INTENSIVE CARE PREPAREDNESS AND MANAGEMENT FOR COVID-19

1. Patients suspected or confirmed with COVID-19 needing intensive care shall be cared for in designated isolation rooms identified in the individual hospital as most existing intensive care units in the Ministry of Health hospitals do not have appropriate isolation facilities

2. Ideally use airborne infection isolation room (AIIR) i.e. negative pressure isolation room with anteroom for confirmed or possible cases. In the event an AIIR is not available the patient should be placed in a single room with closed doors.

3. In an outbreak, where AIIR or single room capacity is exceeded, ICU beds may need to be closed to non COVID-19 cases to accommodate the increase in COVID-19 patients

4. Coordinate with hospital management and other healthcare professionals to ensure care of other critically ill patients are not compromised

5. Nursing staff from the intensive care units or those with formal intensive care training or experience shall be deployed to nurse patients who are mechanically ventilated

Infection prevention and control in intensive care setting for COVID-19

A. Personal Protective equipment(PPE)

- All healthcare workers (HCW) to wear designated scrubs.

- Alcohol-based hand rubs and disinfectants, gloves, gowns and mask shall be readily available.

- HCW must adhere to standard, contact and airborne precautions including the use of eye protection.

- Practice appropriate hand hygiene before and after all procedures.

- Personal protective equipment (PPE) shall be used before entering the room. This includes:
  - Fit-tested particulate respirator i.e. N-95 or higher level of protection
  - Head cover
  - Long sleeve, fluid resistant gown
  - Eye protection with face shield or goggles
  - Gloves

- Personal items are not allowed into the room. This includes rings, watches hand phones, pens etc.

B. Healthcare workers (HCW)

- All HCW should receive education on the appropriate use of PPE
- HCW should strictly follow the procedures for the wearing (donning) and the safe removal (doffing) of PPE in correct sequence
- Limit the number of HCW present in the room to the minimum required without compromising care of the patient
- HCW providing care to COVID-19 cases, to be actively followed-up for development of symptoms and provided the appropriate care from occupational safety and health administration (OSHA)
- Hospitals should maintain a record of all HCW providing care for confirmed COVID-19 cases.

C. Patient care equipment

- Use disposable respiratory equipment wherever possible
- Reusable equipment shall be disinfected in accordance with local policy and manufacturers guidelines
- Items that cannot be appropriately cleaned and disinfected should be discarded upon patient transfer or discharge

D. Oxygen delivery devices and humidifiers

- For non-intubated patients requiring oxygen therapy, non-humidified oxygen can be delivered via nasal prongs or simple face mask. These low flow oxygen systems do not need to be humidified
- Generally higher the flow rate, greater the risk of aerosolisation.
- The use of non-invasive ventilator or high flow nasal cannula is discouraged. If used, place patient in a negative pressure isolation room

E. Tracheal intubation

- Should be performed in a negative pressure isolation room whenever feasible. If this is not available, then a single room should be used.
- Strictly adhere to the use of PPE.

- Whenever possible, only experienced doctors shall attempt intubation. (spread of infection at the time of intubation appears to be associated with difficult intubation and prolonged manual ventilation).

- Rapid sequence induction shall be used. Avoid awake fibreoptic intubation. Ensure the patient is adequately paralysed before attempting laryngoscopy

- Use of video laryngoscopy may avoid placing the operator's face close to the patient

- A viral filter shall be fitted between the facemask and manual resuscitator bag

- Minimise manual ventilation. If essential, it shall be carried out by two personnel; one holds the mask tightly against the patient's face while the other squeezes the bag gently

- Inflate the cuff of endotracheal tube before ventilating the patient

- Turn on the ventilator only when it is connected to the endotracheal tube

- Re-sheath the laryngoscope immediately post intubation (double glove technique). Use disposable laryngoscope blades if available.

- Clean and disinfect procedure room immediately after the procedure

F. Invasive ventilation

- Ventilators shall be identified only for use of patients with COVID- 19

- All ventilators shall be fitted with viral filter. The filter is to be placed between the distal end of the expiratory tubing and the ventilator

- Use disposable breathing circuits

- The ventilatory circuit shall not be disconnected unless absolutely necessary. If there is a need to disconnect the circuit, ventilators shall be put on either on standby mode or turned off temporarily. ETT may be clamped temporarily during disconnection

- Do not change ventilatory circuits on a routine basis

- Mechanical ventilation creates high gas flows. Tracheal cuff pressures should be checked frequently and kept inflated at pressures of 25- 30 cmH2O to create a good seal against the tracheal wall

- Avoid water humidification

- Use a heat and moisture exchanger with viral filter (HMEF) at the Y-piece of the breathing circuit

- HMEF will need to be changed periodically. Each change results in patient circuit disconnection for a short period of time where expired airborne particles will not be filtered

- Use closed in-line tracheal suctioning systems. Do not disconnect from ventilator and manually ventilate patients during suctioning. Instead apply 100% oxygen on the ventilator during suctioning

- Use metered dose inhalers (MDI) instead of small volume nebuliser if nebulisation is required

- Consider paralysing patients during bronchoscopy to minimise coughing

G. Aerosol-generating procedures (AGP)

(this includes tracheal intubation, extubation, open tracheal suctioning, tracheostomy care, bronchoscopy and CPR)

- Avoid or minimise the performance of AGP without compromising patient care

- Limit the number of HCW present during the procedure to only those essential for patient care and procedural support

- AGP should ideally take place in a negative pressure isolation room.

- Clean and disinfect procedure room surfaces promptly after the procedure

H. Environmental cleaning

- Staff engaged in environmental cleaning and waste management should wear the appropriate PPE

- Increase frequency of cleaning high touch surfaces to at least every nursing shift

- Cleaning and disinfection procedures must be followed consistently and correctly

- Adhere to the terminal cleaning protocol in accordance to local policy for cleaning of the patient's room after discharge.

I. Transport of patients

- Transport outside the ICU should be avoided as much as possible and discussed on a case-by-case basis

J. Visitors

- Visitors should be kept to the absolute minimum
- A register for visitors should be maintained

PPE used during aerosol generating procedures

Procedure	PPE
Open tracheal suctioning Tracheostomy care Extubation	• Fit tested particulate respirator i.e. N-95 • Head cover • Long sleeve fluid resistant gown • Eye protection: goggles or eye shield • Gloves
Tracheal intubation Bronchoscopy CPR	• Fit tested particulate respirator i.e. N-95 or Powered air purifying respirator (PAPR) if one is adequately trained • Head cover • Long sleeve fluid resistant gown • Eye protection: goggles or eye shield • Gloves