N95 RESPIRATOR TRAINING PROGRAM

Participant's Guide

Occupation Health and Safety Section
Corporate Support Group
Emergency Health Services Branch

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INTRODUCTION

During the course of their duties, health care workers including ambulance personnel may sometimes be exposed to communicable diseases including those that could be potentially spread through the respiratory system e.g. Infectious TB (tuberculosis). To help address this, the Laboratory Center for Disease Control (LCDC of Health Canada) has issued recommendations for health care workers regarding the selection of a protective mask suitable for respiratory protection against Tuberculosis.

The Emergency Health Services Branch in turn has developed new standards for respiratory protective wear such that Ontario ambulance services are now required to carry N95 respirators. As a result, the Emergency Health Services Branch has developed this training course to advise ambulance personnel on how to effectively utilize the N95 respirator.

This training course is based on the #m 1860 N95 particulate respirator that is currently available at the Ontario Government Pharmacy. If the ambulance service chooses to use another brand of respirator, they are required to comply with the minimum requirements as per the Provincial Equipment Standards for Ontario Ambulance Services. For additional information about Ambulance Service Operators' Responsibilities, see Appendix for details.

BACKGROUND

It is important to note that infectious TB particles are one to five microns in size (1). Although surgical masks are effective in decreasing aerosolization of exhaled infectious particles, they effectively filter less than 50% of inhaled particles that are one to five microns in size and have marked leakage because of loose facial seals. Thus surgical masks may not prevent the inhalation of droplet nuclei (3).

It has been determined that the N95 respirator is more suitable for protecting the health care worker from inhaling such droplet nuclei. This type of respirator is designed to minimize wearer exposure to certain airborne particles in a size range of 0.1>10>0 microns (as stated on the 3M 1860 N95 package). See Appendix for more details regarding the N95 respirator and (NIOSH).

DEFINITION

Some of the documents related to personal respiratory protection use either the term respirator and/or mask. In this document, the term respirator is to be used. For purposes of this document a respirator is defined as a protective face piece hood or helmet that is designed to protect the wearer against a variety of harmful airborne agents.

DESCRIPTION

The N95 respirator meets the minimum requirements as per the Provincial Equipment Standards for Ontario Ambulance Services (Version 1.0, Dec. 12, 1997) That is, it

- Is constructed of a hypoallergenic material
- Is disposable
- Has an adjustable nosepiece and an elastic attachment strap
- Is fluid resistant to splash and splatter of blood and infectious materials
- Fits a wide range of face sizes (see note below)
- Has filter efficiency level of 95% or greater against particulate aerosols free of oil
- Minimizes wearer exposure to airborne particles in a size range of 0.1 to> 10 microns (Note that infectious TB particles are one to five microns in size (1).)
- Complies with National Institute of Safety and Health (NIOSH) Standard 42 CFR 84 or better

WHEN TO USE THE RESPIRATOR

Listed below are situations when ambulance personnel should wear the N95 respirator.

- When sharing air space with a patient with suspected or confirmed infectious TB. E.g. when Paramedic is
  - -In contact with a patient with signs and symptoms that suggest infectious TB (e.g. During ambulance transport or transport in protective custody);
  - -Entering a room where a patient with suspected or confirmed infectious TB is being isolated;
  - -Appropriate ventilation is not available and the patient's signs and symptoms suggest a high potential for infectious TB;
  - -The patient is potentially infectious, has a productive cough, and is unable to cover coughs;
  - -In contact with a patient with suspected or confirmed infectious TB who is undergoing a procedure that is likely to produce aerosolized infectious particles or to result in coughing or copious sputum production, even if appropriate ventilation is in place.

- When there is a risk that the emergency service worker may be splashed with blood or body fluids
- **When caring for a patient with any other communicable disease where a respirator/mask is required.** Such a communicable disease may include but not be limited to viral haemorrhagic fevers.

NOTE: Patients with suspected or confirmed infectious TB should use surgical masks (or a more efficient mask that does not have an expiratory valve) during transport or when they are required to leave the isolation room (3). DO NOT mask patient if contraindicated e.g. Difficulty breathing, patient anxiety.

WARNING:

- **This respirator helps protect against certain particulate contaminants but does not eliminate exposure to or the risk of contracting any disease or infection.** MISUSE may result in sickness or death.

- **Replace and discard the respirator immediately if it:**

  Becomes contaminated with blood or body fluids;
  Soiled and/or;
  Physically damaged.

- If breathing becomes difficult, replace and discard the respirator.

FITTING THE RESPIRATOR

Ambulance personnel must know how to effectively wear the respirator to ensure a tight facial seal. The user must ensure there is no interference with the face and respirator seal.

