

COVID-19

St Thomas' Main Theatres

QUICK REFERENCE HANDBOOK

TAP Theatres QRH - Contents

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T1-1: Aerosol Generating Procedures

Objective: To define aerosol generating procedures that require maximal PPE. To be used in conjunction with **ACTION CARD 8a: Personal Protective Equipment with FFP3 Mask/T2-1: Donning PPE for a COVID-19 Patient in Theatre**

Agreed list of Aerosol Generating Procedures

Procedure List

- Intubation, extubation, and related procedures such as manual ventilation and open suctioning
- Tracheotomy/tracheostomy procedures (insertion/open suctioning, removal)
- Bronchoscopy
- Surgical procedures on the upper and lower respiratory tract only involving high-speed devices
- Some dental procedures (such as high-speed devices)
- Non-invasive ventilation (NIV) such as Bi-level Positive Airway Pressure (BIPAP) and Continuous Positive Airway Pressure (CPAP) ventilation
- High-frequency Oscillating Ventilation (HFOV)
- High-flow Nasal Oxygen (HFNO), also called High-flow Nasal Cannula
- Induction of sputum

Notes

- Fit-tested FFP3 masks are only required for those conducting the procedures listed above, or for any staff who must also be in the room during the procedure
- Administration of medication via nebulisation is **not** an AGP
- Where AGPs are medically necessary, they should be undertaken in a negative-pressure room if available, or in a single room with the door closed
- If AGPs are undertaken in the patient's own room the room should be decontaminated 20 minutes after the procedure has ended
- Dentistry and post-mortem procedures are being dealt with separately

T1-2: Surgical Procedures for a COVID-19 Patient

Objective: To co-ordinate teams and allow sufficient preparation, allowing safe conduct of a surgical procedure for both patient and staff

- 1 Check the consultant anaesthetist is aware of the booking**
 - ▷ Priority consultant weekdays 0800 - 1700, otherwise contact on-call consultant
- 2 Check critical care team is aware of the booking**
- 3 Prepare teams**
 - ▷ Assemble all team members
 - ▷ Check PPE requirements with all team members (see *General Principles*)
 - ▷ Perform WHO team brief
 - ▷ Theatre Co-ordinator and consultant anaesthetist to confirm theatre allocation
 - ▷ If long operation, identify a relief team
 - ▷ Prompt staff to take comfort breaks before donning PPE
- 4 Prepare theatre**
 - ▷ Apply infection control notices to theatre doors
 - ▷ Prepare empty bins dedicated for used PPE in both theatre and sluice
 - ▷ Check supplies of alcohol gel, sterilising equipment, and Clinell wipes
 - ▷ Check anaesthetic machine and drug/fluid stock levels
- 5 Don PPE appropriate to role and risk (see *T2-1: Donning PPE for a COVID-19 Patient*)**
- 6 Confirm consultant anaesthetist is ready then send for patient**
 - ▷ Call security/porters and Essentia to clear route to theatre
 - ▷ Call ward and instruct to keep notes at origin
- 7 Induce anaesthesia in theatre (see *T3-1: Preparing for intubation of a COVID-19 Patient* and *T3-2: Intubation of a COVID-19 Patient*)**
 - ▷ Start a 20 minute timer

General Principles

- Elective surgery should be postponed until the patient has recovered
- Decision to proceed must involve consultant surgeon, consultant anaesthetist, infection control, and HCID team
- On arrival the patient must be transferred directly into the allocated theatre
 - Bypass the anaesthetic room; this must remain clean during the procedure
 - If there has been contamination or spills on transfer, routes used may not be used for 30 minutes
- Only essential people should be in theatre during the procedure; a runner should be stationed in the anaesthetic room
 - All staff involved must be trained in safe PPE use
 - If possible, the surgical team should not enter theatre until 20 minutes post-intubation
- PPE for surgical team:
 - If AGP (see *T1-1: Aerosol Generating Procedures*) or if required to enter within 20 minutes of intubation FFP3 PPE must be worn
 - If no AGP and can wait 20 minutes, gown, gloves, and surgical facemask must be worn

Useful Contacts

Infectious Diseases Teams

- HCID Consultant: 0963
- HCID Registrar: 0962
- CRT Registrar: 0610
- ID Registrar: 07827 841972
- Virology Consultant: via switchboard

Theatres

- Anaesthetic Consultant: via switchboard or CLW
- Anaesthetic Registrar: 0153
- Theatre Co-ordinator: 0191

T1-3: Post-operative Procedures for a COVID-19 Patient

Objective: To co-ordinate teams allowing safe conduct of a surgical procedure for both patient and staff

