CODE BLUE GUIDING PRINCIPLES during COVID-19 Pandemic

Goals:

To align with the patient's goal of care while providing the best care in the event of with the respiratory and cardiac arrest. We aim to minimize the risk of exposing members of the clinical and resuscitation team to COVID-19 during resuscitation efforts.

At admission to hospital all inpatients **must** have goals of care discussion with their healthcare team. The patient's choice regarding resuscitation in the event of Code Blue must be clearly documented in the patient's chart (recommend visual identification, such as a bracelet on patient whose choice is Do Not Resuscitate).

This document will be reviewed on a weekly basis by the COVID-19 Code Blue Working Group. The Code Blue COVID-19 pandemic strategy could change as the Public Health epidemiological data shows evidence of widespread community transmission.

Guiding Assumptions:

Health care providers are to proceed with age appropriate BLS and ACLS in the event of:

- an inpatient admitted for reasons unrelated to COVID-19 and does not have any identified risk factors (COVID Risk Assessment)
- a patient does not have any symptoms of acute respiratory illness is found unresponsive or in cardiac arrest in hospital

All inpatients are assessed/screened twice a day for symptoms of acute respiratory illness **using COVID-19 ILI symptom monitoring for inpatients**. Patients will be placed on droplet and contact precautions if:

- they exhibit any acute respiratory illness symptoms
- are tested for COVID-19 and

Infection Prevention and Control will indicate removal of precautions if patient tests COVID-19 negative and symptoms have resolved. Twice daily assessment will assist the health care team in making clinical risk assessment for donning appropriate PPE when providing care and in the event of cardiac arrest.

Health care professional will complete a point of care risk assessment in selecting appropriate PPE Point of Care Risk Assessment.

- CPR with bag mask valve is considered an aerosol generating medical procedure (AGMP)
- Chest compression as part of CPR maybe an AGMP

During a code blue situation:

- A maximum of 7 responders should be in the patient's room when responding to a Code Blue. Students should NOT be part of the Code Blue team.
- Minimize the equipment that enters the room: defibrillator, backboard, airway kit, and only necessary drugs (see contents of code blue medication mini-bag appendix A) enter the room. Do NOT bring the crash cart into the room.
- The DOOR of the patient's room must remain closed at all times; inpatients will not be moved to a negative pressure room in the middle of a Code Blue.

- The Code Blue team members and Respiratory Therapists should carry appropriately fitted N95 masks with them to a code, to ensure they have ready access to a properly fitted N95.
- If any member of the Code Blue Team or healthcare team breaches PPE integrity (e.g.: mask/visor falls) doff PPE (using proper hand hygiene), leave the room and don correct PPE prior to reentering; Use the "buddy" system.

In all likelihood, even in full PPE, you will have contamination of your hospital attire; we recommend that you change your scrubs and shower, if appropriate.

Each site will need to determine alternative or rotating Code Blue Teams in the event traditional Code Teams members are unable to attend codes.

SUSPECTED or KNOWN COVID-19 patients:

- Identify, as early as possible, patients with suspected and confirmed COVID-19 who are at risk of acute deterioration or cardiac arrest.
    - Inpatient should have been monitored with early warning signs tools such as MEWS (Modified Early Warning Signs, MEWS Scoring System) to assist with early detection of deterioration.
    - Patients with suspected and confirmed COVID-19 who require escalation of care related to deterioration or who have a deteriorating health status should be acted upon quickly. Patient should be moved to negative pressure rooms in advance of Airway team's arrival
        - Physicians caring for suspected and confirmed COVID-19 patients who anticipate the need for intubation should contact the critical care physician to discuss and notify COVID Airway team.

