

INFECTION CONTROL MEASURES

Refer to KKM Guidelines on COVID-19 Management in Malaysia No. 04/2020 (Edisi Keempat)

1. Infection control procedures including administrative rules and engineering controls, environmental hygiene, correct work practices, and appropriate use of personal protective equipment (PPE) are all necessary to prevent infections from spreading during healthcare delivery.
2. Infection control measures for patients with PUI/ suspected COVID-19 before admission at point of entry (triage/ registration counter etc):
 - a. Give patient a **surgical mask** (facemask) to wear (NOT N95 mask).
 - b. If patient unable to tolerate (tachypneic, hypoxic) - avoid surgical mask. Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others.
 - c. Separate PUI cases to a dedicated waiting areas away from other patients.
 - d. Keep **more than 1 meter** distance between suspected patients and other patients.
 - e. Emphasise on respiratory hygiene: provide tissues and no-touch receptacles for disposal of tissues/biohazard bag.
 - f. Emphasise on hand hygiene: ensure alcohol hand rub bottles available in the waiting area and at the point of care.
 - g. Adequate environmental ventilation and environmental cleaning at waiting and triage areas.
3. Infection control measures to be taken by healthcare workers (HCW)
 - a. When providing care for the patient adherence to STANDARD, CONTACT AND DOPLET precautions, including the use of EYE PROTECTION is essential to prevent unnecessary exposures among HCW (including radiographer, physiotherapy etc).
This includes use of the following PPE for HCW :
 - single-use surgical mask
 - eye protection (for example, safety glasses/goggles or face shield)
 - long-sleeved gown
 - gloves (non-sterile).

Patient should be wearing a mask when HCW is in the room. If patient unable to wear a mask, HCW to use N95 mask instead of surgical mask.
 - b. Airborne and contact precautions should be used routinely for AGPs
This include the following PPE:
 - N95 respirator (mask) – fit-check with each use
 - eye protection (for example, safety glasses/goggles or face shield)
 - long-sleeved gown
 - gloves (non-sterile).

All PPE should be single-use and disposed of into clinical waste when removed.

Examples of Aerosol-generating procedures (AGP):

- bronchoscopy
 - tracheal intubation
 - non-invasive ventilation (BiPAP, CPAP, HFOV)
 - manual ventilation before intubation
 - intubation
 - cardiopulmonary resuscitation
 - sputum induction
 - suctioning
 - NP/OP swab especially in someone who is coughing
- c. **Standard precautions** include hand and respiratory hygiene, the use of appropriate personal protective equipment (PPE) according to risk assessment, injection safety practices, safe waste management, proper linens, environmental cleaning and sterilisation of patient-care equipment.
- d. After patient care, appropriate doffing and disposal of all PPE's and hand hygiene should be carried out
- e. Limit the number of persons present in the room to the absolute minimum required for the patient's care and support. Only essential personnel should enter patients' room.
- f. Ensure a log of all HCW who care for or enter the rooms or care area of these patients is kept in the ward, ED and all areas where patient was cared for.

Table 1.0

REQUIREMENTS	
Placement	An adequately ventilated single room and door kept closed is sufficient If available place in single negative pressure room Cohorting not recommended unless absolutely necessary (consultation with infection control professional, or infectious diseases physician).
Signage	Place an isolation sign to all entry points to the patient's room