1 Perform sign-out per usual practice

2 Check if patient can be extubated

↳ If yes:

Staff not wearing FFP3 PPE must doff PPE and leave theatre (see *T2-2: Doffing PPE*)

Perform extubation (see *T3-3: Extubation of a COVID-19 patient*)

Patient must be recovered in theatre

↳ If no:

Call CRT registrar, HCID team, and Infection Control teams

Prepare for transfer to critical care area (see *T4-1* for principles of transfer)

3 Start a 20 minute timer

4 Prepare specimens for transfer

↳ Check specimens are double-bagged and labelled

↳ Use a dedicated specimen box or cooler

↳ Send specimens directly to laboratory

5 Scan documentation to EPR then safely dispose of paper records

6 Check timer

↳ Staff may doff PPE 20 minutes after the last AGP (see *T2-2: Doffing PPE*)

7 Request disinfection of theatre (see *theatre disinfection protocol*)

↳ After disinfection:

Check surgical stock

Check anaesthetic stock

General Principles

- Extubation is an aerosol generating procedure (see *T1-1: Aerosol Generating Procedures*)
 - Only essential staff should be present at extubation
 - All staff require PPE appropriate to AGP (see *T2-1: Donning PPE*)
- Transferring post-operative patients is complex
 - Awake patients must wear a Hudson mask and surgical facemask during transfer
 - Routes the patient will travel along may not be used during and for 30 minutes after transfer
 - Security/porters and Essentia will assist with securing routes

Useful Contacts

Infectious Diseases Teams

- HCID Consultant: 0963
- HCID Registrar: 0962
- CRT Registrar: 0610
- ID Registrar: 07827 841972
- Virology Consultant: via switchboard

Theatres

- Anaesthetic Consultant: via switchboard or CLW
- Anaesthetic Registrar: 0153
- Theatre Co-ordinator: 0191

T1-5: Cath-lab procedures for a confirmed COVID-19 patient

Objective: Safe transfer of a patient with confirmed COVID-19, who needs an emergency or urgent procedure in the Cath-lab, whilst minimising risk to the patient, staff, and the hospital environment.

- 1 Assemble team members**
- 2**
 - ↳ Plan procedure (see *general principles*)
 - ↳ Brief all team members on PPE requirements
 - ↳ Check sample-handling procedures (see *Action Card 10: Sample Collection*)
 - ↳ Order all required tests on EPR
 - ↳ Confirm a bed is available in an isolation area post-procedure
- 3 Confirm with sending team when ready to receive patient**
 - ↳ Inform the sending team to consult *T4-3: Internal transfer of a patient with confirmed COVID-19 for a procedure*
 - ↳ Inform the sending team of the destination and route (see *General Principles*)
- 4 Don PPE (see *Action Card 8a: PPE with FFP3*)**
- 5 Perform procedure**
 - ↳ Other than PPE there are no modifications to usual practice during the procedure
 - ↳ Defer chest X-ray until admission if possible, otherwise request portable X-Ray (see *T4-5: Portable imaging for a suspected or confirmed COVID-19 patient*)
 - ↳ Call blood gas technician if ABG samples are required and quarantine machine pending decontamination (see *Action Card 13: Taking Arterial Blood Gas in suspected Coronavirus*)
- 6 Call EW6 ICU team if patient critically ill**
- 7 Perform post-procedure actions:**
 - ↳ Patient to remain in Cath-Lab until destination is available
 - ↳ SNP to arrange transfer (see *T4-3: Internal transfer of a patient with confirmed COVID-19 for a procedure*)
 - ↳ Waste disposal (see *Action Card 5: Waste Management*)
- 8 Doff PPE (see *Action Card 8a: PPE with FFP3* or *Action Card 8b: PPE for suspected COVID-19*)**
- 9 Call rapid response team for room decontamination (see *Action Card 9: Environmental Cleaning*)**

General Principles

- Patient will have undergone initial assessment in the Emergency Department or by London Ambulance Service
- Requirement for procedure must be confirmed with Cardiovascular Directorate Management team and SNP
- All staff will require PPE (see *Action Card 8a: PPE with FFP3*)
- Minimise entries and exits from the room; prepare all equipment in advance
 - Prepare food and water for patient as necessary
 - DO NOT take stethoscopes, mobile phones, computers, pens, paper, or other equipment into the patient room
- Specimens must be hand-delivered; inform CSR that samples are confirmed COVID-19 (see *Action Card 10: Sample Collection*)

Treatment Locations:

