

Strategies for Optimizing Supplies of N95 Respirators for Healthcare Facilities in Kansas

Updated May 13, 2020

The following contingency and crisis strategies are based upon these assumptions:

1. Facilities understand their current N95 respirators inventory and supply chain
2. Facilities understand their N95 respirator [utilization rate](#)
3. Facilities are in communication with local healthcare coalitions, county emergency managers, and local public health partners (e.g., health departments, emergency preparedness and response staff) regarding identification of additional supplies
4. Facilities have already implemented other [engineering and administrative control measures](#) including:
 - Reducing the number of patients going to the hospital or outpatient settings
 - Excluding healthcare personnel (HCP) not essential for patient care from entering their care area
 - 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
5. Facilities have provided HCP with required education and training, including having them demonstrate competency with donning and doffing, with any personal protective equipment (PPE) ensemble that is used to perform job responsibilities, such as provision of patient care
6. Facilities have provided respirator fit-testing for all HCP that will be wearing them. In response to shortages related to COVID-19 response, OSHA has waived the annual fit-testing requirements for anyone who has previously been fit-tested.

Fit-testing for respirators:

- Quantitative – numerically measures the effectiveness of the respirator to seal with the wearer’s face, without relying on the wearer’s voluntary or involuntary response to a test agent; involve adaptation of the respirator to the fit-testing equipment, which can involve making holes in the respirator, making it not ideal for use outside of conventional capacity use
- Qualitative – a pass/fail test to assess the adequacy of respirator fit that relies on the individual’s sensory detection of a test agent; minimal destruction respirator used in fit-testing allowing for reuse of the same respirator the HCP being tested; may also allow for rapid fit-testing of larger numbers of HCP
- Just-in-time – facilities should have a plan in place for concise training and fit-testing staff in times of urgent need (e.g. during pandemic responses)
- [User seal check](#)
- [OSHA temporary guidance](#)

Conventional Capacity Strategies: measures consist of providing patient care without any change in daily evidence-based practices. This set of measures, consisting of engineering, administrative, and PPE controls should already be implemented in general infection prevention and control plans in healthcare settings.

Use Standard N95 Respirators according to product labeling and local, state, and federal requirements.

Prioritization of Surgical N95 Respirators for surgical procedures.

- Do NOT use any N95s past manufacturer-designated shelf life in surgical settings
- Use in sterile field or when high velocity splashes/sprays anticipated
- If no surgical N95s available, use face shield over a standard N95 during the above high-risk procedures

Alternatives to N95 Respirators: these include other classes of filtering facepiece respirators, elastomeric half-mask, and full facepiece air purifying respirators, powered air purifying respirators (PAPRs) where feasible. These will all provide equivalent or higher protection than N95 respirators.

- NIOSH approves these other filtering facepiece respirators [N99, N100, P95, P99, P100, R95, R99, and R100](#) which are as protective as N95s
- Elastomeric (aka reusable) respirators require the facepiece to be cleaned but the filter cartridges are discarded and replaced when they become unsuitable for further use; annual fit-testing is [required](#); these should NOT be used in surgical settings due to concerns that air coming out of the exhalation valve may contaminate the sterile field
- PAPRs should NOT be used in surgical settings due to concerns that the blower exhaust and exhaled air may contaminate the sterile field
- Ensure up-to-date cleaning/disinfection procedures exist and are followed for elastomeric respirators and PAPRs

Contingency Capacity Strategies: measures may change daily standard practices but may not have any significant impact on the care delivered to the patient or the safety of HCP. These practices may be used temporarily during periods of expected N95 respirator shortages.

Use of N95 Respirators beyond the manufacturer-designated shelf life for training and fit-testing purposes.

- CDC and NIOSH believe [certain types of N95s](#) should provide the expected level of protection if the stockpile conditions have generally been in accordance with the manufacturer-recommended storage conditions and an OSHA-compliant respiratory protection program is used by employers
- Expired respirators might not perform to the requirements for which they were certified

Implement extended use of N95 Respirators: the practice of wearing the same N95 respirator for repeated close contact encounters with several different patients, without removing respirator between patient encounters.

- Best suited when caring for cohorted patients diagnosed with the same infectious disease
- Remove and discard if soiled, damaged, or hard to breathe through
- HCP must take care not to touch their respirator; if touched/adjusted immediately perform hand hygiene
- HCP should leave the patient care area if they need to remove the respirator

Prioritize limited reuse of N95 Respirators for diseases in which contact transmission is not a concern (e.g. tuberculosis [TB]): using the same N95 respirator for multiple encounters with different patients with removal of the respirator after each encounter. Note – restrictions should be in place to limit the number of times the same respirator is able to be reused (i.e. “limited reuse”); be sure to consult product manufacturer to help set number of reuses, if no manufacturer guidance exists limit to 5 uses per device.

- HCP should NOT share the same disposable respirator
- Do NOT place material within or over the respirator
- HCP should leave the patient care area before removal of the respirator
- Hang in a designated storage area or keep in a clean, breathable container (e.g., paper bag) between uses
- Remove and discard if soiled, damaged, or hard to breathe through or after use limit has been reached

Use of respirators approved under standards used in other countries that are similar to NIOSH-approved N95 Respirators.

