

# Southeast Minnesota EMS

## Suggested Guidelines: Respiratory Protection Program

### **PURPOSE**

To ensure the protection of all employees from respiratory hazards through the proper use of respirators.

### **Program Components**

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• 3M N95 Model 1860 Instructions		
• 3M Battery Insert for BreatheEasy		
• 3M BreatheEasy 10 Insert		
• 3M BreatheEasy FR-57 Canister Insert		

### **Program Administration**

- [Preston Area Ambulance Director](#) (Service Director) will be responsible for the administration of the Respiratory Protection Program.
- [Preston Area Ambulance](#) (Ambulance Service) will collaborate with the Regional EMS Office concerning ongoing and changing needs for respiratory protection.

### **Program Scope, Application and Identifying Work Hazards**

This program applies to all ambulance employees who are required to wear respirators during patient care and transport. The work activities required to wear respirators are outlined in the table below:

<b>HAZARD</b>	<b>LOCATION</b>	<b>RESPIRATOR</b>
Tuberculosis and other airborne diseases	EMS scene and during patient transport	N95 Mask
SARS or suspected SARS	EMS scene and during patient Transport	N95 Mask
Chemicals, biological agents	EMS scene and during transport of the field decontaminated patient	PAPR (Breathe Easy )

### **RESPIRATOR SELECTION**

Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) will be selected and used. Respirators will be chosen based on potential hazards. Respirator users will be able to select the appropriate fitting respirator.

### **MEDICAL EVALUATION**

- Persons assigned to tasks that require respirator use must be physically able to perform the work while wearing a respirator.
- Medical Director will determine individual medical clearance by questionnaire and/or medical exam. Employees refusing a medical evaluation will not be allowed to respond to ambulance calls or perform cleaning of patient compartment.
- Re-evaluation will be conducted under these circumstances:
  1. Employee reports physical symptoms that are related to the ability to use a respirator. (wheezing, shortness of breath, chest pain, etc.)
  2. It is identified that an employee is having a medical problem during respirator use.
  3. **The Director** (Service Director) determines employee needs to be re-evaluated.
  4. A change occurs in the workplace conditions that may result in an increased physiologic burden on the employee.

All examinations and questionnaires are to remain confidential between the employee, Preston Area Ambulance(Ambulance Service), and the Medical Director. A person may obtain their records upon request.

### **RESPIRATOR TRAINING**

Workers will be trained prior to the use of a respirator and annually thereafter.

Training will include:

- Identification of potential/real hazards and health effects of hazard
- Respirator fit, improper fit, usage, limitations, and capabilities
- Maintenance, usage, cleaning, storage

- Emergency use if applicable
- Inspecting, donning, removal, seal check and trouble shooting
- Identification of resources (respirator program, policies, procedures, OSHA standard, etc)

### **FIT TESTING**

- Fit tests are conducted with N95 Style masks or other tight fitting respirators to determine which brand, model and size of respirator fits the user adequately. WARNING: Respirators that do not seal do not offer adequate protection.
- Fit testing is required for all negative or positive pressure tight fitting respirators.
- Fit testing is not required for hood-style respirators.
- Fit tests will be conducted:
  - Prior to being allowed to wear any respirator with a tight fitting face piece.
  - If the annual review indicates need for re-fit.
  - Fit tests may be conducted with an annual frequency.
- Fit test procedure (See ATTACHMENT G)

### **RESPIRATOR USE**

#### General Use

- Employees will use their respirators under conditions specified by this program, and in accordance with the training they receive on the use of each particular model. In addition, the respirator shall not be used in a manner for which it is not certified by NIOSH or by its manufacturer.
- All employees shall conduct user seal / performance checks each time they wear a respirator.
- All employees shall leave a potentially hazardous work area if the respirator is impeding their ability to work.
  - N95 (See ATTACHMENT A)
  - PAPR BREATHE EASY (See ATTACHMENT B)

### **VOLUNTARY RESPIRATOR USE**

Some employees may be irritated by the presence of non-hazard air contaminants. When use of a respirator will help alleviate irritation and when the respirator itself is judged to pose no additional risk to the wearer, employees will be allowed to voluntarily use respirators for comfort reasons. (ATTACHMENT C)

### **PROGRAM EVALUATION**

[Preston Area Ambulance](#) (Ambulance Service) will annually evaluate the Respiratory Protection Program.