- Coronary interventions: Cath-Lab 1
- Arrhythmias: Cath-Lab 4

Transfer Route:

- The patient must be escorted along a secure route via the East Wing lift block
- Transfer directly into the designated Cath-Lab if at all possible
 - If there is any delay, the patient must wait in the Cath-Lab Day Unit

Staffing Requirements

- Only essential staff should be in the room with the patient; plan for on-call staffing requirements to minimise exposure
- All staff must be trained in PPE and fit-tested
- Team should comprise: 1 x Consultant, 1 x Physiologist, 1 x Radiographer, 1 x Clean-room nurse, 1 x Hot-room nurse
- Out-of-hours the clean room nurse will be from the CCU team

Useful Contacts

- SNP: 1165
- Blood Gas technician: 1364

T1-6: Cath-lab procedures for a suspected COVID-19 patient

Objective: Safe transfer of a patient with suspected COVID-19, who needs an emergency or urgent procedure in the Cath-lab, whilst minimising risk to the patient, staff, and the hospital environment.

- 1 Assemble team members**
- 2**
 - ▷ Risk assess PPE requirements based on likelihood of aerosol generating procedures (see *T1-1: Aerosol Generating Procedures*)
 - ▷ Plan procedure (see *general principles*)
 - ▷ Brief all team members on PPE requirements (see *PPE requirements*)
 - ▷ Check sample-handling procedures (see *Action Card 10: Sample Collection*)
- 3 Check with sending team when ready to receive patient**
 - ▷ Inform the sending team to consult *T4-4: Internal transfer of a patient with suspected COVID-19 for a procedure*
- 4 Don PPE (see *Action Card 8a: PPE with FFP3* or *Action Card 8b: PPE for suspected COVID-19*)**
- 5 Perform procedure**
 - ▷ Other than PPE there are no modifications to usual practice during the procedure
- 6 Take a throat swab for COVID-19 screening**
- 7 Perform *Post-procedure Actions***
- 8 Doff PPE (see *Action Card 8a: PPE with FFP3* or *Action Card 8b: PPE for suspected COVID-19*)**

General Principles

- Patient will have undergone initial assessment in the Emergency Department or by London Ambulance Service
- Requirement for procedure must be confirmed with Cardiovascular Directorate Management team

Treatment Locations:

- Coronary interventions: Cath-Lab 1
- Arrhythmias: Cath-Lab 4

PPE Requirements

If NO aerosol generating procedure planned

- The receiving team must be wearing PPE including surgical mask (see *Action Card 8b: Suspected COVID-19 PPE*)

If aerosol generating procedure IS planned

- The receiving team must be wearing PPE including FFP3 mask (see *Action Card 8a: PPE with FFP3*)

Post-procedure Actions

- Transfer patient to an isolation room pending screening swab results
- Call rapid response team for environmental clean

T2-1: Donning PPE for a COVID-19 patient in theatre

Objective: Safe donning of PPE for a COVID+ confirmed or suspected patient requiring aerosol generating procedure(s) in theatre (see **T1-1: Aerosol Generating Procedures**)

Preparation

IN CLEAN ROOM

- 1 Prepare a 'buddy' to assist donning
- 2 Prepare PPE per *PPE equipment list*
- 3 Remove personal items e.g. ID badge, mobile phone, keys, pens
- 4 Don theatre shoes
- 5 Check if X-Ray required and don a lead apron under PPE if needed
- 6 Don gown
 - ↳ Do not tie the inside tie of the gown
- 7 Remove glasses if worn
- 8 Don FFP3 mask
 - ↳ Put on glasses if worn
 - ↳ Check arms of glasses are on top of mask straps
- 9 Put on theatre hat
- 10 Put on face shield
- 11 Put on non-sterile gloves
 - ↳ Tuck gown cuffs under gloves
 - ↳ Put on sterile gloves if required for procedure
 - ↳ Apply two strips of duct tape around the end of your gloves
- 12 Check PPE with buddy
 - ↳ Gloves covering cuffs
 - ↳ Mask correctly applied
 - ↳ Face covered by face-shield
 - ↳ Gown closed behind

PPE Equipment List

Equipment:

- Long-sleeved waterproof gown
- Fit-tested FFP3 mask
- Non-sterile gloves
- Sterile gloves (if required for procedure)
- Face shield
- Four strips of duct tape
- Theatre cap
- Theatre shoes (NOT personal footwear)
- A lead apron is required if X-Ray is required during the case

T2-2: Doffing PPE for a COVID-19 patient in theatre

Objective: Safe doffing of PPE for a COVID+ confirmed or suspected patient after operative intervention in theatre