Hand Hygiene	<p>Apply the WHO's My 5 Moments for Hand Hygiene approach before touching a patient, before any clean or aseptic procedure is performed, after exposure to body fluid, after touching a patient, and after touching a patient's surroundings; and as per doffing protocol (Annex 5)</p> <p>HCWs should refrain from touching eyes, nose or mouth with potentially contaminated gloved or bare hands.</p> <p>alcohol-based hand rubs (ABHR) are preferred if hands are not visibly soiled;</p> <p>wash hands with soap and water when they are visibly soiled.</p>
Gloves	Non-sterile gloves (as per standard and contact precautions).
After patient care	<p>Appropriate doffing and disposal of all PPE's and hand hygiene should be carried out.</p> <p>A new set of PPE is needed, when care is given to a different patient</p>
Equipment	<p>Equipment should be either single-use and disposable or dedicated non-critical equipment (e.g., stethoscopes, blood pressure cuffs and thermometers. Stethoscopes should be kept in the anteroom and cleaned after each use).</p> <p>If equipment needs to be shared among patients, clean and disinfect it between use for each individual patient by using the hospital recommended disinfectant wipes.</p>
Transport of patients	<p>Limit transport and movement of the patient from the room.</p> <p>If transport or movement is necessary use routes of transport that minimize the exposures of staff, other patients and visitors to potential infection</p> <p>When outside of the airborne isolation room, patient should wear a surgical mask if not in respiratory distress. Oxygen supplement using nasal prong can be safely used under a surgical mask.</p> <p>Patients on oxygen therapy must be changed to nasal prongs and have a surgical mask over the top of the nasal prongs for transport (if medical condition allows).</p> <p>Patient can remove surgical mask once in the isolation room and no one else is in the room.</p> <p>notify the receiving area of the patient's diagnosis and precautions that will be required before the patient's arrival.</p> <p>Clean and disinfect surfaces that the patient comes into contact with (e.g. bed/ wheelchair) after use</p>

Portable X-ray equipment	Use designated the designated portable X-ray equipment and/or other designated diagnostic equipment. All equipment used must be cleaned and disinfected between use for each individual patient by using the hospital recommended disinfectant wipes.
Transport via ambulance	Refer section Annex 7: Protocol for Ambulance Transfer for PUI for COVID-19
Linen	Used or infected linen should be place directly in alginate plastic bag. Ensure wet linen is double bagged and will not leak
Visitors	No visitors allowed. If absolutely necessary, discuss with and obtain approval from the COVID-19 team before allowing visitors into the room. Staff must instruct and supervise all visitors on the donning and doffing of PPE (gown, gloves, face mask, eye protection) before entering the room. The visit time must be limited and avoid close contact (< 1 m). Perform hand hygiene on entering and before leaving the room. Also refer KKM Guidelines on COVID-19 Management in Malaysia No. 04/2020 (Edisi Keempat)
Room / environment Cleaning	Environmental cleaning and disinfection procedures are followed consistently and correctly as per (Refer to DS0954-E02 - Guidelines and Procedure for Cleaning of the Hospital Environment). Daily isolation cleaning of admitted patients' rooms Terminal cleaning upon patient discharge from room or waiting area.
Spillage	Use chlorine granules in the spillage kit to absorb the spill (DS0954-E02 - Guidelines and Procedure for Cleaning of the Hospital Environment).
Room Turnover	A good rule of thumb is 30 to 45 minutes. During that time the door should remain closed and respiratory protection is still required to enter the room. A new patient may not be placed in the room until it has been cleaned and the time stated above has elapsed.

PPE For HCW based on risk assessment :

- **patient should always wear a surgical face** mask during transfer and in the presence of other people.
- **Limit the number and unnecessary of personal entering the a patient's room**
- Adapted from KKM 'RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE USED IN THE CONTEXT OF COVID19 DISEASE ACCORDING TO RISK OF EXPOSURE (KKM Guidelines 19th March 2020)'

Table 2.0

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR HEALTH CARE WORKER INVOLVED IN MANAGING PUI / CONFIRMED CASE OF COVID-19 ACCORDING TO RISK EXPOSURE

SETTING	TARGET PERSONNEL	ACITIVITY	TYPE OF PPE
EMERGENCY DEPARMENT			
Triage	HCW	Maintained 1-2m spatial distance at all time	<ul style="list-style-type: none"> • Surgical mask • Frequent Hand hygiene <p>*Full PPE set must be made available at the site in case of emergency</p> <p>* Use physical barriers (such as glass or plastic windows) to reduce exposure</p>
Patient Waiting Area	Patients	Patient With respiratory symptoms	<ul style="list-style-type: none"> • Patient to wear a face mask. Should be seated at the designated area and to sit at least 1m apart
Examination Room / Consultation Room	HCW	History taking and Physical examination * patient should be reminded to wear a surgical mask when the HCW enters the room	<ul style="list-style-type: none"> • Surgical mask • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) -based on risk assessment

