

COVID-19: SURGICAL MASKS AND FILTERING FACE PIECE RESPIRATORS (FFR) FOR HEALTH CARE PROVIDERS



A Rapid Guidance Summary from the Penn Medicine Center for Evidence-based Practice
Last updated May 6, 2020, 7:00 am. All sources rechecked May 6.

Key questions answered in this summary

- When should healthcare workers wear a surgical mask or FFR?
- At times of shortage, when may surgical masks or FFR be reused or use extended?

Summary of major recommendations

- Healthcare workers providing direct patient care: wear a surgical mask at all times when providing care for suspected or confirmed COVID-19 patients; N95-level or other filtering face piece respirators (FFR) should be worn when performing aerosol-generating procedures.
- During times of PPE shortage: extended surgical mask use and re-use of surgical masks may be considered, particularly when caring for patients with the same diagnosis (e.g. COVID-19); FFR may be worn for an extended period of time or re-used (by a single provider) as a means of dealing with a shortage.
- Cloth masks are not considered appropriate PPE for healthcare workers caring for patients with known or suspected COVID-19.
- Discard surgical masks when soiled, contaminated or wet. Discard FFR when soiled, or if appropriate fit is not maintained.
- Use a face shield (or surgical mask with eye protection if face shields are unavailable) over the respirator to prevent surface contamination, especially if respirator availability is limited and a re-use policy is in effect.
- Identified and publicly available medical center guidance do not agree on whether FFR should be re-used after shifts
- Store surgical masks in a clean sealable paper bag or other breathable container between uses. Some, but not all, medical center guidance specify paper bag. Fold surgical mask so the outer surface is held inward and against itself during storage.
- Store FFR in an individual paper bag or other breathable container between uses (label bag and FFR to prevent reuse by another provider)

Key Definitions

Extended use: wearing the same mask or respirator for repeated encounters with several different patients, without removing it between patient encounters.

Limited Reuse: the practice of using the same facemask for multiple encounters with different patients but removing it after each encounter.

Public health agency and professional society guidelines on surgical mask usage

Source	Recommendations
IDSA April 27	In healthcare settings with patients with suspected or known COVID-19, personnel should use either a surgical mask or N95 respirator at all times.
CDC April 23	<p>HCP should wear a facemask at all times while they are in the healthcare facility (a mask is preferred over cloth face coverings when available).</p> <p>Care of patients with known or suspected COVID-19: Masks are an acceptable alternative when respirators are unavailable. (April 23)</p> <p>Respirators should be prioritized for procedures that are likely to generate respiratory aerosols, which would pose the highest exposure risk to HCP. (April 13). When the supply chain is restored, facilities with a respiratory protection program should return to use of respirators for patients with known or suspected COVID-19. (April 13)</p> <p>Wear PPE including a medical mask when entering a room that has been occupied by a COVID-19 patient or a patient with respiratory symptoms. Discard masks after exiting the room or care area and closing the door.</p>
DoD April 13	<p>All employees in inpatient units, ambulatory clinic spaces, and procedural areas should wear surgical facemasks at all times.</p> <p>Wear mask for entire shift unless soiled, damaged, or hard to breathe through.</p> <p>Store masks in a clean, breathable container between uses. Do not store in plastic bag.</p>
WHO April 6	<p>Wear a mask when entering a room where patients with suspected or confirmed COVID-19 are admitted.</p> <p>Cloth (e.g. cotton or gauze) masks are not recommended under any circumstances.</p> <p>Individuals/patients with respiratory symptoms should wear a mask while waiting in triage or other areas and during transportation within the facility</p>

Public health agency and professional society guidelines on extended use or re-use of surgical masks

Source	Recommendations
FDA April 27	<p>Extend the use of masks when there is lower risk of transmission (e.g. non-surgical).</p> <p>Extend the use of masks during care for multiple patients when the activity has low transmission risk (e.g. dispensing medications).</p>
CDC (See note)	<p><u>Extended use during limited PPE availability:</u> consider having health care workers remove only gloves and gowns (if used) and perform hand hygiene between patients with the same diagnosis (e.g., confirmed COVID-19) while continuing to wear the same eye protection and respirator or mask (i.e., extended use). Risk of transmission from eye protection and masks during extended use is expected to be very low. (April 13)</p> <p><u>General guidance during times of surge capacity</u> (March 17):</p> <p>“Contingency Capacity” situations (times of <i>expected</i> mask shortage): implement mask extended use. The facemask should be removed and discarded if soiled, damaged, or hard to breathe through. Restrict facemasks to use by HCP, rather than patients for source control.</p> <p>“Crisis Capacity” situations (times of <i>known</i> mask shortage), implement limited re-use of facemasks. Facemasks should be carefully folded so that the outer surface is held inward and against itself to reduce contact with the outer surface during storage. The folded mask can be stored between uses in a clean sealable paper bag or breathable container.</p>
WHO April 6	<p>Do not re-use single use masks, dispose immediately upon removal.</p> <p>Current recommendations are to not re-use single-use masks. Replace masks as soon as they become damp with a new clean, dry mask. Discard single-use masks after each use and dispose of them immediately upon removal.</p>

