

Protecting Emergency Medical Services Workers from Airborne Infectious Diseases



A Step-by-Step Guide and Model Respiratory Protection Program for using N-95, N-99 and N-100 Disposable Particulate Respirators

**Public Health Services Branch
Division of Epidemiology, Environmental and Occupational Health
Occupational Health Service
Public Employees Occupational Safety and Health Program
(609) 984-1863**

www.nj.gov/health/eoh/peoshweb



**Jon S. Corzine
Governor**



**Fred M. Jacobs, M.D., J.D.
Commissioner**

**Protecting Emergency Medical Services Workers
from Airborne Infectious Diseases**

**A Step-by-Step Guide and Model Respiratory Protection Program
for using N-95, N-99 and N-100 Disposable Particulate Respirators**

Document prepared by:

Karen Worthington, MS, RN, COHN-S
Public Employees Occupational Safety and Health Program

New Jersey Department of Health and Senior Services
Public Health Services Branch
Division of Epidemiology, Environmental and Occupational Health
Occupational Health Service

Eddy A. Bresnitz, MD, MS
Deputy Commissioner / State Epidemiologist
Public Health Services

Gary Ludwig
Director
Occupational Health Service

Eric Beckhusen
Program Manager
Public Employees Occupational Safety and Health Program

March 2007

ACKNOWLEDGEMENTS

Special acknowledgement is given to the following persons for assistance in the development and review of this document:

Theodore Cashel	New Jersey State Police Hazardous Materials Response Unit
Terry Clancy	Health Infrastructure Preparedness and Emergency Response, NJDHSS
Joseph Kitchell	New Jersey Emergency Medical Serviced Task Force
Gerard McEntee	New Jersey First Aid Council
Charles McSweeney	Office of Emergency Medical Services, NJDHSS
Barbara Montana	Health Infrastructure Preparedness and Emergency Response, NJDHSS
James Sweeney	Office of Emergency Medical Services, NJDHSS
Christina Tan	Communicable Disease Service, NJDHSS

Overview

Emergency Medical Services (EMS) personnel in New Jersey provide prompt response to medical emergencies within communities and participate in state-wide emergency preparedness efforts. Maintaining the health and safety of EMS personnel is critical. However, in the line of duty, these important public employees are potentially exposed to many safety and health hazards.

Over the past decade, a great deal of attention has been focused on preventing exposure to serious and fatal bloodborne diseases like HIV and hepatitis, which are spread through skin and mucous membrane contact. The PEOSH Bloodborne Pathogens Standard, including the practice of Universal or Standard precautions, has been widely implemented by EMS agencies throughout the state. However, contact transmission is not the only way that EMS personnel can be exposed to serious and fatal diseases.

Communicable diseases like tuberculosis, severe acute respiratory syndrome, chickenpox and measles can be transmitted to susceptible EMS responders through inhalation of these airborne infectious agents. While uncertainty exists about how much of the agents need to be inhaled to cause disease, it is clear that the best line of prevention is to stop their inhalation in the first place. The minimum level of protection needed to prevent occupational respiratory exposure to these agents is an N-95 disposable particulate respirator. If these or any other respirators are issued to EMS personnel, a complete respiratory protection program that complies with the requirements of the PEOSH Respiratory Protection Standard must be in place.

The purpose of this guide and model program is to assist EMS agencies to develop and implement the required respiratory protection program for N-95, N-99 and N-100 disposable particulate respirators. The PEOSH Respiratory Protection Standard (29 CFR 1910.134) calls for critical elements like medical evaluation, fit-testing and training to ensure the safe and effective use of respirators. The standard applies to public sector EMS responders in New Jersey, whether paid or volunteer. The employer is responsible for implementing this standard as well as other applicable PEOSH health and safety regulations.

The information contained in this publication is not considered a substitute for the PEOSH Respiratory Protection Standard. It provides general guidance but should not be considered the definitive interpretation for compliance with PEOSH requirements. The reader should consult the PEOSH Respiratory Protection Standard (29 CFR 1910.134) in its entirety for specific compliance requirements.

