



VITAL ANAESTHESIA SIMULATION TRAINING

Many of you will be working on the front line helping to care for patients with suspected COVID-19. It is recognised that procedures that aerosolise the virus, such as intubation, are particularly at-risk times for transmission to health care workers. As such, we have developed this simple simulation scenario and intubation checklist to function as a training tool to help rehearse for these intubations and minimise the risk and exposure to you and your colleagues.



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COVID-19 SIMULATION RESOURCES

Intubation for suspected COVID-19 case

Learning objectives
Utilise VAST COVID-19 intubation checklist to organise team and plan for intubation
Correctly don personal protective equipment (PPE)
Conduct rapid sequence intubation (RSI), minimising exposure to staff
Correctly doff personal protective equipment (PPE)

Scenario summary
The purpose of this scenario is to provide a simple simulated scenario to familiarise intubation teams with the processes of intubation of suspected COVID-19 cases
Michael Mori is a 48yo male, presented to your Emergency Department with presumed COVID-19. Has had contact with a known case and has been in self isolation for 2-days. He has developed fever and increased shortness of breath. His past medical history is only significant for mild asthma. The scenario is located in a negative pressure room of the ED (if available), otherwise in an area with as little traffic as possible. The patient is unwell, requiring intubation. The anaesthesia provider has been called for assistance with intubation. The intubation team will should consist of the anaesthesia provider an anaesthesia assistant, team leader and 2 other nurses. The scenario should end after intubation has occurred, ventilation established and ongoing care started. In order to conserve personal protective equipment (PPE), participants should be instructed to walk through the process of donning / doffing PPE utilising the cognitive aids, cross checking with a 'buddy', but not actually using the PPE.

SCENARIO SETUP

Location	Emergency department - ve pressure room if available or low traffic area
Layout	Awake 'patient' on stretcher inside room All other required equipment outside room
Patient	
<i>Type</i>	Intubation trainer; wearing surgical mask and nasal prongs
<i>Details</i>	Michael Mori, 48-year-old man
<i>Position</i>	Lying supine on emergency department stretcher, one pillow under head
<i>Equipment on</i>	Monitors are on (ECG, SaO ₂ , BP cuff), 18 gauge IV running with crystalloid IL, nasal prongs at 4L/min O ₂
Other	
<i>Standard equipment</i>	Your institution's airway and drug carts 'outside' the patient room
<i>Extra equipment</i>	PPE cart Videolaryngoscope, if available Container or plastic bag for dirty equipment Patient monitors (i.e. SimMon)
<i>Documentation</i>	PPE donning/doffing posters outside room VAST COVID-19 Intubation Checklist

BRIEFING INSTRUCTIONS

Overview of roles	
<i>Participants</i>	Anaesthesia team <ul style="list-style-type: none">- Anesthesia provider- Anesthesia assistant ED Team <ul style="list-style-type: none">- ED Doctor (co-facilitator)- ED Nurse – ante-chamber runner- ED Nurse – outside runner
<i>Present at start</i>	ED team waiting for anaesthesia team to arrive

Prepare the scenario
<p>Prepare the simulation room and confirm monitoring is synched</p> <p>Place the ED team outside the patient room waiting for the anaesthesia team to arrive</p> <ul style="list-style-type: none">- Hand out briefing cards <p>Provide briefings to:</p> <ul style="list-style-type: none">- The emergency department team (ED doctor and nurses)- The anaesthetic team (anaesthesia provider and anaesthesia assistant)

Briefing to the emergency department team
<p>You have been looking after Michael Mori, a 48-year-old patient with presumed COVID-19 infection requiring escalation of care / respiratory support:</p> <ul style="list-style-type: none">- Anaesthesia has been called to assist as members of the intubation team- You are waiting outside the patient room for a team introduction / planning

Briefing to the anaesthesia team
<p>You have been called down to the emergency department to assist with an intubation for suspected COVID-19 patient</p>

How to start the scenario
<p>Cue the anaesthesia team to rendezvous with the ED team near the patient room</p>

BRIEFING CARDS (to be printed out and given to the following roles)

ED Doctor (co-facilitator)

You are the ED doctor. You have decided for early intubation of Mr Michael Mori:

- You have a small ICU in your hospital and they are happy to accept him post intubation
- You have asked the anaesthesia providers in your hospital to help with the intubation and you are waiting for them to arrive

When they arrive, complete introductions, provide handover and then proceed through the steps of preparing / performing the intubation

Patient background / handover:

Situation: Michael Mori is a 48-year-old-male with presumed COVID-19. He had close contact with a known case and has been in self isolation for 2-days.

