Queensland Paediatric Consensus Statement: Paediatric Intubation Guide during the COVID-19 outbreak

The following recommendations are provided by senior Paediatric Critical Care and Emergency clinicians from GCUH, SCUH and CHQ HHS' to reduce the risk of COVID-19 transmission from children with an unknown COVID-19 status requiring intubation. Recommendations are current as of 07.04.2020 and it is recognised that advice is evolving. The consensus group was chaired by Dr. Phil Sargent, chair of Paediatric Intensive Care Advisory Group (PICAG) who can be contacted on Philip.Sargent2@health.qld.gov.au

Based on current knowledge, most paediatric patients requiring emergent intubation will not have COVID-19 as their primary pathology mandating airway intervention. As community spread broadens, the rates of co-infection or asymptomatic carriage of coronavirus will increase, and particular measures (in **red**) are essential in minimising staff exposure. Clinical care should not be compromised by the additional measures outlined below, but staff safety must be a priority.

Approach to Intubation

1. Pre-brief team outside room by proceeding through this list – take into room.
2. Use **COVID** airway checklist inside room (paper version in intubation pack) – (*Appendix 7)*

Planning:

- ☐ **Negative Pressure room or single room with closed door if negative pressure unavailable**
- ☐ **Senior Clinician Involvement - At QCH call Anaesthetics as early as possible**
- ☐ PICU/RSQ informed to prepare ongoing care

Prepare:

- ☐ 6 person airway/resuscitation/runner team (A*ppendix 1)*
- ☐ pre-intubation huddle to designate roles, confirm drug doses, other items/meds/fluids needed in room.
- ☐ **COVID Intubation pack** *(Appendix 4)* **- weight based, taken into room + paper copy QCH COVID airway checklist** *(Appendix 7)*
- ☐ **Resus grab bag – IV fluids, lines, syringes** (A*ppendix 5)*
- ☐ **IV access grab bag** (*Appendix 6)*
- ☐ Ensure suction tubing, appropriate yankauer, basic 02 delivery equipment available in room
- ☐ Ventilator in room – airway staff to familiarise with **COVID circuit setup** (*Appendix 2)*
- ☐ Airway + resuscitation trolleys outside room (with IO available/CICO equipment/drug labels)
- ☐ Drugs to be prepared outside room
- ☐ **Video laryngoscope in room plugged in PLUS appropriately sized blade (at QCH: to be taken in with CMAC)**
- ☐ Monitor in room
- ☐ **Communication method verbalised (whiteboard/speakerphone)**

PPE:

- ☐ **Airborne/contact PPE observed by spotter for those in room**
- ☐ **Primary airway operator should double glove.**
- ☐ **Face shield/goggles**
- ☐ **Follow local protocols**

Pre-oxygenation:

- ☐ **Consider head up position**
- ☐ Pre-oxygenate with NRB @ 6L/min OR BVM/T-Piece **(+ viral filter)** if respiratory support required *(Appendix 2)*
  - **Two handed technique to minimise leak** *(Appendix 3)*
- ☐ **Viral filter immediately above face mask in case of disconnection**
- ☐ **No Apnoeic Oxygenation**

Perform:

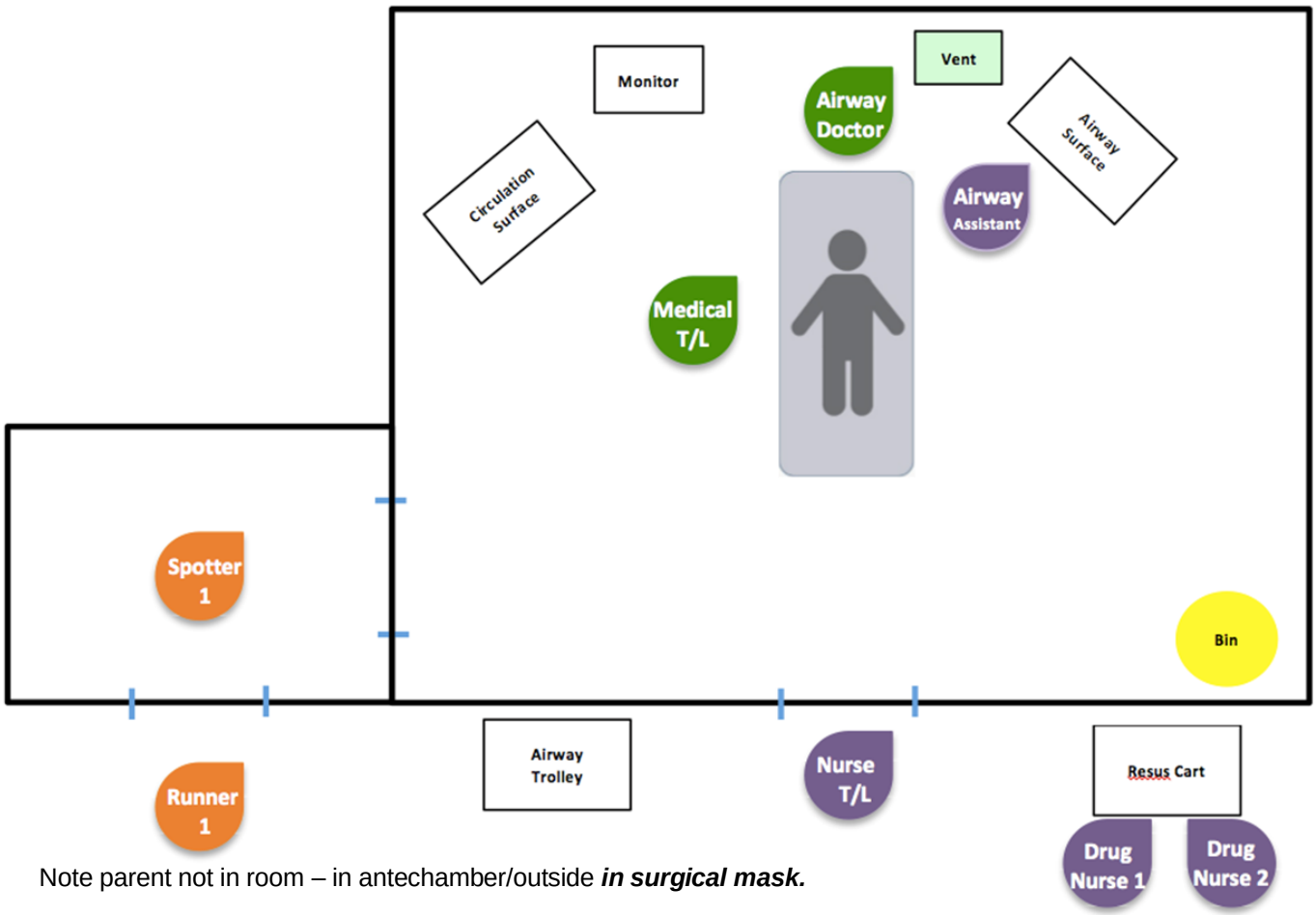
- ☐ Most experienced operator @ airway (Anaesthetic SMO/PICU SMO/ED SMO), Medical TL is backup airway doctor.
- ☐ **Use Video Laryngoscopy as Plan A where available**
- ☐ RSI with **1.2-1.5mg/kg Rocuronium** or 1.5mg/kg Suxamethonium (only if contraindication to Rocuronium) and 1-2mg/kg Ketamine.
- ☐ Wait full 60 sec post paralysis where able

Post-ETT:

- ☐ **Inflate cuff prior to initiating ventilation**
- ☐ **Ventilate via complete suction/filter/CO2 circuit with BVM/T-Piece, never directly attached to ETT** (*Appendix 2)*
- ☐ **Remove outer gloves once position confirmed**
- ☐ **Avoid disconnection where possible**
- ☐ **Consider ongoing paralysis to avoid cough/vent dyssynchrony (Vecuronium 0.1mg/kg IV)**
- ☐ consider disposition if no PICU bed on site
- ☐ consider confirmation CXR location (possibly PICU if ventilating well)

