

## Priority Medical Devices in the context of COVID-19

### A. Medical Devices for Case Management

#### Objective

The list of priority medical devices in the context of COVID-19 provides descriptions for the management of patients with severe acute respiratory infection (SARI) when a COVID-19 virus infection is suspected at different levels of health care provision. The first level, for outpatient; second level includes general hospitals and laboratories; and third level, includes specialized hospitals with intensive care units and SARI units. The technologies listed are for the interventions and should be adapted to the health care workforce, infrastructure and technological resources available.

#### Target Audience

This document is recommended to support decision-making regarding the allocation and use of medical devices in the context of COVID-19 and is intended for healthcare providers, managers of SARI Units, procurement and regulatory agencies and Ministries of Health. Recommend to involve Biomedical Engineer in the selection and verification of installation of the equipment and ensure training of health care workforce.

#### Considerations

\* An assessment of the health facility is required prior to choosing equipment from the list in order to have a fully functional unit. For more details consult the technical specifications per equipment.

\* Accessories and consumables for starting operation are not disaggregated in this list. They should be provided with the purchase of the equipment for at least 3 months of operation.

\* Extended warranty of at least one year and additional spare parts for maintenance should be also aggregated, according to the health care capacity.

Note: Training is indispensable for invasive ventilation.

**Table 1. Medical Devices for Case Management of severe and critical patients by health facility level.**

Type	Medical Purpose	Remarks	Medical Device Generic Name	Triage	Treatment of severe patients	Treatment of critical patients	1st level	2nd Level	3rd Level
		-	Infrared thermometer	X			•		
		Option 1 - Desirable.	Pulse oximeter - portable handheld, with cables and sensor		X	X		•	•
		Option 2.	Pulse oximeter - fingertip	X	X	X	•	•	•
		Option 3.	Pulse oximeter - table top, with cables and sensor		X			•	•
	Monitoring	Option 1 - Desirable.	Patient monitor, multiparametric, including EKG, non invasive blood pressure (NIBP), oxygen saturation (SpO2), respiratory rate (RR), temperature (TEMP), with sensors and cables			X		•	•
		Option 2.	Patient monitor, multiparametric, NIBP, SpO2, TEMP, respiratory rate (RR) with sensors and cables, (without EKG)		X	X		•	•
	Oxygen therapy -	Option 1 - It is recommended that the device provides at least 5 to 6 L/min for adult patient.	Concentrator O2, 10 L, with accessories		X	X	•	•	•
	Oxygen source to be selected according to capability of the health facility (i.e. power supply, pipeline oxygen network)	It is recommended that the device has electrical protection ( power surge). Option 2 - Sizes, labelling and connections are, according to international regulations. Refilling and transport, according to manufacturer's quality procedures	Medical gas cylinder, portable, for oxygen, fitted with a valve and a pressure and flow regulator		X	X	•	•	•

**Medical Equipment**

Airway Management and Intubation	Option 1 - To be chosen by the clinician.	Laryngoscope, FO, diameter 28 mm, with blades			X			•	•
	Option 2 - To be chosen by the clinician according to training skills and infrastructure capabilities.	Videolaryngoscope, with blades and accessories			X			•	•
Mechanical Ventilation - Invasive ventilation requires trained staff to be performed.	Option 1 - Most of ICU ventilators work with high pressure inlet gases (air and oxygen). Preferable that the device has internal air compressor.	Patient ventilator, intensive care, for adult and paediatric, with breathing circuits and patient interface			X				•
	Option 2 - Transport or Mass-casualty: suitable when there is no wall pipe oxygen.	Patient ventilator, transport, for adult and paediatric, with breathing circuits and patient interface			X			•	•
Non-Invasive Ventilation -	Option to be chosen by the clinician. The use of helmet or nasal mask are preferable to reduce the dead space generated as consequence of improper face sealing.	CPAP, with tubing and patient interfaces for adult and paediatric, with accessories			X			•	•
Clinical decision according to the management of patient; generated aerosols require special protective equipment measures to minimize the risk of contagion.	Option to be chosen by the clinician. The use of helmet or nasal mask are preferable to reduce the dead space generated as consequence of improper face sealing.	BiPAP, with tubing and patient interfaces for adult and paediatric, with accessories			X			•	•
	Option to be chosen by the clinician. The device can provide more than 50 L/min.	High Flow Nasal Cannula, with accessories			X			•	•
IV Infusion	-	Electronic drop counter, IV fluids		X	X			•	•
Blood Chemistry -	-	Infusion pump, with accessories			X			•	•
According to the capability of the health facility. To consider some options may be already available (e.g. Automated Clinical Chemistry Analysers).	-	Blood Gas Analyser, portable, with cartridges and control solutions		X	X			•	•
Imaging	Equipment per ward.	Ultrasound, portable, w/linear and phased array cardiac transducer (5.0-7.5 MHz), w/trolley			X			•	•
ICU	Equipment per ward.	Drill, for vascular access, with accessories adult and paediatric, with transport bag			X				•
	Equipment per ward.	Electrocardiograph, portable, with accessories		X	X			•	•
	Option 1 - Desirable.	Suction pump, electrical, with accessories			X			•	•
	Option 2.	Suction pump, manual			X			•	•
Sterilization -	Option 1 - Equipment per facility.	Autoclave, 40-60L, with accessories		X	X			•	•