This guide and model program as well as other PEOSH publications and standards can be found on the PEOSH website at: <http://www.nj.gov/health/eoh/peoshweb/odispubp.htm>

CONTENTS

STEP-BY-STEP GUIDE

Step 1: Name a “Respiratory Protection Program Administrator”	p. 7
Step 2: Identify potential respiratory hazards	p. 8
Step 3: Select the appropriate type of respirator	p. 10
Step 4: Obtain multiple brands, styles and sizes of NIOSH-approved respirators	p. 13
Step 5: Arrange for EMS personnel to be medically evaluated	p. 14
Step 6: Conduct fit-testing	p. 16
Step 7: Develop the written respiratory protection program	p. 18
Step 8: Conduct initial and annual respirator training	p. 20
Step 9: Maintain written records	p. 21
Step 10: Evaluate the program regularly	p. 22

MODEL RESPIRATORY PROTECTION PROGRAM

Introduction	p. 25
Binder Cover Page	p. 26
Table of Contents	p. 27
Section 1: Written Respiratory Protection Program	p. 28
Section 2: Respirator Product Information	p. 36
Section 3: NIOSH Approval Documentation	p. 37
Section 4; Medical Evaluation Forms	p. 38
Section 5: Fit-test Records	p. 40
Section 6: Fit-test Protocols	p. 42
Section 7: Documentation of Initial and Annual Training	p. 53
Section 8: Training Materials	p. 55
Section 9: Program Evaluation	p. 73
Section 10: PEOSH Respiratory Protection Standard (29 CFR 1910.134)	p. 75
Section 11: Appendices	p. 122
a. Respiratory Protection Guidance on Specific Airborne Infectious Agents	p. 123
b. PEOSH Respirator Medical Evaluation Questionnaire	p. 124
c. NIOSH Guidance about Escape-Only Respirators	p. 134

Step-by-Step Guide

**Developing a Respiratory Protection Program
for using N-95, N-99 and N-100
Disposable Particulate Respirators
in Emergency Medical Services**

STEP 1: NAME A RESPIRATORY PROTECTION PROGRAM ADMINISTRATOR

Employers of EMS personnel must designate a “Program Administrator” to run the Respiratory Protection Program and evaluate its effectiveness. An individual is qualified to be a Program Administrator if he or she has appropriate training in relation to the program’s level of complexity. The training or experience is appropriate if it enables the program administrator to recognize, evaluate, and control the hazards to which EMS personnel may be exposed. The program administrator must become familiar with the requirements of the PEOSH Respiratory Protection Standard (29 CFR 1910.134, Appendix A) and take the steps necessary to comply.

For example, if only a few types of relatively simple respirators are used, knowledge of this guide and materials supplied by the manufacturer may be sufficient for any squad member or EMS responder to serve as the program administrator; N-95, N-99 and N-100 disposable particulate respirators would fall into this category. If sophisticated respirators are used (such as Self-Contained Breathing Apparatus or air-purifying respirators with multiple cartridges), the program administrator must have or obtain more extensive experience and/or training.

Requiring an administrator with sole responsibility helps to clarify who is responsible for the program. Nonetheless, the administrator may rely on other people to help run parts of the program (e.g., fit testing, medical evaluation). A major responsibility for the Program Administrator is developing and implementing a written respiratory protection program.

Duties of the Respiratory Protection Program Administrator

- **Become knowledgeable about the Respiratory Protection Standard**
- **Develop the written respiratory protection program**
- **Identify tasks that require respiratory protection**
- **Select respirators; assure that they are available to EMS personnel**
- **Arrange for medical evaluation / distribute questionnaire**
- **Arrange for and/or conduct initial and annual fit-testing**
- **Coordinate initial and annual respirator training**
- **Monitor respirator use, maintenance, disposal and storage**
- **Maintain records required by the program**
- **Evaluate and update the program as needed**
- **Monitor PEOSH standards for changes**

