Recommended Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings

Background

This document recommends practices for extended use and limited reuse of NIOSH-certified N95 filtering facepiece respirators (commonly called “N95 respirators”).

Supplies of N95 respirators can become depleted during an influenza pandemic or wide-spread outbreaks of other infectious respiratory illnesses. Existing CDC guidelines recommend a combination of approaches to conserve supplies while safeguarding health care workers in such circumstances. These existing guidelines recommend that health care institutions:

* Minimize the number of individuals who need to use respiratory protection through the preferential use of engineering and administrative controls;
* Implement practices allowing extended use and/or limited reuse of N95 respirators, when acceptable; and
* Prioritize the use of N95 respirators for those personnel at the highest risk of contracting or experiencing complications of infection.

This document focuses on one of the above strategies, the extended use and limited reuse of N95 respirators.

Definitions

**Extended** use refers to the practice of wearing the same N95 respirator for repeated close contact encounters with several patients, without removing the respirator between patient encounters. Extended use may be implemented when multiple patients are infected with the same respiratory pathogen and patients are placed together in dedicated waiting rooms or hospital wards. Extended use has been recommended as an option for conserving respirators during previous respiratory pathogen outbreaks and pandemics.

**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. For pathogens in which contact transmission is not a concern, non-emergency reuse has been practiced for decades.

Respirator Extended Use Recommendations

A key consideration for safe extended use is that the respirator must maintain its fit and function. Workers in other industries routinely use N95 respirators for several hours uninterrupted. Experience in these settings indicates that respirators can function within their design specifications for 8 hours of continuous or intermittent use.

The following steps will be taken to reduce contact transmission after donning:

* Discard N95 respirators following use during aerosol generating procedures (it gets wet from something being sprayed on it).
* Discard N95 respirators contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.
* Perform hand hygiene with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator (if necessary for comfort or to maintain fit).
* Discard any respirator that is obviously damaged or becomes hard to breathe through.

Extended use alone is unlikely to degrade respiratory protection.

**Respirator Reuse Recommendations**

There is no way of determining the maximum possible number of safe reuses for an N95 respirator as a generic number to be applied in all cases. Safe N95 reuse is affected by a number of variables that impact respirator function and contamination over time. The recommendations below are designed to provide practical advice so that N95 respirators are discarded before they become a significant risk for contact transmission or their functionality is reduced.

Employees will take the following steps to reduce contact transmission:

* Discard N95 respirators following use during aerosol generating procedures.
* Discard N95 respirators contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.
* Discard N95 respirators following close contact with any patient infected with an infectious disease requiring contact precautions.
* Place respirators in a clean, breathable container such as a paper bag between uses. To minimize potential cross-contamination, store respirators so that they do not touch each other and the person using the respirator is clearly identified. Storage containers should be disposed of or cleaned regularly.
* Clean hands with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator (if necessary for comfort or to maintain fit).
* Avoid touching the inside of the respirator. If inadvertent contact is made with the inside of the respirator, discard the respirator and perform hand hygiene as described above.
* Use a pair of clean (non-sterile) gloves when donning a used N95 respirator and performing a user seal check. Discard gloves after the N95 respirator is donned and any adjustments are made to ensure the respirator is sitting comfortably on your face with a good seal.

Secondary exposures can occur from respirator reuse if respirators are shared among users and at least one of the users is infectious (symptomatic or asymptomatic). Thus, N95 respirators must only be used by a single wearer. To prevent inadvertent sharing of respirators, healthcare facilities should develop clearly written procedures to inform users to:

* Label containers used for storing respirators or label the respirator itself (e.g., on the straps) between uses with the user’s name to reduce accidental usage of another person’s respirator.

Risks of Extended Use and Reuse of Respirators

Although extended use and reuse of respirators have the potential benefit of conserving limited supplies of disposable N95 respirators, concerns about these practices have been raised. The most significant risk is of contact transmission from touching the surface of the contaminated respirator. One study found that nurses averaged 25 touches per shift to their face, eyes, or N95 respirator during extended use. Contact transmission occurs through direct contact with others as well as through indirect contact by touching and contaminating surfaces that are then touched by other people.

Respiratory pathogens on the respirator surface can potentially be transferred by touch to the wearer’s hands and thus risk causing infection through subsequent touching of the mucous membranes of the face. While studies have shown that some respiratory pathogens remain infectious on respirator surfaces for extended periods of time, in microbial transfer and reaerosolization studies more than ~99.8% have remained trapped on the respirator after handling or following simulated cough or sneeze.

While contact transmission caused by touching a contaminated respirator has been identified as the primary hazard of extended use and reuse of respirators, other concerns have been assessed, such as a reduction in the respirator’s ability to protect the wearer caused by rough handling or excessive reuse.

<https://www.cdc.gov/vhf/ebola/hcp/ppe-training/n95respirator_gown/donning_07.html>

<http://cdc.gov/vhf/ebola/hcp/ppe-training/n95respirator_gown/doffing_08.html>

<https://www.cdc.gov/vhf/ebola/hcp/ppe-training/n95respirator_gown/donning_09.html>

<http://cdc.gov/vhf/ebola/hcp/ppe-training/n95respirator_gown/doffing_17.html>