Background

- Prodromal symptoms for 1-2 days and now with a fever, cough and increased difficulty in breathing
- Presented to ED 3hrs ago and has had increasing O₂ requirements / borderline saturations
- **PMH:** Well controlled asthma
- **Medications:** PRN Ventolin
- **Allergies:** Nil
- Examination findings:
 - o End of bed assessment - Alert, anxious, high work of breathing. 90kg
 - o *Airway* – Own teeth (none loose), Mallampati 2, good mouth opening, neck motion
 - o *Breathing* – On 4L Nasal prongs, SaO₂ 90%, RR30, bilateral coarse crackles
 - o *Circulation* – 2 x IV in situ, has been given 1.5L fluid resus, HR 105, BP 110/60
 - o *Disability* – Alert, appears anxious
 - o *Exposure* – no other cause of infection found, Temp 38.5
- **Investigations / imaging**
 - o Bilateral infiltrates on CXR
 - o Elevated inflammatory markers

ICU is willing to accept the patient. They have requested that you intubate prior to transfer.

- You have activated the COVID airway team and are awaiting their arrival

Following intubation and post intubation care indicate that you will continue to look after the patient

- Progress the scenario to the final stage by instructing the other team members to doff their PPE

ED Nurse – antechamber runner

You will be the ante-chamber runner

- Provide assistance as required, including scribing the events

ED Nurse – outside runner

You will be the outside runner

- Provide assistance as required

SCENARIO SEQUENCE

Parameters	Actions	Transition triggers	Additional notes
A. Alert, anxious B. RR 30, SaO ₂ 90% on NP 4L/min, Coarse crackles to auscultation bilaterally C. HR 105, BP 110/60	Team introductions Receive handover Role allocation Recognize need for airborne/droplet protection Confirm airway plan A / B / C / D Prepare drugs and equipment	Organise team and assign roles	Refer to VAST COVID-19 intubation checklist
As above	Don PPE in accordance with algorithm Buddy check	Correctly don PPE	CDC PPE cognitive aide
<u>Pre-intubation:</u> B. SaO ₂ to 98% with preoxygenation CO ₂ initially then stops when unconscious Patient desaturates to 84% during intubation - Consider BVM <u>Post-intubation:</u> A. ETT at 22cm B. SpO ₂ 96% on 100% O ₂ C. BP 90/50, HR 110	Enter room in staggered fashion Introduce self to patient and team Confirm patient assessment and monitoring attached Optimise position of patient and haemodynamics Reconfirm airway plan Pre-oxygenate Perform intubation Post intubation confirmation <ul style="list-style-type: none"> - Airway - Breathing - Ongoing care Dispose of used equipment	Perform RSI	
Cue the ED Doctor to 'take over care' Have the team move on to perform post extubation doffing of PPE			
	Remove all PPE in room except mask Remove mask once in ante-chamber	Correctly doff PPE	CDC PPE cognitive aide
END scenario when expected actions are complete.			

INTUBATION CHECKLIST FOR SUSPECTED COVID-19

PREPARATION

TEAM

Name check, assign roles & confirm plan:

- Role 1 - Airway (most experienced intubator)
- Role 2 - Drugs / procedures / team leader
- Role 3 - Airway assistant
- Role 4 - Runner / Scribe in *ante-chamber off –ve pressure room*
- Role 5 - Outside Runner
- Verbalise plan:
 - A / B / C
 - Can't Intubate, Can't Oxygenate
- Verbalise clinical deterioration / arrest plan

DRUGS

- IV fluid and giving set
- Modified Rapid Sequence Intubation drugs
- Vasopressors and essential emergency drugs
- Post-intubation infusions and muscle relaxant

EQUIPMENT

- Select breathing circuit, mask, ETT and LMA, filter
- Select videolaryngoscope and blade *if available*
- Sealable box **or** plastic bag for dirty equipment
- Additional airway equipment immediately available
 - The outside runner will access

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Wear changeable scrubs
- Empty pockets & remove non-essential items
- Correctly don PPE; hand hygiene (HH) before each step
(*Gown > HH > mask > cap > HH > eye protection > HH > gloves x 2*)
- Cross check PPE and mask seal with colleague
- Enter –ve pressure area in a staggered fashion

