

CDH Intubation protocol for SARS-CoV-2 training video supplementary notes

Welcome to the CDH intubation video for intubation of known or suspected SARS-CoV-2 infected patients.

The goal of this video is to illustrate the intubation protocol step-by-step, so that the roles and tasks are clear to all the health care providers that will be involved in this procedure. The target audience for this video is the following staff at CDH: ICU RNs, ED RNs, RTs, ED MDs, ICU MDs, Anesthesia MDs, Anesthesia assistants, as well as for staff (ex. non-ICU/ED RNs, non ED MDs) that might be working outside of their regular scope of practise in times of low personnel resources.

There is an optional survey that will help us gather information about if this style of training (the video and supplementary material) is a useful format for learning.

For the training, I recommend you print a copy of these notes and have them readily available while you watch the training video.

Suggested use of material:

1. Complete the optional pre-training survey:
<https://surveys.viha.ca/Checkbox/Video-Simulation-QI-Survey.aspx>
2. Read the CDH intubation protocol in the Case of a Highly Contagious Respiratory Illness (such as SARS-CoV-2)
3. Watch the CDH Intubation protocol for SARS-CoV2 training video in its entirety to understand the big picture of the protocol
4. Watch the CDH Intubation protocol for SARS-CoV2 training video, but when a number appears on the screen, pause the video and read the supplementary material related to that number, then resume the video once the supplementary material has been reviewed.
5. Watch the CDH Intubation protocol for SARS-CoV2 training video in its entirety again, picturing yourself in any of your possible role(s)
6. If questions remain, please post in the Slack website for the intubation protocol.
7. Complete the optional post-training survey:
<https://surveys.viha.ca/Checkbox/Video-Simulation-QI-PostSurvey.aspx>

Supplementary material (by numbers as in the video)

1.

- Pt with Covid Like symptoms arrives at triage
- Surgical mask applied to patient
- **If patient moderately distressed:**
 - Triage Nurse notifies ERP/RT to assess patient stability
 - Move to monitored room in ER (8/9/10) for period of observation
 - Consider Early transfer per **ER Physician** discretion
- ER Charge Nurse assigns **Initial ER nurse**

2.

- **Moderately distressed patient**
- **ER Physician** makes a decision regarding controlled intubation:

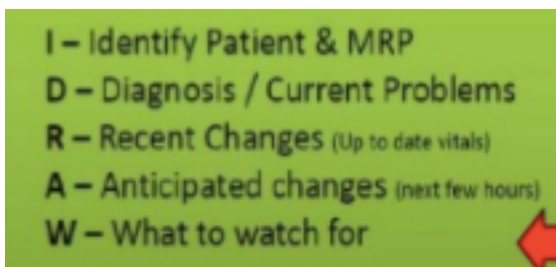
Suggested Indications for Covid Intubation (from appendix):

- Failure to maintain O2 saturations >90% on NP at 4L/min (can go up to 6L/min with NP but consider intubating at 4L/min re: likely clinical course)
- Signs of respiratory fatigue
- Consider if hemodynamic instability
- Consider intubating a patient with borderline respiratory distress prior to interfacility transfer
- All the regular intubation indications (ex. Failure to protect airway if ALOC 2ndary to hypoxia)
 - **Patient passes observation → Transfer EARLY**
 - Patient remains stable, requires admission, and not likely intubation →> strongly consider **EARLY** consultation to Primary COVID cohort site - RJH (as of April 2, 2020)
 - **Patient fails observation → Intubation**
 - MD notifies **Internist** to alert of intubation and ICU admission
 - MD notifies **Anesthetist** to alert of intubation, determine availability
- **Initial ER nurse** provides initial care (droplet precautions):
 - Apply O2 via nasal prongs at a rate of **NO MORE than 6L/min**
 - **NO NRB unless filtered NRB** (HiOx mask) available (only available via RT as of April 2, 2020)
 - **NO IV boluses** to be given to patients without approval from **ER Physician**
 - Once intubation decision made, transfers patient to ICU with **Second ER nurse** attending (droplet precautions)