NOTE: CDC guidelines: [Strategies for Optimizing the Supply of Facemasks](#) (March 17),
[Interim Infection Prevention and Control Recommendations](#) (April 13)

Public health agency and professional society guidelines on FFR usage

Source	Recommendations
IDSA April 27	In healthcare settings with patients with suspected or known COVID-19, personnel should use either a surgical mask or N95 respirator. For aerosol-generating procedures, personnel should use an N95 respirator.
DOD April 13	Use a face shield over N95 respirator to reduce surface contamination Discard N95 respirator if used for an aerosol-generating procedure
CDC April 13	<p>Mode of transmission: transmission most commonly happens during close exposure to a person infected with COVID-19, primarily via respiratory droplets produced when the infected person coughs, sneezes, or talks. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19.</p> <p>Put on a respirator or facemask (if a respirator is not available) before entry into the patient room or care area. Prioritize respirators for situations where respiratory protection is most important (see below) and for care of patients with pathogens that require airborne precautions (e.g. TB, measles, varicella)</p> <p>N95 respirators or respirators that offer a higher level of protection should be used instead of a facemask when performing or present for an aerosol-generating procedure, including nasopharyngeal swabbing. Procedures that are likely to induce coughing (e.g., sputum induction, open suctioning of airways) are likely to generate aerosols. Disposable respirators and face masks should be removed and discarded after exiting the patient's room or care area and closing the door.</p> <p>During times of limited PPE, consider having health care workers remove only gloves and gowns (if used) and perform hand hygiene between patients with the same diagnosis (e.g., confirmed COVID-19) while continuing to wear the same eye protection and respirator or facemask (i.e., extended use). Risk of transmission from eye protection and facemasks during extended use is expected to be very low.</p> <p><u>Face masks are an acceptable alternative when respirators are unavailable.</u> Cloth face covering are NOT PPE and should not be worn for care of patients with known or suspected COVID-19.</p>
ECDC March 31	<p>Healthcare workers in contact with a confirmed case, or a suspected case of COVID-19, should wear PPE for contact, droplet and airborne transmission of pathogens: FFP2 (N95) or FFP3 respirator tested for fitting, eye protection (i.e. goggles or face shield), long-sleeved water-resistant gown and gloves.</p> <p>Highest priority for use of respirators: health care workers should wear an FFP2 (N95)/FFP3 level mask when performing aerosol-generating procedures, including endotracheal intubation, bronchoscopy, open suctioning, administration of nebulized treatment, manual ventilation before intubation, physical prone positioning of the patient, disconnecting the patient from the ventilator, non-invasive positive pressure ventilation, tracheostomy, and cardiopulmonary resuscitation.</p> <p>In the absence of respirators, healthcare workers should use masks with the highest available filter. In enclosed spaces, healthcare workers collecting diagnostic respiratory samples should wear gloves, eye protection, a gown, and a surgical mask if a respirator is not available. For drive-through or outdoor testing facilities, the use of a surgical mask should be sufficient.</p>

Public health agency and professional society guidelines on extended use or re-use of FFR

