

COVID-19 NETS INTUBATION GUIDELINE

DOCUMENT SUMMARY/KEY POINTS

- SARS- CoV2 is highly transmissible through contact, droplet and sometimes (during AGPs) airborne media
- Intubation and Airway Management are Aerosol Generating Procedures (AGPs), with a higher risk of respiratory pathogen transmission.
- COVID-19 requires a change to practice when performing intubation and mechanical ventilation in order to minimize exposure of the virus to airway operators.
- These changes include: Indications for intubation; PPE requirements; and ventilation processes that avoid or minimize AGPs
- Use this guide line in conjunction with Neonatal Intubation; Advanced (Difficult) Airway Management; Cuffed endotracheal tubes; Using Inline ETT Suction in Suspected and Confirmed COVID-19 Patients guideline; COVID-19 Ventilator setup guideline & Securing ETT guidelines.

CHANGE SUMMARY

- This is a new practice guideline

READ ACKNOWLEDGEMENT

- All NETS clinical staff are to read and acknowledge they understand the contents of this guideline.

Disclaimer

This document is available on-line as a stimulus for interchange of knowledge and ideas in the field of Neonatal and Paediatric Retrieval. It is provided "as-is" and without support or warranty of any kind. Many of our guidelines may not be appropriate for use in retrieval settings other than NETS NSW, especially in non-Australian environments.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy Procedure and Guideline Committee	NETS Executive
Date Effective:		Review Period: 3 years
Team Leader:	Staff Specialist	Area/Dept: NETS

Rationale

- NETS is committed to ensure staff safety and well-being
- To minimize aerosolization of pathogens
- To minimize exposure of pathogens to the airway operators
- To highlight change in practice, and provide guidance when caring for suspected/confirmed COVID-19 patients that require intubation and mechanical ventilation
- To guide successful tracheal intubation for ventilatory support

Indications for Intubation

- In addition to general indications for intubation, consider intubating patients with suspected/confirmed COVID-19 in the following circumstances to minimize the risk of aerosol generation in transport
 - Patient on Humidified High Flow Nasal Cannula, where care cannot be continued at referring hospital and cannot be transported safely on low flow oxygen
 - Patient on CPAP, where care cannot be continued at the referring hospital and who would usually be safely transported on CPAP

Any variations to this will require a high level discussion between the NETS Consultant, the NETS State Director, Nurse Manager on Call and Critical Care Program Medical Lead

Equipment

- Intubation trolley or clean surface e.g. drape such as bluey
- Laryngoscope handle, preferably video laryngoscope
- Appropriate size laryngoscope blade
- Introducer (Stylet) or Bougie (for oral intubations only)
- Magills forceps
- Cuffed ETTs, uncuffed for Preterm infants [appropriate size and $\pm 0.5\text{mm}$]
- NETS Clinical Calculator for ETT sizing & insertion depth guidance, and drug doses
- Lubricant
- Gauze to trap secretions when removing stylet or bougie.
- Leucoplast brown tape to secure ETT

- Appropriate size in-line suction catheter
- Viral filters for anaesthetic bag and ventilator circuit (NB: not for neonates \leq 14 days)
- ETT smooth clamp
- ETCO₂ sampling line (do not use colorimetric CO₂ Detectors)
- Syringes for induction/ resuscitation drugs, inotropes and fluid bolus
- BVM with PEEP valve/ anaesthetic bag with Bact-trap™ filter/ HME filter attached, and mask. No Bact-trap™ filter/ HME filter in bagging circuit of neonates \leq 14 days of life. May use a small HME filter for neonates $>$ 14 days of life
- Gastric tube and syringe for gastric decompression
- Hospital medical gases available
- Suction apparatus, short suction catheter and/or Yankauer sucker
- Monitoring (SpO₂; ECG; BP & ETCO₂)
- Sterile plastic drape (to cover patient's face if extubation or surfactant administration is required)
- Small Biohazard bag for contaminated instruments
- IV cannulation pack and cannulas
- Airway adjuncts (Guedel & LMA)
- PPE (Contact + airborne), including level 3 or 4 gowns, face shields and hats

Procedure

Before Intubation (outside patient isolation room procedure):

- Ensure 4 Core roles are allocated:
 1. **Most experienced airway proceduralist (local COVID team member or NETS doctor)**
 2. **Airway assistant (local COVID team member or NETS nurse)**
 3. **Team leader/ drugs administrator/ in-room assistant**
 4. **Outside runner**
- Discuss intubation plan aiming for 1st attempt success, and discuss difficult airway plan
- Perform ventilator check and set baseline ventilation parameters (see COVID-19 Ventilator Setup guideline)
- Prepare and check essential intubation equipment as per COVID-19 intubation checklist.
- Test ETT cuff inflates and deflates using syringe
- Prepare ETT tapes

- Don contact + airborne PPE, including face shield and hat
- Perform buddy checks

Intubation (inside patient room procedure):

