposure Appendix

General Symptomology Correlation to Toxidrome

HazMat Toxidrome	General Symptomology	General Examples
Irritant Gas Syndrome (see Corrosive syndrome)	Irritation to mucus membranes Bronchospasm Non-cardigenic PE	Ammonia Formaldehyde Chlorine Phosgene
Asphyxiant Syndrome	Hypoxemia CNS & CVS effects	Carbon Monoxide Methemoglobin forming Cyanides Sulfides Azides
Corrosive Syndrome	Chemical burns Coagulative necrosis Liquefactive necrosis	Acids Acetic Acid Nitric Acid Hydrochloric Acid Bases Potassium hydroxide Sodium hydroxide
Hydrocarbon & Halogenated HC	Hypoxemia CNS & CVS effects	Methane Butane Hexane Turpentine Toluene
Cholinergic Syndrome	Muscarinic Effects DUMBELS Nicotinic Effects Tachycardia, Weakness, Hypertension, Fasciculations	Malathion Parathion Chlorpyrifos Aldicarb Propxur

Return to: Contents at top Hazardous Material Exposure Appendix

8.1 HAZARDOUS MATERIAL EXPOSURE (CHEMICIALS)

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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 hypocholorite 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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.4 AROMATIC HYDROCARBONS (BENZENE, TOLUENE, XYLENE) KETONES

Treatment:

Chemical Treatment Guide 2: [redacted] (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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.5 ARSENIC COMPOUNDS (OR HEAVY METAL POISONING)

Treatment:

Chemical Treatment Guide 2: [redacted] (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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.7 CARBON MONOXIDE POISONING

Treatment:

Chemical Treatment Guide 2: [redacted] (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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.8 CHLORINATED HYDROCARBONS

Treatment:

Chemical Treatment Guide 2: [redacted] (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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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 HC1). 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.10 CYANIDE-HYDROGEN CYANIDE, HYDROCYANIC ACID (AC), CYANOGEN CHLORIDE (CK), POTASSIUM CYANIDE, SODIUM CYANIDE

Treatment:

Chemical Treatment Guide 5: **RED** (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.

Gl - 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index Burn Injuries

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:

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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 pneumonitits, 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1.14 HYDROGEN SULFIDE, SULFIDES & MERCAPTANS

Treatment:

Chemical Treatment Guide 5: RED (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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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 Fe^2 to Fe^3 (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.).

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol

Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical)
Chemical Chemical Treatment Guide index

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

8.1G. Chemical Treatment Guides

Chemical Treatment Guide Index:

Chemical Name or Group Name:	**Treatment Guide:**
Acids & Acid Mist	**Guide 1- Yellow**
Alkaline Compounds	**Guide 1- Yellow**
Ammonia (Liquid & Gas)	**Guide 1- Yellow**
Aromatic Hydrocarbons (Benzene, Toluene, Xylene)	**Guide 2-**
Arsenic Compounds (or Heavy Metal Poisoning)	**Guide 2-**
Blister Agents (H, HD, HS)	**Guide 1- Yellow**
Carbamate-Insecticide Poisoning	**Guide 4- Green**
Carbon Monoxide Poisoning	**Guide 2-**
Chlorinated Hydrocarbons (Methylene Chloride)	**Guide 2-**
Chlorine Gas	**Guide 1- Yellow**
Cyanide	**Guide 5- Red**
Cyanogen Chloride (CK)	**Guide 5- Red**
Methylene Biphenyl Isocyanate	**Guide 1- Yellow**
Dinitrobenzene (D.N.B.)	**Guide 3- Gray**
Ethylene Glycol	**Guide 6- Pink**
Ethyl Isocyanate	**Guide 1- Yellow**
Hydrocyanic Acid (AC)	**Guide 5- Red**
Hydrogen Cyanide	**Guide 5- Red**
Hydrofluoric Acid (HF)	**Guide 7- Orange**
Hydrogen Sulfide, Sulfides	**Guide 5- Red**
Ketones	**Guide 2-**
Lewisite	**Guide 1- Yellow**
Mercaptans	**Guide 5- Red**
Methanol	**Guide 6- Pink**
Methylene Biphenyl Isoyanate	**Guide 1- Yellow**
Methylene Dilsocyanate (MDI)	**Guide 1- Yellow**
Mustard (Sulfur Mustard)	**Guide 1- Yellow**
Nerve Agents (GA, GB, GD, GF, VX)	**Guide 4- Green**
Nitrogen Products and Other Products Causing Methemoglobinemia	**Guide 3- Gray**
Organophosphate Insecticide Poisoning	**Guide 4- Green**
Phenol (Carbolic Acid)	**Guide 9- White**
Phosgene (CG)	**Guide 1- Yellow**
Phosphine	**Guide 8- Purple**
Potassium Cyanide	**Guide 5- Red**
Sodium Cyanide	**Guide 5- Red**
Sulfur Mustard (Mustard)	**Guide 1- Yellow**