## **ROLES AND RESPONSIBILITIES**

### Employee

- Participate in all training
- Wear respirator in accordance to it's specified use.
- Maintain equipment
- Report malfunctions or concerns
- Report change in health status or difficulties with respirator usage.

### Preston Area Ambulance Director (Service Director)

- Monitor program
- Evaluate medical evaluations for respirator use
- Evaluate any feedback information or surveys
- Collaborate with Infection Control Practitioner, Facilities Director and Safety Council as needed to review any new hazards or changes that would require respirator use
- Make recommendations for change to the Regional EMS Office

## **DOCUMENTATION AND RECORDKEEPING**

- A list of staff medically cleared, trained in PAPR use, and fit tested for the N95 mask will be maintained by Preston Area Ambulance (Ambulance Service)
- Preston Area Ambulance (Ambulance Service) maintains the medical information for all employees covered under the respiratory program. The completed medical forms and documented findings are confidential and will remain with Preston Area Ambulance(Ambulance Service). A person may obtain their records upon request.

### References:

NIOSH Respiratory Protection Program, US Department of Health and Human Services, 1999,  
OSHA Technical Manual: Respiratory Protection 29 CFR 1910.134

## ATTACHMENT A

### **N 95 MASK**

These disposable air-purifying respirator masks work by drawing ambient air through the filter material. Inhalation causes a negative pressure to develop in the tight filtering face piece and allows air to enter while particles are captured on the filter. Air leaves the face piece during exhalation because a positive pressure develops in the face piece and forces air out of the mask.

### **HAZARD IDENTIFICATION**

The N95 masks are to be used for particulate aerosols free of oil. The N95 masks (3M 1860 and 1870) meet the Centers of Disease Control requirements for Tuberculosis exposure control. It is intended to reduce wearer exposure to airborne particles in a size range of 0.1 to >10 microns.

### **PROPER FIT**

- Chin properly placed—spans distance of nose to chin
- Adequate strap tension, not overly tight
- Fit across nose bridge
- Respirator does not slip
- Room for eye protection
- Room to talk

### **LIMITATIONS AND CAPABILITIES**

#### **Capabilities**

1. Meet CDC guidelines for protection against TB.
2. No maintenance/cleaning required.
3. Can fit many different face sizes.

#### **Limitations**

1. Not to be used for industrial uses.
2. Cannot be worn with facial hair.
3. Recurrent fit testing suggested
4. Contaminant can leak into the mask

### **EMERGENCY USE (Not Applicable)**

### **INSPECTING**

- Examine the face piece of the disposable respirator to determine if it has structural integrity. Discard if there are nicks, abrasions, cuts, or creases in seal area or if the filter material is physically damaged or soiled.
- Check the respirator strap to be sure they are not cut or otherwise damaged.
- Make sure the nose clip is in place and functions properly (if applicable).
- N95 masks are not to be re-used. They are to be discarded after use.

### **PERFORMANCE/USER CHECK/"FIT CHECK"**

Place 2 hands slightly over the mask and sharply exhale, any leaking of air under chin or around eyes would indicate a poor placement. Reposition mask and recheck.

### **MASK PLACEMENT (donning) AND REMOVAL (doffing)**

**NOTE:** Donning and doffing should take place away from area of contamination.

#### Equipment placement (donning)

1. PLACE straps over head,
2. PINCH area around nose.
3. PERFORM user check
4. NOTE: Only wear the size mask you were fitted tested for

#### Equipment removal (doffing)

6. REMOVE other personal protective equipment (gowns, gloves) and discard
7. CLEAN hands
8. LIFT strap off and forward with one hand while using other to stabilize mask.
9. CLEAN hands.

