

PPE infographic text	Additional information (quoted or paraphrased from source)	Reference	URL
Do: Use the highest appropriate PPE protection available to you.			
Do: Remove and discard PPE if soiled, damaged, or hard to breathe/see through.		CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/face-masks.html#crisis-capacity
	Other considerations: If PPE is not available, consider excluding healthcare workers at high risk for severe illness and/or designate convalescent healthcare workers to care for COVID-19 patients.	CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/face-masks.html#crisis-capacity
Don't touch outside of PPE. If adjustments are needed, immediately perform hand hygiene.	"Limited re-use of facemasks is the practice of using the same facemask by one HCP for multiple encounters with different patients but removing it after each encounter. As it is unknown what the potential contribution of contact transmission is for SARS-CoV-2, care should be taken to ensure that HCP do not touch outer surfaces of the mask during care, and that mask removal and replacement be done in a careful and deliberate manner."	CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/face-masks.html#crisis-capacity
Don't share masks, gowns, or gloves.	Limited supplies: where recommended PPE for direct clinical care is still available, but the supply is insufficient to enable full adherence to standard IPC practice. Strategies to conserve supplies under this scenario include: Extended use: by one HCW among multiple patients with COVID-19 (one donning and doffing) Reuse: by one HCW among multiple patients with COVID-19 (multiple donning and doffing)	CDC Operational Considerations for Personal Protective Equipment in the Context of Global Supply Shortages for Coronavirus Disease 2019 (COVID-19) Pandemic: non-US Healthcare Settings (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/non-us-settings/emergency-considerations-ppe.html
	Other considerations: Avoid using shoe covers in routine care as this increases risk for self-contamination. "During... doffing, the participants have to wear the clean clogs after removing their boots. However, the clogs may be possibly contaminated by the gowns or the environment in some cases. Hence, using footwear covers is an unideal option. During boot cover removal, HCWs struggle to balance their legs in the air [20]. Shoe covers are also difficult to doff, thereby often requiring assistance and increasing the risk of cross-contamination among workers [22]."	Suen LKP, Guo YP, Tong DWK, Leung PHM, Lung D, Ng MSP, Lai TKH, Lo KYK, Au-Yeung CH, Yu W. Self-contamination during doffing of personal protective equipment by healthcare workers to prevent Ebola transmission. Antimicrobial Resistance and Infection Control (2018) 7, 157.	https://aricjournal.biomedcentral.com/articles/10.1186/s13756-018-0433-y
Hand Hygiene			
Effective hand hygiene can prevent transmission even when gloves are not available. Perform hand hygiene:			
Before touching a patient		World Health Organization, 5 Moments of Hand Hygiene for Infection Prevention and Control (accessed 29 April 2020)	https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/
Before clean/aseptic procedures		World Health Organization, 5 Moments of Hand Hygiene for Infection Prevention and Control (accessed 29 April 2020)	https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/
After body fluid exposure/risk		World Health Organization, 5 Moments of Hand Hygiene for Infection Prevention and Control (accessed 29 April 2020)	https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/
After touching a patient		World Health Organization, 5 Moments of Hand Hygiene for Infection Prevention and Control (accessed 29 April 2020)	https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/
After touching patient surroundings		World Health Organization, 5 Moments of Hand Hygiene for Infection Prevention and Control (accessed 29 April 2020)	https://www.who.int/infection-prevention/campaigns/clean-hands/5moments/en/
Before eating		CDC When & How to Wash Your Hands (accessed 29 April 2020)	https://www.cdc.gov/handwashing/when-how-handwashing.html
After using the bathroom		CDC When & How to Wash Your Hands (accessed 29 April 2020)	https://www.cdc.gov/handwashing/when-how-handwashing.html https://www.cambridge.org/core/journals/infection-control
			https://www.cdc.gov/coronavirus/2019-ncov/hcp/hand-hygiene.html
Wash with soap and water or alcohol-based handrub.		CDC, Hand Hygiene Recommendations, Guidance for Healthcare Providers about Hand Hygiene and COVID-19 (accessed 13 May 2020)	https://www.sciencedirect.com/science/article/pii/S0195670120300463
When gloves are worn, perform hand hygiene before and after glove use.		World Health Organization, Infection prevention and control during health care when COVID-19 is	https://www.who.int/publications-detail/infection-prevention
	Gloves are not a substitute for hand hygiene. If your task requires gloves, perform hand hygiene prior to donning gloves, before touching the patient or the patient environment. Perform hand hygiene immediately after removing gloves.	CDC, Hand Hygiene in Healthcare settings, Healthcare Providers (accessed 29 April 2020)	https://www.cdc.gov/handhygiene/providers/index.html
Gown			
	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 practices		
	Prioritize gowns. Gowns should be prioritized for the following activities: During care activities where splashes and sprays are anticipated, which typically includes aerosol generating procedures During the following high-contact patient care activities that provide opportunities for transfer of pathogens to the hands and clothing of healthcare providers, such as: Dressing, bathing/showering, transferring, providing hygiene, changing linens, changing briefs or assisting with toileting, device care or use, wound care Surgical gowns should be prioritized for surgical and other sterile procedures. Facilities may consider suspending use of gowns for endemic multidrug resistant organisms (e.g., MRSA, VRE, ESBL-producing organisms).		