First stage

IN HOT ROOM

- 1 Prepare a 'buddy' to assist doffing
- 2 Prepare a suitable container to discard used PPE into
- 3 Undo gown tie at the hip then loosen neck fastening
 - ↳ Do not reach behind you, do not touch your neck or the inside of the gown
- 4 Peel off gown and gloves together
 - ↳ Roll the gown inside-out
 - ↳ Place the gown and gloves into the bin
- 5 Perform hand hygiene with alcohol gel
- 6 Move to warm room

Second stage

IN WARM ROOM

- 7 Perform hand hygiene with alcohol gel
- 8 Prepare a suitable container to discard used PPE into
- 9 Remove face shield by grasping the strap behind your head
- 10 Remove theatre hat
- 11 Request buddy to remove your glasses if worn
 - ↳ Buddy must be wearing gloves
 - ↳ Buddy must clean the glasses with an alcohol wipe
- 12 Remove mask
 - ↳ Buddy may put your clean glasses back on
- 13 Step out of your hot-room shoes into a clear pair
- 14 Perform hand-hygiene to the elbows

Doffing Principles

- Brief with your buddy before starting the process
- Allow enough time to remove equipment and do not rush
- Discard contaminated single-use equipment straight into an appropriate bin
- Do not stuff contaminated materials into the bin
- If there are any doubts about contamination during doffing check with your buddy and perform meticulous hand hygiene
- Consider a 'Hibiscrub' shower after doffing

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)

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 5cmH₂O 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 5cmH₂O 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

T3-3: Extubation of a COVID-19 patient

Objective: Extubation of a suspected COVID-19 patient whilst minimising aerosolisation of virus particles. Only those essential to care should be present. PPE required per **T2-1: Donning Personal Protective Equipment for a COVID-19 patient in theatre**

Extubation

IN HOT ROOM

- 1** Check whether to extubate on theatre table or bed (see *Location Risk Assessment*)
- 2** Prepare patient for extubation
 - ⊃ Position table/bed so that all staff are behind patient
 - ⊃ Sit patient upright and place an inco-pad on the patient's chest
 - ⊃ Administer sugammadex
 - ⊃ Begin pre-oxygenation
- 3** Prepare equipment (see *Minimum Equipment List*)
- 4** Clear airway of secretions
 - ⊃ Careful oral suction with Yankaeur sucker
 - ⊃ Tracheal suction with inline suction system
- 5** Perform final pre-extubation checks
 - ⊃ Check train-of-four > 0.9 and establish self-ventilation
 - ⊃ Check $E_tO_2 > 0.9$
 - ⊃ Fully open APL value
- 6** Stop anaesthetic agent(s)
- 7** Untie tube tie and maintain control of tracheal tube
- 8** Prepare team for extubation process
 - ⊃ Check patient can obey commands
 - ⊃ Deflate cuff at the point of extubation then remove tube to inco-pad
 - ⊃ Apply anaesthetic facemask immediately
 - ⊃ Apply Hudson mask AND surgical mask once airway confirmed and coughing subsided
- 9** Observe patient for at least five minutes prior to transfer

Location Risk Assessment

Consideration must be given to extubation on theatre table or bed

- If extubating on theatre table then a transfer post-extubation will be required. Take care to maintain distance from the airway when this happens. It may be appropriate to keep the patient sitting upright on the theatre table for a longer period than normal to ensure the airway is clear and there will be no further coughing.
- If extubating on bed then a transfer prior to extubation will be required. If the patient is already self-ventilating then it will not be possible to clamp the tube and disconnect the breathing circuit during the transfer. Extra care **MUST** be taken to avoid accidental disconnection or extubation during the transfer.

Minimum Equipment List

- Oropharyngeal airway
- Anaesthetic facemask
- Hudson mask
- Surgical facemask
- iGel
- Yankaeur sucker
- Syringe to deflate tube cuff
- Intubation equipment for emergency use

T3-4: Scrub preparation for surgery in a paediatric COVID-19 patient

Objective: Preparation of equipment and staff for operative intervention in a COVID-19 patient. To be used in conjunction with **T2-1: Donning PPE for a COVID-19 patient in theatre**

