

# PERSONAL PROTECTIVE EQUIPMENT (PPE) MANAGEMENT AND MAINTENANCE POLICY

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## Introduction

### Purpose

To provide guidelines for the shipboard medical teams on how to manage and maintain personal protective equipment.

### Background

Coronaviruses are a large family of viruses, which may cause illness in animals or humans. SARS-CoV-2, the causative agent of COVID-19, is a coronavirus. It is transmitted through large respiratory droplets and direct contact; other modes of transmission (i.e. airborne and fecal-oral) have also been proposed.

SARS-CoV-2 persists on surfaces up to three hours in the air post aerosolization, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel. These findings resulted from in vitro studies therefore caution is recommended when interpreting and extrapolating them to real life.

Evidence regarding the transmission of SARS CoV-2 suggest that while the virus is transmitted mainly by symptomatic confirmed cases, persons who are asymptomatic and / or in early stages of the infection can contribute to transmission of the virus. The recommended PPE should be used in combination with other personal protective measures:

- Hand Hygiene
- Respiratory Hygiene and Etiquette
- Avoidance of touching mouth / nose / eyes
- Proper handling and proper cleaning and disinfection of patient care equipment and devices
- Safe injection practices and proper handling of needles and other sharps

## Definitions and Uses

### Defining PPE

- PPE is the equipment used every day by medical staff to protect themselves, patients, and others when providing care.
- PPE helps protect from potentially infectious patients and materials, toxic medications, and other potentially dangerous substances used in healthcare delivery. During a pandemic like COVID-19, the PPE is used to prevent contact with the infectious agent and body fluids that may contain the infectious agent.
- The management of PPE will ensure that all vessels are supplied with adequate quantity and quality of these specific supplies to be carried onboard to ensure competent medical treatment of Guests and Crew members.
- Outbreak PPE supplies shall be located within the Medical Center and / or Secondary Medical Center storing area.

### Using PPE on Cruise Ships

The World Health Organization and the Centers for Disease Control and Prevention recommend that health care workers, cleaners and patients should wear personal protective equipment.

- At this time some authorities and countries have enforced additional mandatory use of PPE within the public setting.

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html>

[https://www.healthygateways.eu/Portals/0/plcdocs/EUHG\\_PPE\\_Overview\\_24\\_04\\_2020\\_F.pdf?ver=2020-05-20-201841-010](https://www.healthygateways.eu/Portals/0/plcdocs/EUHG_PPE_Overview_24_04_2020_F.pdf?ver=2020-05-20-201841-010)

When visiting multiple persons in isolation, all personnel assigned to wearing PPE should change PPE before entering multiple rooms in order to prevent cross contamination. For all purposes any member of the medical team caring for persons with symptoms of potential COVID-19 infection, from the first encounter and during the entire isolation period MUST wear full PPE.

It is important for medical teams to perform hand hygiene before and after removing PPE. Hand hygiene should be performed by using alcohol-based hand sanitizer that contains 60-95% alcohol or washing hands with soap and water for at least 20 seconds.

PPE recommendations for use and guidelines are contained within the **Task Driven PPE Recommendations** document which is available in the VMM as well as by request from you VIKAND Medical Managers.

## Training for PPE

All members of the medical team should know how to properly put on, adjust and take off the PPE and should become familiar with the available donning and doffing training tools within the first 72 hours after signing on. PPE training completion shall be integrated into the familiarization form

All crew shall receive Biannual training in understanding the symptoms of Covid-19, what precautions to take such as personal hygiene, social distancing and the use of PPE.

Any crew member assisting the medical staff, e.g. stretcher team members, other shipboard first responders, must receive the appropriate training regarding the donning of PPE as well as the doffing techniques on a regular basis as part of the Emergency drills.

