

Regional guide

Management of airway protection in adults: COVID-19 (ER/ICU)

BASIC PRINCIPLES

- Avoid any aerosol-generating treatment on suspected or confirmed COVID-19 patients:
 - Nebulization
 - Non-invasive ventilation (NIV) such as BIPAP or CPAP
- Administration of high flow oxygen through a nasal cannula (Airvo, Optiflo) is acceptable in a negative pressure chamber only.
 - **Note:** HFNO is more and more recommended by experts. It is increasingly clear that it decreases the need for intubation and possibly even a decrease in mortality. The potential for aerosol generation is also less significant than thought at the start of the pandemic.
 - We do not recommend the use of NIV (BiPAP and CPAP) in patients with respiratory disease linked to COVID. Use of NIV due to COVID-related lung damage is associated with a high failure rate, and the need for emergency intubation. The use of NIV is a technique that generates a lot of aerosol and even in a negative pressure chamber has the potential to con-taminate caregivers.
 - For patients with increasing oxygen requirements, transfer to a negative pressure chamber should be considered for more aggressive treatments such as high flow oxygen administration or possibly intubation.
 - For patients with a maximal level of care, other than resuscitation or intubation, and who require high respiratory support, we suggest re-evaluating the level of care to determine if the patient could, under the circumstances, be intubated or alternatively, administer comfort or symptomatic care without NIV.
 - The use of the ROX index for determining the success of the HFNC is recommended to assess its effectiveness.
- Use of an N95 mask by health care staff caring for intubated patients with COVID-19: Health care staff caring for intubated patients with COVID-19 must wear an N95 mask inside the room of intubated patients, as well as during the transportation of intubated patients. This is based on the fact that priority is given to protecting staff—for instance, the ventilator circuit may sometimes be opened inadvertently or intentionally.
- We recommend that staff who do errands outside the rooms (runner) also be dressed in full PPE, including wearing the N95 mask.
- Intubation is considered when respiratory distress must be done in a negative pressure chamber.
- If such a room is not available, intubation must be performed in strict airborne isolation.
- The site of intubation must have a system for the team inside the room to communicate with the team outside the room to limit the need to open the door. For instance: Two-way baby monitors; white board system if the door has a window; telephone. A table and basket must be set up inside the room by the door in which additional material or Rx can be placed without coming into contact with the intubation team.
- A dedicated resuscitation and intubation cart for COVID patients should be set up in areas where intubation may take place (ER, ICU).

- Resuscitation techniques are considered to be at high risk for propagating aerosols, and the potential risk for health care staff has to be weighed against the expected benefits to the patient. Should cardiorespiratory arrest occur during the intubation sequence, the patient will not be able to be resuscitated UNTIL the airway is protected. Defibrillation is allowed, but not cardiac massage.<
- Intubation must:
 - Be performed by the designated person at the hospital or the care unit on which the patient is located. Usually, this is the most experienced person in intubation.
 - 100% FiO₂ pre-oxygenation (Ventimask with tank and HEPA filter) x 5 minutes if the situation allows it.
 - Mask ventilation (bag-mask) should be avoided as much as possible before intubation. If mask ventilation is administered, place a high efficiency filter between the mask and the bag, ventilate with two people and use an oropharyngeal cannula (Guedel cannula) and ventilate at low tidal volumes.
 - Staff in the room reduced to a minimum:
 - Nurse responsible for the patient;
 - Respiratory therapist;
 - Professional who performs the intubation.
 - A video laryngoscope (Glidescope / King Vision) should be used and reserved for cases of COVID-19.
 - Rapid sequence intubation should be encouraged (limits the risk of coughing and aerosol production).
 - Avoid using topical xylocaine, as it may produce aerosols.
 - Once intubation is performed, it is recommended to confirm the correct positioning of the tube with ET-CO₂, and to avoid auscultation.
 - After intubation, the patient can be transferred to another room in intensive care.
 - You must wait the determined length of time before entering the negative pressure room, until the aerosol charge decreases, unless you are wearing an N95 mask. It varies in each room depending on the air exchange rate.

The intubation sequence will follow the steps as described in the *Intubation Guide*.