- **ER Charge Nurse:**
 - Notifies **ICU Charge Nurse** of patient coming to ICU
 - Notifies **RT** of intubation decision
- **ICU Charge Nurse**
 - Assign Assign **Procedure Nurse, Anteroom Nurse**
 - If sufficient time, delegate these nurses to draw up:
 - *RSI Med Package*
 - Propofol Infusion
 - Norepinephrine infusion
 - Confirm that **RT** is aware of intubation
 - Confirm in-room communication is ready (Baby monitor on and functioning, whiteboard ready and whiteboard markers in room)
 - Ensure ICU hallways clear and patient room doors closed in preparation for patient being transported into the ICU
 - **Procedure Nurse, Anteroom Nurse** begin donning PPE
- **RSI MED PACKAGE** (From appendix):
 - **SEQUENCE:** Drawn up by **Anteroom RN**, given and delivered by **Procedure RN**
- 1. Ketamine 200mg (**Recommended**) or Propofol 200mg (if pt weighs <100kg)
 - 300 mg doses if >100kg
- 2. Rocuronium 200mg (if pt weighs <100kg), 300mg dose if >100kg
- 3. Phenylephrine 100mg/ml x 3 ml (3ml syringe)
- 4. 5 x 10cc Saline Flushes (10ml)

3.

- **ER Charge Nurse** or **ICU Charge Nurse** delegate/personally ensure Negative pressure applied to respective room
- If ICU 1(controlled):
 - **Initial ER nurse** gives iDRAW handover (see appendix) to ICU nurses and assumes role of **Charting nurse** for intubation.
 - **Second ER nurse** remains with patient and completes initial tasks (see below)
- **Initial Nursing Tasks**
 - HOB 45 Degrees
 - Position stretcher at 45 degrees inside room (so that ETCO2 tubing reaches monitor in ICU1 and to give more room in ED14)
 - Apply vital signs, cardiac monitor
 - **Apply 100% @ up to 15L NRB WITH FILTER (when available)**
 - Avoid BiPAP, BVM,Optiflow, Nebulization, NRB without filter
 - Ensure 2 x IV in place, run Ringers Lactate 100cc/hr



4.

- Determine intubation team, options:
 - Anesthesia / Anesthesia Assistant / RT
 - Availability variable. If available will be the primary intubation team. Strongly consider if anticipated difficult airway or if pediatric patient.
 - ER Physician / RT / Procedure Nurse
- Anteroom nurse
 - Reviews *RSI MED PACKAGE* w Physician:
 - Consistent pan-provider approach with ketamine + rocuronium preferred.
 - Propofol may be substituted for ketamine in case of drug shortages or in special clinical circumstances.
 - Place drugs into a cardboard tray and provide it to the Procedure Nurse.
- RT
 - Prior to Donning
 - Ensures intubation equipment brought into room - review INTUBATION CHECKLIST (Appendix) outside room

5.

- Intubation team dons *Enhanced AGMP PPE* (See appendix) in hallway as per instructions.
 - Donning via Buddy System
 - Anteroom nurse dons AGMP PPE (See appendix)

DONNING - don outside / Buddy System must be used

1. Inspect PPE Equipment

2. Prepare

Remove all jewellery, ID tags, etc
Wear hospital scrubs
Tie hair back, if long

3. Wash Hands

4. N95 Mask



N95 Mask

- N95 mask to be used for aerosol-generating procedures
- Put respirator over nose, mouth and chin
- Secure on head with top elastic, followed by bottom elastic
- Perform a seal check to ensure that respirator collapses on inhale and does not leak on exhale

5. Place Surgical Hood



- Take ends of opposite ties and cross over to cover the front of your neck
- Tie at the back of the neck over the hood
- Trained observer to ensure front and back of neck are fully covered

Tie loosely in back (reduces risk of self-contamination during doffing)

6. Inner Gloves (For RT and MD)

Ensure cuffs go up the forearm as possible - should use green extended-cuff Nitrile/latex gloves (ideally higher on arm than external glove)



7. Put on Surgical Gown

Loosely tie gown in the front (makes doffing easier)
Partner ensures your gown covers your back entirely

8. Goggles (if available)

9. Face Shield

10. Second Glove (For RT and MD, single glove only for RN)

Larger size
Ensure cuff goes over the gown

6.