	According to the capability of the health facility. To consider some options may be already available (e.g. ETO sterilizers).	Option 2 - Equipment per facility.	<b>Autoclave, 90L, with accessories</b>		X	X		•	•		
<b>Accessories and consumables associated to medical equipment</b>  <b>To ensure compatibility with the equipment.</b>	Oxygen therapy	ASSOCIATED WITH EQUIPMENT - Ensure compatibility with equipment connector.	Bubble humidifier		X			•	•		
			Connector, biconical, symmetric, ext. diam. 7-11 mm		X	X		•	•	•	
			Tubing, medical gases, int. diam. 5 mm		X	X		•	•	•	
			Flow splitter, 5 flowmeters 0-2 L/min, for paediatric use		X			•	•	•	
		ASSOCIATED WITH EQUIPMENT - When source is pipe oxygen; it should be adapted for the type of oxygen outlet. Other options may be available according to the country.	Flowmeter, Thorpe tube, for oxygen 0-15 L/min		X	X		•	•	•	
	Mechanical Ventilation	ASSOCIATED TO VENTILATORS - Ensure compatibility with equipment.	Filter, heat and moisture exchanger (HMEF), high efficiency, with connectors, for adult and paediatric, single use				X			•	
Imaging	For EKG and Ultrasound.	Conductive gel, container		X	X				•	•	
ICU	For suction devices. Equipment may have its own type of tubing.	Tubing, silicone				X			•	•	
<b>Consumables (single use devices)</b>	Oxygen delivery devices	-	Catheter, nasal, 40 cm, with lateral eyes, sterile, single use; different sizes: 10 Fr, 12 Fr, 14 Fr, 16 Fr, 18 Fr		X	X			•	•	
		Recommended for flows 1 to 6 L/min.	Nasal oxygen cannula, with prongs, adult and paediatric		X	X			•	•	•
		Recommended for flows 10 to 15 L/min.	Mask, oxygen, with connection tube, reservoir bag and valve, high-concentration, adult and paediatric non-sterile, single use		X	X			•	•	•
		FI <sub>O2</sub> can be regulated.	Venturi Mask, with percent O <sub>2</sub> Lock and tubing, adult and paediatric		X	X				•	•
	Airway Management and Intubation	-	Compressible self-refilling ventilation bag for adult, capacity > 1500 mL, with masks (small, medium, large)		X	X			•	•	•
		-	Airway, nasopharyngeal, sterile, single use, set with sizes of: 20 Fr, 22 Fr, 24 Fr, 26 Fr, 28 Fr, 30 Fr, 32 Fr, 34 Fr, 36 Fr		X	X				•	•
		-	Airway, oropharyngeal, Guedel, set with sizes of: No. 2 (70 mm), No. 3 (80 mm), No. 4 (90 mm), No. 5 (100 mm)		X	X				•	•
		-	Colorimetric End Tidal CO <sub>2</sub> detector, adult and paediatric, single use				X			•	•
		-	Cricothyrotomy, set, emergency, 6 mm, sterile, single use				X			•	•
		-	Syringe, Luer slip, 10 mL, sterile, single use				X			•	•
		Option 1 - To be chosen by the clinician.	Endotracheal tube introducer, Stylet, sterile, single use, sizes: 10 Fr, 30 to 45 cm and 14 Fr, 30 to 45 cm					X		•	•
		Option 2 - To be chosen by the clinician.	Endotracheal tube introducer, Bougie, sterile, single use, sizes: 10 Fr, 60 cm and 15 Fr, 70 cm.					X		•	•