Use: For patient care and cleaning in COVID-19 wards.		CDC Strategies for Optimizing the Supply of Isolation Gowns, Crisis Capacity (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/isolation-gowns.html#crisis-capacity
	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. In a situation where the gown is being used as part of standard precautions to protect HCP from a splash, the risk of re-using a non-visibly soiled cloth isolation gown may be lower. However, for care of patients with suspected or confirmed COVID-19, HCP risk from re-use of cloth isolation gowns without laundering among (1) single HCP caring for multiple patients using one gown or (2) among multiple HCP sharing one gown is unclear. The goal of this strategy is to minimize exposures to HCP and not necessarily prevent transmission between patients. Any gown that becomes visibly soiled during patient care should be disposed of and cleaned.		
Decontamination and reuse: For cloth gowns or lab coats, remove gown when leaving patient care area. Launder gowns according to routine procedures when soiled and at least daily.		CDC Strategies for Optimizing the Supply of Isolation Gowns, Crisis Capacity (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/isolation-gowns.html#crisis-capacity
	Consider using gown alternatives that have not been evaluated as effective		

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<p>If gowns are not available, what else can be used?</p> <p>Laboratory coats Disposable aprons Layered clothing, preferably with long sleeves and closures that can be fastened</p>	<p>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.</p> <ul style="list-style-type: none"> -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: <ul style="list-style-type: none"> ---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 <p>Reusable patient gowns and lab coats can be safely laundered according to routine procedures.</p> <ul style="list-style-type: none"> -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) <p>If possible, avoid coveralls or hazmat suits as these can increase risk for self-contamination during removal. There was more contamination risk when doffing coveralls as compared to a long gown. (Suen 2018)</p>	<p>CDC Strategies for Optimizing the Supply of Isolation Gowns, Crisis Capacity (accessed 29 April 2020)</p> <p>Suen, L. K., Guo, Y. P., Tong, D. W., Leung, P. H., Lu</p>	<p>https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/isolation-gowns.html#crisis-capacity</p> <p>https://aricjournal.biomedcentral.com/articles/10.1186/s13756-018-0433-y</p>
Face Shield or Goggles			
<p>Use: For patient care and cleaning in COVID-19 wards.</p>	<p>Prioritize eye protection for selected activities such as: During care activities where splashes and sprays are anticipated, which typically includes aerosol generating procedures. During activities where prolonged face-to-face or close contact with a potentially infectious patient is unavoidable.</p> <p>Adhere to recommended manufacturer instructions for cleaning and disinfection.</p> <p>When manufacturer instructions for cleaning and disinfection are unavailable, such as for single use disposable face shields, consider:</p> <p>While wearing gloves, carefully wipe the inside, followed by the outside of the face shield or goggles using a clean cloth saturated with neutral detergent solution or cleaner wipe.</p> <p>Carefully wipe the outside of the face shield or goggles using a wipe or clean cloth saturated with EPA-registered hospital disinfectant solution. Wipe the outside of face shield or goggles with clean water or alcohol to remove residue.</p> <p>Fully dry (air dry or use clean absorbent towels).</p> <p>Remove gloves and perform hand hygiene.</p>	<p>CDC, Strategies for Optimizing the Supply of Eye Protection, Crisis Capacity (accessed 29 April 2020)</p> <p>CDC, Strategies for Optimizing the Supply of Eye Protection, Crisis Capacity (accessed 29 April 2020)</p>	<p>https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/eye-protection.html#crisis-capacity</p> <p>https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/eye-protection.html#crisis-capacity</p>
<p>Decontamination and reuse: Wearing gloves, wipe the inside using a clean cloth saturated with detergent, hospital disinfectant, 0.5% chlorine, or 70% alcohol solution, then wipe the outside.</p> <p>Wearing a face shield with a mask increases respiratory protection and reduces external contamination of the mask.</p>			
What if I don't have a face shield?			
