

LEON COUNTY E.M.S.

Standard Operating Guideline

Title: Respiratory Personal Protective Equipment Guidelines
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I. PURPOSE:

The purpose of the Leon County Emergency Medical Service (LCEMS) Respiratory Personal Protection Guideline is to provide all LCEMS employees with clear guidelines for the selection, use and care of the proper respiratory Personal Protective Equipment (PPE) when faced with a situation that involves a suspected infectious disease, chemical, biological component or potentially related to a Weapons of Mass Destruction response plan. It is not directed toward Hazmat or other specially trained emergency response teams whose primary purpose is to enter a known “Hot Zone” and rescue victims. These guidelines do not constitute a response protocol but serve as a guideline for the respiratory personal protection of each of our responders.

II. GUIDELINE:

It is the policy of Leon County Emergency medical Service to use an abundance of caution when faced with respiratory threats. Since most respiratory threats are invisible to the human eye and absolute detection cannot be assured. Specific respiratory threats are natural and manmade, intentional and unintentional. Infectious threats are common in the health care setting and must be planned for in advance. This guideline specifies actions both to employ and avoid, and should be referred to periodically for personal edification. Specific guidelines regarding usage, training, fit testing; cleaning, storage and inspection follow specific OSHA/NIOSH standards and must be adhered to.

III. PROCEDURE:

It is the responsibility of each individual employee to fully familiarize themselves with The Respiratory Personal Protection Guidelines offered here. Employees must fully evaluate each and every patient encounter and scene to estimate the likelihood of a respiratory threat that may require respiratory protective measures to be initiated. It is also the individual employee’s responsibility to attend all offered training, fit testing, and use classes on the proper donning and doffing of the various types of PPE provided for their personal safety. When considering the use of PPE employees must also consider the

need for other PPE provided for their safety, Universal Precautions and other eye and environmental protection devices should be considered as well.

Special Note: *LCEMS employees are specifically not permitted to enter enclosed spaces where an air oxygen percentage of < 19.5% exists, nor are they to enter the “Hot Zone” or “Warm Zone” of any chemical scene involving contaminants of any description where respiratory PPE has been mandated. LCEMS employees are permitted to function in the “Cold Zone” of scenes provided they are using the proper PPE for the scene. LCEMS does not transport “contaminated” patients nor does it “Decontaminate” patients for transport .all patients received by LCEMS from any other entity involved on scene must be properly decontaminated prior to treatment and transport by LCEMS. Respiratory PPE equipment is provided for the protection of employees should a unsuspected hazard present itself in the normal course of duty, specific threat hazards should be identified and verified prior to using “tight fitting” respiratory protection equipment so that the filtering NBC cartridge employed meets the anticipated threat specifications. Employees must assume that any hazard that presents a need for significant tight fitting respiratory protection also will likely meet the criteria for decontamination and should not doff PPE until and unless definitive decontamination methods have been initiated.*

Definitions

The following definitions are important terms used in the respiratory protection guideline.

Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

Demand respirator means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

Employee exposure means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

Filter or air purifying element means a component used in respirators to remove solid or liquid aerosols from the inspired air.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Fit test means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT.)

High efficiency particulate air (HEPA) filter means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

Immediately dangerous to life or health (IDLH) means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Level “C” PPE means Personal Protective Gear that is provided to employees that is OSHA/NIOSH approved for use as Nuclear, Biological, and Chemical protective equipment. The equipment consists of a Tight Fitting Mask; NBC Air Filtering cartridge, chemical protective suit, inner and outer gloves, boots or boot covers, tape, chemical identification card, that is cached in a protective duffel designed for rapid acquisition by crew members in a chemical or biological emergency.

Loose-fitting facepiece means a respiratory inlet covering that is designed to form a partial seal with the face.

Negative pressure respirator (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator. (APR)

Oxygen deficient atmosphere means an atmosphere with available oxygen content below 19.5% by volume.

Positive pressure respirator means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

Powered air-purifying respirator (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

Qualitative fit test (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

Service life means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

This section means this respiratory protection guideline.

Tight-fitting face piece means a respiratory inlet covering that forms a complete seal with the face.

User seal check means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

Written protection program. This written respiratory protection program uses required worksite-specific procedures and elements for respirator use. The program is administered by the Deputy Chief of Administration for Leon County Emergency Medical Service who has the knowledge, skills and authority to oversee this program. In addition any scene where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer has established and implemented a written respiratory protection program with worksite-specific procedures. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. LCEMS provides only OSHA/NIOSH approved respiratory protection equipment for use by its employees.

IV. GENERAL CONSIDERATION for RESPIRATORY PPE SELECTION:

LCEMS personnel are routinely called to treat and transport patients with infectious disease. This may include a patient with Infectious Pulmonary Tuberculosis or the flu. You may also be called to a patient who is carrying a disease delivered by a bio terrorist. In any instance immediately available universal precautions and PPE are available without turning initially to your level “C” equipment. Initial protection with a properly fitting N-95 mask, Tyvek gown, gloves and face shield or safety glasses will serve to protect you from most threats that present themselves. Patients that present to you with fever and extensive rash are possible biologic threats and should be considered contagious, if there are multiple patients on scene with similar symptoms or a series of patients from the same area complaining of similar problems you should become suspicious and initiate PPE precautions. In any circumstance communication with EMS control and the hospital *prior to transporting the patient from the scene* will help to mitigate what may be a possible contamination event. Should you encounter a scene of this type immediately don PPE and notify the receiving hospital of your findings, try to communicate directly with a ER doctor and be as specific as possible. Proper scene control and astute observation will possibly prevent cross contamination with other agencies and the receiving facility and help mitigate the spread of the possible contaminate.

