

# THE INFECTION PREVENTION AND CONTROL (IPC) MEASURES IN MANAGING PATIENT UNDER INVESTIGATION (PUI) OR CONFIRMED CORONA VIRUS DISEASE (COVID-19)

## THE INFECTION AND PREVENTION CONTROL GUIDING PRINCIPLES

The principles of IPC for Acute Respiratory Infection (ARI) patient care include:

- a) Early and rapid recognition AND source control that includes promotion of respiratory hygiene
  - Early recognition and investigation, prompt implementation of IPC precautions, reporting and surveillance, and supportive treatment to make patients non-infectious by strictly adhering to Interim definitions of the epidemiological AND Clinical Criteria in the case definition
  - Post visual alerts (in appropriate languages) at the entrance to outpatient facilities (e.g., emergency departments, physicians' offices, outpatient clinics) instructing patient and the persons who accompany them to inform healthcare personnel of symptoms of a respiratory infection when they first register for care, and practice respiratory hygiene/cough etiquette
- b) Application of routine IPC precautions (Standard Precautions) for all patients;
- c) Additional precautions (Transmission Based Precautions) in selected patients (i.e. contact, droplet, airborne)based on the presumptive diagnosis;
- d) Establishment of an IPC infrastructure for the healthcare facility, to supportIPC activities.
- e) Provision of adequate and regular supply of PPE and appropriate training of staff. Using the PPE help to further reduce the risks of transmission of respiratory pathogens to health-care workers and other people interacting with the patients in the health-care facility

*\* Refer to Table 2 for recommended PPE to be used when attending / treating ARI patient.*

## STANDARD PRECAUTIONS

Standards Precautions are routine IPC precautions that should apply to **ALL** patients,in **ALL** healthcare settings. The precautions, described in detail within Chapter 3 ofthe 'Policies and Procedures on Infection Prevention and Control – Ministry of Health Malaysia; 2018'are:

- a) Hand hygiene before touching a patient; before any clean or aseptic procedure; after body fluid exposure risk; after touching a patient; and after touching a patient's surroundings, including contaminated items or surfaces.
- b) Use of personal protective equipment (PPE) guided by risk assessment concerning anticipated contact with blood, body fluids, secretions and non-intact skin for routine patient care.
- c) Respiratory hygiene in anyone with respiratory symptoms.
- d) Environmental control (cleaning and disinfection) procedures according to standard procedures.
- e) Waste management according to safe routine practices.
- f) Packing and transporting patient-care equipment, linen, laundry and waste from the isolation areas.
- g) Prevention of needle-stick or sharps injuries.

## **INFECTION PREVENTION AND CONTROL (IPC) MEASURES IN MANAGING PATIENT UNDER INVESTIGATION (PUI) OR CONFIRMED CORONAVIRUS DISEASE (COVID-19)**

*This guideline is based on current information available regarding disease severity, transmission efficacy and shedding duration. This document will be updated as more information is made available.*

*\*Refer to Table 1 for recommended PPE to be used when managing PUI or confirmed COVID-19*

### **A. POINT OF ENTRY**

***(Applies to hospital emergency departments, health clinics / private GP clinics / fever centres / ambulatory care units and travellers screening points)***

#### **Clinical Triage**

- Use physical barriers to reduce exposure to the COVID-19 virus, such as glass or plastic windows.
- Rapid case identification of patients at risk by using visual aid, and proper travel history taking in patient presenting with fever and cough.
- Rapid triage of patients with acute febrile respiratory diseases is recommended.

- Must offer surgical mask (not N95 mask) if patient is able to tolerate (not tachypneic, not hypoxic). If patient is unable to tolerate, advise the patient to cover nose and mouth during coughing or sneezing with tissue or flexed elbow.
- Separate PUI to a dedicated waiting area which is well ventilated with spatial separation of at least 1 - 2m between patients in the waiting rooms.
- Provide tissues/ surgical mask with a no-touch bin for disposal of tissues/biohazard bag.
- Provide resources for performing hand hygiene (alcohol based hand rub made available).
- Cleaning of high touch areas (i.e. chair, table, couch) at waiting and triage areas after patient leaves the area or as required (i.e. spillage, soiling).