BEFORE ENTERING THE ROOM

- 1- Assign roles / team caucus**
- 2- Prepare material**
- 3- Prepare medications**
- 4- Personal protective equipment (PPE)**

INSIDE THE INTUBATION ROOM

- 1- PRE-INTUBATION**
- 2- RAPID SEQUENCE INTUBATION**
- 3- POST-INTUBATION**

EXITING THE ROOM

- 1- Exiting the room (removal of PPE under supervision)**

BEFORE ENTERING THE ROOM

1- Assign roles / team caucus

	<i>INSIDE THE INTUBATION ROOM</i>		<i>OUTSIDE THE INTUBATION ROOM</i>
1	1 experienced MD available	1	2 nd MD for intubation PRN (with PPE)
2	1 experienced RT	2	2 nd standby RT
3	1 experienced RN (monitor, Rx)	3	1 runner to go get material/ RX
		4	1 staff member to ensure safety

*Each hospital will determine in advance who will make up this team.

*Always have a team caucus to determine who intubates and what material will be needed for its intubation PLAN A-B-C.

***FIND PATIENT INFORMATION IF POSSIBLE : AGE, ALLERGIES, WEIGHT, HISTORY.**

2- Prepare medications

- The choice of intubation medications will be specific to the intubating physician. This document is only a guide.
- Rapid sequence intubation requires an agent for **INDUCTION** followed by a **PARALYTIC**.
- Always have a **VASOPRESSOR** ready to maintain a MAP > 65 or sysBP >90.
- After intubation, sedation by **PERFUSION** should be started quickly.

RX CLASS:	NAME OF RX:	CONCENTRATION (in vial)	DOSE
INDUCTION	KETAMINE		1 - 2 mg/Kg IV push ***IN SHOCK 1 mg/Kg ***IF MORBID OBESITY 1 mg/kg
PARALYTIC	ROCURONIUM *acts in 60 seconds *lasts 60 minutes		1.2 - 1.5 mg/Kg IV push
VASOPRESSOR	PHENYLEPHRINE		50-100 mcg/dose IV push can be repeated q1 to 2 minutes PRN
	NOREPINEPHRINE		0.1 mcg - 0.5 mcg/kg/min PERFUSION

*E.G.: 70-kg patient: KETAMINE 100 mg and ROCURONIUM 100 mg

*E.G.: LEVOPHED: 8 mg in 250 cc normal saline in pump at rate of 10 cc/h titrated for MAP 65

*If MD uses SUCCINYLCHOLINE, since it is short-acting, the recommendation is to administer a dose of ROCURONIUM 0.6 mg/kg after intubation.

- * Perfusion of medication immediately after intubation
 - Aim for a score of 0 on the Critical Care Pain Observation Tool (CPOT)
 - Aim for a score of -4 on the Richmond Agitation-Sedation Scale (RASS)

* Use order (RC-121F 2019-07) OR refer to document below:

PERFUSION 1 - ANALGESIA: Aim for a score of 0 on the Critical-Care Pain Observation Tool (CPOT)

- fentaNYL** (Withdraw 20 mL from the 100-mL bag of D5%E or NaCl 0.9% and add 1000 mcg (20 mL) of fentaNYL in 80 mL of a chosen diluent for a final concentration of 10 mcg/mL).
 - Start perfusion at 15 mcg/kg/min.
 - Intermittent bolus of 50 to 100 mcg IV q 15 minutes PRN to aim for a score of 0 on the CPOT scale.
 - If more than 3 bolus doses needed in 1 h, increase the flow by 15 mcg/kg/min q 5 minutes to maintain the target score of 4 on the CPOT scale (max. 80 mcg/kg/min).

OR

- HYDRomorphone** (Withdraw 10 mL from the 100-mL bag of D5%E or NaCl 0.9% and add 20 mg of HYDRomorphone 2 mg/mL OR dilute 20 mg of HYDRomorphone 10 mg/mL in 100 mL D5%E or NaCl 0.9% for a final concentration of 0.2 mg/mL).
 - Start perfusion at _____ mg/h (between 0.5 and 3 mg/h).
 - Intermittent bolus of 0.5 to 2 mg IV q 15 minutes PRN to aim for a score of 0 on the CPOT scale.
 - If more than one bolus dose needed, increase the flow by 0.5 mg/h q 30 minutes to maintain the target score on the CPOT scale (max. 3 mg/h).

