Standard Operating Procedure for management of deteriorating suspected/confirmed Covid-19 patient

1. Resus environment:

1.1 *PPE availability and responsibility:*

Follow trust guidance on PPE for aerosol generating procedures (AGP) and for non-AGP.

AGP PPE station is set up in the antechamber of **R3:**
Cupboard has Long sleeve gowns, Clear visors and different types of FFP3 masks.
Drip stand is for drying the visors once cleaned.
Resus nurse in charge has overall responsibility to restocking, overseen by Matron.

1.2 *Equipment:*

All equipment required for delivering patent's care during AGP should be brought into cubicle from the clean side.

Accidental opening or use of the equipment from the cupboards inside the cubicle does not render the cupboard contents contaminated.

Equipment not removed from packaging is not to be disposed unless visibly soiled.

2. Escalation of care in suspected/confirmed Covid-19 patient:

2.1 *Teams:*

Emergency Department (ED)
CRT
Mobile Endotracheal Intubation Team (MErIT) formed to support the CRT with the endotracheal intubation of patients with severe respiratory failure. At present there are two MErIT 24/7 with plans to have multiple teams available as the elective lists drop and anaesthetists are more available.

2.2 *Referrals:*

Adult Escalation Plan – Appendix 1 is to be used as a crude guide for escalation of care (available on S Drive).

Deteriorating patient should be referred to CRT via ext 58913 / bleep 0610.
CRT will activate Mobile Endotracheal Intubation Team (MErIT) for intubation as needed- please see the MErIT document attached
In peri-arrest situation fast bleep CRT and MErIT (Team 1- 0981/Team 2 0982)
Decision to admit to intensive care rests with CRT.

2.3 *Confirmed/suspected Covid-19 patients requiring intubation*

PPE for AGP must be worn by all members of the team in the cubicle during AGP!!!

2.3.1 *Equipment:*

MErIT will bring their own kit for intubation, including drugs and PPE. This may not always be possible, depending on their demand and ability to restock, so as a backup there will be **two Covid-19 intubation boxes** in Resus replicating MErIT kit (without drugs, PPE and syringes) as of 23rd March.

Other items they MErIT may use from ED are:

- Glydoscope (please use single use ordinary stylet instead of reusable)
- Ambuscope
- NG tube
- Ventilator tubing/ HME filter/ Sidestream ETCO2

This list is not exhaustive and will also be situation dependent

2.3.2 *Drugs:*

There are now **5** RSI boxes in Resus fridge
There is enough stock of other required drugs as well(for sedation/paralysis/cardiovascular support etc.)

2.3.3 *Intubation:*

MErIT- primarily intubating team

Minimal number of people to be in the cubicle during intubation (3 in the dirty and 1 in the clean area).
MErIT will be sufficient for intubation of most of the patients. MErIT consists of **3** team members:
1st Intubator-Anaesthetic Consultant
Airway assistant-Senior ODP
2nd intubator/drug giver/monitoring- Anaesthetic Consultant or trainee

ED Nurse will be the **Runner** on the clean side of cubicle

MErIT will use own action cards to assemble the kit and as a checklist (please see Appendix 2, available on S drive).

ED- backup intubating (or airway management) team

If patient is peri-arrest, but CRT and MErIT are unavailable, ED Consultant or Registrar will have to manage the patient until they arrive. This means that RSI may need to be delivered by ED team.
RSI is to be performed by ED team **only** if clinician feels that RSI is within their skill set and can be delivered safely. In cases when RSI cannot be delivered by ED team, iGel can be used for oxygenation and ventilation until help arrives (ensure HME filter is attached to iGel, followed by ETCO2 sidestream on the clean side of HME filter).

If ED team is to deliver RSI, all Covid-19 specific rules and procedures need to be followed:

- PPE for AGP as per Trust guideline
- Minimal number of people in the hot room (usually 3, as above) and a clean runner outside
- Covid-19 intubation box is to be used for single point of kit access
- All equipment needed is to be assembled outside the cubicle
- Emergency Department Covid-19 RSI checklist must be used (please see Appendix 3, available on S Drive)
- All Covid-19 specific aspects of pre-oxygantion and ventilation to be adhered to in order to minimise aerosolistaion (see section 2.3.4)