Remember: *Use of a fit tested N95 respirator, with standard/universal airborne and droplet precautions, will protect providers from infectious disease that is naturally occurring or man made.*

V. FIT TESTING:

It is the policy of LCEMS that each employee prior to use of respiratory PPE be properly fit tested using the Qualitative Fit Test (QLFT) method. Facial hair, beards, mustaches, sideburns, or any object that interferes with the mechanical seal between bare skin and the edge of the mask will affect the integrity of the safety equipment and is not permitted. Respiratory PPE is safety gear and proper fit and function rely on effective fit testing.

N95 protective masks are fit tested to the above standard and require the same mask to skin seal as the “tight fitting” APR and PAPR masks. Fit testing is mandated by federal guidelines and is inherent to the integrity of the program; there are no current alternatives to proper fit testing.

Skin must be bare to achieve an adequate fit test.

- Fit testing and instruction in the proper donning and doffing of the PPE gear will be completed on each new employee hired for duty in the field prior to assuming that duty. Annual fit testing may be necessary as part of a comprehensive program to ensure continuing compliance with federal regulations.
- Fit testing for individual employees may be necessary for significant changes in weight > 20#, or if significant changes in facial symmetry, endentulation or structural facial surgery are observed.

Specific OSHA fit testing procedures are performed using OSHA approved fit testing equipment to achieve a Qualitative Fit Test. Respirator Fit Test Records are maintained for each employee, records indicate the type of test solutions used and whether or not the individual was able to detect the solution. If the individual was unable to detect the solution then a repeat test will be conducted with an alternate solution and those results are documented. Any possible conditions that affect testing are also noted. All testing is performed by an individual that has been specifically trained and certified to perform this testing. Appropriate MSDS for solutions used during testing are available during the testing procedure for review by each employee tested. The specific equipment used for fit testing is:

Allegro Industries
Qualitative Respirator Fit Test Kit
(Bitrex part # 2041)
(Saccharin part # 2040)

VI. PROCEDURES for SELECTING RESPIRATORS (Biologic Threat):

Potential exposure to infectious disease during an emergency response call is not a particularly new threat to LCEMS. Patients with measles, influenza, or chickenpox are no less infectious than patients with an infectious disease caused by a WMD biological

agent. As an EMS provider you have had extensive training in the use of Standard/Universal Precautions for both airborne and patient contact situations. Utilizing this knowledge and the practice of these skills will protect EMS providers from exposure to infectious biologic threats and benefit patients. Should you encounter a suspected biologic threat of unknown origin don immediately available respiratory PPE (N95) protection and other universal protection (Gloves, goggles or safety glasses, gowns, shoe covers, face shields) as the situation demands. Your individual safety is your primary objective. Biologic infectious events are generally slowly evolving events with incubation periods of one or more days prior to symptom development. EMS employees are to look for patterns of calls or patients with similar symptoms in close proximity. If you encounter these types of patients you should become highly suspicious and relay your concerns through your supervisor and the receiving hospital. Level “C” PPE is generally not required for slowly evolving biologic events.

VII. PROCEDURES for SELECTING RESPIRATORS (Chemical Threat):

Unfortunately in the event of a chemical WMD event first in responders will probably not understand the nature of the threat they face in the first few minutes of an event, responders will likely fall victim to the agent employed while still in the initial evaluation of the scene. Chemical threats by their very nature are far more life threatening, rapidly evolving scenarios. It is of paramount importance for the arriving responders to use the information provided by call takers to formulate a hypothesis of the possible scene environment and consider staging upwind and uphill from the call. If there is a scene where multiple patients are present near a chemical facility, laboratory, or material processing facility suspicion should be high for possible chemical involvement. In these types of situations LCEMS is not to enter the scene or accept any patients that may self evacuate until the threat has been determined by a bonafide hazmat response complement. Retreat is the best option until the exact cause has been determined.

LCEMS provides level “C” PPE gear for protection of its employees, this level of protection does not protect against all hazards. Does not provide supplemental oxygen in environments with ambient oxygen content of < 19.5% and is applicable to only certain chemical precursors or compounds. Suit permeability is different for each chemical encountered and dependent upon chemical concentration, vapor or aerosol, powder or liquid, and proximity to the particular threat. In chemical contamination events Respiratory Personal Protection from environmental chemical insult is of primary importance, rapid acquisition of APR’s or PAPR’s with NBC filters is imperative even during a retreat. Chemical vapors or clouds can travel with air movement or seek low spots and can gather some distance from the scene. Depending on time of day and ambient weather, lethal chemical fumes or vapors can travel some distance from the release area.