Some of the generic consumables may be available in the health facility. Are disaggregated to be considered in the medical procedure.		Option 1 - To be chosen by the clinician.	Tube, endotracheal, No. 2, No. 2.5, No. 3, No. 3.5, No. 4, No. 5, without cuff, sterile, single use			X		•	•	
			Tube, endotracheal, No. 4, No. 5, No. 6, No. 7, No. 8, No. 9, with cuff, sterile, single use			X		•	•	
		Option 2 - To be chosen by the clinician.	Laryngeal mask airway (LMA), size 2, size 3, size 4, sterile, single use			X		•	•	
			Lubricating Jelly			X		•	•	
	Blood Chemistry	The sample to be sent to laboratory.	Arterial Blood Sample Kits (syringes with dry lithium heparin [23.5 iu/mL])		X	X		•	•	
	Central Line		Central Venous Catheters kit with: Finder needle, syringe, wire, dilator, lidocaine, scalpel, needle, thread				X			•
			Transparent adhesive plasters, wash proof, 5x5 cm		X	X		•	•	
	Gastro-enteral feeding		Syringe, feeding, LDT, ENFit, sterile, single use, sizes: 1 mL, 2.5 mL, 5 mL				X			•
			Syringe, feeding, ENFit, sterile, single use, sizes: 10 mL, 20 mL, 60 mL				X			•
			Tube, feeding, nasogastric, ENFit tip, sterile, single use, sizes: 6 Fr, 50 cm / 8 Fr, 50 cm / 10 Fr, 50 cm / 12 Fr, 90 cm / 14 Fr, 90 cm				X			•
			Stethoscope, binaural, adult/child, single use				X			•
			Lubricating Jelly				X			•
	General		Pad, absorbent		X	X	X		•	•
			Antiseptic Wipe with Alcohol & Chlorhexidine	X	X	X		•	•	•
			Compress, gauze, 10 x 10 cm, 8 to 12 ply, sterile, single use		X	X		•	•	•
		Tape, surgical, hypoallergenic, 2.5 x 5 m		X	X		•	•	•	
		Drape, surgical, non woven, sterile, single use		X	X		•	•	•	
Urine Collection		It can be replaced by surgical gloves, sterile.	Gloves, examination, nitrile, powder-free, pair-packed, large, medium, small, sterile, single use			X		•	•	
		Bag, collecting, urine, with outlet tap, with non-return valve, 2000 mL, adult, non-sterile, single use		X	X			•	•	
		Catheter, urethral, Foley, 2-way, sterile, single use, set of sizes of: 10 Fr, 12 Fr, 14 Fr, 16 Fr, 18 Fr		X	X			•	•	
Instruments and Utensils	Airway Management and Intubation		Forceps Magill, 24 cm			X		•	•	
	Gastro-enteral feeding		Basin kidney, stainless steel, 825 mL		X	X		•	•	

Type	Medical Purpose	Remarks	Medical Device Generic Name	Triage	Treatment of severe patients	Treatment of critical patients	1st level	2nd Level	3rd Level
Personal Protective Equipment	Healthworkers personal protection		Medical / surgical mask	X	X	X	•	•	•
		Reserve for aerosol generating procedures	Respirator		X	X		•	•
			Face shield, single use	X	X	X		•	•
			Protective goggles, wraparound, soft frame, indirect vent	X	X	X		•	•
			Surgical gowns / isolation gowns, non-sterile	X	X	X		•	•
			Apron, plastic, single use			X		•	•
			Gloves, examination, nitrile, powder-free, large, medium, small, non-sterile, single use	X	X	X		•	•