Strategies for the Conservation of Respiratory PPE


**Background:** The novel coronavirus (COVID-19) outbreak has caused a worldwide shortage of N95 respirators and face masks used in medical settings. As a result, we must assume that supplies will be restricted for some time to come and, therefore, ensure that these devices are available when specifically indicated. Moreover, studies indicate that Healthcare Workers’ (HCW’s) willingness to work during a pandemic increase when healthcare organizations have mature respiratory protection programs and an adequate supply of respirators.\(^1\) This document offers guidance on how to optimize supplies of N95 filtering facepiece respirators (commonly called “N95s”) and face masks in healthcare settings in the face of ongoing global supply chain issues and potential transmission of coronavirus disease 2019 (COVID-19) in United States.

**Recommended Strategies for the Conservation of Respiratory Personal Protective Equipment**

**Ensure N95s and face masks are only used for their proper indications**

- Provide refresher training to relevant staff about indications for use of N95s and face masks.
- Empower staff to enforce a culture of adherence to these indications.

**Indications for N95 Use**

- N95s are **only** indicated for HCWs who come into close contact with persons with a respiratory infection warranting airborne precautions.
- In times of shortage, reserve surgical N95s for HCWs working in a sterile field or are at risk for splashes and sprays of fluids, including aerosol generating procedures (i.e., operative or procedural settings).\(^2\)
  - Standard N95s can be used for most other indications that warrant airborne precautions.
- Only health care workers who have undergone fit-testing should wear N95s; fit-testing should occur annually.
- **Visitors and patients should never be offered N95s!**


\(^2\) NIOSH Respirator Information: [https://www.cdc.gov/niosh/rpptl/topics/respirators/disp_part/respsource3healthcare.html](https://www.cdc.gov/niosh/rpptl/topics/respirators/disp_part/respsource3healthcare.html)
Indications for Face Mask Use

- Source control
  - for patients presenting with influenza-like illness (ILI) or fever and rash
  - for patients on airborne or droplet precautions when in public spaces (e.g., ED, radiology waiting area, during transport)
  - for staff and visitors with respiratory infection symptoms
- Staff caring for patients on droplet precautions
- Regulatory compliance (e.g., staff members not vaccinated for influenza)
- Visitors of patients on droplet or airborne precautions
- When performing procedures requiring aseptic technique

Use engineering controls to limit patient encounters requiring PPE

- Implement rigorous screening and isolation protocols in areas where patients with acute illnesses may present (including emergency departments, urgent care, walk-in clinics, labor and delivery) to rapidly identify and isolate potentially infectious patients.
  - Patients identified with potential COVID-19 infection should be immediately placed in an airborne infection isolation room (AIIR) preferably, or a private room with closed door.
  - Limit the number staff that enter the room to only the primary clinical care team.
- Consider installing physical barriers such as glass or plastic windows in registration and triage areas.
- Use telephone or video chat devices on tablets, cell phones, or video monitors in designated ED isolation rooms and other patient care areas to decrease the need for face-to-face interactions with patients with suspected or confirmed COVID-19.
  - Ensure spoken language and sign language translation services are available as part of remote communication strategies.

Implement administrative controls to limit patient encounters requiring respiratory PPE and to reduce the need to use masks for source control

- Whenever possible, patients with confirmed or suspected COVID-19 should be co-located on units with appropriate engineering controls (i.e. AIIR rooms) to consolidate resources in dedicated patient care areas and to limit the risk of exposures in multiple areas of the facility.
- Consider establishing dedicated care teams for patients with confirmed or suspected COVID-19 to limit staff participating in direct care of these patients and to limit staff that need to be fit tested.
  - Having designated teams of HCWs could also minimize respirator use when extended wear of N95s is implemented (see resources).
- Encourage staff to bundle patient care-related activities into a single interaction.
- Implement policies to limit staff entering the rooms of patients on airborne and/or droplet precautions to only those providing direct patient care – consider excluding dietary and housekeeping staff.
- Have symptomatic patients/residents stay in their own rooms as much as possible, including restricting them from common activities, and have their meals served in their rooms when possible.
- Restrict visitors to patients with confirmed or suspected COVID-19 and/or utilize audiovisual communication equipment to allow visitor interaction without entering the patient rooms.
- Reinforce to families/visitors that they should not enter the facility when ill; consider letters to families, providing instructions on admission and placing conspicuous signage near entrances.
Consider restricting visitation by children during community outbreaks of influenza or community transmission of SARS-CoV-2 (the virus which causes COVID-19).

- Whenever possible, use expired supplies of personal protective equipment (PPE) for trainings and fit testing.
- Develop a plan for just in time fit testing for staff whose normal duties do not place them at risk for exposure to airborne infections. Fit testing can be performed for these staff in the event of sustained community transmission of SARS-CoV-2.
- If using a qualitative fit-testing program, encourage HCWs to keep and use the fitted N95 for subsequent patient encounter requiring airborne precautions.