INTUBATION

OPTIMISE

- Early airway assessment
- Patient position & consider ramping
- Nasal prongs under a surgical mask
- Apply monitoring and arrange equipment
- 2 x IV cannulae with running IV fluids
- Optimize haemodynamics prior to intubation
- Reconfirm plan with team

PRE-OXYGENATE

- 3-5 minutes using <5L/min flow with:
 - BVM (tight seal & HME/viral filter) **or**
 - Mapleson-C (tight seal & HME/viral filter)

MODIFIED RSI

- Use videolaryngoscope *if available*
- Deep muscle relaxation - avoid cough
- Inflate cuff and attach filter before ventilation
- Clamp tube if disconnection required
- Use 2 hand, 2 person rescue ventilation if required
- If Can't Intubate, Can't Oxygenate:
 - to scalpel-bougie-tube technique

KEY PRACTICE POINTS

Practice with simulation improves performance

Aim to minimise staff exposure

Correctly use available PPE



VITAL
ANAESTHESIA
SIMULATION
TRAINING

Acknowledgement to Dr Susan Mills and Tarin Booler for their input into this checklist

POST-INTUBATION

AIRWAY

- Place used equipment in a sealable box or plastic bag
- Confirm intubation with ET_{CO}₂ *if available*
- Secure ETT and HME/viral filter; avoid disconnections
- Attach in-line suction *if available*

BREATHING

- Ventilate with lung protective settings:
 - SIMV or PCV, aim for 4 - 8mls/kg Vt
 - Use PEEP, start at 10 - 15 & titrate
 - RR 14-16
 - Start at FiO₂ 100%, wean as soon as possible
- Raise the head of bed to 30-45°

ONGOING CARE

- Commence ongoing analgesia and sedation
- Use vasopressors as required:
 - Aim to limit IV fluid administration
- Insert nasogastric tube (NGT) and urinary catheter
- Confirm ETT and NGT placement with portable CXR
- Ensure patient is paralysed if transferring

PPE

- Correctly doff PPE, using HH after each step:
 - IN ROOM, **all PPE except mask**
(*gloves>HH>eye protection>HH>cap>HH>gown>HH*)
 - OUTSIDE ROOM (*HH > mask > HH > consider shower*)

AVOID

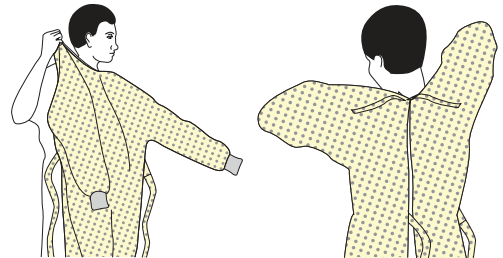
- Exposure – only essential / experienced staff in the room
- Procedures that aerosolise the virus:
 - Non invasive ventilation for pre-oxygenation
 - High flow nasal prongs (>6l/min) / high circuit flow
 - Manual ventilation during apnoea – *unless needed*
 - Unplanned circuit disconnections
 - Cough during intubation
 - Use of open suction, t-piece, nebulisers, Entonox
 - Awake fiberoptic intubation – *unless indicated*

SEQUENCE FOR **PUTTING ON** PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

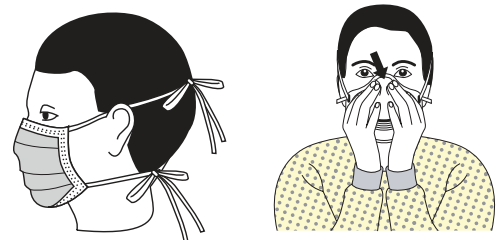
1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



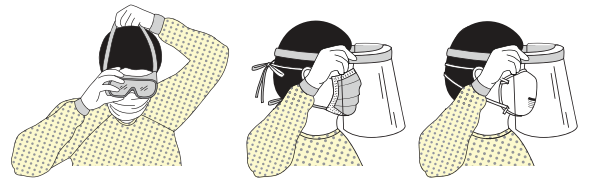
2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



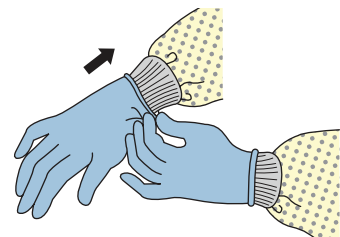
3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

