NHS Guy's and St Thomas' NHS Foundation Trust
TAP THEATRES ANAESTHESIA PERIOPERATIVE MEDICINE

T3-1: Preparation for emergency intubation of a COVID-19 patient

Objective: Preparation of equipment and staff for intubation of a suspected COVID-19 patient. To be used in conjunction with **T2-1: Donning Personal Protective Equipment for a COVID-19 patient in theatre**

Pre-intubation

IN CLEAN ROOM

1. **Assemble team in clean room**
   - ➲ Perform team introductions
   - ➲ Three hot-room team roles: intubator, airway assistant, drug administration/monitoring
   - ➲ Clean-room team roles: runner/donning buddy
2. **Prepare for intubation**
   - ➲ Request COVID airway supplies trolley
   - ➲ Check *intubation equipment list*
   - ➲ Prepare airway equipment and rescue devices on a metal trolley
   - ➲ Assemble breathing system prior to intubation
   - ➲ Plan for airway difficulty and brief team (see *T3-2: Intubation of a COVID-19 patient*)
3. **Check patient has an ID wristband**
4. **Check patient allergy status**
5. **Remove personal items e.g. mobile phone, ID badge, keys from pockets**
6. **Don and check AGP PPE equipment**
7. **Move to hot room**
   - ➲ Take ONLY the metal trolley into the hot room
   - ➲ Any additional equipment will be handed through by the runner

Intubation Equipment List

Intubation Equipment:
- Appropriately sized tracheal tube with subglottic suction
- Airtraq and screen or I-view videolaryngoscope
- Direct laryngoscope
- Bougie and stylet
- Tube tie
- Syringe
- Cuff manometer

Breathing Circuit:
- DO NOT USE High Flow Nasal Oxygenation
- Inline suction system
- Tracheal tube clamp
- Mainstream capnograph preferred; side stream on clean-side if no alternative
- If anaesthetic machine is being used:
  - HME filters at both patient and machine ends of circuit
  - DO NOT USE side-stream gas analyser where mainstream capnograph available
  - DO NOT use a Waters Circuit
- If no anaesthetic machine is available:
  - Waters Circuit with HME filter between patient and APL will be necessary
  - Place HME filters at the patient end of the circuit, and at the ventilator if possible

Drugs and IV access:
- Induction drugs for RSI
- Emergency drugs e.g. vasopressors
- Maintenance drugs and equipment e.g. propofol and pumps
- IV cannula, dressing, tourniquet with spares immediately available in clean room

Rescue Devices:
- Alternative supraglottic airways in a range of sizes
- Prepare an Aintree Intubating Catheter, an Ambu-scope Slim and a monitor in the clean room, but do not take it in to the hot room until needed at *Plan B: Secondary Intubation*
- Marker pen
- Emergency front of neck airway kit (scalpel, bougie, tube)

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T3-2: Emergency intubation of a COVID-19 patient

Objective: Intubation of a suspected COVID-19 patient minimising risk to staff. Only essential staff should enter the room with the patient. To be used in conjunction with **T2-1: Donning Personal Protective Equipment for a COVID-19 patient in theatre**

Intubation

IN HOT ROOM

1. **Receive patient on trolley**
   - ➲ Check HME filters at both ends of breathing circuit and Yankauer sucker available
   - ➲ Check patient positioning, monitoring, and room ergonomics are suitable for intubation
   - ➲ Check landmarks for front of neck airway and mark cricothyroid membrane
2. **Check IV access adequate and functional then connect IV fluids**
3. **Pre-oxygenate for at least 5 minutes with tight seal on mask**
   - ➲ Consider 5cmH_2O PEEP
4. **Apply cricoid pressure if appropriate, then give RSI drugs**
   - ➲ if hypoxia low pressure/low volume mask ventilation (two handed technique)
5. **Turn oxygen off before removing mask**
   - ➲ Perform *Plan A: Primary intubation*
6. **If intubation successful:**
   - ➲ Perform *post-intubation actions*
7. **If laryngoscopy difficult:**
   - ➲ Insert iGel and ventilate
   - ➲ Perform *Plan B: Secondary Intubation*
   - ➲ If successful perform *post-intubation actions*
8. **If cannot ventilate via iGel:**
   - ➲ Perform *Plan C: Mask ventilation*
9. **If cannot mask ventilate:**
   - ➲ Perform *Plan D: Front of neck airway*
   - ➲ Perform *post-intubation actions*

Airway Plans

Plan A: Primary Intubation
- Laryngoscopy with Airtraq and screen or I-view videolaryngoscope preferred
- Direct laryngoscopy if this is the most familiar technique