- 1 Prepare team before sending for patient**
 - ↪ Check PPE requirements with all team members (see *General Principles*)
 - ↪ Perform WHO team brief
 - ↪ Assign scrub team roles (see *Scrub Team Roles*)
 - ↪ Check infection control notices have been placed on theatre doors
 - ↪ Check sufficient PPE is available in REEF theatres
 - ↪ Prepare PPE in anaesthetic room
 - ↪ Check which surgical kits are needed
- 2 Prepare surgical kits and equipment in preparation area as usual**
 - ↪ Prepare only kits that were specified at briefing
 - ↪ Kits that may (but not certainly) be required can be left in the anaesthetic room
- 3 Remove personal items e.g. mobile phone, ID badge, keys from pockets**
- 4 Check if X-Ray will be required for case**
 - ↪ Don a lead gown if required
- 5 Don and check PPE equipment (see *E2-1: Donning PPE for a COVID-19 Patient*)**
 - ↪ Do NOT enter theatre until signalled by anaesthetic team

Scrub Team Roles

Hot room:

- Scrub nurse
- Runner

Clean Room:

- PPE buddy
- Runner

• PPE for surgical team:

- If AGP (see *T1-1: Aerosol Generating Procedures*) or if required to enter within 20 minutes of intubation FFP3 PPE must be worn
- If no AGP and can wait 20 minutes, gown, gloves, and surgical facemask must be worn

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 with FFP3 Mask/T2-1: Donning PPE in Theatre**), **T3-1: Preparation for intubation**, and **T3-2: Intubation of a COVID-19 patient**

1 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

2 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*

3 Check cardiovascular stability

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

4 Check blood gas

5 Prepare for transfer

- ↳ Call CRT consultant to determine transfer destination
- ↳ Check consumables prior to departure
- ↳ Tape breathing circuit joins
- ↳ Avoid secondary transfers e.g. to radiology en-route to ICU

Preparation

- Essential team members in room only
- Intubation is an aerosol generating procedure, so PPE with an FFP3 mask is required for all known or suspected COVID-19 patients per **Action Card 8a: PPE with FFP3 facemask** (or **Action Card 8c: Failed fit testing - PPE** if required)
- Intubation in ED should take place in Resus 3 if possible, as this is a negative pressure room
 - ED patients with respiratory symptoms will generally be cohort in Majors 3 as this is also a negative pressure room
- The MErIT team have the final say in the location of intubation if difficulty is predicted
 - Aim to minimise transfers by moving directly to ICU for intubation if ED is unsuitable

Recommended Ventilation Strategy for ARDS

- Pressure controlled ventilation (BIPAP)
 - P_{insp} ≤ 30 cmH₂O
 - PEEP ≥ 10 cmH₂O
 - Driving pressure (P_{insp} - PEEP) ≤ 15cmH₂O
 - Tidal volume 6ml/kg ideal body weight
- Allow permissive hypercapnia

Target Values

- SpO₂ > 90%
- pH > 7.2

Ideal 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

T4-1: Internal ward-to-ward transfer of a patient with confirmed COVID-19

Objective: Safe transfer of a patient with confirmed COVID-19, minimising risk to the patient, staff, and the hospital environment.

- 1** Check with clinical team that transfer is essential
- 2** Call destination ward to ensure they are ready to receive
 - ↳ Agree arrival time window with receiving team
 - ↳ Inform the receiving team how the patient will be moved (bed, trolley, chair)
- 3** Call SNP to co-ordinate assisting teams
- 4** Check assisting teams ready for transfer
- 5** Prepare staff to accompany patient
 - ↳ Staff require PPE including FFP3 mask
 - ↳ Place patient notes in a sealed plastic bag for collection by transfer team
- 6** Don PPE (see *Action Card 8a: PPE with FFP3*)
- 7** Prepare for departure
 - ↳ Apply surgical mask to patient
 - ↳ Collect patient notes in a sealed bag
 - ↳ Check consumables e.g. oxygen supplies, pump batteries, monitoring
- 8** Perform transfer of patient
 - ↳ Senior nurse or security person to walk 2m ahead of patient
 - ↳ If any spills occur, one member of team must remain with spill and alert SNP
- 9** Perform *Actions on Arrival*
- 10** Doff PPE (see *Action Card 8a: PPE with FFP3*)

Actions on Arrival

- The receiving team must be wearing PPE including FFP3 mask (see Action Card 8a: PPE with FFP3)
- if the patient has been transferred on a bed, leave them on this bed
- If the patient has been transferred on a trolley or chair, this must be decontaminated using Clinell wipes THEN 1% hypochlorite wipes prior to removal from ward
 - Cleaning team must be wearing single-layer PPE

Useful Contacts

- SNP: 1165

T4-2: Internal ward-to-ward transfer of a patient with suspected COVID-19

Objective: Safe transfer of a patient with suspected COVID-19, minimising risk to the patient, staff, and the hospital environment.