<p>Face shields can be made out of common plastic materials such as soda bottles. Ensure the shield covers eyes, nose, and mouth and extends from ear to ear.</p>		<p>Youtube video demonstrating how to make face shields from soda bottles (posted 11 April 2020, and accessed 14 May 2020)</p> <p>Khan MM, Parab SR. Simple Economical Solution for Personal Protection Equipment (Face Mask/Shield) for Health Care Staff During COVID 19. Indian J Orolaryngol Head Neck Surg. 2020</p> <p>DIY PPE Face Shield</p>	<p>https://www.youtube.com/watch?v=W-4ASh9Cky0</p> <p>https://link.springer.com/content/pdf/10.1007/s12070-020-020-0</p> <p>https://www.instructables.com/d/DIY-PPE-Face-Shield-3D/</p>
Mask			
N95/FFP2			
<p>Use: For aerosol-generating procedures (intubation, CPR, collection of nasal or oral swabs, use of high-flow oxygen/non-invasive ventilation).</p>	<p>In patient rooms, healthcare workers participating in aerosol-generating procedures performed on COVID-19 patients should have the following PPE: respirator N95 or FFP2 standard, or equivalent; gown; gloves; eye protection; apron</p> <p>CDC: "A key consideration for safe extended use is that the respirator must maintain its fit and function. Workers in other industries routinely use N95 respirators for several hours uninterrupted. Experience in these settings indicates that respirators can function within their design specifications for 8 hours of continuous or intermittent use. Some research studies have recruited healthcare workers as test subjects and many of those subjects have successfully worn an N95 respirator at work for several hours before they needed to remove them. Thus, the maximum length of continuous use in non-dusty healthcare workplaces is typically dictated by hygienic concerns (e.g., the respirator was discarded because it became contaminated) or practical considerations (e.g., need to use the restroom, meal breaks, etc.), rather than a pre-determined number of hours."</p> <p>WHO: "Extended use: The use without removing for up to 6h, when caring for a cohort of COVID-19 patients"</p> <p>Storage: The mask can be stored between uses in a clean sealable paper bag or breathable container. Avoid touching the outside of the mask.</p>	<p>WHO Interim guidance 27 February 2020. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19) (accessed 29 April 2020)</p> <p>CDC National Institute for Occupational Safety and Health (NIOSH) Recommended Guidance for Extended Use and Limited Reuse of N95 Filtering Facepiece Respirators in Healthcare Settings (accessed 29 April 2020)</p> <p>Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages, 6 April 2020. (accessed 29 April 2020)</p> <p>CDC Crisis Capacity Mask use (accessed 29 April 2020)</p> <p>N95 decontamination research group & Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages, 6 April 2020. (accessed 29 April 2020)</p>	<p>https://apps.who.int/iris/bitstream/handle/10665/331215/WHO-2019-nCoV-IPCPE-use-2020.1-eng.pdf</p> <p>https://www.cdc.gov/niosh/topics/hccwcontrols/recommendedguidanceextendeduse.html</p> <p>https://www.who.int/publications-detail/rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages</p> <p>https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/face-masks.html#crisis-capacity</p> <p>https://www.cdc.gov/coronavirus/2019-ncov/hcp/pep-strategy/decontamination-reuse-respirators.html</p> <p>https://www.who.int/publications-detail/rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages</p>
<p>Reuse: Can be worn up to 6 hours and reused following decontamination if face seal is maintained and no obvious damage or difficulty breathing through mask. Perform hand hygiene after removal.</p>			
Surgical			
<p>Use: For patient care and cleaning in COVID-19 wards.</p>	<p>In patient rooms, healthcare workers and cleaners providing care/entering the room of a COVID-19 room (not participating in any aerosol-generating procedures performed on COVID-19 patients) should have the following PPE: medical mask, gown, gloves, eye protection. For cleaners, they should additionally ensure they wear closed work shoes and heavy duty gloves. All should perform hand hygiene.</p> <p>Risks: Wearing the mask for a prolonged period may increase the chance of the health care worker touching the mask or having inadvertent under-mask touches; if the mask is touched/adjusted, hand hygiene must be performed immediately. Removal criteria and precautions: the mask becomes wet, soiled, or damaged, or if it becomes difficult to breathe through</p>	<p>WHO Interim guidance 27 February 2020. Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19) (accessed 29 April 2020)</p> <p>Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages, 6 April 2020. (accessed 29 April 2020)</p>	<p>https://apps.who.int/iris/bitstream/handle/10665/331215/WHO-2019-nCoV-IPCPE-use-2020.1-eng.pdf</p> <p>https://www.who.int/publications-detail/rational-use-of-personal-protective-equipment-for-coronavirus-disease-(covid-19)-and-considerations-during-severe-shortages</p>
<p>Reuse: Can be worn up to 6 hours if not soiled, damaged, or hard to breathe through. Perform hand hygiene after removal.</p>	<p>Extended use: "The use without removing for up to 6h, when caring for a cohort of COVID-19 patients"</p>		

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	Storage: Carefully fold 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.	CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html#crisis-capacity
Can I use a cloth mask?			