ER/IM Physician or Anesthesia will pre brief team (see OUTSIDE ROOM CHECKLIST)

OUTSIDE ROOM CHECKLIST

Patient

- IV x 2
- Cardiac/BP/O2 Monitor
- CODE STATUS**
- Non-Rebreather O2
-

Roles

Inside-Room (Enhanced AGMP PPE)

ERP/RT/RN **-OR-**
Anesthesia/AA/RT

Outside-Room

Anteroom RN (AGMP PPE)
Charting Nurse, Remaining team

Medications

- RSI Med Package reviewed w MD / Drawn by Anteroom RN
- Post-Intubation sedation and Vasopressor – either already in room or being prepped

Equipment

- Intubation Equipment – RT to bring
- GLIDESCOPE – ICU 1 (should be in room already), ER 14 (RT to bring from Trauma A)
- Ventilator – ICU 1 (should be in room already), ER 14 (RT to bring from Trauma A)

Plan

Confirm plans for:

- Anticipated airway difficulty
- Pre-Oxygenation
- 1st Attempt
- Reoxygenation
- 2nd attempt
- Cricothyroidotomy trigger

7.

- Intubating team enters room with supplies in their Enhanced AGMP PPE:
 - **Physician** coordinates with in-room nurse
 - **RT** brings intubation equipment
 - **Procedure RN/AA** brings tray containing RSI meds
- External Door is locked now that team is in room
- Confirm communication functioning (Baby monitor), confirm whiteboard markers working

- **Second ER Nurse** lets the intubation team enter first and gives handover
- **Second ER Nurse** doff their droplet PPE, they leave into the hallway and can return to the ED to resume patient care

- Once Anteroom clear, **Anteroom Nurse** enters Anteroom in AGMP PPE, they remain in here during the procedure in case anything is required to be handed into the Intubation Suite.
- They receive word from **Procedure RN** via whiteboard or from staff documenting outside.

8.

- **Physician** reviews INSIDE ROOM CHECKLIST with the team

INSIDE ROOM CHECKLIST

Patient

- IV x 2
- Cardiac/BP/O2 Monitor
- HOB @ 45**
- Airway Assessment
- Non-Rebreather O2

Equipment Status

- Suction
- BVM w Filter, OPA/NPA working
- ETT w 10cc syringe attached
- Ventilator on Standby
- Anchorfast Prepped
- Biohazard bag nearby

Preoxygenation – 5 minutes

- Non-Rebreather (HiOx) 15L/mi
- BVM + PEEP + Filter (2 handed-seal, no bagging)

Medications

- RSI Medications - IV Push
- Wait 60 seconds

Intubation

- 1st Attempt – VL w Stylet – rigid or flexible, or Bougie
- INFLATE CUFF before ventilation
- NO AUSCULTATION
- AnchorFast secure
- Clamp ETT if ever disconnecting

Re-oxygenation

- LMA – 2nd Generation w bagging **-OR-**
- Gentle 2 Person BVM w 2 hand seal + OPA

Failed Airway

- Change Method
- Change Provider
- Consider Surgical Airway

Post-Intubation

- ARDS Protocol
- Check Hemodynamics
- Sedation
- Insert OG
- DOFF via Buddy System

9.

Communication

Closed loop communication should be used at every step of the intubation.

Communication between the isolation room, the charting nurse in the hallway, and the Anteroom nurse in the anteroom is CHALLENGING. Here are some hot tips:

In ICU 1:

- Charting nurse should position him/herself to at the far LEFT of the room (when facing the room), so that they can see the whiteboard
- the baby monitor works OK in this room

In ER 14:

- Charting nurse should position him/herself immediately in front of the hallway door.
- when the negative pressure is on, the baby monitor is VERY difficult to hear due to the very loud fan

Procedure nurse (in ICU1 or ED14) should write down their drugs or requests for equipment on the whiteboard. In ICU 1, the whiteboard is easily visible by the Anteroom nurse and the procedure nurse in the hallway. In ED14, make sure to hold the whiteboard after writing on it, so it can be seen by the charting nurse or Anteroom nurse as required.

10.

