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N95 Respirator Emergency Decontamination

Example Guide to Beginning N95 Decontamination and Reuse

Intended Audience: Hospital administrators, Decision makers

Introduction

This document outlines approaches and issues to be considered by hospitals if they plan to decontaminate and reuse N95 filtering facepiece respirators (FFRs). N95 decontamination is a component of an overall strategy for optimizing N95 respirator supply. Decontamination is to be used only under crisis conditions. See CDC guidance for optimizing respirator supply. The CDC recommends implementing extended use and limited reuse before implementing decontamination and reuse.

Decontamination procedures are under development at many organizations. The guidance may change. See n95decon.org for updates. Please send comments and feedback at https://www.n95decon.org/contact.

Reviewed by: MDs (2), COVID ICU RNs (2), and Hospital Health and Safety Staff (2)

Important Points for Decontamination and Reuse

Decontamination is a risk-mitigation practice for crisis conditions, and decontamination approaches vary considerably in (1) pathogen inactivation, (2) effects on N95 fit and filtration, and (3) accessibility to a range of healthcare environments.

- Some protocols achieve sterilization (destruction of all microorganisms) while others only achieve low-level decontamination (pathogens and spores may survive) (*Guideline for Disinfection and Sterilization*, 2008).
- The number of decontamination cycles an N95 can withstand depends on the method used (N95DECON Fact Sheets). User seal checks are crucial to ensure proper fit (Filtering out Confusion, 2018).
- Different models of N95 have different performance after decontamination by various protocols. Ensure an appropriate decontamination method is used for the N95 model in use (N95DECON Fact Sheets).
- Each don/doff reduces the likelihood that an N95 will fit well. In one study the fit factor was observed to drop with each don/doff, and after five dons was consistently below the OSHA standard of 100 (Bergman et al., 2010).
- Improper doffing has been shown to expose the wearer to contamination risk. Proper doffing must accompany decontamination (Brady et al., 2017).

The decision to implement N95 decontamination and reuse should be made on a per-hospital basis after reviewing regulatory guidance and after exhausting conventional and contingency capacity strategies. Any decontamination approach needs to be accompanied by an industrial hygiene workflow that meets FDA and OSHA standards.

Adoption

1. Review CDC, FDA, and OSHA regulatory guidance. See ECRI guide for additional information.
2. Review documents on N95DECON's Example Processes Page,
3. Communicate to staff who use N95 FFRs to stop wearing makeup, sunscreen, Vaseline, or facial oils. Explain that N95 FFRs cannot be processed for decontamination if they are soiled.
4. Decide whether to implement **pooled** or **return-to-user** processing and which method (H_2O_2, humid heat, UV-C) is best suited to your organization's needs and resources. Pooled return is appropriate for sterilization methods only.
5. Begin collecting used N95 FFRs as soon as personnel are fully trained.

Implementation

1. Use the Hospital Incident Command Structure (HICS) to:
    a. Identify personnel, in-house equipment, and supply needs to implement the method-specific protocol and reuse plan. Implementation will require coordination of Materials Management, Infection Control, Decontamination, Healthcare Workers, Sterile Processing Units, Hygiene Experts, and others.
    b. Set up collection and return stations well before (e.g. ~10 days if possible) reaching crisis shortage. Prepare the rollout of the chosen N95 FFR return protocol:
        i. **Pooled.** Widely distribute clearly-labelled N95 collection bins—one bin at the nursing station of every patient care unit. Repurpose recycling and trash bins from closed areas (labs, clinics). Label side and top of bin. Make a smaller collection hole in the top of the bin. Clearly mark "For N95 FFRs to be decontaminated ONLY."
        ii. **Return-to-index-user.** Read Example Return-to-Index User Setup and Logistics document.
        iii. If an **external decontamination service** is used (with either pooled or return-to-indexed user), they may provide more specific or additional guidelines to follow.
    c. Train healthcare workers (HCWs). An example of training material for healthcare workers can be found on n95decon.org. Provide information about the decontamination process chosen and **emphasize any important changes to proper doffing technique** that may be necessary to facilitate N95 decontamination and reuse (e.g. Nebraska video on donning and doffing)

   d. Train decontamination personnel with the method-specific SOP, safety, and chain of custody. Begin collecting N95 FFRs.
   e. Develop and pilot-test a protocol using on-site equipment and personnel. (e.g. Nebraska UVGI Decontamination and Reuse).
2. When the decontamination and reuse program is approved by the hospital quality control team and meets regulatory standards, begin implementing the program on a rolling basis.
3. Perform regular verification/quality control to check for compliance with the method-specific critical processing parameters.
4. Obtain and incorporate continual feedback to improve the program.
5. Monitor new N95 supply levels. When able, end the reuse program or make modifications as necessary or in response to updated federal guidance.

Regulatory Guidance

- **CDC guidance for optimizing respirator supply**
  https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html
- **CDC extended use and limited reuse**
  https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html
- **CDC Decontamination and Reuse of Filtering Facepiece Respirators**
  https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/decontamination-reuse-respirators.html

Information and Resources

- **ECRI CLINICAL EVIDENCE ASSESSMENT: Safety of Extended Use and Reuse of N95 Respirators**
  https://www.elsevier.com/__data/assets/pdf_file/0006/997863/COVID-ECRI-N95-Respirators_2020-03.pdf
- **Processes published by N95DECON and other sources**
  https://www.n95decon.org/example-processes
- **Literature reviews of different decontamination methods published by N95DECON**
  https://www.n95decon.org/publications
- **A bibliography of sources for this and other N95DECON publications**
  https://www.n95decon.org/bibliography
- **Training material on donning and doffing N95 FFRs for reuse**
  N95 Respirator Limited Resue - Healthcare Professionals Providing Clinical Care
  https://app1.unmc.edu/nursing/heroes/mpv.cfm?updateindex=132&src=yt

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