Appendix 1

Personnel Setup



Note parent not in room – in antechamber/outside ***in surgical mask.***

Roles:

Note: Non-essential staff in italics

Inside Room:

- Doctor TL – lead team, back up airway operator, deliver RSI / resus drugs
- Airway Doctor – airway management
- Airway Assistant – airway management

Outside Room:

- Nurse TL – lead nursing team, scribe
- Runner 1 – source additional equipment/drugs as needed
- Drug Nurse 1 – prepare drugs as instructed by medical TL
- *Spotter - Supervise PPE Donning/Doffing, door control*
- *Drug Nurse 2 - prepare drugs as instructed by medical TL*

Appendix 2

Safe pre-oxygenation, manual ventilation and ventilator circuit setup guide

Process:

1. Pre-oxygenate patient - if using T-Piece or BVM, set up as per **Diagram 1** - **COVID-19 Bag Valve Mask Assembly**
2. Disconnect BVM/T-Piece (+/- EtCO2 line) from mask/viral filer combination (at **Safe Disconnect Line** as seen on **Diagram 1**)
3. Intubate as per checklist
4. Attach COVID-19 circuit + BVM/T-Piece to ETT as per **Diagram 2 - COVID-19 Circuit for BVM ventilation** whilst confirming tube position, re-oxygenating/re-recruiting.
5. Once stabilised/tube position confirmed, remove BVM/T-Piece from EtCO2 line (at **Safe Disconnect Line** as seen on diagram 2) and connect ventilator circuit as per **Diagram 3 - COVID-19 Ventilator Circuit Assembly**

Please note, to allow safe transfer between manual bag ventilation and ventilator circuit (without requiring clamping of the ETT), an **adult/paediatric EtCO2 line MUST be used on all patients regardless of weight/age (i.e. including <10kg). If a neonatal EtCO2 line is used, the circuit cannot be safely assembled with a viral filter.

We strongly recommend individual facilities trial this ventilation set-up as individual components may vary by location, with the emphasis on ensuring any disconnection points have a VIRAL filter between the patient/ETT tube and the disconnection point for staff protection.

Similarly, we acknowledge that placing the EtCO2 line so distant from the ETT tube is contrary to usual advice to have it placed as proximal to the patient as possible. This modification is necessary to allow safe disconnection strategies, BUT will result in 'damped' EtCO2 trace. The trace is still useful for tube confirmation and EtCO2 trending, but the absolute number is likely to be lower than the actual arterial CO2 levels.

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Diagram 1 - COVID-19 Bag Valve Mask Assembly (applicable to T-Piece also)