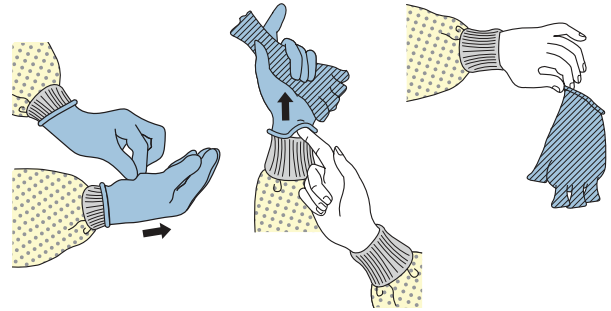


HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



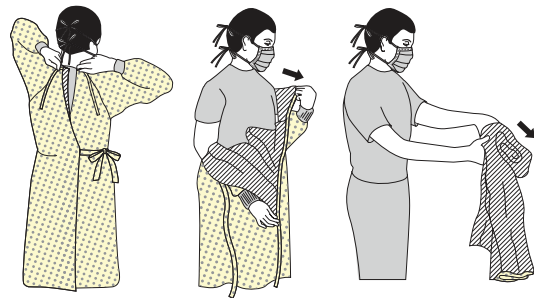
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



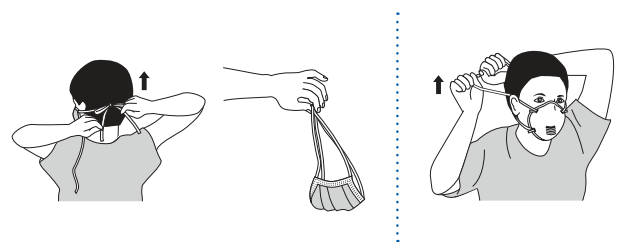
3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

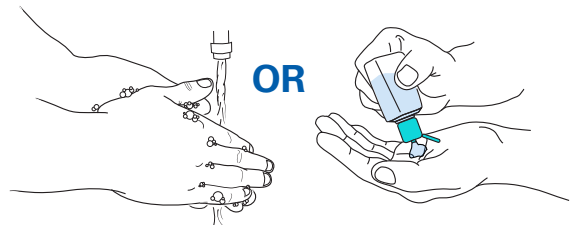


4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS
BECOME CONTAMINATED AND IMMEDIATELY AFTER
REMOVING ALL PPE**

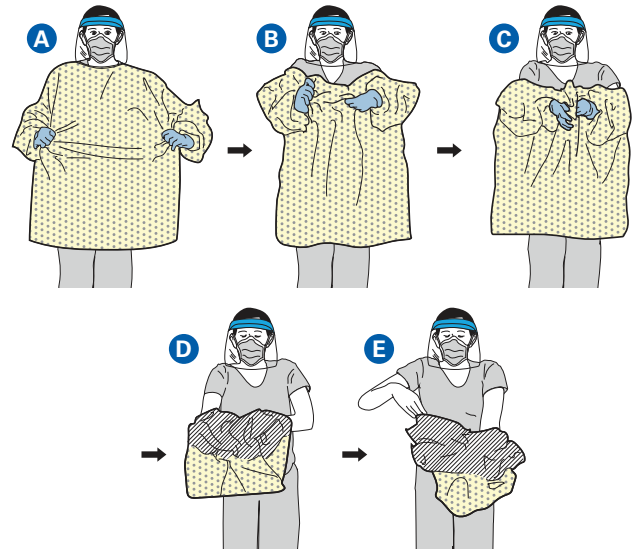


HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



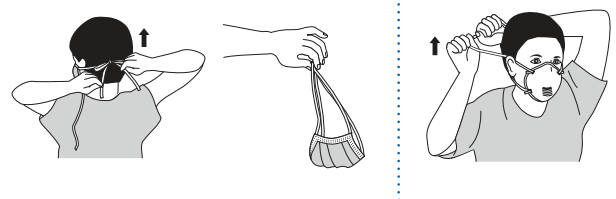
2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

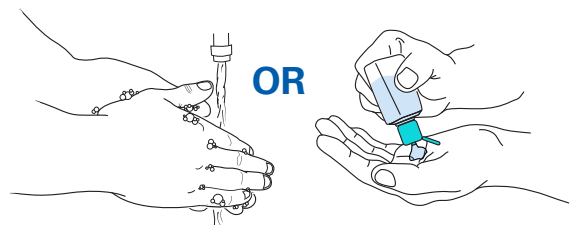


3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — DO NOT TOUCH!
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

