

Guidance on optimizing the supply of personal protective equipment (PPE) and the use of PPE when in short supply

Due to the COVID-19 pandemic, high consumption of PPE worldwide may result in an acute shortage of PPE supplies. In order to meet the demand, alternative measures may be needed to optimize the supply of PPE that based on scientific evidence, the principles of safe care delivery and more importantly health-care worker safety, in addition to workload minimization for health care workers, and avoiding a false sense of security. These measures are strictly on temporary basis during periods of PPE shortages.

Purpose and scope

This document aims to describe two approaches to PPE use optimization: Extended Use and Reuse of PPE.

General Measures:

1. limit contact of patients to urgent or emergency situations.
2. Maximizing the use of telemedicine
3. limit the admission of COVID-19 to symptomatic patients only if possible.
4. Reduce the number of patients going to the hospital or outpatient settings
5. Reduce face-to-face HCP encounters with patients

Definitions:

Extended use: refers to the practice of wearing the same N95 respirator for repeated close contact encounters with several patients, without removing the respirator between patient encounters. Extended use may be implemented when multiple patients are infected with the same respiratory pathogen and patients are placed together in dedicated waiting rooms or hospital wards. Extended use has been recommended as an option for conserving respirators during previous respiratory pathogen outbreaks and pandemics. Entails the use of PPE by one health-care worker during one shift for no longer than 6 hours.

Reuse: refers to the practice of using the same N95 respirator for multiple encounters with patients but removing it ('doffing') after each encounter. The respirator is stored in between encounters to be put on again ('donned') prior to the next encounter with a patient. For pathogens in which contact transmission (e.g., fomites) is not a concern, non-emergency reuse has been practiced for decades. For example, for tuberculosis prevention, CDC recommends that a respirator classified as disposable can be reused by the

same worker as long as it remains functional² and is used in accordance with local infection control procedures.⁽⁹⁾ Even when N95 respirator reuse is practiced or recommended, restrictions are in place which limit the number of times the same FFR is reused. Thus, N95 respirator reuse is often referred to as “limited reuse”. Limited reuse has been recommended and widely used as an option for conserving respirators during previous respiratory pathogen outbreaks and pandemics. May be reused up to 5 times using the procedures detailed below.

- **EXTENDED USE IS PREFERRED OVER RE-USE**
- **ALWAYS USE PROPER HAND HYGIENE AND DON AND DOFF TECHNIQUE (Attached below)**

TYPE OF PPE	MEASURE	DESCRIPTION	PRECAUTIONS AND REMOVAL CRITERIA	
Medical/Surgical mask	1) Extended use	The use without removing for up to 6h, when caring for a cohort of COVID-19 patients	<ul style="list-style-type: none"> • Follow the safe procedure for removal and do not touch the front of the mask (Attached) • The mask needs to be changed whenever providing care outside a designated cohort of COVID-19 patients • If the mask becomes wet, soiled, or damaged, or if it becomes difficult to breathe through • If the mask is exposed to splash of chemicals, infectious substances, or body fluids • If the mask is displaced from face for any reason. • If the front of the mask is touched to adjust it • Use of the same medical mask by a health care worker between a patient with COVID-19 and a patient who does not have COVID-19 is not allowed owing to the risk of transmission to another patient who would be susceptible to COVID-19 	
	2) Re-use	Not recommended		
Respirators (FFP2, FFP3 or N95)	1) Extended Use	The use without removing for up to 6h, when caring for a cohort of COVID-19 patients	<ul style="list-style-type: none"> • Needs to be changed If respirator becomes wet, soiled, damaged, or difficult to breathe through, or loses its fit. • If exposed to splash of chemicals, infectious substances, or body fluids • If displaced from the face for any reason. • If the front of the respirator is touched to adjust it 	

			<ul style="list-style-type: none"> • Use of the same respirator by a health care worker between a patient with COVID-19 and a patient who does not have COVID-19 is not recommended owing to the risk of transmission to another patient who would be susceptible to COVID-19 • Discard N95 respirators following use during aerosol generating procedures • Discard N95 respirators contaminated with blood, respiratory to nasal secretions, or other bodily fluids from patients • Discard N95 respirators following close contact with, or exit from, the care area of any patient infected with an infectious disease requiring contact precautions • Consider use of a face shield or a surgical mask over an N95 respirator and/or other steps (e.g., masking patients) to reduce surface contamination 	
	2) Re-use	Using the same N95 respirator for multiple encounters with patients but removing it ('doffing') after each encounter with proper storage as described.	<ul style="list-style-type: none"> • May be used with surgical mask or face shield over the respirator • 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 any patient co-infected with an infectious disease requiring contact precautions. • Hang used respirators in a designated storage area and keep them in a clean, breathable container between uses. • To minimize potential cross-contamination, store respirators so that they do not touch 	