#### **CLEANING**

The N95 mask is disposable. There is no cleaning or disinfecting process. Discard after patient care has been transferred, if soiled, if breathing becomes labored, or if structural integrity is compromised.

#### **MAINTENANCE/REPAIRS** (Not applicable)

#### **STORAGE**

N95 masks are stored in a clean, sealed container

#### **USER INSTRUCTIONS:**

See Additional Documentation at end of this packet or [www.3m.com](http://www.3m.com) or [http://solutions.3m.com/wps/portal/1/en\\_US/s.155/138509/s.155/10119](http://solutions.3m.com/wps/portal/1/en_US/s.155/138509/s.155/10119)

## ATTACHMENT B

### **POWERED AIR PURIFYING RESPIRATOR (PAPR)—BREATHE EASY**

The Breathe Easy system consists of a blower/filtration unit, head piece, breathing tube, battery (lithium), and 3 cartridges(520-04-5701). The Powered Air Purify Respirator (or PAPR) draws air through the belt-mounted cartridges and passes air through the breathing tube connected to the hood. The filtered air then passes over and in front of the user's head and face, providing respirable air. The hood maintains the filtered air within the breathing zone. Air is expelled at the base of the hood.

#### **HAZARD IDENTIFICATION**

The 3M FR-57 has been tested against military and NIOSH protocol and found to effective against a number of different chemical warfare and industrial agents. This is a high efficiency filter to remove solid and liquid aerosols. It also contains activated and impregnated carbon to absorb or react with gaseous or liquid vapors.

**WARNING:** This product is to be utilized for transport of patient only after field decontamination has been completed. **It is not be used for spill containment and/or rescue.**

#### **PROPER FIT**

Hood will sit next to employee's face.  
This hood can be used with facial hair

#### **LIMITATIONS AND CAPABILITIES**

Capabilities  
Used for organic vapors, acid gas,  
Airborne Particulate, inorganic gases  
Comfortable to wear  
Good visibility and flexibility  
Provides continuous flow of filtered air  
Can be worn with facial hair

Limitations  
Cleaning and Maintenance required  
**Need at least 19.5% oxygen in the air**

#### **EMERGENCY USE**

There is no indication for emergency use of the PAPR in a hot zone.  
This device is for EMS use for transport of field decontaminated patients only

#### **INSPECTING**

Respirators used for emergencies must be inspected monthly and checked for proper function before and after use. Records of inspections are kept with the respirators.  
Examine all equipment for cracks  
Inspecting breathing tube and headcover/hood for punctures, rips or worn material.  
Bend tube to verify flexibility

## **EQUIPMENT PLACEMENT AND REMOVAL**

### Equipment Placement (donning)

Equipment will be donned when employees receive information that there is a need for Respiratory Protection. Sources of information may include but are not limited to: State or Local Health Departments; Local, Regional, or Private Hazmat Teams; CDC; or other special response units.

Equipment will be donned prior to making contact with field decontaminated patient.

### Equipment Removal (doffing)

Equipment will be doffed after patient care has been transferred. Doffing will take place in an area designated by receiving for the purpose of removal of such PPE.

## **PERFORMANCE CHECK**

1. After assembly of the equipment, check to make sure the system has adequate airflow.
  - With the breathing tube disconnected from the blower unit and the system on, insert the flow meter in the air outlet (hold in vertical position—do not block intake cartridge area).
  - Check that the center of the float rests at or above 6 cfm. If the float does not rest high enough, replace the filters/cartridges/ canisters as needed--Recheck.
  - Connect headpiece and then verify the air is flowing into the headpiece before placing on head.