## Donning and Doffing PPE

### Sequence for Donning Personal Protective Equipment

- Prior to donning PPE, you should first remove all personal items such as rings, necklaces and bracelets.
- Long hair should be pulled up and away from the face
- Hands should be washed for 20 seconds with antibacterial soap and water
  - If soap and water is unavailable, use hand sanitizer
- Assemble all necessary PPE per the for the planned intervention, based upon the **Task Driven PPE Recommendations Document** to ensure completeness of the “kit”

### Gown

- The gown should be unfolded away from the body.
- Place arms inside the gown to cover torso from neck to knees and from arms to end of wrists.
- Wrap the waist tie around the back and tie securely.
- Fasten the second tie in back of neck.
  - Assistance may be required to properly fasten and tie straps.

### Particle Respirator N95 Mask

- Fit the flexible piece to the nose with both hands.
  - Do not bend or tent the mask

- Affix the top strap to the crown of the head
- Affix the bottom strap to the base of the neck
- Use both hands to cover the surface of the mask – and exhale to secure fit

### Cloth or Fabric Mask

- Secure the top edge to the bridge of the nose by pinching in place
- If the mask has elastic earpieces, slip each strap around the ear
- If the mask has tie straps, tie one strap to the top of the head and the other to the base of the neck
- Fit the mask to cover the nose and chin

### Goggles or Face Shield

- Place face shield over face and eyes and adjust to fit at the back of the head
- Goggles should fit securely to the face and not interfere with the fit of the mask or respirator mask

### Gloves

- Prior to putting on the gloves, hands should again be washed for 20 seconds or cleaned with hand sanitizer
- Slide each glove on, and be sure to pull down so that the ends cover the wrist completely, including the isolation gown

***\*See Annex I for visual representation***

### Sequence for Removing (Doffing) Personal Protective Equipment

Gloves and gown should be removed prior to leaving the patients room.

### Gloves

The outside of the gloves **are** contaminated.

- **Single Removal Technique**
  - Pinch the edge of the glove and peel down so that it is inside out
  - Toss in the appropriate receptacle
  - With the ungloved hand, slide a finger under the edge of the glove to again peel down and off so that the glove is inside out
  - Toss in the appropriate receptacle
  
- **Glove-in-Glove Technique**
  - Pinch the outside edge of the glove with opposite gloved hand; peel off
  - Hold the discarded glove in gloved hand
  - Slide fingers of ungloved hand under remaining glove at wrist.
  - Peel glove off over first glove.
  - Discard gloves in the appropriate receptacle
  
- **Beaking Method**
  - Pinch the outside edge of one glove and pull down over the hand and fingers to form a “beak”
  - With the “beaked” hand, pull the opposite glove off by pinching the edge and rolling the glove off inside out.
  - Discard in appropriate receptacle.
  - With the ungloved hand, reach under the “beak” and slide the glove off inside out.
  - Discard in appropriate receptacle

## Gown

- Gown front and sleeves are contaminated
- Reach around the waist and untie or break the ties gently
- Reach up to the neck and untie or break the ties gently
- Place your hands inside at the shoulders and pull away from neck and shoulders, touching inside of gown only while turning the gown inside out
- Fold or roll into a bundle and discard in the appropriate receptacle

After removing the gloves and gown and leaving the patient’s room hand hygiene should be performed by using alcohol-based hand sanitizer that contains 60-95% alcohol or washing hands with soap and water for at least 20 seconds.

Special attention should be paid to the wrists where the gloves and gown overlapped.

## Goggles or Face Shield

- The outside of goggles or face shield is contaminated
- To remove, handle by head band or earpieces and pull away from the face

- Face shield should be pulled up and away from the head and face
- Goggles should be pulled straight off from the face
- Place in designated receptacle for reprocessing or in appropriate receptacle if disposable.

### Particle Respirator N95 or Mask

- The front of mask/respirator is contaminated, do not touch the front with your hands or glasses if you wear them
- Grasp the bottom strap and pull up and over the head
- Then grasp the top strap and pull up and over your head, while also holding the mask away from your face
- Discard in the appropriate receptacle

### Cloth or Fabric Mask

- Depending on the type of mask and securing straps:
  - Remove the straps away from the ears and pull mask away from the face and dispose in appropriate receptacle
  - Untie or break the strap at the base of the neck first, then pull the strap on the crown of the head up and away from the face.
    - Dispose in appropriate receptacle

After removing the masks and gown hand hygiene should be performed by using alcohol-based hand sanitizer that contains 60-95% alcohol or washing hands with soap and water for at least 20 seconds.