#### **Examination / isolation room**

- Examination/ isolation room should be in descending order of preference:
  - i. Single room (nursed with door closed) and en-suite bath
  - ii. Single room

### **B. PATIENT PLACEMENT ON ADMISSION**

- Patient placement should be in descending order of preference:
  - i. Single room (nursed with door closed) and en-suite bath OR
  - ii. Single room
- Cohorting confirmed COVID-19 patient is allowed. However, for PUI awaiting result should be placed in a single isolation room.
- Dedicate the use of non-critical patient-care equipment to avoid sharing between clients/patients/residents
  - E.g. stethoscope, sphygmomanometer, thermometer or bedside commode
  - If unavoidable, then adequately clean and disinfect them between use for each individual patient with hospital recommended disinfectant.

### **C. AEROSOL-GENERATING PROCEDURES (AGP)**

An aerosol-generating procedure (AGP) is defined as any medical procedure that can induce the production of aerosols of various sizes, including small (< 5µm) particles. The aerosol-generating procedures include:

- 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

#### **Patient placement**

In descending order of preference:

- i. Negative pressure rooms/AIRR room
- ii. Adequately ventilated single room with at least natural ventilation with at least 160 l/s/patient air flow, with closed doors

### **D. PATIENT TRANSFER AND TRANSPORT**

- Avoid the movement of patients unless medically necessary.
- If movement of patient is required, use pre planned routes that minimize exposure to other staff, patients and visitors. Notify the receiving area before sending the patient.
- Clean and disinfect patient-contact surfaces (e.g. bed, wheelchair, incubators) after use.
- HCWs transporting patients must wear appropriate PPE. (Surgical Face Mask, Eye Protection, Isolation Gown, Gloves).

- When outside of the airborne isolation room, patient should wear a surgical mask (not N95 mask) if not in respiratory distress. Oxygen supplement using nasal prong can be safely used under a surgical mask. If patient is unable to tolerate surgical mask, advise the patient to cover nose and mouth during coughing or sneezing with tissue or flexed elbow during transport.

## **E. SPECIMEN COLLECTION AND TRANSPORT**

All specimens should be regarded as potentially infectious, and health-care workers who collect or transport clinical specimens should adhere rigorously to Standard Precautions, to minimize the possibility of exposure to pathogens.

- Deliver all specimens by hand whenever possible. Do not use pneumatic-tube systems to transport specimens.
- State the name of the PUI suspect of potential concern clearly on the accompanying request form. Notify the laboratory as soon as possible that the specimen is being transported.
- Ensure that health-care workers who collect respiratory specimens from PUI / confirmed COVID-19 patients wear appropriate PPE.
- Place specimens for transport in leak-proof specimen bags (please refer to Annex 5c for instructions on specimen packaging).
- Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures. There are no special requirements for transport of samples to lab and they can be transported as routine samples for testing. However, personnel may wear gloves ± plastic apron during transfer.

## **F. DISINFECTION AND STERILIZATION**

- Ensure environmental cleaning and disinfection procedures are followed consistently and correctly as per hospital recommendation.
- Clean and disinfect surfaces that are likely to be contaminated with pathogens, including those that are in close proximity to the patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms):

- The Minimum requirement of cleaning and disinfection recommended is at least once a day and more frequently if visibly soiled using standard hospital registered disinfectants, such as sodium hypochlorite 1000 ppm.
- If visible contamination or spills, it is recommended to use a higher dilution of EPA registered disinfection such as sodium hypochlorite at 10,000ppm.
- If equipment is reused, follow general protocols for disinfection and sterilization:
  - If not visibly soiled, wipe external surfaces of large portable equipment (e.g. X-ray machines and ultrasound machines) that has been used in the isolation room or area with an approved hospital disinfectant upon removal from the patient's room or area.
  - Proper cleaning and disinfection of reusable respiratory equipment is essential in patient care.
  - Follow the manufacturer's recommendations for use or dilution, contact time and handling of disinfectants.

## **G. TERMINAL CLEANING OF AN ISOLATION ROOM**

A terminal cleaning and disinfection should be done following discharge/transfer of a patient as per hospital guideline.