Adapted from the OSHA Small Entity Compliance Guide

STEP 2: IDENTIFY POTENTIAL RESPIRATORY HAZARDS

Biological Hazards

The respiratory hazards most likely to be encountered in emergency medical response duties are biological in nature. This step-by-step guide and model program focus on protecting EMS personnel from these respiratory biological hazards, often referred to as airborne infectious agents. Examples are:

Mycobacterium tuberculosis (TB)	Smallpox
Severe Acute Respiratory Syndrome (SARS)	Chickenpox
Measles	

It has not yet been determined that highly pathogenic avian influenza of the H5N1 strain (HPAI H5N1) can be spread from person to person. However, due to the potential risks of human to human infection, precautions identical to those recommended for SARS, should be implemented for all patients diagnosed or under evaluation for HPAI H5N1.

Respiratory protection is important because exposure to these agents can result in serious or fatal diseases. Exposure alone (as in the case of TB) may require prophylactic treatment with drugs that may have significant side effects. Drug-resistant strains of tuberculosis can prove fatal. In addition, EMS personnel who have been exposed to respiratory infectious agents can put family, friends, co-workers and patients at risk.

EMS personnel should be aware of the signs and symptoms of infectious respiratory diseases and the procedures necessary to protect themselves. Not all respiratory infections are transmitted in the same way. Transmission can occur from direct or indirect contact, large droplets, or small droplet nuclei. The mode of transmission will depend on the agent. Certain procedures can also increase the risk of exposure by producing aerosols. These are deemed "high risk respiratory procedures" and include intubation, extubation, deep tracheal suctioning, nebulized respiratory treatments and bronchoscopy. Good infection control practices should always be followed.

Chemical Hazards

This guide and model program are geared to biological hazards, however, each EMS agency should also assess whether their personnel will be exposed to chemical hazards. For example, if squad members will play a role in hazardous materials emergency response or decontamination activities, the appropriate type of respiratory protection should be identified and issued. Participation in local emergency planning activities is critical to understanding expected response activities and determining the personal protective equipment necessary. It is likely that as emergency preparedness responsibilities expand, more EMS personnel will require additional types of respirators and expanded training in respiratory protection.

If air-purifying respirators or self-contained breathing apparatus that protect against chemical hazards are issued, the respiratory protection program will need to be expanded. Information about chemical cartridge storage, use and expected service life will need to be incorporated in the program and a

means of understanding the concentration of chemicals in the air must be assured. In addition, any new respirators must be fit-tested and, if they place additional physiologic burdens on wearers, new medical clearance must be obtained.

Contact the PEOSH Program for assistance in expanding the respiratory protection program to address protection from chemical hazards.

Preventing exposure to airborne infectious agents

- **Be aware of the symptoms of infectious respiratory diseases**
- **When assessing a patient with symptoms of a known or unknown airborne infectious disease, EMS personnel should wear a fit-tested N-95 respirator**
- **Place a surgical mask on the patient**
- **Adhere to Standard Precautions - use gown, gloves and eye protection if contact with bodily secretions is anticipated**
- **Keep the door between the driver and the patient compartment closed; place the vehicle's ventilation system on the non-re-circulating (fan) mode; keep windows open**
- **Wash hands immediately after removal of gloves; use waterless hand sanitizer if a sink is not immediately available**
- **Assure adequate cleaning of equipment between transports**

Adapted from New York State Department of Health, Bureau of EMS Policy Statement #03-11

STEP 3: SELECT THE APPROPRIATE TYPE OF RESPIRATOR

Respirator selection for biological hazards is based on the respirator's ability to:

- ◆ Filter infectious particles out of the air
- ◆ Be qualitatively or quantitatively fit-tested
- ◆ Fit different facial sizes and characteristics
- ◆ Be checked for facepiece fit each time the respirator is used

Respirator selection guidance comes from several federal agencies with responsibility for worker protection and public health. The agencies include the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration and the Centers for Disease Control and Prevention. Website links to guidance from these agencies for specific agents (TB, SARS, HPAI H5N1) are included in Appendix A of the Model Program.

Based on this guidance, the New Jersey Department of Health and Senior Services advises the EMS community to use N-95 disposable particulate respirators as the minimum level of protection for EMS personnel from the airborne infectious agents listed in Step 2 of this guide.