***See Annex II***

## WHO Recommendations on PPE

The following recommendations are based on guidance from the World Health Organization.

PPE	Description	Regulation
Gloves, examination, non-sterile	Gloves, examination, nitrile, powder-free, non-sterile, single-use Gloves should have long cuffs, reaching well above the wrist, ideally to mid-forearm Sizes: small, medium, large	EU MDD Directive 93/42/EEC Category III <ul style="list-style-type: none"> <li>• EU PPE Regulation 2016/425 Category III</li> <li>• EN 455 • EN 374 • ANSI/ISEA 105,</li> <li>• ASTM D6319,</li> </ul>
Gloves, examination or surgical, sterile	Gloves, examination or surgical, nitrile, powder-free, sterile, single-use Gloves should have long cuffs, reaching well above the wrist, ideally to mid-forearm Sizes: small, medium, large	EU MDD Directive 93/42/EEC Category III, <ul style="list-style-type: none"> <li>• EU PPE Regulation 2016/425 Category III,</li> <li>• EN 455,</li> <li>• ANSI/ISEA 105,</li> <li>• ASTM D6319</li> </ul>
Goggles, protective	Good seal with the skin of the face, flexible PVC frame to easily fit all face contours with even pressure, enclose eyes and the surrounding areas, accommodate wearers with prescription glasses; clear plastic lens with fog- and scratch-resistant	<ul style="list-style-type: none"> <li>• EU PPE Regulation 2016/425</li> <li>• EN 166</li> <li>• ANSI/ISEA Z87</li> </ul>
Face shield	Made of clear plastic and providing good visibility to both the wearer and the patient Adjustable band to attach firmly around the head and fit snugly against the forehead, fog-resistant (preferable). Completely covers the sides and length of the face. May be re-usable (made of robust material which can be cleaned and disinfected) or disposable.	<ul style="list-style-type: none"> <li>• EU PPE Regulation 2016/425</li> <li>• EN 166</li> <li>• ANSI/ISEA Z87.1</li> </ul>



Particulate respirator, grade N95 or higher.	N95 or FFP2 respirator, or higher Good breathability with a design that does not collapse against the mouth (e.g. duckbill, cup-shaped).	<ul style="list-style-type: none"> <li>• Minimum "N95" respirator according to FDA Class II, under 21 CFR 878.4040, and CDC NIOSH, or</li> <li>• Minimum "FFP2 according to EN 149, EU PPE</li> <li>• Regulation 2016/425 Category III,</li> </ul>
Mask, surgical – health care worker.	Surgical mask, good breathability; internal and external faces should be clearly identified Type II or higher.	<ul style="list-style-type: none"> <li>• EU MDD Directive 93/42/EEC Category III or equivalent</li> <li>• EN 14683 Type II, IR, IIIR</li> <li>• ASTM F2100 minimum level 1</li> </ul>
Mask, surgical – patient	Surgical mask, good breathability; internal and external faces should be clearly identified Type I.	<ul style="list-style-type: none"> <li>• EN 14683 any type including Type I</li> <li>• ASTM F2100 minimum level 1</li> </ul>
Scrubs, tops	Tunic/tops, woven, scrubs, reusable or single-use, short-sleeved (tunic/tops), worn underneath the coveralls or gown	
Scrubs, pants	Trouser/pants, woven, scrubs, reusable or single use, worn underneath the coveralls or gown	
Apron, heavy duty	Straight apron with bib, Fabric: 100% polyester with PVC coating, or 100% PVC, or 100% rubber, or other fluid-resistant coated material. Waterproof, sewn strap for neck and back fastening Minimum weight: 300 g/m <sup>2</sup> Covering size: 7090 cm (width) x 120–150 cm (height) Reusable (provided appropriate arrangements for decontamination are in place)	<ul style="list-style-type: none"> <li>• EN ISO 13688</li> <li>• EN 14126-B and partial protection (EN 13034 or EN 14605)</li> <li>• EN 343 for water and breathability</li> </ul>
Gown	Single-use, length mid-calf.	<p>EU PPE Regulation 2016/425 and EU MDD Directive 93/42/EEC</p> <ul style="list-style-type: none"> <li>• FDA Class I or II medical device, or equivalent</li> <li>• EN 13795 any performance level,</li> <li>• AAMI PB70 all levels acceptable, or equivalent</li> </ul>