	Cleaners	<p>Cleaning in the outpatient consultation rooms</p> <p>*increase frequency of cleaning at areas with higher environmental contamination rates</p>	<ul style="list-style-type: none"> • Surgical mask • Long sleeved plastic gown/ apron • Gloves • Eye Protection (goggles/ face shield) • Boots or closed shoes
		Decontamination of ambulances that transported COVID positive patients/ PUI	<ul style="list-style-type: none"> • Surgical mask • Long sleeved plastic gown/ apron • Gloves • Eye Protection (goggles/ face shield) • Boots or closed shoes
Ambulance transfer vehicle	HCW	Transporting PUI/COVID 19 patient to the referral health	<ul style="list-style-type: none"> • N95 • Long sleeved plastic gown/ apron

		care facility - distance to patient within 1m.	<ul style="list-style-type: none"> Gloves Eye Protection (goggles/ face shield)
	Driver	Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID-19 patient.	Maintained 1m spatial difference <ul style="list-style-type: none"> Surgical mask *Windows should be kept open throughout the drive
		Assisting with loading or unloading patients with suspected COVID from ambulance to wards	<ul style="list-style-type: none"> Surgical mask Long sleeved plastic gown/ apron Gloves Eye protection (goggles/ face shield) *Windows should be kept open throughout the drive
		No direct contact with patient with suspected COVID-19, but NO separation between driver's and patient's compartments.	<ul style="list-style-type: none"> Surgical mask *Windows should be kept open throughout the drive
Specimen Collection Area	HCW	Performing oropharyngeal or nasopharyngeal swab	<ul style="list-style-type: none"> N95 Gloves Isolation Gown (fluid-repellent long-sleeved gown) Eye protection (goggles/ face shield) Head cover *It is sufficient to change gloves and plastic apron between patients. Any soiled protective equipment's should also be changed
INPATIENT FACILITIES			
Patient Room	HCW	Providing care to COVID19/ PUI patients who are not intubated and able to wear surgical mask	<ul style="list-style-type: none"> Surgical mask Isolation Gown (fluid-repellent long-sleeved gown) Gloves

			<ul style="list-style-type: none"> • Eye Protection (goggles/ face shield) <p>Head covers are not necessary.</p>
		Providing care to COVID19/ PUI patients who are not intubated but NOT able to wear surgical mask	<ul style="list-style-type: none"> • N95 mask • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) • Head cover
		Performing oropharyngeal or nasopharyngeal swab to COVID19 / PUI patients	<ul style="list-style-type: none"> • N95 mask • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) • ±Head cover (based on risk assessment)
		Providing care to COVID 19 /PUI Patients who are ventilated in a closed circuit	<ul style="list-style-type: none"> • N95 mask • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) • Head cover
		Performing Aerosol Generating Procedures (AGP) on COVID 19/PUI patients <ul style="list-style-type: none"> • Intubation, extubation and related procedures; • Tracheotomy/tracheostomy procedures; • Manual ventilation; • Suctioning; • Bronchoscopy; 	Option 1 (Preferred): <ul style="list-style-type: none"> • PAPR • Isolation Gown (fluid-repellent long-sleeved gown) with plastic apron/ Tyvec suit • Gloves • Eye Protection (goggles/ face shield) • Shoe Cover