PERFUSION 2 - SEDATION : Aim for a score of -4 on the Richmond Agitation-Sedation Scale (RASS)

**** Choose one of the following agents depending on the patient's status and known contraindications**

- Propofol** (100 mL vial, undiluted solution. Concentration 10mg/mL).
 - Start perfusion at _____ mg/kg/h (0.3 to 1 mg/kg/h).
 - Intermittent bolus of 10 to 20 mg IV q 5 minutes PRN.
 - If more than 3 bolus doses needed in 1 h, increase the flow by 0.3 mg/kg/h q 5 minutes to maintain a score of -4 on the RASS scale (max. flow 3 mg/kg/h).

OR

- Midazolam (VERSED)** (Withdraw 20 mL from the 100-mL bag of D5%E or NaCl 0.9% and add 100 mg (20 mL) of midazolam 5 mg/mL in 80 mL of a chosen diluent for a final concentration of 1 mg/mL).
 - Start perfusion at _____ mg/h (between 1 and 7 mg/h).
 - Intermittent bolus of 1 to 5 mg IV q 5 minutes PRN to target a score of -4 on the RASS scale.

If more than 3 bolus doses needed in 1 h, increase the flow by 1 mg/h q 10 minutes to maintain a score of -4 on the RASS scale (max. flow 20 mg/h).

3-Prepare intubation material

- ALL the material listed below should be available rapidly.
- The MD/RT who intubates will choose certain equipment based on the patient's weight and height.
- The rest of the equipment stays at the door and will be brought in on request.

Note: The available equipment may vary from one area to another.

	Leak-proof BVM mask with HEPA filter installed (PEEP valve set at 0)
	Disposable measuring tape to measure the patient's height (ventilation parameter) + CALCULATOR
	Continuous ETCO2 (may already be in the intubation room)
	Packet of lubricant
	Endotracheal tube 6 (PRN), 7 (woman), 8 (man)
	Guedel 9 (woman), 10 (man), 11 (large size)
	Supreme laryngeal mask 3 (small patient), 4 (woman), 5 (man)
	Eschmann bougie
	Forceps for endotracheal tube
	10-cc syringe (to inflate balloon)
	Fixation for endo tube
	Videolaryngoscope (depending on site) BLADE (3 and 4 glide scope) (3 for King vision) OR OTHER
	Videolaryngoscope rigid stylet
	Single-use standard blade MAC 3 and 4 (direct laryngo)
	Videolaryngoscope bag / Biobag for soiled material
	Assembled percutaneous crico kit (10 or 20 blade, 5 or 6 tube + bougie + 10-cc syringe)
	Neurostimulator *** IF ANESTHESIA
	Material for IV placement (NURSE)

4- Personal protective equipment (PPE)

WHO?	WHERE?	WHAT PROTECTION?
MD, RT, RN	Intubation room	PPE: airborne + contact + eye shield (N95)
MD #2	Anteroom or outside	PPE: airborne + contact + eye shield (N95)
RT #2	Anteroom or outside	PPE: airborne + contact + eye shield (N95)
RN #2-3, RUNNER	Outside	
Security	Outside; Has to stay away from patient and room	PPE: airborne + contact + eye shield (N95)

INSIDE THE INTUBATION ROOM

1- PRE-INTUBATION	<p>*Entry: MD, RT, NURSE (PPE + N95) *pre-oxygenation: mask at 100 % with reservoir and HEPA filter (flow 10-15L/ min) +/- 5 min *stabilize hemodynamics as much as possible VASOPRESSOR for MAP 65 or sysBP 90</p> <p>NURSE: pulse oximeter, cardiac monitor, program BP every 2-3 minutes, 2 functional IV accesses RT: capnography, functional suction, prepares intubation material with MD Measures patient's height / prepares ventilator (O2 source and parameters) * * parameter guideline: -volume-controlled 6 mL/ kg (ideal weight) -PEEP 10 -RR 16-20/min -FiO2 100 %</p> <p>PHYSICIAN: assesses airway/evaluates and optimizes the patient's position (stretcher at umbilicus + ramping PRN) Confirms PLAN A-B-C and confirms arrangement of intubation material Confirms medications/dose if prepared by nurse</p>
2. RAPID SEQUENCE INTUBATION	<p>*Administer INDUCTION agent followed by PARALYTIC *WAIT 45-60 seconds *Avoid mask ventilation (PRN if desaturation: filter + 2 persons + Guedel + small volumes and low pressures)</p>
PLAN A:	<p>Intubation via videolaryngoscope so as not to be near the airway Advance the endotracheal tube mounted on the stylet Cricoid pressure PRN Bougie PRN</p>
PLAN B:	<p>If intubation fails / emergency oxygenation 1——> Insertion laryngeal mask 2——> 2 people ventilation with BVM mask + PEEP valve 0 + HEPA filter +Guedel *** 2 hands small volumes and low pressures *Entrance of 2nd MD/RT (PPE + N95)</p>
PLAN C: (if ORL available)	<p>If failure of laryngeal mask or ventilation with 2nd MD/RT ——> Emergency crico</p>

