

Audience: Medical Directors, Healthcare Administrators, Infectious Disease, Infection Prevention and Control, Occupational Health and Safety, Materials Management and Procurement.

In times of severe shortages, consider contingency measures for reuse and extended use of Personal Protective Equipment (PPE). In general, *extended use is preferred over re-use to reduce the risk of self-contamination from repeated donning and doffing of the same equipment*. Policies on reuse and extended use of PPE should be developed in consultation with your respiratory protection program, occupational health and infection control departments with input from public health partners.

REUSE OF PPE

Reuse refers to the practice of using the same PPE for multiple encounters with patients but removing it ('doffing') between each of those encounters. The equipment is safely stored in between patient encounters. Previously used PPE should never be taken outside of patient care areas unless the item is decontaminated or placed in a clean breathable container.

Reuse of eye protection (e.g., disposable face shields, goggles):

- Disposable face shields and non-disposable eye protection should be decontaminated and reused whenever possible provided that the integrity of the equipment remains intact and visibility is not compromised.
- Avoid touching eye protection when wearing as it should be considered contaminated. Immediately perform hand hygiene after touching or adjusting eye protection during patient care.
- Eye protection should be decontaminated when visibly soiled or each time it is removed prior to reusing it. Store in a clean paper bag or other container between use.
 - Wipe the inside and outside of the shield with an Environmental Protection Agency (EPA)-registered hospital disinfectant and allow for drying before re-donning.
 - Suggest PDI super sani-cloth wipes (or other alcohol-based wipes).
- For detailed information on cleaning/disinfecting eye protection, see: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/eye-protection.html>

Reuse of isolation gowns:

- During shortages of isolation gowns, consider shifting to the use of washable gowns that are laundered after use.
- Reuse of single use isolation gowns is difficult, due to breakage of ties when removing, and should be avoided.
- Cloth gowns could be considered for reuse without washing if there was minimal to no direct physical contact with the patient or nearby surfaces (e.g. bedrails).
- If single use gowns must be reused, care should be taken to minimize contact with the outside of the gown to limit self-contamination.

Reuse of facemasks:

For non-COVID scenarios

- If facemask is used for encounters during which droplet precautions were not needed, it may be reused with appropriate donning and doffing between each patient so long as it is not visibly soiled, damaged, wet or hard to breathe through.

When caring for confirmed or possible COVID patients or other infections requiring droplet precautions

- Face masks may be reused with appropriate donning and doffing between each patient so long as they are not visibly soiled, damaged, wet or hard to breathe through.
- When reusing facemasks, avoid touching the inside surface and use a face shield during patient care if possible, to limit contamination.
- After use with patients with confirmed or possible COVID-19, masks should be considered contaminated. There are no recommended decontamination procedures for masks, so between use, masks should be doffed appropriately, folded so that the outside surface is inwards and stored in a clean space.

Reuse of N95 respirators:

- In periods of short supply, N95 respirators should be prioritized for use with patients in intensive care units or during aerosol generating procedures including:
 - Endotracheal intubation and extubation
 - Non-invasive ventilation (BIPAP/CPAP)
 - Manual ventilation before intubation
 - Open suctioning
 - Bronchoscopy
 - Nebulizer treatments
 - High-flow oxygen via mask
 - Sputum induction
 - Tracheotomy
- N95 respirators can be reused if they remain functional¹ and are used in accordance with your facility's protocols. Reuse should be avoided after encounters with a higher risk of contamination (e.g., performing aerosol generating procedures).
- When reuse is necessary, a barrier such as a full-face shield (preferable) or face mask should be worn over the N95 respirator to limit contamination.
- If performing aerosol generating procedures, practice extended use of N95s over reuse. If reuse cannot be avoided, use a barrier (as described above) to limit contamination.
- Avoid touching the inside of the respirator and use clean gloves when donning *a used* N95 respirator and performing a user seal check.
- Between use, N95 respirators should be stored in a clean paper bag and labelled with the provider's name.
- When available, N95 respirators can be decontaminated and reused using certain procedures such as:
 - UV light- see [Nebraska protocol](#)
 - [Vaporized hydrogen peroxide](#)
 - [Hot air](#) (75 °C, 30 min, 20 cycles)
- For more detailed guidance on N95 reuse see: <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>

EXTENDED USE OF PPE EQUIPMENT

Extended use refers to the practice of wearing the same equipment for repeated encounters with patients without removing the PPE. This approach could be used while seeing multiple patients with confirmed or possible COVID-19.

- Eye protection, isolation gowns, face masks, N95 respirators can be considered for extended use. Gloves should be changed between each patient if possible or perform hand hygiene with gloves before and after donning and doffing if unable to change out.
 - Gowns and gloves should be changed between patients if they are on contact precautions for different pathogens (e.g., *Candida auris*).
- Extended use of PPE should be done in conjunction with cohorting of patients as described below.
 - Areas designated for donning and doffing should be identified for high- and moderate-risk units if extended use PPE is adopted.
- The maximal amount of time PPE can be worn continuously is not well defined. Studies show that N95 respirators remain effective for up to 8 hours of continuous use. However, provider tolerability may limit this to shorter durations.
 - PPE equipment should be removed if the integrity is damaged, visibly soiled, wet or becomes difficult to breathe through.

¹Functional means that the N95 respirator has maintained its physical integrity and when used properly provides protection (exposure reduction) consistent with the assigned protection factor for this class of respirator.

COHORTING AS A STRATEGY TO MAXIMIZE PPE SUPPLIES

- Facilities should identify high, moderate, and low risk units and begin cohorting of patients accordingly.
- High risk units (i.e. ICUs):
 - Includes patients with confirmed or possible COVID-19 who are likely to require ongoing aerosol generating procedures (i.e. intubation, frequent suctioning, high-flow oxygen delivery).
 - Use negative pressure rooms/spaces when possible to reduce contamination of PPE.
 - PPE in these units should include eye protection, isolation gown, N95 respirator, and gloves.
 - Powered air-purifying respirators (PAPRs) when available should be prioritized to these high-risk units. See UW Medicine resources (link below) for a PAPR hood decontamination protocol.
 - If PPE resources limited
 - Eye protection and N95 respirators: Can extend use between patients
 - Isolation gowns: Change between patients if supplies permit
 - Can extend use if patient is not on contact precautions for other pathogens
 - Gloves should be changed between patients if possible.
- Moderate risk units:
 - Should include patients with confirmed or possible COVID-19 who are not critically ill and do not require ongoing aerosol generating procedures.
 - Confirmed COVID-19 positive patients can be cohorted in the same room. If possible, isolate patients with possible COVID-19 in individual rooms until diagnosis can be confirmed.
 - PPE in these units should include surgical mask, eye protection, gown, and gloves.
 - If an aerosol-generating procedure is to be performed in moderate risk units, the patient should be moved to an airborne isolation room and appropriate PPE (i.e. N95 respirator) should be donned.
- Low risk units:
 - Should include all other patients admitted to the hospital without confirmed or possible COVID-19.
 - PPE requirements should follow hospital PPE-conserving protocols.

Resources on PPE Conservation:

- CDC's Strategies to Optimize the Supply of PPE and Equipment
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html>
- CDC's Recommended Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings
<https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>
- Nebraska Medicine COVID-19 Resources for Providers- example policies and procedures
<https://www.nebraskamed.com/for-providers/covid19>
- University of Washington Medicine COVID-19 Resource Site- example policies and procedures
<https://covid-19.uwmedicine.org/Pages/default.aspx>