**NJ Department of Health and Senior Services
Memo to the NJ EMS Community
March 2005**

“N-95 respirators should be worn when responding to patients with unknown, potentially infectious respiratory or influenza-like illness.....and.... when caring for patients with diagnosed infectious illnesses such as tuberculosis.....”

Properly fitted, N-95 respirators should protect the worker against bioterrorism and non-bioterrorism related respiratory pathogens.”

**Eddy Bresnitz, MD, MS, Deputy Commissioner/State Epidemiologist
<http://www.state.nj.us/health/ems/documents/n95.pdf>**

N-95 disposable particulate respirators are also known as “air-purifying respirators” or filtering facepiece respirators because of their ability to protect the wearer by filtering particles from the air that is breathed. There are many brands and hundreds of models of N-95 respirators that can be used for protection from airborne infectious agents.

Examples of N-95 Disposable Particulate Respirators



The “N” in N-95 refers to the material that the filter is made of and whether or not it is resistant to oil. “N” means “not resistant to oil” which is appropriate for most medical response activities. (The need for oil resistant filter material would arise mostly in industrial environments.) Respirators labeled P-95 or R-95 indicate that they are oil-resistant and could be used but are not necessary for the hazards encountered in EMS work.

The “95” in N-95 refers to how efficient the filter material is at removing particles greater than 0.3 microns in size from the air. Some common particle sizes are described below. An N-95 respirator is at least 95% efficient in removing these particles. There are also N-99 and N-100 respirators, which are 99 and 99.97% efficient in removing particles. N-99 or N-100 respirators could also be used by EMS personnel but an N-95 is the minimum filter efficiency recommended. The term N-95 will be used in this guide but the same respiratory protection program requirements apply to N-99 and N-100 respirators.

N-95's are 95% efficient in removing particles that are small enough to be inhaled

Micron sizes of some pathogen groups	
Fungi	2-200
Mold spores	1-70
Bacteria	0.5-10
Viruses	0.02-0.3

Particles < 100 microns can be inhaled through nose and mouth

1-5 micron particles can enter upper airways


0.1 – 1 micron particles can enter lower lungs and alveoli

[N-95 filters are tested on particles greater than 0.3 microns in size.]

All N-95 filtering facepiece respirators issued to EMS personnel are considered tight-fitting respirators and require both fit-testing and medical clearance prior to use. The N-95 respirator chosen must be approved by the National Institute for Occupational Safety and Health (NIOSH). **A surgical mask does not provide adequate protection for EMS personnel against the airborne infectious agents described on page 8 of this guide, although a surgical mask may be placed on the patient to limit spread of respiratory secretions.**

Is an N-95 respirator the same as a surgical mask?

NO !!



A surgical mask is not a respirator.
It is NOT NIOSH-approved.

EMS personnel should be sure to distinguish between the NIOSH-approved N-95 respirator issued to protect from airborne infectious hazards and the disposable masks that may be available to protect responders from splash exposures to blood and body fluids. These differences should be discussed during training and the respirators and splash protection stocked on rigs should be clearly labeled.

Escape-Only Respirators

Escape-only respirators have been purchased by some EMS agencies and issued to personnel. PEOSH encourages EMS agencies to implement policies about how these respirators should be used. It is important to know that escape-only respirators have many limitations:

- ◆ Escape-only respirators are designed to be used only in an emergency, and only to escape from a dangerous to a safe area.
- ◆ They may not protect from all chemicals or infectious particles or from atmospheres that are deemed “IDLH” or immediately dangerous to life and health.
- ◆ These respirators are never to be used to intentionally enter a contaminated response area.
- ◆ Escape-only respirators are designed for one-time use for a short period, typically 15 minutes to an hour.
- ◆ Most escape-only respirators are NOT NIOSH-approved and are loose-fitting, so, cannot be fit-tested. Currently, PEOSH does not require a medical evaluation for these respirators.

Whenever exposure of EMS personnel to specific hazards can be anticipated, PEOSH requires that a NIOSH-approved respirator that is capable of protecting responders from the specific airborne hazard, be selected, issued and fit-tested.