3. POST-INTUBATION

1. Remove stylet **AND** clamp tube
2. -Inflate the balloon (10 cc with Luer-lok syringe)
3. Connect the BVM and HEPA filter **OR** the ventilator with filter
4. Unclamp the tube and ventilate
5. Check the position of the tube by capnography
6. The nurse confirms the prescription with the MD for perfusion of sedative and analgesia and starts it following the MD's orders.
7. Place reusable material in designated bags and leave in the room

EXITING THE ROOM

1- **Exiting the room (removing PPE under supervision)**

Refer to the steps to put on / remove PPE.

- Action with the HIGHEST RISK of contamination!!!
- The person removes PPE in the room by following the steps, ideally under supervision
- N95 and eye shield must be removed outside the patient's room.

CHECKLIST OUTSIDE THE ROOM

ALLOCATION OF ROLES

INSIDE the intubation room (3)

Outside the intubation room (3-4)

TEAM CAUCUS

A-B-C Plan for intubation

Patient info:

Age:

Weight: _____ **kg**

Allergies:

History:

MEDICATIONS

INDUCTION:

PARALYTIC:

VASOPRESSOR:

POST-INTUBATION SEDATION:

OTHER:

INTUBATION MATERIAL

Rapid check

PERSONAL PROTECTIVE EQUIPMENT

1- WASH HANDS

2- GOWN

3- N95 MASK

4- VISOR / GOGGLES

5- GLOVES

CHECKLIST CHECKLIST OF TASKS

NURSE

PLACES the **pulse oximeter**

CONNECTS the **cardiac monitor**

PROGRAMS **blood pressure** every 2-3 minutes

ENSURES **2 functional venous accesses**

**RESPIRATORY THER-
APIST**

CONNECTS the **capnography** (ventilator OR BVM with HEPA filter)

CHECKS functional suction

PREPARES the **intubation material** with the MD

MEASURES the **patient's size**

PREPARES the **ventilator** (O2 source and parameters)

*** parameter guideline:**

-volume-controlled 6 mL/ kg (ideal weight)

-PEEP 10

-RR 16-20/min

-FiO2 100%

MD

ASSESSES airway + CONFIRMS **PLAN A-B-C**

CONFIRMS arrangement of intubation material

EVALUATES AND OPTIMIZES the patient's **position**

-stretcher at umbilicus

-ramping if morbid obesity

CONFIRMS **medications/dose** if prepared by nurse

CHECKLIST INTUBATION SEQUENCE

PRE-OXYGENATION

Mask 100% + reservoir flow 10 L/min with HEPA filter, if available

BP STABILIZATION

VASOPRESSOR for **MAP 65 or BPsys 90**

PRE-INTUBATION

CHECKLIST OF TASKS: RN, RT, MD

RAPID SEQUENCE

Administered medications 1- **INDUCTION**
2- **PARALYTIC**

WAIT 45- 60 seconds AVOID

mask ventilation

If desaturation:

VENTILATE with 2 persons / Guedel / mask with filter

small volumes and low pressures

PLAN A - B - C

POST-INTUBATION

1. REMOVE **stylet** AND CLAMP **endo tube**
2. INFLATE **balloon (10 cc)**
3. CONNECT bag valve mask **OR** CONNECT **Ventilator with HEPA filter**
4. UNCLAMP the tube and VENTILATE
5. **ASSESS** capnography
6. CONFIRM intubation/SECURE the tube
7. CONFIRM MD orders: perfusion medication (sedation + analgesia)
8. PLACE reusable material in designated bags and leave in room