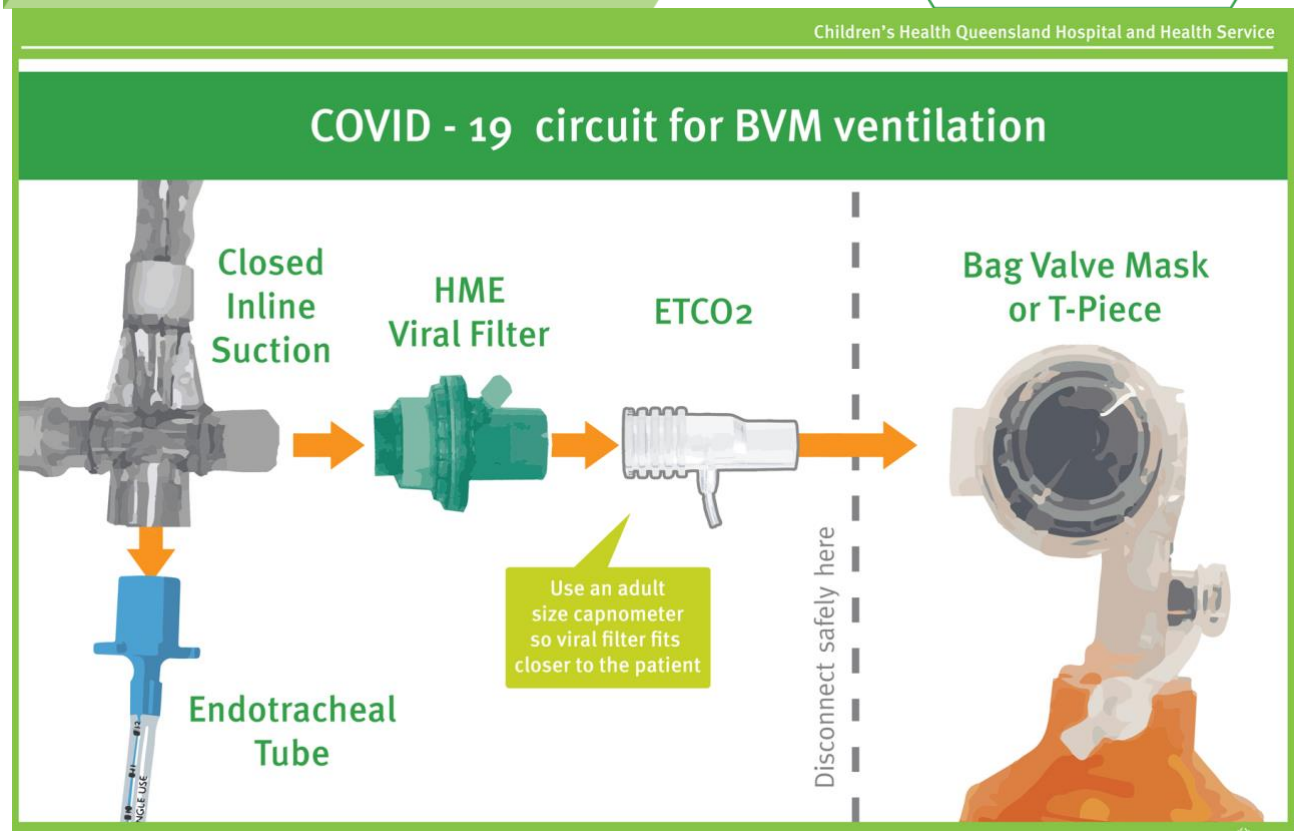

Diagram 2 - COVID-19 Circuit for BVM ventilation (applicable to T-Piece also)