**Implement measures to secure and control supplies of respiratory PPE**

- Designate PPE stewards, such as Nursing Administrators, that are responsible for securing and distributing N95 and mask supplies to staff when indicated.
- Remove N95s from units that do not require routine mask/N95 protection. Limit access to face mask supplies as appropriate.
  - Consider maintaining N95s only in the ICU, ED and any other high-priority units identified by infection prevention and control.
  - When other units receive a patient on airborne isolation precautions, they may be given a supply of N95s.
- Remove N95s from isolation carts that are not being used for airborne precautions.
- Do not leave face masks out in public spaces; instead, train staff when to offer masks to patients and visitors.
- Educate staff on why they should not hoard N95/mask supplies or take them home for personal use.

**Take steps to promote healthcare worker and patient safety to reduce transmission of respiratory infections in healthcare settings and limit the need for respiratory PPE for symptomatic healthcare workers or those required to wear masks because they did not receive a flu vaccine**

- Require or otherwise incentivize the flu shot!
- Do not penalize staff for taking appropriate sick leave.
- Ensure staff with symptoms of influenza-like illness (ILI), including suspected COVID-19, are excluded from work according to public health recommendations.
- Train staff to recognize and monitor for ILI symptoms and to implement the appropriate infection control measures (e.g., offering masks, transmission precautions) to reduce the risk of healthcare-associated transmission of infections.
- If there are shortages of N95s and other PPE, prioritize equipment for healthcare workers caring for confirmed or suspected COVID-19 patients with severe illness (e.g., those requiring ventilator support) and for those needing procedures that could generate infectious aerosols (e.g., sputum induction, open suctioning of airways).
Consider alternatives to N95s for healthcare workers whose duties require the regular use of respirators, particularly those likely to be caring for confirmed or suspected COVID-19 patients with severe illness

Explore alternative respiratory protective devices that offer equivalent protection or greater than standard N95 respirators including:
- N99 and N100
- Powered Air Purifying Respirator (PAPR)
- Elastomeric Respirators (EHFR)

In times of severe shortages, consider contingency measures for extended use and limited reuse of N95 respirators

Extended use refers to the practice of wearing the same respirator for repeated close contact encounters with multiple patients, without removing the respirator between patients. This approach could be used on a special ED or inpatient respiratory pathogen surge unit for confirmed or suspected COVID-19.

Reuse refers to the practice of using the same N95 respirator for multiple encounters with patients but removing it (‘doffing’) after each encounter. The respirator is stored in between encounters to be put on again (‘donned’) prior to the next encounter with a patient. This strategy should only be employed for pathogens in which contact transmission (e.g. fomites) is not a concern (e.g. TB). **N95s should not be reused after aerosol generating procedures or encounters with patients with confirmed or suspected COVID-19.**

- Policies on extended use and reuse of N95s should be developed in consultation with your respiratory protection program, occupational health and infection control departments with input from the NYS Department of Health and/or the NYC Department of Health and Mental Hygiene

Resources
- Healthcare supply of Personal Protective Equipment (CDC)
- Strategies for Optimizing the Supply of N95 Respirators (CDC)
- Elastomeric and Powered-Air Purifying Respirators in U.S. Healthcare
- Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings (CDC/NIOSH)
  https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
- Hospital Respiratory Protection Program Toolkit (CDC/NIOSH)
  https://www.cdc.gov/niosh/docs/2015-117/default.html

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3 Recommended Guidance for Extended Use and Limited reuse of N95 Respirators in Healthcare Settings:
https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
Appendix A: Comparison of respirators

Surgical 95s vs. standard N95s
- All are for non-oil filtration applications
- All have N95 filtration rating
- All have Assigned Protection Factor = 10

*Surgical N95 respirators*: The criteria are, it needs to cover the nose and mouth, be fluid resistant, and if rated as N95, block particles at >0.3 microns at an efficiency of 95%. A common model of surgical N95 is the 3M 1860.

*Standard N95 respirators*: Appropriate for aerosol and particle filtration in a healthcare setting. They could not be used for procedures that generated splash or other fluid contact since they are not rated fluid resistant. Also not recommended for high-risk aerosol-generating procedures (e.g., intubation, bronchoscopy). Common models include 3M 8201, 8511 and 9201.

<table>
<thead>
<tr>
<th>Considerations for Respirator Selection in Healthcare</th>
<th>N95</th>
<th>Surgical N95</th>
<th>Loose-Fitting PAPR</th>
<th>Elastomeric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complies with OSHA Standards</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Requires Proper Use Training</td>
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<td>X</td>
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<tr>
<td>Requires Fit Testing</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>Can be used for Airborne Precautions</td>
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<td>X</td>
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<tr>
<td>Can be used with Sterile Field</td>
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<td></td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Can be used for High-Risk Aerosol-Generating Procedures*</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Can be used With Facial Hair</td>
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<td>X</td>
</tr>
<tr>
<td>Designed for Reuse (can be cleaned/maintained)</td>
<td>X</td>
<td></td>
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</tr>
</tbody>
</table>

*Additional PPE may be required
Source: OSHA/NIOSH Hospital Respiratory Protection Program Toolkit

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4 CDC/NIOSH list of surgical N95 respirators: [https://www.cdc.gov/niosh/nptl/topics/respirators/disp_part/respsource3surgicaln95.html](https://www.cdc.gov/niosh/nptl/topics/respirators/disp_part/respsource3surgicaln95.html)