

# **APIC Position**

## **Reuse of Respiratory Protection in Prevention and Control of Epidemic- and Pandemic-prone Acute Respiratory Diseases (ARD) in Healthcare**

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## APIC Position

### Reuse of respiratory protection in prevention and control of epidemic- and pandemic-prone acute respiratory diseases (ARD) in healthcare

#### I. Introduction

APIC has received numerous requests for guidance on the reuse of respiratory protection during an epidemic or pandemic of acute respiratory diseases in healthcare settings, including homecare. N-95 respirators, when used solely to prevent occupational exposure to *Mycobacterium tuberculosis*, can be safely reused until contaminated, damaged or until they can no longer form a good seal.<sup>1</sup>

Unlike *Mycobacterium tuberculosis*, which is transmitted exclusively via airborne droplet nuclei, most other respiratory pathogens are transmitted primarily via direct and indirect (droplet) contact with respiratory secretions. Therefore personal protective equipment used in caring for these other patients can become potentially contaminated and serve as a reservoir for infectious agents.

Various types of respiratory protection are used in healthcare facilities, including reusable and disposable respirators, as well as different types of masks. Use of each requires advance planning in the event of an epidemic or pandemic of acute respiratory disease. For example, some reusable respirators require attention to maintaining supplies of batteries and cartridges as well as proper cleaning and disinfecting. Use of N-95 respirators requires maintaining appropriate supplies of types used in surgical suites (valveless) as well as for patients in airborne precautions.

Planning, according to the CDC/HHS Interim Guidance on Planning for the Use of Surgical Masks and Respirators in Health Care Settings, is a critical aspect, noting that in the *event of actual or anticipated shortages of N-95 respirators*:

- Other NIOSH-certified N-, R-, or P-class respirators should be considered in lieu of the N-95 respirator.
- If re-useable elastomeric respirators are used, these respirators must be decontaminated according to the manufacturer's instructions after each use.
- Powered air purifying respirators (PAPRs) may be considered for certain workers and tasks (e.g., high-risk activities). Loose-fitting PAPRs have the advantages of providing eye protection, being comfortable to wear, and not requiring fit-testing. However, hearing (e.g., for auscultation) is impaired, limiting their utility for clinical care. Training is required to ensure proper use and care of PAPRs.<sup>2</sup>

The following recommendations from APIC were developed from existing federal, public policy and international agencies' guidelines including the CDC/NIOSH, FDA, OSHA, WHO and the IOM. This guidance is primarily directed to the reuse of disposable masks and N-95 respirators since these are the types most likely to be available in all care settings. They are also likely to be desired by the public and are being stockpiled by federal agencies. These recommendations are based on the premise that existing recommendations/guidelines are followed when supplies are adequate.

## **II. Recommendations for reuse of respirators, surgical and procedure masks during periods of scarce resources**

Having stated that reuse may be considered but only under dire conditions, APIC recommends organizations should develop priorities as follows:

### **1. Aerosol-generating procedures:** *First priority should be given to healthcare workers (HCW) performing aerosol-generating procedures.*

- If supplies are limited, use of particulate respirators should be prioritized for providing care for patients with obligate and preferential airborne-transmitted diseases such as tuberculosis, e.g., HCWs performing aerosol-generating procedures associated with documented risk of pathogen transmission.<sup>3</sup>
- If a particulate respirator is not available, performance of aerosol-generating procedures associated with a documented increased risk of pathogen transmission should be avoided in patients with ARDs of potential concern whenever possible<sup>3</sup>

### **2. Cohorting:** *Workers assigned to an infected cohort since those workers can keep the device on while in the unit, not removing or manipulating the device*

#### **Respiratory protection**

- If patients with ARDs known or suspected to be airborne are cohorted in a common area or in several rooms on a nursing unit, and multiple patients will be visited, it may be practical for a HCW to wear one particulate respirator for the duration of the activity. This type of use requires that the respirator is not removed at any time during the activity and that the user does not touch the respirator. If the respirator gets wet or dirty with secretions, it must be changed immediately. Hands should be considered contaminated after contact and hand hygiene should be performed.
- Specific training on how to put on the respirator, perform the seal check every time the respirator is worn, and avoid contamination during use, removal and disposal of the respirator is necessary to ensure compliance with correct respirator use.<sup>3</sup>

### **3. Administrative and environmental measures:** *Measures to minimize potential airborne contaminants*

**Healthcare facility:** *Establish cohort unit and limit crossover of staff from affected units.*

To minimize the number of personnel required to come in contact with suspected or confirmed infectious patients, thereby reducing worker exposure and minimizing the demand for respirators, the following measures should be undertaken:

- a. Establish specific wards for patients with infectious conditions
- b. Assign dedicated staff (e.g., healthcare, housekeeping, custodial) to provide care for infectious patients and restricting those staff from working with non-infectious patients
- c. Dedicate entrances and passageways for infectious patients<sup>2</sup>

**Prioritization hierarchy:** Decision guidance for determining respirator wear should consider factors such as *duration, frequency, proximity, and degree of contact with the patient.*<sup>2</sup>  
For example:

**Face shield use:** A face shield can be worn over a respirator to protect it from contamination with blood or other body fluids thus allowing the respirator to be reused (if it remains uncontaminated). Care should be taken during removal of the face shield to ensure that the respirator is not contaminated. If reusable, the face shields must be decontaminated between uses. Perform hand hygiene after removal of the face shield and before removing the respirator.

**Homecare setting:**

- a. Open windows to increase air changes and dilute the concentration of organisms.
- b. Place patient in separate room with door closed.
- c. Minimize patient contact with others in the home.
- d. Have patient follow respiratory hygiene and cough etiquette. Mask patient or at a minimum, cover cough with tissue or arm. Request the patient perform frequent hand hygiene and place alcohol hand rub within reach of patient.

**4. If supplies are insufficient or unavailable:**

*N-95*

- Reuse N95 as long as possible, taking care to avoid contamination: If a sufficient supply of respirators is not available during a pandemic, employers and employees may consider reuse as long as the device has not been obviously soiled or damaged (e.g., creased or torn), and it retains its ability to function properly. This practice should only be considered under the most dire of conditions.<sup>4</sup>

Surgical and procedure masks do not offer appropriate respiratory protection against small particle aerosols (droplet nuclei) and should not be used unless particulate respirators are not available when dealing with diseases transmitted by the airborne route. *If a particulate respirator is not available, use a tightly-fitting mask.*<sup>5</sup>

***Surgical and procedure masks***

- **If supplies of N-95 (or higher) respirators are no longer available, surgical masks can provide benefits against large droplet exposure, and should be worn for all healthcare patient activities**<sup>6</sup>
  - Select surgical masks that can be tied tightly or have elastic straps (not ear loop masks that do not form a seal).
  - Disposable medical masks should fit the user's face tightly and be discarded immediately after use. If the mask gets wet or dirty with secretions, it must be changed immediately.<sup>3</sup>
  - Proper surgical mask or respirator use and removal includes the following:<sup>2</sup>
    - Prior to putting on a respirator or surgical mask, wash hands thoroughly with soap and water or use an alcohol-based hand sanitizer to reduce the possibility of inadvertent contact between contaminated hands and mucous membranes.
    - If worn in the presence of infectious persons, a respirator or surgical mask may become contaminated with infectious material. Therefore, avoid touching the outside of the device to help prevent contamination of hands.

- Once worn in the presence of an [infected] patient the surgical mask or disposable N-95 respirator should be removed and appropriately discarded.
- After the surgical mask or respirator has been removed and discarded, wash hands thoroughly with soap and water, or use an alcohol-based hand sanitizer.
- If supplies of FDA-approved healthcare surgical/procedure masks become *absolutely* unavailable, APIC recognizes that:
  - Controversies exist regarding how to proceed when supplies of N-95 or higher level respirators, FDA-approved healthcare surgical/procedure masks or even FDA-approved respirators for public health emergencies, intended for general public use are depleted/unavailable<sup>7</sup>
  - Review of the scientific literature identified a published letter detailing construction of a handmade, reusable cotton mask. This type of mask may provide some level of protection, based on anecdotal and/or limited evidence<sup>8-10</sup> No recommendation can be made but decision makers should be aware of such potential resources
  - No evidence about the effectiveness of non-FDA-approved masks (fabric masks or masks intended to filter dust and mist from wood, metal, and masonry work) in preventing infectious disease spread has been found in the literature to date. As such, no recommendation for their use can be made.<sup>6</sup>

**5. Regardless of the availability of respirators or surgical masks, environmental control measures, respiratory hygiene/cough etiquette and extreme vigilance with proper hand hygiene are critical in minimizing the likelihood of exposure.**

Research into respiratory protection is continuing and ICPs should keep abreast of developments from CDC/HHS, FDA, and IOM concerning the use of masks and respirators developed for the public in the likelihood of a pandemic or other conditions requiring respiratory protection.<sup>6-11</sup>

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