- 1** Check with clinical team that transfer is essential
- 2** Call destination ward
 - ▷ Agree arrival time window with receiving team
 - ▷ Inform the receiving team how the patient will be moved (bed, trolley, chair)
- 3** Prepare two members of staff to accompany patient
 - ▷ Staff require PPE including surgical mask
 - ▷ Place patient notes in a sealed plastic bag for collection by transfer team
- 4** Don PPE (see *Action Card 8b: Suspected COVID-19 PPE*)
- 5** Prepare for departure
 - ▷ Apply surgical mask to patient
 - ▷ Collect patient notes in a sealed bag
 - ▷ Check consumables e.g. oxygen supplies, pump batteries, monitoring
- 6** Perform transfer of patient
 - ▷ If any spills occur, one member of team must remain with spill and alert SNP
- 7** Perform *Actions on Arrival*
- 8** Doff PPE (see *Action Card 8b: Suspected COVID-19 PPE*)

Actions on Arrival

- The receiving team must be wearing PPE including surgical mask (see Action Card 8b: Suspected COVID-19 PPE)
- Bed, trolley or chair must be decontaminated using Clinell wipes THEN 1% hypochlorite wipes prior to removal from ward
 - Cleaning team must be wearing single-layer PPE

Useful Contacts

- SNP: 1165

T4-3: Internal transfer of a patient with confirmed COVID-19 for a procedure

Objective: Safe transfer of a patient with confirmed COVID-19, minimising risk to the patient, staff, and the hospital environment.

- 1** Confirm with clinical team procedure is essential
- 2** Call destination to ensure they are ready to receive
 - ↳ Confirm COVID-19 status receiving team
 - ↳ Agree arrival time window with receiving team
 - ↳ Inform the receiving team how the patient will be moved (bed, trolley, chair)
- 3** Call SNP to co-ordinate assisting teams
- 4** Confirm assisting teams ready for transfer
- 5** Identify staff to accompany patient
 - ↳ Staff require PPE including FFP3 mask
- 6** Don PPE (see *Action Card 8a: PPE with FFP3*)
- 7** Prepare for departure
 - ↳ Apply surgical mask to patient
 - ↳ Check consumables e.g. oxygen supplies, pump batteries, monitoring
 - ↳ DO NOT take patient notes
- 8** Transfer patient
 - ↳ Senior nurse or security person to walk 2m ahead of patient
 - ↳ If any spills occur, one member of team must remain with spill and alert SNP
- 9** Perform *Actions on Arrival*
- 10** Doff PPE (see *Action Card 8a: PPE with FFP3*)
- 11** Perform *Post-procedure actions* when appropriate

General Principles

- If transferring for imaging, patient MUST be able to transfer in chair
 - If unable, contact radiology to request portable X-Ray See *T4-5: Portable Imaging for a patient with suspected or confirmed COVID-19*)
- The patient MUST NOT be left in a waiting room with other patients
 - The patient should be transferred directly into the procedure room
 - The patient must return to the ward immediately on completion of the procedure
- DO NOT take patient notes

Actions on Arrival

- The receiving team must be wearing PPE including FFP3 mask (see Action Card 8a: PPE with FFP3)

Post-procedure Actions

- Clean all surfaces in contact with the patient using Clinell wipes THEN 1% hypochlorite wipes prior to removal from ward
 - Cleaning team must be wearing single-layer PPE
- If in theatres/endoscopy, call rapid response team for environmental clean

Useful Contacts

- SNP: 1165

T4-4: Internal transfer of a patient with suspected COVID-19 for a procedure

Objective: Safe transfer of a patient with confirmed COVID-19, minimising risk to the patient, staff, and the hospital environment.

- 1** Check with clinical team that procedure is essential
- 2** Call destination to ensure they are ready to receive
 - ↳ Check COVID-19 status with receiving team
 - ↳ Agree arrival time window with receiving team
 - ↳ Inform the receiving team how the patient will be moved (bed, trolley, chair)
 - ↳ Check whether an aerosol generating procedure is planned
- 3** Prepare two members of staff to accompany patient
 - ↳ Staff require PPE including surgical mask
- 4** Don PPE (see *Action Card 8b: Suspected COVID-19 PPE*)
- 5** Prepare for departure
 - ↳ Apply surgical mask to patient
 - ↳ Check consumables e.g. oxygen supplies, pump batteries, monitoring
 - ↳ DO NOT take patient notes
- 6** Perform transfer of patient
 - ↳ Senior nurse or security person to walk 2m ahead of patient
 - ↳ If any spills occur, one member of team must remain with spill and alert SNP
 - ↳ DO NOT take patient notes
- 7** Perform *Actions on Arrival*
- 8** Doff PPE (see *Action Card 8a: PPE with FFP3/Action Card 8b: Suspected COVID-19 PPE*)
- 9** Perform *Post-procedure actions* when appropriate