For patient care activities only when surgical mask is not available. Use with face shield, if possible. Can also be worn by patients and caregivers to reduce transmission.	Homemade masks should ideally be used in combination with a face shield that covers the entire front (that extends to the chin or below) and sides of the face.	CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html#crisis-capacity
	Avoid touching your face as much as possible. Keep the covering clean. Clean hands with soap and water or alcohol-based hand sanitizer immediately, before putting on, after touching or adjusting, and after removing the cloth face covering. Don't share it with anyone else unless it's washed and dried first. You should be the only person handling your covering. Laundry instructions will depend on the cloth used to make the face covering. In general, cloth face coverings should be washed regularly (e.g., daily and whenever soiled) using water and a mild detergent, dried completely in a hot dryer, and stored in a clean container or bag.	CDC Important Information About Your Cloth Face Coverings, 2020 (accessed 5 May 2020)	https://www.cdc.gov/coronavirus/2019-ncov/downloads/cloth-face-coverings-information.pdf
When soiled or at least daily, wash with soap and water. Dry before reusing.	Storage: Carefully fold 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.	CDC Crisis Capacity Mask use (accessed 29 April 2020)	https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html#crisis-capacity
Gloves			
	Wear gloves, according to Standard Precautions, when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, non-intact skin, potentially contaminated skin or contaminated equipment could occur. Gloves are not a substitute for hand hygiene. -If your task requires gloves, perform hand hygiene prior to donning gloves, before touching the patient or the patient environment. -Perform hand hygiene immediately after removing gloves.		
Use: For patient care and cleaning in COVID-19 wards. Remove or decontaminate gloves before touching non-contaminated items and surfaces (e.g. phones) and between patients. Do not reuse gloves. Perform hand hygiene immediately after removal.	Change gloves and perform hand hygiene during patient care, if -gloves become damaged, -gloves become visibly soiled with blood or body fluids following a task, -moving from work on a soiled body site to a clean body site on the same patient or if another clinical indication for hand hygiene occurs.	CDC Hand Hygiene in Healthcare Settings. Healthcare Providers. Glove use. When and how to wear gloves (accessed 29 April 2020)	https://www.cdc.gov/handhygiene/providers/index.html
	In a 2018 Letter to the Editor in the Annals of Laboratory Medicine, researchers described a small study in which they applied ethanol-based hand sanitizer to five brands of latex and nitrile gloves, rubbed and dried them, and checked for leaks. All brands of gloves were leak-free after 30 cycles, and one brand of latex gloves was leak-free after 100 cycles of disinfection with 83% ethanol. This indicates that disinfection of gloves with ethanol-based hand sanitizer does not quickly compromise mechanical integrity. However, hand contamination risk may increase after 10 disinfection cycles.	Chang, J., Jeong, T., Lee, S., Kim, Y., Lee, J., Lee, H. K., & Kwon, H. J. (2018). Intactness of Medical Nonsterile Gloves on Use of Alcohol Disinfectants. 83-84.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5700156/
	Disinfecting latex and nitrile gloves at least 6 times (the maximum cycles tested) with ethanol-based-hand-rub had a negligible effect on glove integrity, as measured by tensile strength and elongation.	Gao P, Horvatin M, Niezgoda G, Weible R, Shaffer R. (2016) Effect of multiple alcohol-based hand rub applications on the tensile properties of thirteen brands of medical exam nitrile and latex gloves. J Occup Environ Hyg.13(12):905-914.	https://pubmed.ncbi.nlm.nih.gov/27224677/
	Disinfection of non-sterile, latex gloves with chlorhexidine or alcohol-based hand rub was more effective at reducing contamination on gloves than 10 seconds of washing with soap.	Doebbeling BN, Pfaller MA, Houston AK, Wenzel RP. Removal of nosocomial pathogens from the contaminated glove. Implications for glove reuse and handwashing. Ann Intern Med. 1988;109(5):394-398.	https://pubmed.ncbi.nlm.nih.gov/3136685/
Can I use hand sanitizer on my gloves?		Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of Healthcare Quality Promotion (DHQP). Guidance on Personal Protective Equipment (PPE) To Be Used By Healthcare Workers during Management of Patients with Confirmed Ebola or Persons under Investigation (PUIs) for Ebola who are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea in U.S. Hospitals, Including Procedures for Donning and Doffing PPE. Ebola (Ebola Virus Disease).	https://www.cdc.gov/vhf/ebola/healthcare-us/pe/guidance.html
If using latex or nitrile gloves, hand sanitizer can be used up to 10 times to decontaminate gloves if not visibly soiled or damaged.	Use of hand sanitizer on gloves reduces the risk for self-contamination during doffing.		