		<ul style="list-style-type: none"> • Nebulization • Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP); • Surgery and post-mortem procedures in which high-speed devices are used; • High-frequency oscillating ventilation (HFOV); • High-flow Nasal Oxygen (HFNO) • Induction of sputum • Dental procedures 	<p>Option 2:</p> <ul style="list-style-type: none"> • Tyvec suit • N95 • Eye Protection (goggles/ face shield) • Gloves • Shoe Cover
			<p>Option 3 (if Option 1 & 2 not available):</p> <ul style="list-style-type: none"> • N95 • Isolation Gown (fluid-repellent long-sleeved gown) with plastic apron • Gloves • Eye Protection (goggles/ face shield) • Shoe Cover
		Transporting specimen to lab	<ul style="list-style-type: none"> • Gloves • ± Plastic Apron
	Cleaners	<p>COVID19/ PUI patients who are not intubated and able to wear surgical mask</p> <p>*IF COVID 19 patient is discharged. It is recommended for cleaners to enter the room after about 45 minutes if the ACHR is not known</p>	<ul style="list-style-type: none"> • Surgical mask • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) • Boots or closed shoes
		<p>COVID19/ PUI patients who are not intubated but NOT able to wear surgical mask</p> <p>*IF COVID 19 patient is discharged. It is recommended for cleaners to enter the room after about 45 minutes if the ACHR is not known</p>	<ul style="list-style-type: none"> • N95 • Isolation Gown (fluid-repellent long-sleeved gown) • Gloves • Eye Protection (goggles/ face shield) • Boots or closed shoes
Outside patient room within 1-2	All staff including HCW	Any activity that does not lead to contact with COVID 19 patient	<ul style="list-style-type: none"> • Surgical Mask

metres of patient room/ care areas YELLOW ZONE			
Other areas of patient transit (wards / corridors) GREEN ZONE	All staff including HCW	Any activity that does not lead to contact with COVID 19 patient	No PPE needed
ADMINISTRATIVE AREAS/ PUBLIC AREAS			
Any Areas	ALL STAFF And Asymptomatic Individuals	ANY ACTIVITIES	NO PPE NEEDED
	Security Officer	Security officers at ED entrance	<ul style="list-style-type: none"> No PPE needed Frequent Hand Hygiene <p>* maintain spatial distance of 1 meter, if not able to achieve, use surgical mask</p>
		Security officers escorting patient (no direct contact with patient and > 1 metre from patient) Security officer must not follow patient into the lift	<ul style="list-style-type: none"> No PPE needed Frequent Hand Hygiene <p>* maintain spatial distance of 1 meter, if not able to achieve, use surgical mask</p>

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE USED WHEN ATTENDING OR TREATING ACUTE RESPIRATORY INFECTION (ARI) PATIENT

For those attending / treating ARI patients with unknown pathogens, should practice droplet precautions. The PPE requirement as shown below:

SETTING	TARGET PERSONNEL	ACTIVITY	TYPE OF PPE
Examination Room / Consultation Room	HCW	History taking / physical examination / providing care Patient should be reminded to wear a Surgical mask (if tolerable) or if intolerable, advise the patient to cover nose and mouth during coughing or sneezing with tissue or flexed elbow.	<ul style="list-style-type: none"> Surgical mask
		Performing Aerosol Generating Procedures (AGP)	<ul style="list-style-type: none"> N95

		<ul style="list-style-type: none"> • Intubation, extubation and related procedures; • Tracheotomy/tracheostomy procedures; • Manual ventilation; • Suctioning; • Bronchoscopy; • Nebulization • Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP); • Surgery and post-mortem procedures in which high-speed devices are used; • High-frequency oscillating ventilation (HFOV); • High-flow Nasal Oxygen (HFNO) • Induction of sputum • Dental procedures 	<ul style="list-style-type: none"> • Gloves • Isolation Gown (fluid-repellent long-sleeved gown) • Eye protection (goggles / face shield)
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Staff category	Hand hygiene	Eye protection	N95 mask or equivalent	Surgical mask	Gown single layer	Gloves
Housekeeping staff when cleaning patients' rooms (while patient in room) & transfer lift	Yes	Yes (if risk of splash from organic material or chemicals).	No	Yes	Yes	Yes
Housekeeping staff when cleaning transfer lift	Yes	Yes (if risk of splash from organic material or chemicals).	No	Yes	Yes	Yes