- Preoxygenation x 5 minutes, options:
 - BVM + Peep Valve + Filter (2 handed seal, no bagging) - preferred
 - OR
 - NRB w Filter 15L/min
- Avoid Apneic Oxygenation
- Position patient for optimal videolaryngoscopy (sniffing position, ear-to-sternum)
- Anchor-Fast positioned
- Medications:
- **Procedure Nurse** delivers medications and steps away from the patient.
 - Administer Sedation and Paralysis **RAPIDLY AND BACK-to-BACK**
 - Ketamine 1-2mg/kg (**recommended**)
 - Rocuronium 1.5-2mg/kg (**recommended**)
 - Fast push
- **FLUSH GIVEN AFTER BOTH SEDATIVE/PARALYTIC GIVEN**
- Phenylephrine in room
- *Anesthetist consideration: Consider plastic sheet over patient during intubation - this is predominantly a procedure practiced by and discussed with anesthesia, consider this only if all members of intubation team feel comfortable*
- No bag valve mask ventilation after paralytic given

- Optimal intubation conditions @~1 minute
- Anticipate rapid desaturation
- **PLAN A - Video laryngoscopy (with bougie/stylet)**
 - Operator stands as far back as possible
- Back up plans:
 - As per specific team, and what has been discussed prior to intubation
 - Suggestions:
 - **PLAN B - LMA and BVM with filter** to oxygenation/ventilate
 - Consider reattempt ETT via 2nd operator, if oxygenation improves
 - **PLAN C - BVM - 2 Person technique**
 - Place an oral airway
 - Apply filtered BVM system with 10cm PEEP, 15 LO2 *with* manual breaths (6-10 over 1 minute). Avoid pressures >15 if possible
 - **PLAN D - Cricothyroidotomy** (Bougie assisted technique recommended).
 - Don't ventilate the patient via the mouth and nose during attempt
 - Place mask over patient's mouth and nose once cricothyroidotomy in place
 - At any point, if the intubator decides it is necessary, there is a direct laryngoscope on a tray outside the anteroom which can be requested from the Anteroom nurse. It is not recommended to use direct laryngoscopy due to the proximity of your face to the patient, but we recognize that in an emergency, an intubating physician might opt for direct laryngoscopy, so it is available.

11.

Step 1 - Ventilator Attachment

- **CUFF UP Immediately** before ventilator attachment
- Connect ventilator

Step 2 - Confirmation:

- Confirm endotracheal tube placement by ETCO2 (no auscultation of chest)
- Secure ETT w Anchorfast/Tie
- **Charting nurse** note time to start counting down 35 min until isolation room can be opened

Step 3 - HD support

- If needed phenylephrine bolus or norepinephrine titration if post-intubation hypotension noted

Step 4 - Ventilation:

- ARDSnet
- Avoid disconnection of circuit, if disconnection is required, clamp ETT with Kelly or kink tube

- Caution: make sure pt is deeply sedated or paralysed if clamping ETT to avoid a spontaneously breathing patient from having their tube occluded

Step 5 - Procedures:

- Insert NG or OG done by **RT**

Step 6 - Post intubation sedation

- Propofol (**recommended**) Run infusion at 0-5mg/h. Follow infusions protocol.
- Fentanyl (**if 2nd agent required**) Starting dose 25-50mcg/hr. Max 100mcg/hr. Follow Infusion protocol

Step 7 - Doffing (see below)

Step 8 - Remainder

- Leave patient in negative pressure room for **35 minutes** to let droplets dissipate
 - After 35minutes, entry via main door into Intubation room is permitted
- While care is being provided, admission process with MRP assigned can be completed
- MRP to use AICU COVID Admission order set for orders
- After patient out and appropriate time for droplets to have been dispersed/removed, Terminal clean of negative pressure room by housekeeping
- Post intubation interventions that are recommended once the patients is outside of negative pressure can include:
 - Arterial lines
 - Central venous catheters
 - Urinary catheters
 - XRay for tube placement
- Ensure push dose sedation and paralytics available to address any ventilator dysynchrony/gagging/coughing/reaching for the tube

Step 9:

- In room team should shower before resuming clinical duties
- Consider a few minutes pause for the in room team before resuming clinical duties

Step 10:

- Debrief
- Give feedback re: intubations to Dr. Ava Butler or Dr. Pal Randhawa

12.