STEP 4: OBTAIN MULTIPLE BRANDS, STYLES AND SIZES OF NIOSH-APPROVED RESPIRATORS

The PEOSH Respiratory Protection Standard requires that employers “select a NIOSH-certified respirator” and that “the respirator shall be used in compliance with the conditions of certification.” NIOSH stands for the National Institute for Occupational Safety and Health and is a federal agency in the Centers for Disease Control and Prevention that conducts a range of occupational health and safety efforts, including research, personal protective equipment guidance, and health hazard evaluations.

The standard also requires that the employer select respirators from a sufficient number of models and sizes so that the respirator is acceptable to, and correctly fits the user. Several brands and sizes should be chosen to provide to EMS personnel at the time of fit-testing.

NIOSH maintains a website listing of all NIOSH-approved respirators. Over 300 different models of N-95 disposable particulate respirators have been approved. The NIOSH web page contains the manufacturer names, contact information as well as the NIOSH approval number and can be found at:

http://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/n95list1.html

All respirators purchased should have a NIOSH approval number on the respirator or an approval label in the box. Retain this information as a part of the written respiratory protection program or print the information from the NIOSH-approved respirator list.

How can you tell if a respirator is NIOSH-approved?

NIOSH approval number on respirator: 84A-####

Approval label in box

NIOSH Certified Equipment List Website

THESE RESPIRATORS ARE APPROVED ONLY BY THE FOLLOWING COMPANY(S) AND:		
PROTECTION	RESPIRATOR	CERTIFIED AND LIMITATIONS
N95	84A-####	Respirator

1. PROTECTION
N95 Particulate Filter (95% filter efficiency level) effective against particulate aerosols free of oil, sea salt, and other water-soluble matter.

2. CAUTIONS AND LIMITATIONS
a. Use for use in environments containing less than 10% particulate matter.
b. Use for use in environments containing less than 10% particulate matter.
c. Do not exceed maximum use concentration established by regulatory standard.
d. Filter is not to be used for protection against chemical vapors or gases.
e. All respiratory equipment must be stored, used, and maintained in accordance with OSHA, CDC, and other applicable regulations.
f. Some additional, specific, use or care parts for each equipment part in the specifications are provided by the manufacturer.
g. Refer to user instruction, safety maintenance manuals for additional use and maintenance of these respirators.

3. REFERENCES

http://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/n95list1.html

STEP 5: ARRANGE FOR EMS PERSONNEL TO BE MEDICALLY EVALUATED PRIOR TO FIT-TESTING OR USE OF THE RESPIRATOR

Using a respirator may place a physiological burden on EMS personnel that varies with the type of respirator worn. Even though N-95 respirators are lightweight and non-restrictive in comparison to other respirators, persons using these respirators require a medical evaluation. This must occur before fit-testing or use of the respirator.

If the EMS agency already has an occupational health physician or provider who treats work-related injuries, this person will probably be familiar with the medical evaluation requirements of the PEOSH Respiratory Protection Standard and the medical conditions that may affect respirator use. In addition to occupational health physicians, other licensed health care professionals who are operating within their scope of practice as specified by the state licensing board can also provide medical evaluation services. They must be knowledgeable about the respiratory protection standard and the medical conditions that may affect respirator use. This could include advanced practice nurses, occupational health nurses and physicians assistants. The physician director of the EMS squad may also choose to provide these services. If this is the case, provisions should be made for maintaining any medical files generated for squad members during this process in a confidential manner (particularly the completed PEOSH Respiratory Questionnaire).

The PEOSH Respirator Medical Evaluation Questionnaire

The healthcare professional can instruct the Program Administrator on the medical evaluation procedure. The evaluation must obtain the same information requested in the “Mandatory PEOSH Respirator Medical Evaluation Questionnaire,” Part A, Sections 1 and 2. (See Appendix B of the Model Program)

If the Respirator Medical Evaluation Questionnaire is administered to EMS personnel for review by the healthcare professional, it must be administered confidentially at a convenient time and place. If the healthcare provider is not present to immediately review the questionnaire, the person completing it should place it in a sealed envelope. If the employee’s responses indicate the need for an in-person medical evaluation, the employer needs to provide this evaluation. Any EMS personnel who have questions should be provided with an opportunity to discuss the questionnaire and the healthcare professional’s medical evaluation results with the doctor, nurse or physician’s assistant.