## **CLEANING/DISINFECTING**

After each use, the PAPR should be cleaned and sanitized appropriately. Cleaning agents and procedures must be based on known or suspected contaminants. Utilize resources: Infection Control, Poison Control, Material Safety Data Sheet (MSDS), and or Regional or Local Hazmat Team for guidance. Follow directions given. Equipment may be cleaned with appropriate solution or may need to be discarded.

NOTE:

Motor/blower, battery and breathing tube and hoods should not be submerged in liquids.

## **MAINTENANCE/REPAIRS**

### CARTRIDGE

New cartridges will be utilized with each event. After event, discard according to Infection Control and/or hazardous waste resource recommendations.

### BATTERY

The non-rechargeable lithium battery is expected to provide 12 hours of service when new. Batteries use will be logged on the battery grid and replaced at the indicator line.

## **STORAGE**

Store equipment at room temperature in a dry area.

USER INSTRUCTIONS: See additional documentation at the end of this packet or [www.3m.com](http://www.3m.com)

## **ATTACHMENT C** **VOLUNTARY RESPIRATORY USE**

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers.

However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers wear respirators to avoid exposure to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standard.

If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all the instructions provided by the manufacturer on use, maintenance, cleaning, care, and warnings regarding the respirators.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

*If you have any questions or concerns, please contact the Preston Area Ambulance Service Director@(507)765-2153 (Ambulance Service Director.)*

**ATTACHMENT D**

**RESPIRATOR (PAPR) CLEANING PROCEDURE**

**PAPR #** \_\_\_\_\_ **Date** \_\_\_\_\_ **Run #** \_\_\_\_\_

**Worn by** \_\_\_\_\_

**Length of time PAPR was worn** \_\_\_\_\_

**Reason PAPR was used, (TB vs. chemical risk)** \_\_\_\_\_

Chemical name, (if known) \_\_\_\_\_

**Name(s) of person cleaning PAPR** \_\_\_\_\_

Cleaning Procedure

- Wear gloves and Mask prior to removing PAPR from bag.
  - Make sure filter caps are in place prior to cleaning.
  - Do not let water or cleaning solutions enter the Turbo Unit, filter cartridges or battery terminals.
  - If worn for TB exposure, skip steps 1 and 2. Complete steps 3 – 8.
1. Disconnect the Turbo Unit, breathing tube and hood for individual cleaning.
  2. Clean the outside of the Turbo Unit, breathing tube, battery and hood with a solution of Multi Purpose Cleaner and warm water followed by clean rinse with water.
  3. Disinfect the outside of the Turbo Unit, breathing tube, battery & hood with Sani-Cloth Wipes and air dry.
  4. The inside of the hood may be cleaned and disinfected by following the same guidelines outlined in step 2 and 3.
  5. Make sure all components are completely dry before reassembly.
  6. Mark the battery “Hours Used” grid section for each full or partial hour used (I.e. for 1 hour of use, one section marked out).
  7. Test the PAPR to ensure that all components work properly. (Put filter plugs back in place after testing).
  8. Repack PAPR in designated bag according to inventory.

**TURN THIS FORM INTO THE Preston Area Ambulance Director (SERVICE DIRECTOR)**

**ATTACHMENT E**  
**Monthly PAPR Inspections Checklist**

\_\_\_ **Cleanliness**

Action to be taken: Wash/wipe off with disinfecting wipes.

\_\_\_ **Breathing Tube**

Check for cracks, holes, broken or missing end connectors.

Action to be taken: Replace breathing tube, obtain new clamps or connectors

\_\_\_ **Sensor Probe**

Check to see if damaged, missing or not aligned in the center of the breathing tube opening.

Action to be taken: Replace breathing tube.

\_\_\_ **Turbo Unit**

Check for cracks or areas of stress on case.

Action to be taken: Replace Turbo Unit.

\_\_\_ **Belt**

Check for cracked or damaged buckle and belt.

Action to be taken: Replace belt.

\_\_\_ **Hood**

Check for cracks or holes.

Action to be taken: Replace hood.

\_\_\_ **Battery Pack**

Total hours used \_\_\_\_\_

Maintains  $\geq$  6 CFU airflow. Check for areas of stress.

