

Coronavirus (COVID-19) Pandemic: Personal Protective Equipment Preservation Best Practices

This fact sheet summarizes best practices for national implementation to sustain personal protective equipment (PPE) while ensuring the protection of healthcare personnel (HCP) and first responders during the coronavirus (COVID-19) pandemic response.

Objective

The objective of the COVID-19 National Strategy for Addressing Personal Protective Equipment (PPE) Shortage is to ensure protection for HCP, first responders, and patients against COVID-19 by following three preservation pillars: **Reduce – Reuse – Repurpose**. Due to the COVID-19 pandemic response and associated global PPE shortages, implementation of contingency and crisis capacity plans are viable approaches to ensuring the continued availability of protective gear.

PPE availability should be regularly monitored and projected needs should be regularly assessed. Conventional capacity measures should already be implemented as standard practice, contingency capacity practices used temporarily during periods of expected PPE shortages, and crisis capacity practices considered during periods of known PPE shortages. These are meant to be considered and implemented sequentially. As PPE availability returns to normal, facilities should promptly resume conventional practices. To use the Fact Sheet, select appropriate actions based on your specific organizational and facility PPE requirements and availability. See [CDC Strategies to Optimize the Supply of PPE and Equipment](#) for more details. **All U.S. healthcare facilities and first responder organizations in all states should begin using PPE contingency strategies NOW.**

WHAT DO I DO?

The infographic is divided into three columns. The first column, titled 'Reduce', shows a pair of hands with red arrows pointing to the palms and fingers, indicating a reduction in use. The second column, titled 'Reuse', shows a surgical mask with a green circular arrow around it, indicating safe reuse. The third column, titled 'Repurpose', shows various PPE items like a cap, goggles, and a gown with a blue arrow pointing to alternative sources, indicating the use of different types or sources.

Reduce
Study and **change your environment** to avoid or reduce PPE usage.

Reuse
Implement ways to **safely decontaminate and reuse** PPE.

Repurpose
Use alternative **types or sources** for PPE.

Logos for FEMA and the U.S. Department of Homeland Security are at the bottom.

HOW DO I DO IT?

General Recommendations for Everyone

- Maintain social distancing.
- Focus on proper hand hygiene.
- Non-healthcare industries should make every effort to identify alternatives to medical-grade PPE (such as FDA-cleared N95 respiratory protection devices, surgical gowns, gloves, etc. that are critically needed by the Healthcare, Public Health, and Emergency Responder Sectors). All industries should conserve medical PPE for providing medical care.
- If feasible, conduct interactions with patients and the general public outdoors or in large open spaces.

REDUCE usage rate of PPE

Conventional – Engineering and Physical Barriers

- Use barrier controls when possible to limit the need for PPE (e.g., polycarbonate/acrylic barriers, partially rolled up car windows for COVID interviews or testing).
- Ensure ventilation systems are functioning properly.
- Use of curtains between patients in shared areas.
- Use closed suctioning systems for airway suctioning for intubated patients.
- When clinically appropriate, place infusion monitors, vitals monitors, and ventilators outside of patient rooms, and utilize FDA authorized devices for remote monitoring to allow monitoring and management without entering the room.

Conventional – Work Practices, Administrative Changes, and Technology

- Implement source controls (e.g., patient masking).
- Limit visitor access and offer technology-based alternatives (e.g., video chat) for patient-family and other non-medical interactions and visits.
- Incorporate auxiliary aids and services into technology-based alternatives such as tele-consultation, internet-based interviews, or remote-camera based observation to achieve effective communication.
 - [American's with Disabilities Act \(ADA\) Requirements for Effective Communication](#).
- Minimize number of people with, and frequency of, direct patient or general public contact.
- Cohort patients who are suspected of having COVID-19 or test positive for COVID-19.
- Consolidate activities to a single visit (e.g., meals, welfare checks, vitals checks, medication administration).
- Use automated or “no-contact” delivery of food and supplies.
- Modify supporting staff workflow (e.g., environmental services, food and nutrition) to limit PPE use.

Contingency – Personal Protective Equipment

- Understand your PPE requirements and burn rates and anticipate future needs.
 - [CDC PPE Burn Rate Calculator](#)
- Extend use-times of undamaged, non-visibly soiled PPE beyond single patient contact and other conventional practice durations.
- See FDA considerations for conservation of surgical masks and gowns.
 - [FDA Surgical Mask and Gown Conservation Strategies](#)
 - [FDA Medical Glove Conservation Strategies](#)
- See OSHA guidance temporarily allowing enforcement discretion for certain provisions of the Respiratory Protection Standard (1910.134) and other OSHA guidance regarding PPE shortages

during COVID-19 - [OSHA Safety and Health Topics: COVID-19](#).