- Clear patient surroundings for easy access
 - Connect NETS transport system to power and gas sources.
 - Attach monitoring to patient
 - Team doctor to perform patient examination/assessment
 - Ensure patient has 2 patent IV access lines
 - Proceduralist arrange intubation equipment for easy access
 - Check that wall suction is operational and short catheter/ Yankauer sucker attached.
 - Optimize patient position for intubation, e.g. consider placing roll under patient's shoulders and adjust height of bed accordingly and lock bed wheels.
 - Pause and brief prior to induction
 - Preoxygenate patient using either nasal prongs, facemask, facemask CPAP or BVM+PEEP valve/anaesthetic bag. A Neopuff™ circuit may be used in neonates ≤ 14 days.
 - Ensure proper mask seal when using BVM+PEEP valve/ anaesthetic bag to avoid aerosolization.
 - Use a 2-person technique, one to hold mask and the 2nd to maintain PEEP
- For paediatric patients, a 2-hand technique is recommended. One person holds the mask, with palms of hands resting on the mask, thumbs pointing down towards patient's face and other fingers pulling the patient's jaw towards the mask.
- **Undertake classic RSI:** decompress stomach if gastric tube insitu; administer induction agents; and avoid mask positive pressure ventilation.
 - Confirming muscle relaxation.
 - Gas flow off.
 - Intubate trachea.
 - Declare successful/ unsuccessful intubation.

For successful intubation:

- Confirm ETT position at cords and lips
- Inflate cuff with syringe, under video laryngoscopy visualisation. Ensure that the cuff does not herniate through or above vocal cords
- Remove stylet/ bougie by applying secretions control technique (sliding stylet through gauze) to avoid secretions from airway spreading into the room's atmosphere

- Remove laryngoscope with secretions control technique
- Connect ventilator circuit, then switch ventilator on. Note that it is not necessary to clamp ETT, if connection of ventilator immediately follows successful 1st attempt intubation
- Confirm misting inside ETT, good ETCO₂ tracing and chest excursions are evident
- Secure ETT with pre-cut tapes
- Insert appropriate size gastric tube and organize chest X-ray

For unsuccessful intubation

- Reattach BVM/ anaesthetic bag (Bact-trap™ filter/ HME filter connected) to patient with gas flow off. No Bact-trap™ filter/ HME filter in neonate ≤ 14 days of life
- Continue 2-person bagging technique
- Turn gas flow on and provide manual breaths/ positive pressure ventilation
- Consider further induction agents
- Repeat Intubation, and follow the remaining steps for successful intubation.
- If still unsuccessful, follow difficult airway plan

For Patient Deterioration (post intubation & on ventilator):

Troubleshoot by adjusting ventilator settings - PEEP, PIP, FiO₂

If not successful perform the following steps swiftly and in a well-coordinated, sequential manner:


- Turn ventilator off at end of expiration
- Clamp ETT
- Detach after the filter from ventilation circuit – ETT remains attached to inline suction, viral filter and ETCO₂ adaptor
- Connect to bagging circuit (correct connection order is: Bagging circuit, ETCO₂, viral filter, in-line suction catheter and ETT) – there should be only 1 viral filter in the setup. In neonates ≤ 14 days of life, no viral filter is used. A small HME may be used for neonates > 14 days of life.
- Unclamp ETT
- Turn gas flow on
- Commence manual ventilation ± ETT suctioning (in-line)
- Avoid open suctioning, but if necessary, remember to turn gas flow off

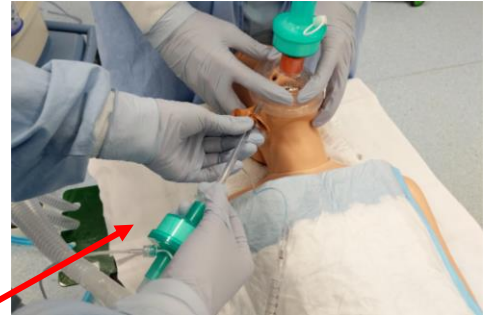
Patient recovered and ready to reconnect to ventilator?

- Turn gas flow off at end of expiration
- Clamp ETT

- Connect ventilator circuit to ETCO₂ + viral filter+ inline-suction catheter
- Unclamp ETT
- Switch on ventilator, adjust parameters as required

In case of Oesophageal Intubation:

- Place sterile drape over patient's face
- Suction oropharynx ± in-line ETT suction as required
- Position ETT to side of the mouth
- Perform 'mask over tube' technique: 
- Place mask + viral filter + bagging circuit over patient's face, maintaining a good seal. In neonates ≤ 14 days of life, no viral filter should be used
- Ensure gas flow is off.
- Turn ventilator off at end-expiration.
- Deflate ETT cuff
- Extubate and place ETT to one side under the sterile drape
- Turn gas flow on to bagging circuit and provide IPPV until ready to reintubate
- Detach used ETT from ventilator circuit
- Consider further induction, especially muscle relaxant
- Intubate, and proceed as per *Successful Intubation* steps above



Abbreviations and definition of terms

1. SARS-CoV2	Formal name of the novel corona virus detected in humans. Corona viruses are a large family of viruses with wild animals such as bats, camels and civets as reservoirs. ^[11]
2. COVID-19	Corona Virus Disease of 2019, a term coined by the WHO to describe the disease associated with this novel virus. ^[11]
3. BVM	Bag -valve- mask
4. HME filter	Heat Moisture exchange filter
5. PPE	Personal Protective Equipment
6. RSI	Rapid Sequence intubation (RSI) is an airway management technique that involves inducing immediate unresponsiveness (induction agent) and muscular relaxation (neuromuscular blocking agent) and is the fastest and most effective means of controlling the emergency airway. ^[5]
7. 2-hand technique	This technique involves placing the thenar eminences and thumbs of both hands on the top of the mask. The rescuer's four other fingers of each hand pull the jaw into the mask while the second rescuer compresses the bag to perform ventilation. ^[10]

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