Without a doubt the tight fitting respirators provided along with a properly fitted NBC cartridges offer the best level of protection from the most chemical threats of IDLH. The same tight fitting respirator and NBC cartridge provide protection from all biologic threats.

The particular brand of equipment LCEMS provides is the 3M Brand tight fitting full face respirator Model 6900DIN that can be configured to use a 3M Turbo Unit if available, capable of increasing filter area 3 times with a full complement of 3M FR-57 NBC filter cartridges. This equipment meets current OSHA/NIOSH requirements.

The current Combination Cartridge / High Efficiency Filter FR-57 provided is capable of filtering the following chemicals in concentrations not IDLH or in atmospheres that are oxygen deficient:

AM-Ammonia, CD-Chlorine Dioxide
CL-Chlorine, FM-Formaldehyde
HC-Hydrogen Flouride, MA-Methylamine
OV-Organic Vapor, SD- Sulfur Dioxide, HE-High Efficiency Particulate Air Filter

The filter cartridges are not specified for use with other than the above listed chemicals, and therefore may not be effective if used in environments where the chemical composition is unknown. Again retreat is the best option for survival until Hazmat Teams can determine the chemical threat and concentration.

VIII. MEDICAL EVALUATIONS

Leon County EMS provides free post offer, pre employment physical medical evaluations to its prospective employees for the purpose of determining suitability of individuals to work in conditions of high performance or high stress. Initiating respiratory PPE may also indicate a need for medical evaluation should an employee realize respiratory compromise from the use of the described safety equipment. Employees will be provided with free medical evaluation from the county's medical provider to determine whether a current employee is able to utilize the equipment provided. Reasonable allowances will be made for employees that are unable to use the equipment provided and will be evaluated on a case by case basis. New employees will be medically evaluated at the time of their pre employment physical for adaptability to PPE equipment prior to final determination.

VIII. CLEANING and STORAGE OF RESPIRATORY PPE:

Each crewmember employed by LCEMS is provided with their own individually fit tested tight fitting mask in the proper size established during fit testing. The tight fitting masks and cartridges are part of a level "C" personal protection cache issued to each employee. All equipment is in new unused condition and has never been exposed to a

contaminated atmosphere of any type. Each tight fitting mask (TFM) is enclosed in a secure bag that also contains appropriately sized chemical protective suit, gloves and boots.

All equipment bags are sealed to assure the respective users that no equipment is missing and that the interior of the cache is maintained in a clean environment. Employees are instructed to treat the equipment with care and not to crush, bend, abuse, or otherwise damage the bag or its contents. All bags are clearly marked with the users name and ID number.

Reusable equipment is cleaned after training and fit testing with a 5% solution of Distilled Water and Bleach, the interior of the mask is cleaned and dried and replaced in the gear bag and resealed with a numbered seal.

Disposable N95 masks are discarded after each use; masks are worn once and discarded in the appropriate Biohazard container for disposal.

X. INSPECTION AND REPAIR:

Individually issued Respiratory PPE equipment is inspected annually by a designate from the Special Operations Manager that is familiar with the proper function of the equipment, individual equipment is checked for cleanliness damage, degradation, missing parts and serviceability. Additionally equipment is evaluated each time it is reassigned to a new user whether yearly as part of a scheduled inspection or at each new reassignment. Equipment that has been identified as defective will be returned to the manufacturer for refurbishment or replacement as deemed necessary by their inspection and repair process. Equipment will be replaced with like models, size and style so as to maintain familiarity to the end user. Inspection records will be maintained showing the last inspection date, condition, and model or serial number of the equipment if identified by serialization. Otherwise issued equipment will be identified by employee name and identification number.

XI. TRAINING PROCEDURES:

Employees are trained in the use and care of equipment at annual training sponsored by LCEMS by instructors specifically trained in instruction on the use of Respiratory PPE. Instructors have been certified as trainers by recognized instructor training colleges or agencies specifically chosen for their expertise. New employees are provided with a minimum of 4 hours of respiratory PPE training that coincides with other PPE training offered. Classes consist of didactic training using slides and other presentations by certified instructors followed by practical hands on training with the specific equipment discussed in the didactic portion. Each employee has the necessary time to familiarize themselves with actual equipment used and instructors available to facilitate full

Instruction. Any employee has the ability to request remedial instruction at anytime to reacquaint themselves with the equipment provided.

Training regimens are evaluated periodically for applicability in the field and throughout the industry. Instructors are encouraged to enhance the training process with further education opportunities made available to them. The LCEMS training manager has responsibility to schedule continuing education in PPE as part of the continuous learning process of each LCEMS employee.

Employees are annually trained in the possible scenarios in which they may encounter possibly hazardous conditions by certified HAZMAT instructors, classes consist of didactic instruction and updates in new technology available to our industry. A typical HAZMAT update includes 4-5 hours of lectures and video presentations in the identification and mitigation of HAZMAT scenes.

LEON County EMS provides OSHA/NIOSH respirators that are adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. These guidelines are reviewed from time to time to insure compliance with standards and review new processes that may enhance the ability of LCEMS to provide a greater level of protection for our employees.