- [https://www.who.int/publications-detail/disease-commodity-package---novel-coronavirus-\(ncov\)](https://www.who.int/publications-detail/disease-commodity-package---novel-coronavirus-(ncov)) <https://www.cdc.gov/niosh/npptl/topics/protectiveclothing/>

## Personal Protective Equipment Detailed

### Gloves

- Provides protection to the hands for Medical Staff or workers with potential exposure to infectious products or bodily fluids.
- Gloves should be well fit to the individual
- Sterile gloves should be used only by medical personnel while conducting sterile procedures
- Each ship should have a range of sizes to ensure fit for all staff
- DO NOT touch your face while wearing gloves and limit touching unnecessary surfaces
- Change gloves frequently
- Hands MUST be washed thoroughly for at least 20 seconds with soap and water after removing gloves

### Goggles

- Provides protection to the eyes
- Personal glasses should not be used as a substitute for the goggles
- May be reusable provided appropriate arrangements for decontamination are in place.
- Personal eyeglasses are not considered adequate eye protection

### Face Shield

- Provides protection to the face, mouth, nose and eyes when skin protection is also required
- Useful when dealing with copious amounts of secretions

### Particulate Respirator N95

- Reserved for Medical Staff or first responders in direct contact with suspected Covid-19 cases
- Requires a very close facial fit to be highly effective. Designed to create a seal and does not collapse against mouth
- Single use. In the event of a wide-spread outbreak of any infectious respiratory illness supplies of particulate respirator N95 can become depleted. With that scenario recommendations for extended use of these elements should apply.  
(<https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html> )
- Protect both patient and health care worker on the transfer of microorganisms and body fluids

### Mask Surgical

- Patients, cleaning staff and close contacts not in direct contact with microorganisms and body fluids
- Help Block particles droplets, splashes, sprays that may contain germs. May not provide complete protection due to loose fitting
- Single use. In the event of a wide-spread outbreak of any infectious respiratory illness supplies of masks can become depleted. With that scenario recommendations for extended use of these elements should apply.

### Fluid Resistant Coveralls

- 360 coverage, including head and feet in some versions, e.g. Tyvek Coveralls
- Zipped at the front of the coverall with a protective flap at the completion of the zip for barrier protection
- Requires very specific removal technique to avoid contamination.

### Gowns

- Not full coverage, usually to mid-calf and open back
- Easy to put on and take off

### Shoe / boot Covers

- When a coverall without integrated socks is worn, boot covers are required.
- The upper band of the boot cover will be worn UNDER the pants leg of the coverall to prevent pooling of liquids between the coverall pants leg and the shoe / boot covers.

## Recommended Personal Protective Equipment (PPE) Par Levels

- PPE items should be maintained as a minimum and should be separate from regular medical inventory securely stored and clearly marked in a separate storage space e.g. Secondary Medical Center (SMC) storage.
- Ship's Doctor is responsible for monitoring the PPE supply inventory and for managing and distributing the supplies to the appropriate departments in the event of an outbreak.
  - On ships having additional medical staff, the monitoring of the inventory will be conducted by the Nursing staff.
- Overall quantities of outbreak PPE supplies should be determined at the individual cruise operator level, with consideration given to size of the vessel, possible infection rate and total number of medical staff onboard.
- In the event of an outbreak, the medical team with the support of Vikand Shipboard Medical Operations Manager, could use the tracking PPE application tool to calculate the average PPE consumption and to determine ordering quantities to maintain the minimum PPE par levels.
  - <https://www.cdc.gov/niosh/ppe/ppeapp.html>
  - <https://www.cdc.gov/coronavirus/2019-ncov/downloads/hcp/PPE-Burn-Rate-Calculator.xlsx>