NOTE: For the mask to filter out droplet nuclei, the air must pass through and not around the mask. When gaps are present between the face and the mask resulting in a poor facial seal, air will preferentially flow through the gaps and bypass the mask filter. (2)

Fit Testing Methods

There are a variety of fit-testing methods. The adequacy of a facial seal may be determined by:

- Formal fit-testing methods (e.g. Saccharine testing). See the document, Health Care Respirator Training Program, 3M Health Care for details.
- Informal testing methods (e.g. Fit check)

Selecting the Size

Prior to initial use,

- Select a respirator that seems to provide the best fit. The manufacturer 3M currently provides a regular and small size.
- Conduct a face fit check to ensure the size or make is appropriate – as per the instructions (to follow).

Facial Hair (e.g. Beards and sideburns)

If the employee has facial hair e.g. Beard and sideburns,

- He is encouraged to ensure all facial hair that may interfere with the respirator and face seal is removed prior to commencing any shift. In some cases, an employee with a well-trimmed beard who is able to consistently pass a Face Fit Check may not need to shave in the area of the face seal mask at all.

NOTE: **POOR FACIAL SEAL HAS BEEN DOCUMENTED IN INDIVIDUALS WITH FULL BEARDS** (4). If the paramedic is wearing the respirator for purposes of protecting themselves from disease transmission, there may be a higher risk of disease transmission for ambulance personnel with facial hair as the fit might not be as tight as the facial hair interferes with the sealing surface of the face piece and the face.

Eyewear

If the employee wears eyewear,

- Ensure the eyewear is worn in a manner that does not interfere with the face and respirator seal. Examples of such eyewear include corrective glasses, goggles or other personal protective equipment.

Physical Condition Changes

If there are changes in the user's physical condition that could affect respirator fit,

- The user may have to change the size or make of the respirator. Examples of physical condition changes include the following:

  Facial scarring
  Dental changes
  Cosmetic surgery
  An obvious change in body weight

Trouble Getting Proper Fit

If an employee has a facial structure such that he/she is having trouble getting a proper fitting respirator,

- Consider another size or different manufacturer. Because of the variability in facial structure in the Canadian population, more than one size, make or model of mask may need to be provided to ensure that a properly fitting mask is available for all users. Respirators may vary in size from manufacturer to manufacturer. Also, users may be able to get a better fit by trying a respirator made by another manufacturer. Employers must help employees find a suitable respirator. Even for the same individual, fluctuations in weight may affect the face and respirator and alter respirator fit.

RECOMMENDED PROCEDURES FOR DONNING AND REMOVING THE RESPIRATOR

Donning and Removing the Respirator

See photos in Appendix.

Note: These respirators are intended for single use for ambulance personnel purposes.

Prior to donning the respirator,

- Inspect the outside of the filter. If it is damaged or soiled, it should be replaced.

To don the respirator (to be followed each time product is worn):

1. Cup the respirator in your hand with the nosepiece at fingertips, allowing the headbands to hang freely below the hand.
2. Position the respirator under your chin with the nosepiece up.
3. Pull the strap over your head so it rests high on the back of head, while continuing to hold the respirator in place.
4. Pull the bottom strap over your head and position it around neck below ears, while continuing to hold the respirator firmly in place. Untwist the straps. Position the respirator low on your nose.
5. Using two hands, mold the nosepiece to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece. NOTE: Pinching the nosepiece using only one hand may result in less effective respiratory performance.
6. Conduct a POSITIVE PRESSURE FIT CHECK. The respirator seal must be checked before each use. Ensure that the respirator is properly situated on the face and is providing a face to respirator seal by doing the following:

Place both hands completely over the respirator and exhale. While performing this step, be careful not to disturb the respirator's position.

If air leaks around your nose, adjust the nosepiece as describe in Step 5.

If air leaks at respirator edges adjust the straps back along the sides of your head.

If an adjustment is made, perform a Fit Check again.

To Remove the Respirator

1. Cup the respirator in your hand to maintain the position on your face. Pull the bottom strap over your head.
2. While still holding the respirator in position, pull the top strap over your head.
3. Remove the respirator from your face and discard it according to local infectious waste policies and practices.

Storage and Maintenance

When storing the respirators, do the following:

- Use Protective devices. Ensure the respirators are protected from contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals and deformation. Consider storing the respirators in the box that they came with, as the box is clearly marked and the respirator information is contained on the box for easy reference. Other protective devices to consider include individual storage bins, compartments and/or covers.
- Place the respirators in a location readily accessible to all potential users.
- Clearly mark the protective device indicating it contains a respirator(s).