2.3.4 ***Covid-19 specific aspects of per-oxygenation and ventilation:***

- *Pre-oxygenation:*

- Mapleson C with **HME filter immediately after the angle piece** with two handed technique (tight mask seal is important to minimise the aerosolisation) for 5 min
- Consider low PEEP (5 cmH20)
- Every time mask is removed from the patient, oxygen needs to be turned off
- If BVM is used (not to be used as a first line method of pre-oxygenation), HME filter must be attached immediately after the mask
- Ventilation is to be avoided, however, if significant desaturation during apnoeic phase, small volume/low pressure breaths can be delivered, as long as tight seal with two handed technique is maintained

- Ventilation:

- Once ETT passed, **cuff has to be inflated before ventilation**
- Breathing circuit must be built in this order: **ETT** (+/- inline suction+/- catheter mount), followed by **HME filter**, followed by side stream **ETCO2**, followed by **ventilator tubing**. Side stream ETCO2 has to be on the clean side of HME filter

- Suggested ventilation modes:
    - Volume controlled ventilation: Vt 6ml/kg IBW, PEEP 10, RR 14, I:E 1:2, FiO_2 100% (titrate down once established on the ventilator to aim SpO_2 94-98%)

    - Pressure controlled ventilation: moderate to high PEEP, driving pressure < 15cmH2O, Pplat <=30cmH2O, Vt 6ml/kg

ETT must be clamped for every circuit disconnection!!!

2.3.5 ***Post intubation:***

MErIT team may place NG tube before CXR.
MErIT will commence maintenance drugs

2.3.6 ***Transfer and on-going care:***

-While in Resus patient will be managed by:
Plan A: CRT
Plan B: MErIT
Plan C: ED
This will depend on what is happening in the rest of Resus/ED/hospital and all teams will need to be flexible as required

-Aim for early transfer to definitive care in ICU
-Unless clinically essential aim to avoid secondary transfers to CT en-route to ICU

Appendix 1- **Adult Escalation Plan for Patients with Confirmed or Suspected Covid-19**

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Adult Escalation Plan for Patients with Confirmed or Suspected Covid-19

For use in Respiratory Majors and Resus for patients with hypoxaemic respiratory failure

This is to be used as an initial guide for escalation, following initial assessment and treatment in the ED

It does not replace clinical judgement and NEWS2 score and it is not an exhaustive list of criteria for escalation

This should be interpreted in the light of senior decision making re. early treatment and escalation planning by ED / GIM / CRT

Category	Clinical criteria for oxygenation	Suggested action
Green	SaO_2 >94% on Room Air and RR≤20	Discharge for self-isolation as per PHE
Yellow	SaO_2 >94% on FiO_2 28-40%	Admit to medical ward **If progress to Amber / Red category on ward refer CRT**
Amber	SaO_2 ≤ 94% on FiO_2 40% despite optimisation	Start 15L O_2 via non-rebreathe mask CRT review in ED
Red	SaO_2 ≤94% on 15L O_2 via non-rebreathe mask	Urgent CRT review and prepare for intubation
Peri-arrest		Fast bleep CRT **(58913 / bleep 0610)** AND MErIT **(bleep 0153)**

For AMBER / RED cases, **CRT (58913 / Bleep 0610)** will activate **MErIT (Bleep 0153)** for intubation as required

DO NOT routinely commence High Flow Nasal Oxygen, CPAP or NIV for hypoxaemic respiratory failure prior to CRT review and senior decision making

This does not apply to patients with, or at risk of acidotic hypercapnic respiratory failure, including those with domiciliary NIV - refer to CRT for review re. NIV

M Gavrilovski, G Glover. Version 1.4 20/03/20

Appendix 2- **MErIT action cards**

Action Card (v1-1) LOCAL TAP APPROVED / TRUST APPROVAL PENDING

TAP

T3-1: Preparation for 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 for patient allergies**
4. **Remove personal items e.g. mobile phone, ID badge, keys from pockets**
5. **Don and check PPE equipment**
6. **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)

Action Card (v1-1)
March 2020

Action Card (v1-1) LOCAL TAP APPROVED / TRUST APPROVAL PENDING

TAP

T3-2: 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 HOT ROOM until 20 minutes have elapsed post-intubation
- Consider inserting NG tube and/or central venous access

Action Card (v1-1)
March 2020

Appendix 3- **Emergency Department COVID-19 RSI Checklist**

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Emergency Department COVID-19 RSI Checklist