- Before entering the room, cleaning equipment should be assembled before applying PPE.
- PPE must be removed, placed in an appropriate receptacle and hands cleaned before moving to another room or task.
- PPE must not be worn or taken outside the patient room or bed space.
- Protocols for cleaning must include cleaning of portable carts or built-in holders for equipment.
- The room should be decontaminated from the highest to the lowest point and from the least contaminated to the most contaminated.
- Remove curtains and placed in red linen bag with alginate plastic after patient is discharged.
- Use disinfectants such as sodium hypochlorite. The surface being decontaminated must be free from organic soil. A neutral detergent solution should be used to clean the environment prior to disinfection or a combined detergent /disinfectant may be used.

- In addition to the above measures, the following additional measures must be taken when performing terminal cleaning for Airborne Infection Isolation Rooms (AIIR).
- The cleaner should wait for sufficient air changes to clear the air before cleaning the room.
- After patient/resident transfer or discharge, the door must be kept closed and the Airborne Precautions sign must remain on the door until sufficient time has elapsed to allow removal of airborne microorganisms. Duration depends on ACHR.
  - With ACHR of 12 or 15, the recommended duration is 23 to 35 minutes and 18 to 28 minutes with 99%-99.9% efficiency respectively.
  - When the ACHR cannot be determined it is recommended that the room is left for time interval of 45 minutes before the cleaning and disinfectant is commenced.

#### **H. DISHES AND EATING UTENSILS**

- Use disposable utensils as much as possible.

#### **I. LINEN MANAGEMENT**

- Contaminated linen should be handled as little as possible to prevent contamination of the air.
- Washing / disinfecting linen should be handled according to hospital protocol.

#### **J. HEALTHCARE WORKER (HCW)**

- Healthcare worker with high risk condition / immune-compromised should not be allowed managing and providing routine care for PUI/ confirmed COVID-19 cases.
- Ensure all health care workers who are managing these patients are up to date with their vaccination schedules.
- Healthcare worker who are managing and providing routine care for PUI cases with Acute Respiratory Infections need to be trained on proper use of PPE.
- Keep a register of health-care workers who have provided care for patients with ARIs of potential concern, for contact tracing.
- The creation of a dedicated team consisting of nurses, medical officers and specialist and other supportive staff from other areas are recommended.

- The HCWs/ support staff who are managing and providing routine care for PUI/ confirmed COVID-19 cases should be monitored for symptoms minimum daily. If HCWs become symptomatic, he / she need needs to report to the supervisor in the team and managed accordingly.

## **K. VISITORS**

- No visitor should be allowed.
- If absolutely necessary, discuss with the managing team.
  - All visitors should be screened for acute respiratory illness before allowing to enter.
  - Document and limit the number of visitors at scheduled time
  - Appropriate instruction on use of PPE and other precautions (e.g., hand hygiene, limiting surfaces touched) should be given while in the patient's room
  - Visitors should be advised to limit their movement in the healthcare facility.
  - Exposed visitors should report any signs of symptoms to their healthcare providers.
- Staff must instruct and supervise all visitors on the donning and doffing of PPE (gown, glove, N95 mask) before entering the room.
- The visit time must be limited and avoid close contact (< 1m).
- Perform hand hygiene on entering and leaving the room.
- Visitors who have been in contact with the patient before and during hospitalization (i.e. parents taking care of their children) are a possible source/ contact of the infection.
- PPE recommend for these long term carers may be limited to surgical mask. The use of plastic aprons and gloves are recommended when anticipating exposure to bodily fluids.

## **L. PATIENT RECORD / BED HEAD TICKET**

- Bed head ticket (BHT) of confirmed COVID-19 should be tagged.
- The patient record / bed head ticket should be kept outside the patient room.