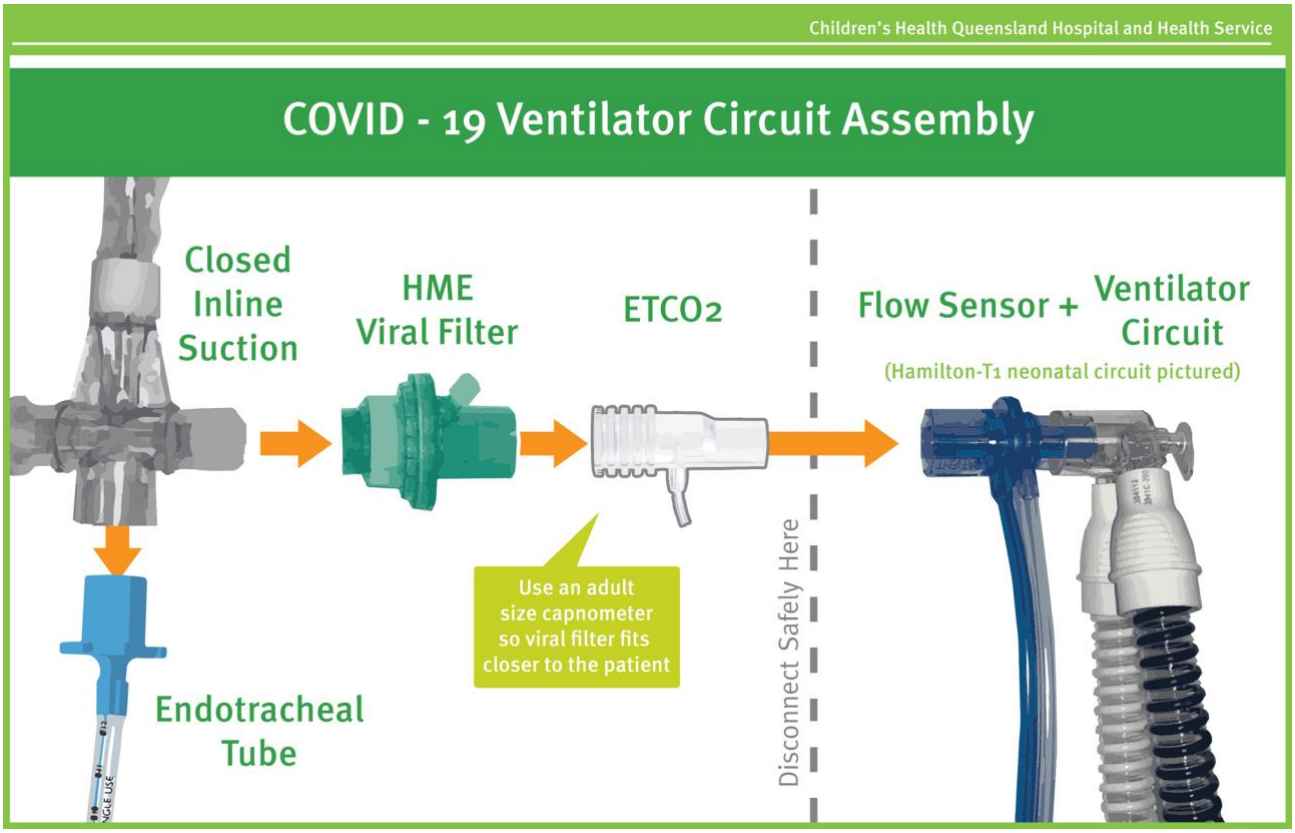

Diagram 3 - COVID-19 Ventilator Circuit Assembly

Appendix 3

Two handed technique:

Appendix 4

Intubation grab bag contents:

0-3yrs (3.5-14kg)	4-8yrs (15-25kg)
Disposable laryngoscope handle	Disposable laryngoscope handle
Mac Blade – 2	Mac Blade - 2
Miller Blade - 1	Miller Blade - nil
ETT – 3, 3.5, 4.0	ETT – 4, 4.5, 5.0
Stylet – 6 and 10	Stylet – 10
Guedel – 00 and 0	Guedel – 1, 2 and 3
NPA – 3 and 4	NPA – 4.0, and 5.0
LMA – 1, 1.5 and 2	LMA – 2 and 2.5
BVM + PEEP valve x 1 - Paed	BVM + PEEP valve - Paed
T-Piece circuit 1L x 1	T-Piece circuit 1L
5ml syringe x 1	5ml syringe
Adult/Paed Inline EtCO2 (NOT neonatal)	Adult/Paed Inline EtCO2
Neonatal Covidien DAR Filter x 2	Paediatric Covidien DAR filter x 2
Trachy tape	Trachy tape
Lubricant x 2	Lubricant x 2
Duoderm x 2	Duoderm x 2
Brown tape	Brown tape
NG tube	NG tube – 10 and 12
30ml ENFit syringe	30ml ENFit syringe
Hypafix	Hypafix
pH strip	pH strip
In-Line Suction	In-Line Suction
Face Masks - 2 and 3 + round	Face Masks 3 and 4
Bougie 8 Fr	Bougie 10Fr
Tongue Depressor	Tongue Depressor

Appendix 4

Intubation grab bag contents:

9-13yrs (26-45kg)	14+yrs (45+kg)
Disposable laryngoscope handle	Disposable laryngoscope handle
Mac Blade – 3	Mac Blade – 3 and 4
Miller Blade - nil	Miller Blade - nil
ETT – 5.5, 6.0, 6.5	ETT – 6.5, 7, 8.0
Stylet – 14	Stylet – 14
Guedel –2 and 3	Guedel – 4 and 5
NPA – 5.0, 6.0 and 7.0	NPA – 7.0 an d8.0
LMA – 2.5 and 3	LMA – 3.0 and 4.0
BVM + PEEP valve Adult	BVM + PEEP valve - adult
T-Piece circuit 1L	T-Piece circuit 2L
5ml syringe	10ml syringe
Adult/Paed Inline EtCO2	Adult/Paed Inline EtCO2
Paediatric Covidien DAR filter x 2	Adult Covidien DAR Filter x 2
Trachy tape	Trachy tape
Lubricant x 2	Lubricant x 2
Duoderm x 2	Duoderm x 2
Brown tape	Brown tape
NG tube – 10 and 12	NG tube – 12
30ml ENFit syringe	30ml ENFit syringe
Hypafix	Hypafix
pH strip	pH strip
In-Line Suction	In-Line Suction
Face Masks 4 and 5	Face Masks 5
Bougie 10/14 Fr	Bougie 14Fr
Tongue Depressor	Tongue Depressor

Appendix 5

Resus Fluid Grab Bag:

Contents
Normal Saline 1L
60ml Syringe
Rapid infuser giving set
Alco wipe
3 way tap
Blunt Needle

Appendix 6

Intravenous Cannulation Kit Bag:

Contents
2 x 20g, 22g, 24g cannula
IV Cannula dressing (Teddy Tegaderm)
Alco wipes x 2
Skin Prep
Dressing pack
Disposable tourniquet
5ml Syringe x 2
Blunt needle x 2
Green needle x 1
Posi Flush
3 way tap
Bung
Tapes pre-cut on laminated sheet
Board
Tubifast
Blood Culture
Blood Gas syringe
Blood tubes – 1x yellow/pink

Appendix 7

Queensland Paediatric Team Resus Brief and Airway Checklist **COVID**

Identify team members

Inside Room

- ☐ Airway Doctor (most experienced available)
- ☐ Airway Assistant
- ☐ Medical Team Leader + Drugs

Outside Room

- ☐ Nurse Team Leader and Scribe
- ☐ Runner
- ☐ Drug Nurse

☐

Has comprehensive monitoring been applied and working?

- SpO2
- In-circuit EtCO2
- Blood pressure (1 minute cycle)
- ECG

☐

Is the patient's position optimal?

- **Consider head up position**
- Bed height Optimised
- Consider C-Spine inline immobilisation

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Is the patient's preoxygenation optimal?

- **BVM or T-Piece with VIRAL FILTER**
- **Consider two handed mask technique**
- **No Apnoeic Oxygenation**

Confirm patency of appropriate IV / IO access ☐

Is the patient's haemodynamic status optimal?

- Consider fluids / inotropes / pressors

☐

Is airway equipment available, sized and checked (go through list)?

- ☐ Suction
- ☐ BVM + PEEP Valve OR T-Piece **PLUS VIRAL FILTER above mask**
- ☐ **Video Laryngoscope where able** + DL + blades
- ☐ ETT x 2 (+/- introducer)
- ☐ LMA
- ☐ CICO equipment – outside room
- ☐ Adjuncts - NP x 2
- ☐ Oropharyngeal
- ☐ Tube tie/tapes
- ☐ Bougie
- ☐ **Connection circuit as per COVID setup**

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Have the intubation drugs and doses been confirmed?

- Drugs (induction / paralytic / pressors / others) and doses
- Sedative infusion

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Team leader to verbalise airway management plans

- **All non-essential staff out of room (aim 3 staff only)**
- **Wait full 60 sec post paralytic administration prior to laryngoscopy where able**
- **Inflate cuff prior to ventilation**
- Include difficult airway plan

☐

Team resus brief complete - proceed to intubation