Doffing

- Intubation teams begins Doffing procedure per instructions
- Anteroom Nurse remains in anteroom until 1 of the 3 members of the Intubation team enters the anteroom.
 - Both individuals doff 1 at a time via Buddy system.
 - These two individuals then leave into the hallway.
- The final two members of the intubation team doff using the buddy system.
- When procedure nurse finished with direct patient care and patient leaving isolation room, doffing can be supervised through the anteroom glass by another nurse

DOFFING – MUST BE DONE IN PAIRS **– 1 at a time**

- **1. Dispose contaminated airway contents into garbage**

- **2. Wash External Gloves**

- **3. Remove External Gloves**



- Remove outer glove of the first hand by pinching glove just above palm area
- Peel glove away from hand and turn the glove inside-out
- Keep removed glove in the opposite hand
- Do not discard glove yet



- Remove outer glove of second hand by inserting index finger under top of glove
- Pull outer glove away and slowly peel it down, over top of the already removed glove
- Discard both gloves into Biohazardous waste
- Decontaminate inner gloves using PerCept™ wipes
- Discard PerCept™ wipes in Biohazardous waste



- **4. Hand Hygiene**

- **5. Remove gown and Inner Gloves**

Remove Gown and Inner Gloves



- Pinch gown at shoulders and gently pull away from the body to loosen back Velcro™ closure or unfasten ties
- Untie side tie of gown
- Slowly pull gown away from neck and shoulders, touching only the outside of the gown
- With one hand grasp cuff and glove of opposite hand and pull hand into sleeve
- With the hand inside the sleeve, grasp glove and cuff of other sleeve and pull hand inside so both hands are now tucked inside their sleeves
- Lean forward rolling the gown off the arms, turning it inside out, as the gown is now contaminated
- The inner gloves are tucked into the gown as you remove it
- Gently roll gown into a loose bundle and discard into Biohazardous waste
- Perform hand hygiene using ABHR

6. Hand Hygiene

7. Remove Face shield



- **Caution:** Do not touch outside of face shield
- Hold onto elastic band and remove away from face



- Discard face shield into Biohazardous waste
- Perform hand hygiene using ABHR

8. Remove hood



- Undo hood tie



- Hold ties out at full length
- Grasp both ties in one hand



- While holding ties, lean forward and pinch top of hood to remove
- Discard hood into Biohazardous waste
- Perform hand hygiene using ABHR

9. Go into Anteroom

- 10. Observe partner to step 14

- 11. Wash hands

- 12. Remove N95 mask

- 13. Wash hands

- 14. Exit Anteroom

- 15. Shower immediately

No further procedures/clinical work to be done
by provider until showered

13.

- **In this scenario, the patient presented to ED with critical respiratory distress and was taken directly to ED14 for assessment and the ERP was immediately called for patient assessment**
- **If patient in critical respiratory distress:**
 - Triage Nurse notifies ERP/RT to assess patient stability
 - Decision to intubate made
 - Move to ER 14 (preferable for *emergent intubation necessity*)
 - ICU 1 - (if patient circumstances allow or if ED14 occupied)
 - If ER14 and ICU1 are both occupied, consider Trauma A as third choice (current to April 2, 2020)

14.

- ER Physician
 - Notifies Internist to alert emergent intubation, pending transfer to unit
 - Notifies Anesthetist to alert emergent intubation, determine availability
 - Peripheral norepinephrine infusion recommended prior to intubation if hemodynamic instability or risk of instability
- ER Charge Nurse:
 - Assign Initial ER Nurse, Procedure Nurse, Anteroom Nurse, Charting nurse
 - When able, alert ICU re: impending transfer once patient intubated

15.

- If ER 14 (emergent):
 - Initial ER nurse remains with patient, completes initial tasks (see below)
- **Initial Nursing Tasks**
 - HOB 45 Degrees
 - Position stretcher at 45 degrees inside room (so that ETCO2 tubing reaches monitor in ICU1 and to give more room in ED14)
 - Apply vital signs, cardiac monitor
 - **Apply 100% @ up to 15L NRB WITH FILTER (when available)**
 - Avoid BiPAP, BVM, Optiflow, Nebulization, NRB without filter
 - Ensure 2 x IV in place, run Ringers Lactate 100cc/hr

16.