## **TABLE 1: RECOMMENDED PPE TO BE USED WHEN MANAGING PUI OR CONFIRMED COVID-19**



**All healthcare workers in healthcare facilities should wear surgical mask when in direct contact with patient.**

SETTING	TARGET PERSONNEL	ACTIVITY	TYPE OF PPE
<b>EMERGENCY DEPARTMENT</b>			
Triage	HCW	Maintained 1-2m spatial distance at all time	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Frequent Hand hygiene</li> </ul> <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"> <li>• Patient to wear a surgical mask. Should be seated at the designated area and to sit at least 1m apart</li> </ul>
Examination Room / Consultation Room	HCW	<p>History taking and Physical examination</p> <p>* patient should be reminded to wear a surgical mask when the HCW enters the room</p>	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> </ul>
	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"> <li>• Surgical mask</li> <li>• Long sleeved plastic gown/ apron</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Boots or closed shoes</li> </ul>
		Decontamination of ambulances that transported PUI / confirmed COVID-19 patient	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Long sleeved plastic gown/ apron</li> <li>• Gloves</li> </ul>

			<ul style="list-style-type: none"> <li>• Eye Protection (goggles / face shield)</li> <li>• Boots or closed shoes</li> </ul>
Ambulance transfer vehicle	HCW	Transporting PUI / COVID-19 patient to the referral health care facility - distance to patient within 1m.	<ul style="list-style-type: none"> <li>• N95</li> <li>• Long sleeved plastic gown/ apron</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Head cover</li> </ul>
	Driver	Involved only in driving the patient with PUI / confirmed COVID-19 and the driver's compartment is separated from the PUI / confirmed COVID-19	<p>Maintained 1m spatial difference</p> <ul style="list-style-type: none"> <li>• Surgical mask</li> </ul> <p>*Windows should be kept open throughout the drive</p>
		Assisting with loading or unloading patients with PUI / confirmed COVID-19 from ambulance to wards	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Long sleeved plastic gown/ apron</li> <li>• Gloves</li> <li>• Eye protection (goggles / face shield)</li> </ul> <p>*Windows should be kept open throughout the drive</p>
		No direct contact with patient with PUI / confirmed COVID-19, but <b>NO separation</b> between driver's and patient's compartments.	<ul style="list-style-type: none"> <li>• Surgical mask</li> </ul> <p>*Windows should be kept open throughout the drive</p>
Specimen Collection Area	HCW	Performing oropharyngeal or nasopharyngeal swab	<ul style="list-style-type: none"> <li>• N95</li> <li>• Gloves</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Eye protection (goggles / face shield)</li> <li>• Head cover</li> </ul>

			*It is sufficient to change gloves and plastic apron between patients. Any soiled protective equipment's should also be changed
<b>INPATIENT FACILITIES</b>			
Patient Room	HCW	Providing care PUI / confirmed COVID-19 patients who are not intubated and able to wear surgical mask	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> </ul> <p>*Shoe covers are not necessary</p>
		Providing care to PUI / confirmed COVID-19 patients who are not intubated but <b>NOT</b> able to wear surgical mask	<ul style="list-style-type: none"> <li>• N95 mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Head cover</li> </ul>
		Performing oropharyngeal or nasopharyngeal swab to PUI / confirmed COVID-19 patients	<ul style="list-style-type: none"> <li>• N95 mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Head cover</li> </ul>
		Providing care to PUI / confirmed COVID-19 patients who are ventilated in a closed circuit	<ul style="list-style-type: none"> <li>• N95 mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> </ul>

			<ul style="list-style-type: none"> <li>• Eye Protection (goggles / face shield)</li> <li>• Head cover</li> </ul>
		<p>Performing Aerosol Generating Procedures (AGP) on PUI / confirmed COVID-19 patients</p> <ul style="list-style-type: none"> <li>• Intubation, extubation and related procedures;</li> <li>• Tracheotomy/tracheostomy procedures;</li> <li>• Manual ventilation;</li> <li>• Suctioning;</li> <li>• Bronchoscopy;</li> <li>• Nebulization</li> <li>• Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP);</li> <li>• Surgery and post-mortem procedures in which high-speed devices are used;</li> <li>• High-frequency oscillating ventilation (HFOV);</li> <li>• High-flow Nasal Oxygen (HFNO)</li> <li>• Induction of sputum</li> <li>• Dental procedures</li> </ul> <p>*Detailed information, refer to Intensive care preparedness and management for COVID-19</p>	<p>Option 1 (Preferred):</p> <ul style="list-style-type: none"> <li>• PAPR</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown) with plastic apron / Tyvec suit</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Shoe Cover</li> </ul>
			<p>Option 2:</p> <ul style="list-style-type: none"> <li>• Tyvec suit</li> <li>• N95</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Gloves</li> <li>• Shoe Cover</li> </ul>
			<p>Option 3 (if Option 1 &amp; 2 not available):</p> <ul style="list-style-type: none"> <li>• N95</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown) with plastic apron</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Shoe Cover</li> <li>• Head cover</li> </ul>
		Transporting specimen to lab	<ul style="list-style-type: none"> <li>• Gloves</li> <li>• ± Plastic Apron</li> </ul>
	Cleaners	PUI / confirmed COVID-19 patients who are not intubated and able to wear surgical mask	<ul style="list-style-type: none"> <li>• Surgical mask</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> </ul>