Source	Recommendations
IDSA April 27	Face shields are recommended for AGPs in addition to N95 respirators to allow extended use and reuse.
CADTH April 27	Extended use alone is unlikely to degrade respiratory protection. N95s may be worn as long as they retain fit and function. Face shields may extend N95 respiratory masks' use by reducing surface contamination.
DOD April 13	Extended use acceptable when patients are infected with same respiratory pathogen and placed in same ward Re-use N95 respirators a maximum of 5 times Store in clean, breathable container such as paper bag. Do not store in plastic bag. Discard if used for aerosol-generating procedure
CDC April 29 April 13	In "Contingency Capacity" situations, where health care providers are anticipating a shortage of respirators, extend the use of N95 respirators by wearing the same N95 for repeated close contact encounters with several different patients, without removing the respirator (8-12 hours). Respirators should not be worn for multiple work shifts and shown not be reused after extended use. Over time, components may degrade that affect the quality of the fit and seal. Consider using/prioritizing expired N95 respirators in situations where HCP are NOT exposed to pathogens (e.g. training and fit testing). In "Crisis Capacity" situations when N95 supplies are running low, implement limited reuse of N95 respirators for patients with COVID-19, measles, and varicella. Prioritize use for HCP with the highest potential exposures (e.g. aerosol generating procedures on symptomatic patients) <u>When no respirators are available, use masks not evaluated or approved by NIOSH or homemade masks as a last resort.</u>
NIOSH Mar. 27	Extended use alone is unlikely to degrade respiratory protection. If extended use of N95 respirators is permitted, respiratory protection program administrators should ensure adherence to administrative and engineering controls to limit potential N95 respirator surface contamination. There is no way of determining the maximum possible number of safe reuses for an N95 respirator as a generic number to be applied in all cases. Discard N95 respirators following use during aerosol generating procedures. Discard N95 respirators contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients. Discard N95 respirators following close contact with, or exit from, the care area of any patient co-infected with an infectious disease requiring contact precautions. Consider use of a cleanable face shield over an N95 respirator and/or other steps (e.g., masking patients, use of engineering controls) to reduce surface contamination of the respirator. Hang used respirators in a designated storage area or keep them in a clean, breathable container such as a paper bag between uses. To minimize potential cross-contamination, store respirators so that they do not touch each other and the person using the respirator is clearly identified. Storage containers should be disposed of or cleaned regularly.

Summary of medical center policies on surgical mask and FFR use and reuse

Policy	Beth Israel	Mt. Sinai	Nebraska	UCSF	Washington
Wear a mask at all times in inpatient units, ambulatory clinic spaces, and procedural areas	✓	✓	✓	✓	Optional
Extended use of masks	✓	✓	✓	✓	✓
Re-use of masks	✓	✓	✓	✓	✓
Discard mask at end of work shift	✓	NOTE 1	X	✓	✓
Wear N95 respirator when performing aerosol-generating procedures.	✓	✓	✓	✓	✓
Wear N95 respirator with a face shield to provide eye-protection and reduce the risk of surface contamination.	✓	✓	✓	✓	✓
Extended use of respirators	✓	✓	✓	✓	✓
Re-use of respirators	✓ (3 shifts)	✓	NOTE 2	✓	✓
Store mask or respirator being re-used in an individually-labeled paper bag	✓	✓	✓	NOTE 3	NOTE 3
Discard respirator at end of work shift	X	NOTE 4	NOTE 5	X	X
Discard mask and N95 respirator if damaged, soiled, or moist	✓	✓	✓	✓	✓

NOTE 1—policy is unclear about re-use, but masks should not be taken home

NOTE 2—yes, but this is not a preferred option

NOTE 3—store in a clean, dry location

NOTE 4—place N95 respirator in paper bag, then in “dedicated area” at end of shift

NOTE 5—do not discard, follow decontamination protocol

UCSF PPE guidelines for healthcare providers (4/21)

		Airborne transmitted infections ² (e.g. TB, measles, varicella)		COVID-19 suspect (PUI) or confirmed positive COVID-19 (novel respiratory isolation OR respiratory illness isolation)		Droplet transmitted infections ² (e.g. influenza, adenovirus) excluding RSV, rhinovirus, parainfluenza, human metapneumovirus		No Concern for Aerosol Transmission ⁴
		PPE	Room criteria	PPE ³	Room criteria ³	PPE	Room criteria	PPE
Type of Procedure	High Risk Aerosol Generating Procedure	PAPR with goggles or face shield, gown, gloves	Airborne Isolation room	PAPR or N95 with goggles or face shield, gown, gloves	Airborne Isolation room for ongoing or continuous HRAGPs	PAPR or N95 with goggles or face shield, gown, gloves	Private patient room preferred	Standard Precautions and refer to isolation table as applicable
	Not aerosol generating procedure	PAPR or N95	Airborne Isolation room	Surgical mask with goggles or face shield, gown, gloves	Private patient room with door closed preferred	Surgical mask with goggles or face shield, gown, gloves	Private patient room preferred	

Key to sources referenced

CADTH—Canadian Agency for Drugs and Technologies in Health

DoD—Defense Health Agency, US Department of Defense

IDSA—Infectious Disease Society of America

NIOSH—National Institute for Occupational Safety and Health

Update history (key additions and changes)

May 6, 2020: New guidance from IDSA, DoD, FDA, and CADTH. Updated guidance from CDC. Sources with repetitive information removed. No significant new conclusions or clinical pearls. Testing for N95 respirator decontamination remains ongoing, and N95 decontamination should only be considered in extraordinary circumstances.