General Principles

- If transferring for imaging, patient MUST be able to transfer in chair
 - If unable, contact radiology to request portable X-Ray (See *T4-5: Portable Imaging for a patient with suspected COVID-19*)
- The patient MUST NOT be left in a waiting room with other patients
 - The patient should be transferred directly into the procedure room
 - The patient must return to the ward immediately on completion of the procedure
- DO NOT take patient notes

Actions on Arrival

If NO aerosol generating procedure planned

- The receiving team must be wearing PPE including surgical mask (see Action Card 8b: Suspected COVID-19 PPE)

If aerosol generating procedure IS planned

- The receiving team must be wearing PPE including FFP3 mask (see Action Card 8a: PPE with FFP3)

Post-procedure Actions

- Clean all surfaces in contact with the patient using Clinell wipes THEN 1% hypochlorite wipes prior to removal from ward
 - Cleaning team must be wearing single-layer PPE
- If in theatres/endoscopy, call rapid response team for environmental clean

Useful Contacts

- SNP: 1165

T4-5: Portable imaging for a suspected or confirmed COVID-19 patient

Objective: Safe use of portable imaging for suspected or confirmed .

- 1 Check with clinical team that imaging is essential
- 2 Check that patient is unable to be transferred to X-Ray in chair
- 3 Call radiographer on-call
 - ▷ Notify of COVID-19 status
 - ▷ Agree time window to perform the imaging
- 4 Prepare an assistant and a receiver (see *X-Ray roles*)
- 5 Don X-Ray gown
- 6 Don PPE over X-Ray gown (see *Action Card 8a: PPE with FFP3* or *Action Card 8b: Suspected COVID-19 PPE*)
- 7 Perform X-Ray using an AMX machine (see *X-Ray roles*)
 - ▷ No cassette covers are required
- 8 Perform *Post-procedure actions*
- 9 Assistant to pass decontaminated cassette to receiver
- 10 Radiographer to doff PPE (see *Action Card 8a: PPE with FFP3/Action Card 8b: Suspected COVID-19 PPE*)
- 11 Assistant to doff PPE (see *Action Card 8a: PPE with FFP3/Action Card 8b: Suspected COVID-19 PPE*)

General Principles

If COVID-19 suspected

- The radiographer and assistant must be wearing PPE including surgical mask (see *Action Card 8b: Suspected COVID-19 PPE*)
- The receiver requires only clean gloves

If COVID-19 confirmed

- The radiographer and assistant must be wearing PPE including FFP3 mask (see *Action Card 8a: PPE with FFP3*)
- The receiver requires only clean gloves

X-Ray Roles

Assistant:

- bring a cassette and lead screen into the patient's room
- hold the door open for the radiographer
- position the cassette
- decontamination of cassette

Radiographer:

- bring AMX machine into the patient's room
- position the X-Ray tube
- confirm cassette position is appropriate

Receiver:

- collect decontaminated cassette from assistant post-procedure

Post-procedure Actions

- Clean surfaces of AMX machine using Clinell wipes THEN 1% hypochlorite wipes prior to removal from room
- Decontaminate the cassette:
 - wipe using Clinell wipes THEN 1% hypochlorite wipes prior to removal from room

T4-6: Internal Guy's to St Thomas' transfer of a patient with confirmed COVID-19

Objective: Safe transfer of a non-ICU patient with confirmed COVID-19, minimising risk to the patient, staff, and the hospital environment. This process is activated after discussion between the patient's clinical team and the HCID consultant.

- 1** Check receiving ward at STH with HCID consultant
- 2** Call Guy's SNP
 - ↳ Notify of patient details
 - ↳ Notify of departing ward at Guy's
 - ↳ Check receiving ward at STH
 - ↳ Agree time window to perform the transfer
- 3** Prepare team
 - ↳ SNP, transferring paramedics, two ward staff
 - ↳ Prepare patient notes in a sealed plastic bag for collection by transfer team
 - ↳ Prepare equipment: PPE, spills kit, two waste bags, alcohol gel
- 4** Brief all team members (see *transfer team roles*)
- 5** Don PPE (see *Action Card 8a: PPE with FFP3*)
- 6** Prepare for departure
 - ↳ Apply surgical mask to patient
 - ↳ Collect patient notes in a sealed bag
 - ↳ Check consumables e.g. oxygen supplies, pump batteries, monitoring
- 7** Perform transfer of patient
 - ↳ Position staff according to role (see *transfer team roles*)
 - ↳ If any spills occur, one member of team must remain with spill and alert SNP
- 8** Perform *Actions on Departure*
- 9** Doff PPE (see *Action Card 8a: PPE with FFP3*)