		<p>*If COVID-19 patient is discharge, 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"> <li>• Eye Protection (goggles / face shield)</li> <li>• Boots or closed shoes</li> </ul>
		<p>PUI / confirmed COVID-19 patients who are not intubated but <b>NOT</b> able to wear surgical mask</p> <p>*If COVID-19 patient is discharge, 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"> <li>• N95</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Gloves</li> <li>• Eye Protection (goggles / face shield)</li> <li>• Boots or closed shoes</li> <li>• Head cover</li> </ul>
<p>Outside patient room within 1-2 metres of patient room/ care areas YELLOW ZONE</p>	<p>All staff including HCW</p>	<p>Any activity that does not lead to contact with PUI / confirmed COVID-19</p>	<ul style="list-style-type: none"> <li>• Surgical Mask</li> </ul>
<p>Other areas of patient transit (wards / corridors) GREEN ZONE</p>	<p>All staff including HCW</p>	<p>Any activity that does not lead to contact with PUI / confirmed COVID-19</p>	<p>No PPE needed</p>
<b>ADMINISTRATIVE AREAS/ PUBLIC AREAS</b>			
<p>Any Areas</p>	<p>All staff and asymptomatic individuals</p>	<p>Any activities</p>	<p>No PPE Needed</p>
	<p>Security Officer</p>	<p>Security officers at ED entrance</p>	<ul style="list-style-type: none"> <li>• No PPE needed</li> <li>• Frequent Hand Hygiene</li> </ul> <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"> <li>• No PPE needed</li> <li>• Frequent Hand Hygiene</li> </ul> <p>* maintain spatial distance of 1 meter, if not able to achieve, use surgical mask</p>
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**TABLE 2: RECOMMENDED PPE TO BE USED WHEN ATTENDING / TREATING ARI PATIENT**

*All healthcare workers in healthcare facilities should wear surgical mask when in direct contact with patient.*

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) If not tolerable, advise the patient to cover nose and mouth during coughing or sneezing with tissue or flexed elbow.	<ul style="list-style-type: none"> <li>• Surgical mask</li> </ul>
		Performing Aerosol Generating Procedures (AGP) <ul style="list-style-type: none"> <li>• Intubation, extubation and related procedures;</li> <li>• Tracheotomy/tracheostomy procedures;</li> <li>• Manual ventilation;</li> <li>• Suctioning;</li> </ul>	<ul style="list-style-type: none"> <li>• N95</li> <li>• Gloves</li> <li>• Isolation Gown (fluid-repellent long-sleeved gown)</li> <li>• Eye protection (goggles / face shield)</li> <li>• Head cover</li> </ul>

		<ul style="list-style-type: none"> <li>• Bronchoscopy;</li> <li>• Nebulization</li> <li>• Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP);</li> <li>• Surgery and post-mortem procedures in which high-speed devices are used;</li> <li>• High-frequency oscillating ventilation (HFOV);</li> <li>• High-flow Nasal Oxygen (HFNO)</li> <li>• Induction of sputum</li> <li>• Dental procedures</li> </ul>	
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**References:**

1. Policies and Procedures on Infection Prevention and Control – Ministry of Health Malaysia; 2018
2. Interim infection prevention and control recommendation for patients with confirmed 2019- Novel coronavirus or patient under investigation for nCoV in healthcare setting. Updated Feb 3 2020. CDC
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