Plan B: Secondary Intubation
- Request Ambu-scope Slim and Aintree Intubating Catheter from clean room:
  - Load Aintree Intubating Catheter on to Ambu-scope
  - Insert Aintree Intubating Catheter via iGel using Ambu-scope
  - Remove Ambu-scope and iGel; leave Aintree Intubating Catheter in trachea
  - Intubate over Aintree Intubating Catheter
  - Remove Aintree Intubating Catheter

Plan C: Mask Ventilation
- Low pressure/low volume mask ventilation
- Two-handed technique to maintain seal

Plan D: Front of Neck Airway
- Scalpel (size 10 blade)
- Bougie
- Size 6.0 tracheal tube

Post-intubation Actions

- Connect breathing circuit HME, inline suction, and mainstream capnograph
- Inflate cuff BEFORE ventilation
- Turn oxygen on
- Confirm capnography
- Secure tracheal tube with tie and note tube depth
- Start sedation/anaesthesia
- Check tracheal tube cuff pressure; must be at least 5cmH_2O above inspiratory pressure to minimise leak
- If the circuit must be disconnected occlude the tracheal tube with a clamp before detaching, and leave the filter on the patient side
- Clean anaesthetic machine and breathing circuit with ‘Clinell’ wipe
- Clean patient’s face, neck, hair, and hands with soap and water
- Do not leave the room until 20 minutes have elapsed post-intubation
- Consider inserting NG tube and/or central venous access

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Action Card (v1-2)
June 2020

Action Card (v1-7) Fig. 3

T3-5: MERIT Team Procedures

Objective: Airway management, ventilation, and transfer of a COVID-19 patient. To be used in conjunction with PPE guidelines (**Action Card 8a: PPE for AGP/T2-1: Donning PPE in Theatre**), **T3-1: Preparation for intubation**, and **T3-2: Intubation of a COVID-19 patient**

1 Check patient history

- Collect brief history and allergy status
- Check the patient has a wristband

2 Prepare for intubation (see *Preparation*)

- Don and check PPE for aerosol generating procedure
- Collect ***T2-1: Preparation for Intubation of COVID-19 patient*** and follow steps
- Collect ***T2-2: Intubation of COVID-19 patient***
- Prepare a Waters Circuit with HME filter between patient and APL valve
- Attach mainstream capnograph on clean side of Waters Circuit
- Prepare mechanical ventilator
- Prepare a tracheal tube clamp

3 Perform intubation per action card

- Check tube position with Waters Circuit and capnograph
- Apply clamp to tracheal tube then disconnect the circuit above the HME filter
- Connect the mechanical ventilator and unclamp the tracheal tube
- Start mechanical ventilation using *recommended ventilation strategy for ARDS*

4 Check cardiovascular stability

- Give vasopressors early to avoid excessive fluid challenges after initial resuscitation phase

5 Check blood gas

6 Prepare for transfer

- Call ICU bed co-ordinator to determine transfer destination
- Check consumables prior to departure and syringes labelled for ICU
- Tape breathing circuit joins
- Avoid secondary transfers e.g. to radiology en-route to ICU

Preparation

- Intubation is an aerosol generating procedure, so AGP PPE is required for all known or suspected COVID-19 patients per ***Action Card 8a: PPE for AGP*** (or ***Action Card 8c: Confirmed or suspected COVID-19: alternative PPE for AGP*** if required)
- Intubation in ED should take place in Resus 3 if possible (negative pressure room)
- The MErIT team have the final say in the location of intubation if difficulty is predicted
  - Minimise transfers by moving directly to ICU for intubation if ED is unsuitable

Recommended Ventilation Strategy for ARDS

- Pressure controlled ventilation (BIPAP)
  - Pinsp ≤ 35 cmH_2O
  - P_{plat}: ≤ 28cmH_2O
  - PEEP ≥ 10 cmH_2O
  - Driving pressure (Pplat - PEEP) < 15cmH_2O
  - Tidal volume 6-8ml/kg predicted body weight
- Allow permissive hypercapnia

Target Values

- SpO_2: 90-94%
- pH > 7.3
- $PaCO_2$: < 6kPa

Predicted Body Weight Formula

- Male: 50 + (0.91 × [height in cm – 152.4])
- Female: 45.5 + (0.91 × [height in cm – 152.4])

If difficulty achieving target values early discussion with CRT consultant for escalation to SRF or ECMO teams

Useful contacts

- All MERIT referrals must be made through the CRT team on your site
- STH ICU Bed co-ordinator: 1556
- Internal MERIT Communications:
  - STH MERIT 1 Consultant: 0981 / ODP: 0983
  - STH MERIT 2 Consultant: 0982 / ODP: 0984
  - Guy's MERIT 1 Consultant: 0985 / ODP: 0986

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eFig. 4 Devices used for intubation (%)