General Principles

- The transferring ambulance will wait in the Guy's car park, while the crew will attend the ward then don PPE

Transfer team roles

SNP:

- Call BEARS and arrange an ambulance crewed by PPE-trained team
- Provide spills kit to ward staff
- Follow transfer at distance of at least two metres
- Carry waste bags, alcohol gel
- Safe disposal of waste bags post-transfer

Paramedics:

- Load patient into ambulance
- Perform transfer to STH

Ward staff 1:

- Carry spills kit during transfer
- Observe patient

Ward staff 2:

- Walk two metres ahead of patient
- Guide team along agreed route
- Open doors

Actions on Departure

- Guy's SNP to call STH SNP and confirm departure
- Place waste bags in safe position for doffing process
- Ward staff to confirm decontamination of patient room (see *Action Card 9: Environmental cleaning*)

T5-2: Daily checks and maintenance for a Drager anaesthetic machine

Objective: Drager Primus anaesthetic machines require a daily check to ensure it functions correctly. The patient must be switched to a new ventilator. This process requires two people in FFP3 PPE, as it is potentially aerosol generating.

- 1** Ensure all staff in your room are wearing FFP3 PPE (see *T2-1: Donning PPE for a COVID-19 patient in theatre*)
- 2** Check the patient is stable enough for you to proceed and a doctor is available
- 3** Prepare a buddy to assist you
 - ▷ Check you both have a copy of this card
 - ▷ Allocate roles for the procedure (see *Roles for Switching Machines*)
 - ▷ Read through the steps on the card together before you begin
- 4** Prepare the new Drager Primus anaesthetic machine on the side of the bed opposite the ventilator
 - ▷ Check self-tests have been successfully completed
 - ▷ Check the new breathing circuit, including the HME filters at both patient and machine end
 - ▷ Connect a test-lung to the new breathing circuit
- 5** Prepare the settings on the new machine
 - ▷ The 'old machine' person confirms the ventilation mode; 'new machine' person selects on their machine and turns it on
 - ▷ The 'old machine' person confirms each setting, starting from the left with O₂
 - ▷ The 'new machine' person sets their machine and performs a read-back after every value
- 6** Check the test-lung is ventilating then disconnect it
- 7** Perform the following steps in order to switch machines:
 - ▷ Switch the old ventilator to standby
 - ▷ Occlude the tracheal tube with a clamp in inspiration if possible
 - ▷ Disconnect the old expiratory limb at the machine end; the HME stays on the CIRCUIT
 - ▷ Disconnect the tracheal tube and immediately connect the new machine circuit
 - ▷ Unclamp the tracheal tube
- 8** Check the patient is ventilating appropriately
- 9** Perform *Post-procedure actions*

Roles for Switching Machines

Old machine role:

- Collect a new CO₂ absorber canister
- Collect paper towels
- Collect Clinell wipes
- Collect a waste bag and ties
- Stand by the old ventilator to which the patient is already connected
- You will: operate the old machine and clean it after the switch

New machine role:

- Collect a tracheal tube clamp
- Collect a test-lung
- Stand by the new ventilator to which the patient will be connected
- You will: prepare and operate the new machine, clamp the tube, switch the circuits, and release the clamp

Post-procedure actions

The old machine must be cleaned and checked before returning to service:

- Connect the expiratory limb of the old circuit to the Y-piece to form a loop
- Turn the old machine off (fully powered-down)
- Fully disconnect the old circuit from the machine then put it in the waste bag
- Perform the block-inspection:
 - Collect the block key
 - Open the block unit by pressing the grey button below the APL valve
 - Undo the three screws using the block key and open the lid
 - Remove the rubber container and empty any water into your waste bag
 - Dry the inside of the well using paper towels, then put them in your waste bag
 - Replace the rubber container
 - Close the lid and redo the three screws
 - Close the block unit
- Replace the CO₂ absorber canister and put the old one in your waste bag
- Check the sampling-line water trap and replace if needed
- Seal your waste bag
- Clean the old machine with Clinell wipes then clean your gloves with alcohol gel
- Prepare the machine for use (see *T5-1: Setting up a Drager Anaesthetic Machine for a new patient*)
 - This machine can now be used as a 'new' machine