The employer must provide the healthcare professional providing the medical evaluation with the following information:

- ◆ The type of the respirator to be used by the employee
- ◆ The duration and frequency of respirator use
- ◆ The expected physical work effort

- ◆ Additional protective clothing and equipment to be worn
- ◆ Temperature and humidity extremes that may be encountered
- ◆ A copy of the written respiratory protection program
- ◆ A copy of the Respiratory Protection Standard (29 CFR 1910.134)

The outcome of the medical evaluation is a written recommendation from the doctor, nurse or physician's assistant to the employer regarding the employee's ability to wear a respirator. The healthcare professional needs to provide the Respiratory Protection Program Administrator with their recommendation which should not contain confidential medical information. It should state only that the EMS member is or is not cleared to use an N-95 respirator and whether there are any restrictions. The medical clearance recommendation must be maintained as part of the written respiratory protection program. A sample form is contained in Section 4 of the Model Program.

Additional medical evaluations would be required if an employee reports signs or symptoms that are related to the ability to use a respirator, if observations made during fit-testing or respirator use indicate the need for employee reevaluation or if workplace conditions substantially increase the physiologic burden placed on an employee.

Medical Evaluation Requirements

- Evaluation must occur PRIOR to fit-testing or use of the respirator**
- Medical questionnaire is confidential**
- Employer must provide in-person medical evaluations and testing deemed necessary by health care provider**
- Clearance form provided to employer should not contain confidential information**
- Additional evaluations required if difficulty wearing the respirator is encountered or if workplace conditions substantially increase the physiologic burden placed on the employee**


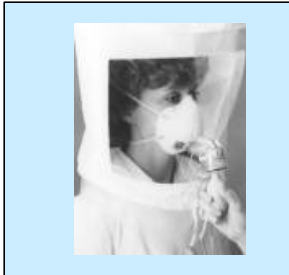
STEP 6: CONDUCT FIT-TESTING

An important step in providing respirators to EMS personnel is assuring a good fit. If a respirator does not make a tight seal around the face during inhalation, contaminated air may leak around the edges of the face seal. The only way to tell if a respirator fits and is capable of protecting properly is to fit-test the respirator. **The PEOSH Respiratory Protection Standard requires fit-testing prior to initial use and annually thereafter.**

In articles published in 1998* and 2006**, NIOSH found that fit-testing respirators is essential in programs employing these respirators and can eliminate poorly fitting respirators, ensuring at least the expected level of protection. Without fit-testing, subjects were exposed to a greater number of particulates found in the surrounding air; however, when fit-tested first, subjects received substantially more protection. Without fit-testing, persons unknowingly may have poor face seals, resulting in excessive leakage and exposure.

Most models of respirators come in different sizes in order to accommodate the size and shape variability in peoples' faces. Before using any respirator with a tight-fitting facepiece, EMS personnel must be fit-tested with the same make, model, style and size of respirator that will be used. The employer should have several different models and sizes to choose from. The fit test can be "quantitative" or "qualitative," and must follow one of the protocols described in Appendix A of the PEOSH Respiratory Protection Standard (page 97 of Model Program). The respiratory protection program administrator can decide whether to use a quantitative or qualitative procedure. Below are appropriate fit-test methods for disposable particulate respirators.

Quantitative vs. Qualitative Fit-Testing

 <p><u>Quantitative:</u> Computerized means of detecting face seal leakage</p>	 <p><u>Qualitative:</u> Relies on wearer's subjective response to taste, odor or irritation</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Quantitative versus Qualitative

A quantitative test requires a small computer which measures particulate counts inside and outside the respirator. Training in use of the computer is usually provided by the manufacturer.

