

1. N95 Mask Decontamination Considerations: An interview with the inventor of the N95 electrostatic charging technology: <https://utrf.tennessee.edu/information-faqs-performance-protection-sterilization-of-face-mask-materials/>
2. FDA and Facemask Decontamination: An approval of Battelle's decontamination process: <https://www.theverge.com/2020/3/29/21198715/fda-approves-battelles-decontaminate-n95-face-masks-coronavirus>
3. A study from Duke regarding Hydrogen Peroxide Vapor N95 decontamination: https://www.safety.duke.edu/sites/default/files/N-95_VHP-Decon-Re-Use.pdf
4. A study from Stanford regarding N95 mask reuse and decontamination strategies: https://m.box.com/shared_item/https%3A%2F%2Fstanfordmedicine.box.com%2Fv%2F covid19-PPE-1-1
5. A study from Nebraska Medicine regarding N95 decontamination through the Ultraviolet Germicidal Irradiation (UVGI) process: Document attached.

Finally, Dr. Lockwood referenced information today for decontamination of PPE other than masks. This decontamination information is located below.

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/isolation-gowns.html>

- Reducing the number of patients going to the hospital or outpatient settings
- Excluding HCP not directly involved in patient care
- Reducing face-to-face HCP encounters with patients
- Excluding visitors to patients with confirmed or suspected COVID-19
- Cohorting patients and HCP
- Maximizing use of telemedicine

Shift gown use towards cloth isolation gowns.

Reusable (i.e., washable) gowns are typically made of polyester or polyester-cotton fabrics. Gowns made of these fabrics can be safely laundered according to [routine procedures](#) and reused. Care should be taken to ensure that HCP do not touch outer surfaces of the gown during care.

- Laundry operations and personnel may need to be augmented to facilitate additional washing loads and cycles

- Systems are established to routinely inspect, maintain (e.g., mend a small hole in a gown, replace missing fastening ties), and replace reusable gowns when needed (e.g., when they are thin or ripped)

Consider the use of coveralls.

Use of expired gowns beyond the manufacturer-designated shelf life for training.

The majority of isolation gowns do not have a manufacturer-designated shelf life. However, consideration can be made to using gowns that do and are past their manufacturer-designated shelf life. If there is no date available on the gown label or packaging, facilities should contact the manufacturer.

Use gowns or coveralls conforming to international standards.

Current guidelines do not require use of gowns that conform to any standards. In times of shortages, healthcare facilities can consider using [international gowns and coveralls](#). Gowns and coveralls that conform to international standards, including with EN 13795 and EN14126, could be reserved for activities that may involve moderate to high amounts of body fluids.

Extended use of isolation gowns.

Consideration can be made to extend the use of isolation gowns (disposable or cloth) such that the same gown is worn by the same HCP when interacting with more than one patient known to be infected with the same infectious disease when these patients housed in the same location (i.e., COVID-19 patients residing in an isolation cohort). This can be considered only if there are no additional co-infectious diagnoses transmitted by contact (such as *Clostridioides difficile*) among patients. If the gown becomes visibly soiled, it must be removed and discarded as per [usual practicespdf icon](#).

Re-use of cloth isolation gowns.

Disposable gowns are not typically amenable to being doffed and re-used because the ties and fasteners typically break during doffing. Cloth isolation gowns could potentially be untied and retied and could be considered for re-use without laundering in between.

When No Gowns Are Available

Consider using gown alternatives that have not been evaluated as effective.

In situation of severely limited or no available isolation gowns, the following pieces of clothing can be considered as a last resort for care of COVID-19 patients as single use. However, none of these options can be considered PPE, since their capability to protect

HCP is unknown. Preferable features include long sleeves and closures (snaps, buttons) that can be fastened and secured.

- Disposable laboratory coats
- Reusable (washable) patient gowns
- Reusable (washable) laboratory coats
- Disposable aprons
- Combinations of clothing: Combinations of pieces of clothing can be considered for activities that may involve body fluids and when there are no gowns available:
 - Long sleeve aprons in combination with long sleeve patient gowns or laboratory coats
 - Open back gowns with long sleeve patient gowns or laboratory coats
 - Sleeve covers in combination with aprons and long sleeve patient gowns or laboratory coats

Reusable patient gowns and lab coats can be safely laundered according to [routine procedures](#).

- Laundry operations and personnel may need to be augmented to facilitate additional washing loads and cycles
- Systems are established to routinely inspect, maintain (e.g., mend a small hole in a gown, replace missing fastening ties) and replace reusable gowns when needed (e.g., when they are thin or ripped)

<https://www.usp.org/.../usp-covid19-garb-and-ppe.pdf>

Head and hair cover

- Use clean fabric to cover head and hair. Preferably, wash after each shift or sooner when visibly soiled.

Shoe cover shortages

- Implement dedicated shoes for the compounding area. Preferably, dedicated shoes should be cleaned regularly.

<https://www.kingcounty.gov/depts/health/communicable-diseases/disease-control/novel-coronavirus/PPE-shortage.aspx>

Eye protection in short supply or unavailable

- Shift eye protection supplies from disposable to re-usable devices (i.e., goggles and reusable face shields). Ensure appropriate cleaning and disinfection between users.

- Implement extended use of eye protection and remove it when soiled or difficult to see through; discard if damaged. Eye protection should not be touched, and hand hygiene should be performed immediately if eye protection is touched.
- Use eye protection devices beyond the shelf life during patient care activities; discard if degraded.
- Prioritize eye protection for selected activities such as:
 - Aerosol generating procedures and those where splashes and sprays are anticipated.
 - Activities where prolonged face-to-face or close contact with a potentially infectious patient is unavoidable.
- In settings where eye protection is unavailable, consider using safety glasses (e.g., trauma glasses) that have extensions to cover the side of the eyes in addition to administrative and engineering controls described above.

Faceshield options

<https://www.facebook.com/555646044505720/posts/3612897172113910/>

<https://www.prusa3d.com/covid19>

<https://making.engr.wisc.edu/shield/>