Action to be taken: Replace battery, replace battery straps.

\_\_\_ **Filter Element** - (requires 3 FR-57 cartridges)

Check for missing or worn gaskets, worn threads on both filter and facepiece for cracks or dents in filter housing, total hours used is  $>$  5 hours.

Action to be taken: Replace filter.

Check for deterioration of gasket canister harness.

Action to be taken: Replace harness.

Make sure PAPR bag contains the PAPR, Tyvek suit, gloves, booties and Duct Tape.

Report items needing repairs to the Director (Ambulance Service Director.)



## **ATTACHMENT G**

### **Fit Testing Procedure For N-95 or Tight Fitting Respirators**

#### **Sensitivity Test**

This test is done to assure that the person being fit tested can detect the sweet taste of the test solution at very low levels. The Sensitivity Test Solution is a very dilute version of the Fit Test Solution.

The test subject should not eat, drink (except water), chew gum, or smoke 15 minutes before the test.

1. Have test subject put on the hood and collar assembly without a respirator.
2. Position the hood assembly forward so that there is about six inches between the subject's face and the hood window.
3. Instruct the test subject to breathe through his/her mouth with tongue extended.
4. Using Nebulizer #1 with the Sensitivity Test Solution (#1), inject the aerosol into the hood through the hole in the hood window. Inject ten squeezes of the bulb, fully collapsing and allowing the bulb to fully expand on each squeeze. Both plugs must be removed from openings during use. Hold nebulizer in upright position during use.
5. Ask the test subject if he/she can detect the sweet taste of the solution. If tasted, note the number of squeezes as ten and proceed to Fit Testing.
6. If not tasted, inject an additional ten squeezes of the aerosol into the hood. Repeat with ten more squeezes if necessary. Note whether 20 or 30 squeezes produced taste response.
7. If 30 squeezes are inadequate, in that the subject does not detect a sweet taste, the test is ended. Another type of fit test must be used.
8. Remove test hood, and give the subject a few minutes to clear the taste from his/her mouth. It may be helpful to have the subject rinse his/her mouth with water.

#### **Fit Test**

1. Have the test subject don the respirator and perform a user seal check per the instructions provided on the respirator package.
2. Have subject wear any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit.
3. Have subject put on and position the test hood as before, and breathe through his/her mouth with tongue extended.
4. Using Nebulizer #2 with Fit Test Solution (#2), inject the fit test aerosol using the same number of squeezes as required in the Sensitivity Test (10, 20, or 30). A minimum of ten squeezes is required, fully collapsing and allowing the bulb to expand fully on each squeeze. Nebulizer must be in an upright position during use.
5. *To maintain an adequate concentration of aerosol during this test, inject one-half the number of squeezes (5, 10, or 15) every 30 seconds for the duration of the fit test procedure.*
6. After the initial injection of aerosol, ask the test subject to perform the following test exercises for 60 seconds each:

1. Normal breathing- no talking
2. Deep breathing- slow and deep (caution DO NOT CAUSE HYPERVENTILATION).
3. Turning head side to side- turn head extreme position, pause at each side for a breath.
4. Moving head up and down- Head should be lower until chin touches chest and rotated upward until subject is looking at the ceiling.
5. Talking- Read Rainbow Passage.

### **Rainbow Passage**

**When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.**

- a. Bending over or Jogging place
  - b. Normal breathing- same as a.
6. The test is terminated at any time the sweet taste of aerosol is detected by the subject because this indicates an inadequate fit.
  7. Repeat the fit test after re-donning and readjusting the respirator. A second failure may indicate that a different size or model may be needed.
  8. If the entire test is completed without the subject detecting the sweet taste of the aerosol, the test is successful and the respirator fit has been demonstrated.
  9. Check the nebulizer between subjects to confirm that it works properly. Clear clogs and clean nebulizer as needed. Empty the nebulizer at the end of the day.