A qualitative fit test relies on the wearer's subjective response to taste, odor, or irritation. It involves spraying a sweet or bitter agent (Saccharin or Bitrex) around the respirator wearer in an enclosed space to determine if the agent can be detected. The Isoamyl Acetate protocol (banana oil) should not be used because the agent is not a particulate. The PEOSH Program can provide training in qualitative fit-testing. Contact the PEOSH Education and Training Project at: 609-984-1863.

The PEOSH Program encourages EMS personnel to contact their local fire department, HAZMAT unit or county health department to investigate sharing of fit-test equipment and fit-testing expertise. Recent research** indicates that, although initially cheaper, qualitative fit-test methods have lower pass rates than the quantitative fit-test method. Therefore, in the long run, using a qualitative fit-test may not be less expensive and less time-consuming due to increased numbers of repeat fit-testings that may have to be done. Contact the supplier or manufacturer for recommendations. It is possible that local fire departments or hazmat units already own quantitative or qualitative fit-test equipment that may be compatible or adapted to fit-test the N-95 respirators chosen.

The Question about Respirators and Beards

Anything that prevents the face mask from fitting tightly against the face, such as a beard, goatee, long sideburns or even stubble, may cause leakage. No facial hair should interfere with the face-to-facepiece seal or valve function.

The PEOSH standard assigns employers the responsibility for monitoring proper respirator use by their employees.

A form for documenting initial and annual respirator fit-testing as required by PEOSH Respiratory Protection Standard is included in Section 5 of the Model Program. A copy of the fit-test protocol used must be included with the written program

* Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Reports (MMWR), December 11, 1998 / 47(48);1045-1049. Laboratory Performance Evaluation of N-95 Filtering Facepiece Respirators, 1996.

** Lawrence R, Duling M, Calvert C, Coffey C. Comparison of Performance of Three Different Types of Respiratory Protection Devices. Journal of Occupational and Environmental Hygiene, 3:465-474, 2006.

STEP 7: DEVELOP THE WRITTEN RESPIRATORY PROTECTION PROGRAM

A fill-in-the blanks version of a written respiratory protection program is provided in Section 1 of the Model Program. It should be completed by inserting the required information in the blank spaces. Include information specific to the squad and to the policies in the municipality or county. A copy of the program should be available to EMS personnel. The program addresses the components of a written program required by the PEOSH Respiratory Protection Standard when N-95 disposable particulate respirators are used. If other types of respirators are issued, the program will need to be expanded to address these needs. If necessary, the PEOSH Program can be contacted for assistance.

Required Components of a Written Respiratory Protection Program

- **Procedures for selecting respirators**
- **Medical evaluations of employees**
- **Fit-testing protocol used**
- **Procedures for proper use of respirators**
- **Procedures for inspecting, cleaning, storing and discarding**
- **Training about respiratory hazards**
- **Training in proper use of respirators and their limitations**
- **If SCBA used, procedures for ensuring adequate air quality**
- **Means of evaluating effectiveness of the program**

The manufacturer's specifications should be relied upon for completing the written program sections that address storage, maintenance, use and disposal of the N-95 disposable particulate respirators. Some general rules are reviewed below and should be tailored to the respirator chosen.

Maintenance and disposal of N-95 disposable particulate respirators:

- ◆ Prior to donning the respirator, inspect to see if the respirator is damaged, misshapen or soiled. If so, discard the respirator.
- ◆ When donning the respirator, determine whether the respirator straps hold the respirator tightly against the face. If not, discard the respirator.
- ◆ If the airborne infectious agent can be transmitted through contact as well as inhalation, discard the respirator after each patient contact.
- ◆ If the shape and integrity of the respirator are good, it may be re-used by the same worker to treat a single patient. Allow to dry completely and store in a clean location.

General rules for “seal-checking” N-95 disposable particulate respirators

A seal check is a quick but important test to determine the presence of face-to-facepiece seal at the time of use.

- ◆ Place one or both hands completely over the filtering facepiece.
- ◆ *Inhale and exhale sharply.* If air leaks around your nose, readjust the nosepiece. If air leaks between the face and facepiece of the respirator, reposition it by adjusting the panels and straps.
- ◆ If you cannot achieve a proper seal, **do not** enter the contaminated area.