REUSE PPE through optimization, decontamination, and reuse procedures

Contingency – Decontamination and Storage for Crisis

- Consider decontaminating undamaged, non-visibly soiled FFRs for storage if needed later during crisis.

Crisis – Decontamination and Reuse

- Implement expanded facility-based PPE reuse policies and procedures.
- Track “check in” and “check out” of certain PPE (e.g., gowns, surgical masks and respirators) designated for reuse (disposable gloves should not be reused). Each worker is provided specific PPE at the beginning of the shift. At the end of the shift, designated PPE is labeled, collected, cleaned, and stored for reuse.
- Implement guidance for decontamination and reuse of FFRs.
 - [CDC Guidance Decontamination and Reuse of FFRs](#)
 - For large-scale decontamination of N95 FFR's consider using the following methods:
 - Industrial or facility-based vaporized hydrogen peroxide sterilization systems authorized by FDA.
 - [FDA Emergency Use Authorizations \(EUA\) for Decontamination](#)
 - [OSHA Enforcement Guidance for Decontamination of FFRs](#)
 - Industrial or facility-based moist heat decontamination systems (NOT autoclaves) – with demonstrated safety and efficacy.
 - Facility-based ultraviolet germicidal irradiation (UVGI) systems – with demonstrated safety and efficacy.
 - For low-volume or personal decontamination of N95 FFR's, consider using commercially available microwavable moist heat disinfection devices following manufacturer's instructions (e.g., do not put metal parts in microwaves).

REPURPOSE alternate types and sources of PPE

Conventional - Use other NIOSH-approved respirators instead of N95 FFRs when respiratory protection is required. See [FDA EUA for other NIOSH-approved respirators](#). Examples include:

- Reusable powered, air-purifying respirators (PAPRs);
- Reusable air-purifying respirators (elastomeric half and full facepiece respirators);
- Other classes of disposable air-purifying particulate FFRs (e.g., P100).

Contingency - Seek alternative supplies of PPE.

- Encourage community members to donate private stocks of PPE to your facility.
- Seek PPE and other equipment from healthcare coalitions, individuals, and other sources, including businesses that are not active.
- Use commercial sources of industrial disposable coveralls, face shields, goggles, shoe covers, clear facemasks for hearing impaired, etc.

Crisis

- Use N95 FFRs beyond their expiration dates if certain conditions are met.
 - [CDC Considerations for Release of Stockpiled N95s Beyond the Manufacturer-Designated Shelf Life](#).
- Use FDA authorized imported, non-NIOSH-approved disposable FFRs.
 - [FDA EUA for Imported, Non-NIOSH-Approved Disposable Filtering Facepiece Respirators](#).
 - [FDA EUA for Non-NIOSH-Approved Disposable Filtering Facepiece Respirators](#).

COMMUNICATE, COMMUNICATE, COMMUNICATE

Organizations need to assemble a team to review existing Health and Safety Plan (HASP) and Respiratory Protection Program (RPP) policies and procedures to identify opportunities to reduce, reuse, or repurpose PPE and develop contingency/crisis plans for COVID-19. Such a team might include (where available) environmental health officers, safety officers, industrial hygienists, logistics officers, infection prevention and occupational health practitioners, facility managers, operations chiefs, medical officers, and workforce representatives. This effort must include worker training to ensure proper implementation of preservation strategies.

To ensure uniform application of modified practices, processes, and procedures, all workers must be trained. Recommended elements of training programs include:

- [NIEHS Training Guidance and Resources](#);
- Reasons for changes from standard practice and for implementing contingency and crisis practices during COVID-19 related PPE shortages;
- New PPE guidance (from FDA, CDC, DOJ, OSHA) related to COVID-19;
- Proper methods to conduct new or changed work practices (e.g., staffing, [social distancing](#), [source control](#), [symptom screening](#), [hand hygiene](#), cleaning and [disinfecting](#), accessibility options under ADA);
- Methods to install or utilize any barrier controls (e.g. patient masking, plastic shields);
- Proper hand hygiene, including the need to wash hands when visibly soiled and after removing PPE;
- Proper donning and doffing of PPE to minimize self-infection;
- Proper wear and use of PPE;
- Limitations of any PPE;
- How to maintain, store, and dispose of PPE.