- Determine intubation team, options:
 - Anesthesia / Anesthesia Assistant / RT

- Availability variable. If available will be the primary intubation team. Strongly consider if anticipated difficult airway or if pediatric patient.
 - ER Physician / RT / Procedure Nurse
- Anteroom nurse
 - Reviews RSI MED PACKAGE w Physician:
 - Consistent pan-provider approach with ketamine + rocuronium preferred.
 - Propofol may be substituted for ketamine in case of drug shortages or in special clinical circumstances.
 - Place drugs into a cardboard tray and provide it to the Procedure Nurse.
- **RSI MED PACKAGE** (From appendix):
 - **SEQUENCE:** Drawn up by Anteroom RN, given and delivered by Procedure RN
- 11. Ketamine 200mg (**Recommended**) or Propofol 200mg (if pt weighs <100kg)
 - 300 mg doses if >100kg
- 2. Rocuronium 200mg (if pt weighs <100kg), 300mg dose if >100kg
- 3. Phenylephrine 100mg/ml x 3 ml (3ml syringe)
- 4. 5 x 10cc Saline Flushes (10ml)
- RT
 - Prior to Donning
 - Ensures intubation equipment brought into room - review INTUBATION CHECKLIST (Appendix) outside room

17.

- Intubation team dons *Enhanced AGMP PPE* (See appendix) in hallway as per instructions.
 - Donning via Buddy System
- Anteroom nurse dons AGMP PPE (See appendix)

SEE PPE INFO AS PREVIOUS

18.

ER/IM Physician or Anesthesia will pre brief team (see OUTSIDE ROOM CHECKLIST)

19.

- Intubating team enters room with supplies in their Enhanced AGMP PPE:
 - **Physician** coordinates with in-room nurse
 - **RT** brings intubation equipment
 - **Procedure RN/AA** brings tray containing RSI meds
- External Door is locked now that team is in room
- Confirm communication functioning (Baby monitor), confirm whiteboard markers working
- **Initial ER Nurse** lets the intubation team enter first and gives handover
- **Initial ER Nurse** doff their droplet PPE, they leave into the hallway and can return to the ED to resume patient care or may become **Charting nurse**
- Once Anteroom clear, **Anteroom Nurse** enters Anteroom in AGMP PPE, they remain in here during the procedure in case anything is required to be handed into the Intubation Suite.
- They receive word from **Procedure RN** via whiteboard or from staff documenting outside.

20.

- **Physician** reviews INSIDE ROOM CHECKLIST with the team

21.

- Preoxygenation x 5 minutes, options:
 - BVM + Peep Valve + Filter (2 handed seal, no bagging) - preferred
OR
 - NRB w Filter 15L/min
- Avoid Apneic Oxygenation
- Position patient for optimal videolaryngoscopy (sniffing position, ear-to-sternum)
- Anchor-Fast positioned
- Medications:
- **Procedure Nurse** delivers medications and steps away from the patient.
 - Administer Sedation and Paralysis **RAPIDLY AND BACK-to-BACK**
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- No bag valve mask ventilation after paralytic given
- Optimal intubation conditions @~1 minute
- Anticipate rapid desaturation
- **PLAN A - Video laryngoscopy (with bougie/stylet)**
 - Operator stands as far back as possible

22.

Intubation troubleshooting:

- As per specific team, and what has been discussed prior to intubation
- Suggestions:
 - **PLAN B - LMA and BVM with filter** to oxygenation/ventilate
 - Consider reattempt ETT via 2nd operator, if oxygenation improves
 - **PLAN C - BVM - 2 Person technique**
 - Place an oral airway
 - Apply filtered BVM system with 10cm PEEP, 15 LO2 *with* manual breaths (6-10 over 1 minute). Avoid pressures >15 if possible
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- Secure ETT w Anchorfast/Tie

- **Charting nurse** note time to start counting down 35 min until isolation room can be opened

Step 3 - HD support

- If needed phenylephrine bolus or norepinephrine titration if post-intubation hypotension noted

Step 4 - Ventilation:

- ARDSnet
- Avoid disconnection of circuit, if disconnection is required, clamp ETT with Kelly or kink tube
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Step 7 - Doffing (see below)

Step 8 - Remainder

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- In room team should shower before resuming clinical duties
- Consider a few minutes pause for the in room team before resuming clinical duties

Step 10:

- Debrief
- Give feedback re: intubations to Dr. Ava Butler or Dr. Pal Randhawa

Doffing as in ICU

- Intubation teams begins Doffing procedure per instructions
- Anteroom Nurse remains in anteroom until 1 of the 3 members of the Intubation team enters the anteroom.
 - Both individuals doff 1 at a time via Buddy system.
 - These two individuals then leave into the hallway.
- The final two members of the intubation team doff using the buddy system.
- When procedure nurse finished with direct patient care and patient leaving isolation room, doffing can be supervised through the anteroom glass by another nurse