			<p>each other and the person using the respirator is clearly identified. Storage containers should be disposed of or cleaned regularly.</p> <ul style="list-style-type: none"> • Clean hands with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator (if necessary for comfort or to maintain fit). • Avoid touching the inside of the respirator. If inadvertent contact is made with the inside of the respirator, discard the respirator and perform hand hygiene as described above. • Use a pair of clean (non-sterile) gloves when donning a used N95 respirator and performing a user seal check. Discard gloves after the N95 respirator is donned and any adjustments are made to ensure the respirator is sitting comfortably on your face with a good seal. • 	
Disposable Gowns used by health workers	1) Extended use	The use without removing, when providing care of a cohort of patients with COVID-19. Not applicable if the patient has multidrug resistant microorganisms or other type of disease requiring contact precautions such as <i>Clostridioides difficile</i> . In such case, the gowns should be changed between patients.	<p>Removal criteria and precautions:</p> <ul style="list-style-type: none"> • If gown becomes wet, soiled, or damaged • If gown is exposed to splash of chemicals, infectious substances, or body fluids • When providing care outside designated cohort of COVID-19 patients • Use of the same gown by a health care worker between a patient with COVID19 and a patient who does not have COVID-19 is not recommended due to the risk of transmission to another patient who would be susceptible to COVID-19 	
	2) Re-use	Not recommended		

<p>Cloth Gowns used by health workers</p>	<p>1) Extended use</p>	<ul style="list-style-type: none"> • Consideration can be made to extend the use of isolation gowns (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 <i>Clostridioides difficile</i>) among patients. If the gown becomes visibly soiled, it must be removed immediately. 	<ul style="list-style-type: none"> • Cloth gown are reusable after laundering. • Cloth gowns could be considered for reuse without washing if there was minimal to no direct physical contact with the patient or nearby surfaces (wear apron in the top of the reusable cloth gown) 	<p>Not available at present in KFSHRC but under consideration.</p>
<p>Goggles or safety glasses used by health workers</p>	<p>1) Extended use Extended use of eye protection can be applied to disposable and reusable devices</p>	<p>The use without removing during the shift period, when caring for a cohort of COVID-19 patients.</p>	<p>Removal criteria and precautions:</p> <ul style="list-style-type: none"> • Eye protection should be removed and reprocessed if it becomes visibly soiled or difficult to see through. • If a disposable face shield is reprocessed, it should be dedicated to one HCW and reprocessed whenever it is visibly soiled or removed (e.g., when leaving the isolation area) prior to putting it back on. • Eye protection should be discarded if damaged (e.g., face shield can no longer fasten securely to the provider, if visibility 	

			<p>is obscured and reprocessing does not restore visibility).</p> <ul style="list-style-type: none">• HCW should take care not to touch their eye protection. If they touch or adjust their eye protection, they must immediately perform hand hygiene.• HCW should leave patient care area if they need to remove their eye protection.• If goggles are contaminated by splash of chemicals, infectious substances, or body fluids• If goggles obstruct health care worker safety or visibility of health care environment or become loose • Use of the same goggles by a health care worker between a patient with COVID19 and a patient who does not have COVID-19 is not recommended due to the risk of transmission to another patient who would be susceptible to COVID-19 <p>How to Clean Eye Protection Equipment (face shields / goggles)</p> <ol style="list-style-type: none">1. 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 cleaning wipe.2. Carefully wipe the outside of the face shield or goggles using a wipe or clean cloth saturated with MOH approved hospital disinfectant solution (alcohol wipes / quaternary ammonium compounds).3. Wipe the outside of face shield or goggles with clean water or alcohol to remove residue.4. Fully dry (air dry or use clean absorbent towels).5. Remove gloves and perform hand hygiene.	
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References:

1. Strategies for Optimizing the Supply of Eye Protection, CDC, Coronavirus Disease 2019 (COVID-19). <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html>. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/eye-protection.html>
2. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages Interim guidance 6 April 2020. file:///C:/Users/f26654/AppData/Local/Microsoft/Windows/INetCache/IE/0U9VA9TO/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf. <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html>
3. How to Reuse PPE, registered nursing, Eye Protection, How to Clean Eye Protection Equipment , <https://www.registerednursing.org/how-reuse-ppe/>
4. MOH Guidelines