Expand limited reuse of N95 Respirators: using the same N95 respirator for multiple encounters with different patients with removal of the respirator after each encounter. Note – restrictions should be in place to limit the number of times the same respirator is able to be reused (i.e. “limited reuse”); be sure to consult product manufacturer to help set number of reuses, if no manufacturer guidance exists limit to 5 uses per device.

- Diseases able to transmit via the route of contact (e.g., measles, varicella, potentially COVID-19) pose a higher threat to HCP than diseases in which contact transmission is not thought to be a concern (i.e. TB)
- HCP should NOT share the same disposable respirator
- Do NOT place material within or over the respirator
- HCP must take care not to touch the outside surfaces of the respirator; if touched/adjusted immediately perform hand hygiene
- HCP should leave the patient care area before removal of the respirator
- Hang in a designated storage area or keep in a clean, breathable container (e.g., paper bag) between uses
- Remove and discard if soiled, damaged, or hard to breathe through or after use limit has been reached

Use of N95 Respirators beyond the manufacturer-designated shelf life during patient care activities.

- If there is no date available on the respirator label or packaging, facilities should contact the manufacturer to discuss.
- CDC and NIOSH believe certain types of N95s should provide the expected level of protection if the stockpile conditions have generally been in accordance with the manufacturer-recommended storage conditions and an OSHA-compliant respiratory protection program is used by employers
- Expired respirators might not perform to the requirements for which they were certified
- Devices should be visually inspected and perform a seal check prior to use, if damaged or degraded the product should be discarded

Prioritize N95 Respirators for selected activities such as:

- Essential surgeries and procedures
- Splash/spray and aerosol-generating procedures
- Use of respirators beyond manufacturer-designated shelf life is preferred to facemasks when caring for COVID-19 patients

IF YOUR FACILITY HAS RUN OUT OF N95 RESPIRATORS

Exclude HCP at higher risk for severe illness from COVID-19 from contact with known or suspected COVID-19 patients:

- Older age
- Chronic medical conditions
- Pregnant

Designate convalescent HCP for provision of care to known or suspected COVID-19 patients. It may be possible to designate HCP who have clinically recovered from COVID-19 to be preferentially assigned to care for COVID-19 patients. Individuals who have recovered from COVID-19 infection may have developed some protective immunity, but this has not yet been confirmed.

Consider use of expedient patient isolation rooms for risk reduction. Portable fan devices with high-efficiency particulate air (HEPA) filtration that are carefully placed can increase the effective air changes per hour of clean air to the patient room, reducing risk to individuals entering the room without respiratory protection. NIOSH has developed guidance for using portable HEPA filtration systems to create [expedient patient isolation rooms](#). The expedient patient isolation room approach involves establishing a high-ventilation-rate, negative pressure, inner isolation zone that sits within a “clean” larger ventilated zone.

Consider use of ventilated headboards. NIOSH has developed the [ventilated headboard](#) that draws exhaled air from a patient in bed into a HEPA filter, decreasing risk of HCP exposure to patient-generated aerosol. This technology consists of lightweight, sturdy, and adjustable aluminum framing with a retractable plastic canopy. The ventilated headboard can be deployed in combination with HEPA fan/filter units to provide surge isolation capacity within a variety of environments, from traditional patient rooms to triage stations, and emergency medical shelters.

Decontamination of N95 Respirators for Reuse

Disposable filtering facepiece respirators (FFRs) **are not approved** for routine decontamination and reuse. However, FFR decontamination and reuse may need to be considered as a crisis capacity strategy to ensure continued availability. Based on the [limited](#) research available, ultraviolet germicidal irradiation, vaporous hydrogen peroxide, and moist heat showed the most promise as potential methods to decontaminate FFRs. Please refer to the [CDC document](#) which summarizes research about decontamination of FFRs before reuse.

HCP use of homemade masks

Homemade masks are **NOT** considered PPE, since their capability to protect HCP is unknown. **Caution should be exercised if considering this option.**

References:

- CDC. NIOSH – *Approved Particulate Filtering Facepiece Respirators*. December 6, 2018. https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html. March 26, 2020.
- CDC. NIOSH – *Filtering out Confusion: Frequently Asked Questions about Respiratory Protection*. 2018. <https://www.cdc.gov/niosh/docs/2018-130/pdfs/2018-130.pdf>. March 26, 2020.
- CDC. NIOSH – *Pandemic Planning*. March 28, 2018. <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>. March 26, 2020.
- CDC. *Personal Protective Equipment (PPE) Burn Rate Calculator*. March 25, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/burn-calculator.html>. March 26, 2020.
- CDC. *Release of Stockpiled N95 Filtering Facepiece Respirators Beyond Manufacturer-Designated Shelf-Life: Considerations for the COVID-19 Response*. March 6, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/release-stockpiled-N95.html>. March 26, 2020.
- CDC. *Strategies for Optimizing the Supply of N95 Respirators*. February 29, 2020. https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Frespirator-supply-strategies.html. March 26, 2020.
- OSHA. *Temporary Enforcement Guidance – Healthcare Respiratory Protection Annual Fit-Testing for N95 Filtering Facepieces During the COVID-19 Outbreak*. March 14, 2020. <https://www.osha.gov/memos/2020-03-14/temporary-enforcement-guidance-healthcare-respiratory-protection-annual-fit>. March 26, 2020.