## Annexes

### Annex I-Donning PPE

## HOW TO GUIDE - PUTTING ON PPE FOR CONTACT/DROPLET PRECAUTIONS

### 1 Perform hand hygiene

Alcohol based handrub  
Rub hands for 20–30 seconds.  
or  
Water and soap  
Wash hands for 40–60 seconds.



### 2 Put on the gown



### 3 Put on the mask

Medical mask.



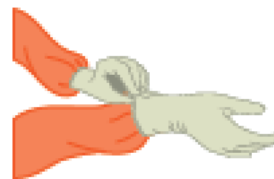
### 4 Put on eye protection

Put on face shield or goggles.



### 5 Put on gloves

Ensure glove is placed over the cuff of the gown.



### Full PPE



## HOW TO GUIDE - TAKING OFF PPE FOR CONTACT/DROPLET PRECAUTIONS

Ensure that infectious waste containers are available for safe disposal of PPE. Separate containers should be available for reusable items.

Order is important

### 1 Remove gloves



### 2 Remove the gown

Ensure gown is pulled away from the body during removal and that clothing does not become contaminated and dispose of them safely.



### 3 Perform hand hygiene

#### Alcohol based handrub

Rub hands for 20–30 seconds.

or

#### Water and soap

Wash hands for 40–60 seconds.



### 4 Remove eye protection

Remove face shield or goggles.



### 5 Remove the mask

Ensure you are taking the mask off from the straps, avoid touching the mask.



### 6 Perform hand hygiene

#### Alcohol based handrub

Rub hands for 20–30 seconds.

or

#### Water and soap

Wash hands for 40–60 seconds.



### Annex III – Par Levels

Supplies shall be available for Guests and Crew for at least 14 days. Re-stocking of items must be initiated upon activation of the outbreak. Below quantities were estimated for 1000 persons ship capacity.

PPE ITEM	Description	Min / Max	
3-ply Surgical Face Mask	For all crew and guests (if requested)	5000	10000
N95 Respirator	For medical staff in contact with infected persons	2500	5000
Disposable Gloves (Latex)		1000	2000
Goggle	For medical staff, and housekeeping	30	60
Face Shield	For medical staff, and housekeeping	30	5
Disposable Gown Size S	Non-surgical fluid resistant	100	10
Disposable Gown Size M	Non-surgical fluid resistant	200	20
Disposable Gown Size L	Non-surgical fluid resistant	50	5
Disposal Apron		500	500
Disposable Tyvek Coverall Size S	For medical staff, maintenance and housekeeping	200	400
Disposable Tyvek Coverall Size M	For medical staff, maintenance and housekeeping	500	1000
Disposable Tyvek Coverall Size L	For medical staff, maintenance and housekeeping	500	1000
Disposable Head Cover		100	200
Disposable Boot Cover		100	200
<b>CONSUMABLES</b>			
Red Biohazard Bags		500	1000
Linen Bag Red		200	400
Disposable Plastic Bed Linens	Two for each isolation rooms		
Reusable Clean Towels		50	100
Disposable Paper Towels		1000	2000
Sharps Container	One for each isolation and ward		
Medical Disinfectant (5L)	EPA approved or equivalent	1	2
75% Alcohol Liquid (1L)		5	10
Hand Sanitizer (500ml)		50	100
Alcohol Cotton Ball		500	1000
Alcohol Pad		500	1000
Cotton Swabs		500	1000
<b>TEST KITS</b>			
Influenza A and B	Test kit with average 20 – 22 tests		
Covid-19			