Staff escorting patients (> 1metre from patient and no direct patient contact)	Yes	No	No	No	No	No
Staff escorting patients (within 1 metre of patient)	Yes	Yes	No	Yes	Yes	Yes
Ambulance driver for suspect /confirmed cases	Yes	No	Yes	No	Yes	Yes
Staff At Forward/ 1st Triage Counters³ (ensure >1 metre distance from patient and no direct contact with patient)	Yes	No	No	yes	No	No
Staff caring for patient in decon room (no AGP)	Yes	Yes	No	Yes	Yes	Yes
Staff caring for patient in decon room (conducting AGP)	Yes	Yes	Yes	No	Yes	Yes
Security officers at ED entrance (advice 1 metre distance from patients/ clients)	Yes	No	No	No	No	No
Security officers escorting patient (no direct contact with patient and > 1 metre from patient) Security officer must not follow patient into the lift	Yes	No	No	No	No	No
Security officers escorting Aggressive patient (if patient not allowing to put on face mask)	Yes	Yes	Yes	No	Yes	Yes
Staff Transporting Specimens To Lab	Yes	No	No	No	No	No

Care of critically ill patients in ICU

- Patients who require admission to ICU with severe COVID-19 are likely to have a high viral load, particularly in the lower respiratory tract.

- Contact and airborne precautions are required for patient care and are adequate for most AGPs.
 - The risk of aerosol transmission is reduced once the patient is intubated with a closed ventilator circuit. There is a potential, but unknown, risk of transmission from other body fluids such as diarrhoeal stool or vomitus or inadvertent circuit disconnection.

If a health care professional is required to remain in the patient's room continuously for a long period (for example, more than one hour), because of the need to perform multiple procedures, the use of a powered air purifying respirator (PAPR) may be considered for additional comfort and visibility

Wearing PPE whilst undertaking cleaning and disinfection

Droplet and contact precautions should be used during any cleaning and disinfection of a room where there has not been an AGP or if more than 30 minutes has elapsed since the AGP was done.

Airborne and contact precautions should be used during any cleaning and disinfection of a room where there has been an AGP performed within the previous 30 minutes

Steps for disinfection and cleaning of a patient consultation room or inpatient room

The patient consultation room should be cleaned at least once daily and following any AGPs or other potential contamination.

There is no need to leave a room to enable the air to clear after a patient has left the room unless there was an AGP performed. Nose and throat swabs are not considered AGPs unless performed on a patient who has pneumonia. If an AGP was performed, leave the room to clear for 30 minutes.

The patient consultation room (or inpatient room after discharge of the suspected case) should now be cleaned and disinfected using the agents listed above. In most cases this will mean a wipe down with a one-step detergent disinfectant as listed above. There is no requirement to wait before the next patient is seen. The room is now suitable for consultation for the next patient.

Training and assessment:

All front-line staff will have to undergo a respirator fit testing, training and assessment on PPE donning and doffing. This will be conducted by the infection control nurse and team leader

DONNING AND DOFFING OF PPE

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms

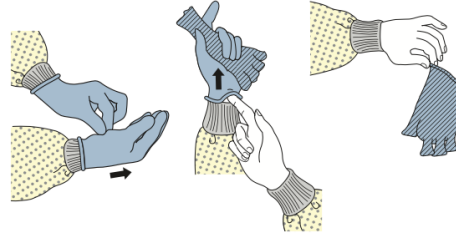


HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



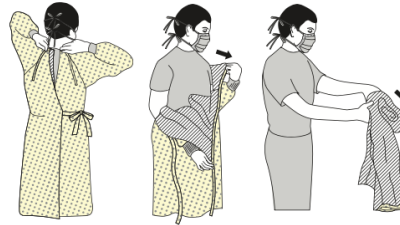
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

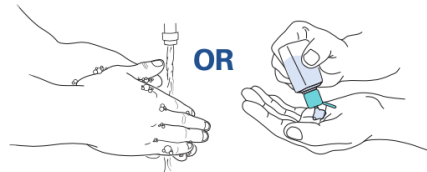


4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS
BECOME CONTAMINATED AND IMMEDIATELY AFTER
REMOVING ALL PPE**