Outside the room

Kit and drugs assembly

Kit

- ✓ Mapleson C with HME attached between patient and APL ☐
- ✓ 2x laryngoscopes (DL or VL) ☐
- ✓ Bougie and stylet ☐
- ✓ ETT x2 (different sizes) ☐
- ✓ KY gel ☐
- ✓ Inline suction ☐
- ✓ ETCO2 sidestream ☐
- ✓ Catheter mount ☐
- ✓ Syringe for cuff and tube ties ☐
- ✓ Tube clamp ☐
- ✓ OPAs ☐
- ✓ iGel (appropriate sizes) ☐
- ✓ eFONA set available ☐
- ✓ Marker pen ☐
- ✓ Discuss and prepare rescue devices (ig. Ambuscope) ☐
- ✓ Cannulas, dressings, tourniquets ☐

Drugs

- ✓ Induction drugs and muscle relaxant ☐
- ✓ Emergency drugs ☐
- ✓ Maintenance drugs ☐

Role allocations/Airway plans/PPE

✓Allocate roles:

- A: team leader and 1st intubator
- B: Cricoid pressure and airway assistant
- C: Drugs, monitor, timer, 2nd intubator
- D: Runner (outside)

✓Airway plans discussed

✓PPE as per Trust guidelines for AGPs before going in (buddy system)

Inside the room

BEFORE THE PROCEDURE		
PREPARATION		
Have all members of the team introduced themselves?	Yes	No
Is patient position optimised?	Yes	No
Are spinal precautions required?	Yes	No
HME filter attached to Mapleson C between mask and APL	Yes	No
Pre-oxygenate: Mapleson C (5l O2/ PEEP 5 cmH2O for 5min) with two handed technique	Yes	No
Is cricoid pressure considered?	Yes	No
Cricothyroid membrane marked	Yes	No
Post intubation sedation ready?	Yes	No
EQUIPMENT & DRUGS		
Is monitoring attached? (ECG, SpO2, BP on regular cycling, EtCO2)	Yes	No
Is suction ready?	Yes	No
Is breathing circuit assembled (inline suction/HME/ETCO2 sidestream)	Yes	No
Is adequate venous access in place and fluids attached?	Yes	No
Are working laryngoscope/s and bougie ready?	Yes	No
Are endotracheal tube/s ready?	Yes	No
10ml Syringe/KY gel/tube tie available?	Yes	No
Are oropharyngeal airways and iGels available?	Yes	No
Is difficult airway trolley available?	Yes	No
Are drugs and vasopressors ready?	Yes	No
Any drug allergies known?	Yes	No
TEAM		
Is senior help needed?	Yes	No
Is role allocation clear? (Intubator, drugs, assistant, cricoid, MILS)	Yes	No
Is difficult airway anticipated?	Yes	No

TIME OUT Verbal confirmation between team members before start of procedure		
Were difficult airway plans discussed?	Yes	No
Is senior help needed?	Yes	No
Is role allocation clear? (intubator, drugs, assistant, cricoid, MILS)	Yes	No
Is difficult airway anticipated and equipment available?	Yes	No
Any concerns about procedure?	Yes	No
Baseline vital signs? SpO2/BP/HR/ETCO2	Read out	
If you had any concerns about the procedure, how were these mitigated?		

Procedure date:		
Time:		
Operator:		
Observer:		
Assistant:		
Level of supervision:	SpR	Consultant
Equipment & trolley prepared:		

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SIGN OUT		
Endotracheal position confirmed (EtCO2 trace)?	Yes	No
Tube depth checked (B/L Air entry)?	Yes	No
ETT secured and cuff pressure checked?	Yes	No
Appropriate ventilator settings confirmed?	Yes	No
Analgesia and sedation started?	Yes	No
ICP optimisation required? D/W Neurosurgeon?	Yes	No
Chest X-Ray requested?	Yes	No
Hand over to nursing staff?	Yes	No

Signature of responsible clinician completing the form	

Patient Identity Sticker:

During the Procedure				
Personnel	Name		Grade	
Intubation				
Drugs				
Other (Assistant)				
Intubation	Laryngoscopy Grade	ETT size (Dmm)	Length @ teeth (cms)	
Oral/Nasal ETT		Method of Intubation		
Pharmacology	Drug		Dose	
Induction agent				
NMB agent				
Opiate				
Vasoactive agent				
Other Drugs				
Spinal precautions used (If Applicable)				
Comments:				
Adverse Events documented:				

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