About this report

A Rapid Guidance Summary is a focused synopsis of recommendations from selected guideline issuers and health care systems, intended to provide guidance to Penn Medicine providers and administrators during times when latest guidance is urgently needed. It is not based on a complete systematic review of the evidence. Please see the CEP web site (<http://www.uphs.upenn.edu/cep>) for further details on the methods for developing these reports.

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APPENDIX: Medical center guidance - specifics and protocols

Hospital policies on surgical mask extended use or re-use

Source	Policy
Nebraska May 5	Non-soiled face masks may be re-used upon return to work if appropriate reuse and storage guidelines are observed. Store masks for re-use (short term) on a paper towel with exterior side of mask down A disposable facemask can be worn for several hours if not wet or distorted, and not touched while delivering patient care.
Mt. Sinai April 22	Based on the current situation and recommendations, in both the inpatient and outpatient setting, when providing direct patient care we recommend a surgical mask should be worn.
UCSF April 7	Extended use: For specialty respiratory care units: wear a face shield with mask/respirator for extended use. Surgical masks can be reused after being doffed (avoid touching the front of the mask) For all other locations: wear a facemask at all times in clinical buildings

Hospital policies on FFR extended use or re-use

Source	Policy
Nebraska April 22	<p>Extended use is preferred over re-use on the assumption that it is safer for the employee to leave their mask and eye protection in place, to reduce the risk of self-contamination through frequent donning and doffing of the same equipment.</p> <p>Label the N95 respirator and paper storage bag with the user's name before using to prevent reuse by another individual. Write name on mask where straps are attachment or on elastic straps of N95 mask. Write dates and times used on the bag to track overall use.</p>
Beth Israel April 14	<p>Reuse of a single N95 respirator is approved for a single provider for multiple patients on a unit over 3 shifts.</p> <p><u>Re-use procedure</u></p> <p><i>Donning (1st use)</i> - follow standard procedure</p> <p>Prepare clean storage bag (single use paper bag), label bag and inside edge of new N95 with name to prevent reuse by another individual</p> <p><i>Remove/store</i> -</p> <p>Perform hand hygiene and don new gloves,</p> <p>Remove mask without touching inside of the respirator; place N95 in labeled paper bag (careful not to deform mask)</p> <p>Remove gloves and perform hand hygiene; store in designated area</p> <p><i>Donning for reuse</i></p> <p>Prepare new storage bag as above</p> <p>Hand hygiene + new gloves</p> <p>Remove N95 from original bag by the straps and check integrity, follow standard donning procedure; perform <u>seal check</u> and dispose single use bag in regular trash</p> <p>Notes: most important steps are hand hygiene and use of clean gloves, N95 should be discarded at any time if deformed, moist, or does not produce adequate seal</p>
Mt. Sinai April 22	<p><u>Extended use procedure</u></p> <p>The same N95 respirator may be worn without removal between patient encounters.</p> <p><u>Limited re-use procedure</u></p> <p>Use face shield to reduce surface contamination of the respirator</p> <p>Use non-bleach germicidal wipe on face shield and allow to dry, then store face shield in an individual paper bag.</p> <p>Don clean gloves before removing respirator</p> <p>Store N95 respirator in an individual paper bag.</p> <p>Use N95 until it no longer retains its fit or function (no longer than the duration of a shift).</p>

<p>UCSE</p> <p>April 7</p>	<p><u>Extended use guidelines</u></p> <p>Wear a face shield with mask/respirator for extended use (face shield will partially cover the mask)</p> <p>Clean hands each time prior to and after touching mask/respirator</p> <p>Extended use masks and/or respirators can be reused after being doffed per reuse guidance</p> <p><u>Re-use guidelines</u></p> <p>Use your mask/respirator for a full shift or longer if it does not meet discard guidance (see below); do not share with other providers. OK to keep N95s for multiple shifts.</p> <p>Wear a face shield with mask/respirator. Reuse OK after aerosol generating procedure if face shield is worn.</p> <p>Clean hands each time prior to and after touching mask/respirator; avoid touching the front/inside of the mask/respirator (clean hands immediately after touching front of the respirator for fit check upon re-use)</p> <p>Between use - store in a clean, dry location that is labeled</p> <p><u>Discard if</u></p> <p>Contaminated hands have touched inside</p> <p>Wet, soiled, or damaged</p> <p>Appropriate fit is not maintained</p>
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