Limitations of N-95 disposable particulate respirators

- ◆ They cannot be used for “IDLH” or “Immediately Dangerous to Life or Health” hazards. The only safe respirators for IDLH environments have their own uncontaminated air supply, i.e., Self Contained Breathing Apparatus (SCBA) or airline respirators with auxiliary SCBA.
- ◆ They do not protect the wearer from:
 - Oxygen deficiency
 - Harmful gases or vapors
 - Skin or eye contact with pathogens
 - High concentrations of pathogens
- ◆ These respirators are only effective for the intended use if properly fitted and worn.

STEP 8: CONDUCT INITIAL AND ANNUAL RESPIRATOR TRAINING

All EMS personnel required to use respiratory protection equipment must be trained. Training must be comprehensive enough so that, when completed, personnel will be able to demonstrate knowledge of the limitations and capabilities of the respirator, why the respirator is necessary, and the steps required for proper fit and maintenance. The training content required by the PEOSH Respiratory Protection Standard is listed in the box below.

EMS agencies must provide training prior to initial use of the respirators and annually thereafter. Documentation of the training must be maintained. Much of the information should come from the manufacturer's specifications about respirator use. In the case of respirators used for emergencies, particular attention should be paid to the limitations of respirators, particularly escape-only and N-95 models.

The PEOSH Program has developed a basic training module for N-95 respirators that can be found in Section 8 of the Model Program and is available electronically on the PEOSH website. Information about the specific respirator chosen, its care, maintenance and limitations should be added to the training program. The manufacturer's seal check procedures and donning instructions must also be addressed.

Required Training Content for Use of N-95 Disposable Particulate Respirators

- Indications for use
- The necessity of proper fit, usage, and maintenance in ensuring the effectiveness of the respirator
- Limitations and capabilities of the respirator
- Effective use in emergency situations
- Proper methods for inspecting, donning, performing a seal-check and disposing of the respirator
- Procedures for maintenance and storage
- Conditions that may limit or prevent effective use

A form for documenting initial and annual training as required by the PEOSH Respiratory Protection Program is contained in Section 7 of the Model Program.

STEP 9: MAINTAIN WRITTEN RECORDS

The PEOSH Respiratory Protection Standard requires the employer to establish and retain written information regarding medical evaluations, fit-testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance.

The records listed below need to be kept by the Program Administrator. The PEOSH Program recommends maintaining a binder with all of the records required by the Respiratory Protection Standard. The attached Model Program can be used to begin compiling the required records. It contains the following items: the written program, a training program, a copy of the standard, fit-test protocols and sample forms. The Model Program is also available on the PEOSH website at: <http://www.nj.gov/health/eoh/peoshweb/odispubp.htm>

Required Written Records

- Written Respiratory Protection Program**
- A copy of the PEOSH Respiratory Protection Standard**
- Product information for the N-95 respirator(s) chosen**
- Documentation of NIOSH approval**
- Medical clearance forms**
- Fit-test records (for the latest year)**
- Copy of the fit-test protocol used**
- Documentation of initial and annual training**
- Copy of training content**

STEP 10: EVALUATE THE PROGRAM REGULARLY

The PEOSH Program requires employers to conduct periodic evaluations to ensure that the written respiratory protection program is being properly implemented, and to consult EMS personnel to ensure that they are using the respirators properly. The PEOSH Program recommends that evaluations be conducted at least annually. A form that can be distributed to EMS personnel to begin the assessment process is included in Section 9 of the Model Program. Problems identified during this assessment should prompt program changes. This could range from updating the written program to replacing the current respirator(s) with a new model. Factors to be assessed include but are not limited to the items listed below.

Factors to be Assessed in a Respiratory Protection Program Evaluation

- Respirator fit, including the ability to use the respirator without interfering with effective workplace performance
- Appropriate respirator selection for the hazards to which the employee is exposed
- Proper respirator use under the workplace conditions the employee encounters
- Proper respirator maintenance

(This page intentionally left blank.)