Return to Adult Hazardous Material Exposure (Chemical)

Adult/Pediatric Chemical Treatment Guide 1: YELLOW

- ACIDS & ACID MISTS
- ALKALINE COMPOUNDS
- AMMONIA (Liquid & Gas)
- CHLORINE GAS AND PHOSGENE (CG)
- METHYLENE BIPHENYL ISOCYANATE, ETHYL ISOCYANATE, AND METHYLENE DILSOCYANATE (MDI)
- MUSTARD (SULFUR MUSTARD)—LEWISITE, BLISTER AGENTS (H, HD, HS)

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 (HCI) 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

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

- 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:

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: 0.2mg/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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index Peds Carbon Monoxide Poisoning

- 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 SpO_2 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

- 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 **S**alivation, **L**acrimation, **U**rination, **D**iarrhea, **G**astrointestinal distress, and **E**mesis). 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 O_2.
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 rhinorrhea 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 l0mg 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index Peds Organophospate Poisoning

- 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 O_2.
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. **CyanoKit**
        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 poinsoining. 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: 2mg 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 2mg) 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index Cyanokit

- ETHYLENE GLYCOL
- METHANOL

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.

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 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 (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% l-2 mEq/kg lV
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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

- HYDROFLUORIC ACID (HF)
- VICANE

Signs and symptoms of exposure include:

Hypovolemic shock and collapse, tachycardia with weak pulse, acute pulmonary edema, asphyxia, chemical pneumonitits, 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

• 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 (Ipecac 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).

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).

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

Adult/Pediatric Chemical Treatment Guide 9: WHITE:

• 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Adult Medical Protocols Administrative Guidelines Peds Medical Protocol
Procedure Protocols Special/specific exposure Haz Material Exposure
Hazardous Material Exposure Biological Hazardous Material Exposure (Chemical) Chemical
Chemical Treatment Guide index

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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)
- Ptosis (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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -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 **erythrocmycin** 500 mg q.i.d. for 3 days.
2. Call medical control or medical director if any questions or concerns.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -800-222-1222)** for guidance or questions if time permits.

ALS LEVE 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.

Return to: Contents at top Appendix Blank Forms Drug Reference

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 36-72hours. 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 (I -800-222-1222) for guidance or questions if time permits.

ALS LEVEL l:

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines

Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference

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 (I -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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines

Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 (I -800-222-1222).

ALS LEVEL l:

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 Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure

Adult Haz Material Exposure Adult Hazardous Material Exposure Biological

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 Serivce 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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Haz Material Radiological

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure Adult Haz Material Radiological

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 CO_2 ($ETCO_2$).
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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
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

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure

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

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure

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.

Return to: Contents at top Appendix Blank Forms Drug Reference
Air Ambulance Serivce Adult Medical Protocols Administrative Guidelines
Peds Medical Protocol Procedure Protocols Special/specific exposure
Adult Haz Material Exposure

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2016 Medical Protocols

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