Airway Management Guidelines for Patients Requiring Intubation for Suspected COVID-19

Additions to crash cart:

- 6 N95 masks (2 of each variety)
- 5 Gowns (high quality)
- 5 Face-shields
- Disposable stop clock
- Portable, working suction
- Ambubag with HME filter attached

CODE BLUE Protocol for known or suspected COVID-19:

If a **patient with suspected or known COVID-19** is found unresponsive or in active cardiac arrest AND the patient's goals of care indicate Resuscitation:

1st responder: Donned in droplet and contact PPE (Unit RN or LPN or medical staff)

- Call Code Blue as per site process
- Place a surgical mask on the patient
- Put patient's bed in CPR mode
- Go to door and have 2nd responder hand 1st responder defibrillation pads and defibrillator
- Place defib pads on patient, connect defibrillator in AED mode, analyze and defibrillate if instructed
- 1st responder doff PPE (supervised and use proper hand hygiene), leave the room, don new airborne PPE, and act as GATEKEEPER

GATEKEEPER:

Do NOT allow more than 7 people in the room
Communicate with team lead to provide background of patient's COVID-19 status (known or suspected COVID-19, not COVID-19)

2nd responder: Unit RN and LPN or medical staff

- Bring crash cart to patient's room
- Hand defibrillator pads and defibrillator to 1st responder
- Don PPE for aerosol generating medical procedure = Airborne PPE, while 1st responder is defibrillating patient
- Bring backboard into room
- Place patient on backboard and start chest compressions (ensure all providers in room have Airborne PPE on before chest compressions start)
- Continue to follow AED instructions
- If SHOCK advised, Pause CPR and defibrillate

3rd responder: Unit staff

- Don airborne PPE
- Assist with resuscitation
- 3rd responder may be the Respiratory Therapist, bring airway kit
    - Respiratory Therapist
        - Brings standard airway box
        - Don airborne PPE and enter room
        - Prepare Ambubag with HME filter with mask
        - *Assist in airway management, perform gentle BVM if good mask seal is obtained*

CODE BLUE team arrival:
STOP
All members don airborne PPE
TEAM LEAD – communicate with unit clinical team (1st responder)
(i.e. suspected or known COVID, NON-COVID, unwitnessed arrest, shockable rhythm on initial analysis); determine next steps
Composition of Code Blue teams vary by facilities, the below protocol provides guidance:
Identify the Team Leader (Internal medicine resident or ICU resident or critical care RN)
- Don airborne PPE, then enter room
- Determine team members roles and responsibilities

Airway person (Anesthesia resident/ Emerg Physician/ RT)
- Prepare COVID-19 airway equipment and medication required for possible intubation
- Don airborne PPE, then enter room
- *Prioritize securing advanced airway device for airway management over CPR when arrive*

Code Team RNsx2 (critical care RNs)
- Don airborne PPE and enter room
- Bring modified COVID-19 age appropriate resuscitation medications into room
- Administer age appropriate resuscitation medication and run defibrillator
- Keep time, document on paper towel and update chart later

Airway goals

- Minimize BVM
- Secured airway with ETT as suggested by COVID Airway Management (Airway Management Guidelines for Patients Requiring Intubation for Suspected COVID-19)

- ***No chest compression*** during airway management
- Ensure ETT cuff is inflated prior to ventilation
- Minimize disconnections of ETT

Overall Code Blue goals:
- Ensure protection of team prior to entering room
- If any breaches in protection (e.g.: mask falls off), member is replaced by team member outside room until appropriate PPE is replaced
- Would suggest terminating code blue if no return of spontaneous circulation (ROSC) after 10 minutes or 3 rounds of CPR
- Charting will be done after the resolution of the code

Upon resolution of the code:
- Consult Critical Care for acceptance
- Ensure stability of patient
- Transfer to ICU
  - Have a "clean" member don proper PPE to open doors and lead team to ICU
  - Call security to have COVID 19 elevator
- After transfer, doff PPE one at a time with a buddy system (see cognitive aids)
- Ensure all equipment is properly disposed of or cleaned in the proper fashion
- Debrief with team members
- Change scrubs and/or shower if significant contamination
- Room to be cleaned as per protocol, awaiting appropriate time period after an AGMP has been done

Guidance for care team in the event of CODE BLUE, outside of inpatient areas:

Active Cardiac Arrest or Unresponsive patient in a person with unknown COVID status in Primary Assessment Centre (external to hospital):
- Call 911(PAC outside hospital); Call Code Blue (PAC inside hospital)
- Staff donned in droplet and contact PPE place surgical mask on patient
- Place defib pads on patient, attach AED use as instructed
- Additional staff don airborne PPE (2 common types of N95 masks should be located with AED in a secure bag)
- Chest compressions started once all team members in airborne PPE, shock as indicated by AED until EHS arrives (PAC outside hospital), or Code Blue Team arrival (PAC inside hospital)
- Have security provide crowd control and move people away or outside if possible

Secondary Assessment Centre and Emergency Departments, unknown or known COVID status:
- Call Code Blue
- Staff donned in droplet and contact PPE place surgical mask on patient
- If possible and appropriate move patient to negative pressure room, private area and close the door
- Attach defibrillator pads and use defibrillator as instructed
- Additional responders don Airborne PPE
- Proceed with chest compressions only when providers have airborne PPE donned
- Code Blue team arrives and will proceed with age appropriate ACLS in airborne PPE as per Code Blue protocol for suspected and known COVID-19

Guidance for care team in the event of CODE BLUE, in inpatient areas without Code Blue teams with known or suspected COVID-19:

- Call a Code Blue as per usual unit process (ie 473-3333 to call EHS)
- Staff donned in droplet and contact PPE place surgical mask on patient
- If patient in a common area move people away from the patient, if patient in a private room shut the door
- Attached defibrillator pads to patient and AED
- Chest compressions are only to be started when N95 airborne precautions are donned
- Await EHS arrival

Appendix 1:

Pharmacy Department (Central Zone)

MINI RESUSCITATION BAG
POSTING (mneumonic) RECORD

Unit: _____ Date: _____

Place each drug in a ziplock bag before placing all drugs in a large ziplock bag

(epinephrine amps can go in the same inner bag)

#	Drug Name/Size	Mneumonic	Expiry Date	Replaced
2	Amiodarone 50 mg/mL (3 mL) vial	AMIO150I		
1	Atropine 0.5 mg/5 mL syringe	ATR.5SY		
1	Calcium Chloride 10% (1 g/10 mL) syringe Lifeshield	CAL10SYR		
1	Dextrose 50% (25 g/50 mL) syringe Lifeshield	DEXT50SY		
1	Epinephrine 1 mg/10 mL syringe Lifeshield	EPI1SY		
2	Epinephrine 1 mg/mL (1 mL) ampoule	EPI1I		
1	Instructions re: dilution of epinephrine amps before IV use; put in bag with amps			
1	Lidocaine 100 mg/5 mL syringe Lifeshield	LID100SY		
1	Magnesium Sulfate 200 mg/mL (10 mL) vial [20% or 2 g/10 mL]	MAG20I		
2	Sodium Bicarbonate 50 mEq/50 mL (8.4%) syringe Lifeshield	SODB8.4SY		

5 bags to be available on 5.2 MSNICU, 5.1 CVICU, 6.4 CCU

Filled: _____ Costed Out: ____

_____

Checked: _____ Expiry Date: _____

Appendix 2: Principles for N95 fit testing for team members who could be first responders in the event of a Code Blue:

- In the event of a cardiac or respiratory arrest, healthcare team members need to be able to respond in safe and timely manner.
- The *Code Blue Guiding Principles during the COVID pandemic*, provide guidance to healthcare providers in the event of a cardiac or respiratory arrest in a suspected or known COVID-19 patient. In suspected and known COVID-19 patient the guidelines indicate that there is a the risk that chest compressions could be aerosol generating and the other elements of CPR are considered AGMP and as such airborne precautions including N95 are indicated before starting CPR.
- To facilitate the timely resuscitation efforts in the event of a cardiac or respiratory arrest, designated first responders should be N95 fit tested. N95 respirators are available in the crash carts.
- PPE is not an unlimited resource and as such needs to be conserved; our current process of quantitative N95 fit testing requires the use of N95 masks to fit test the person.
- Consideration of staff and patient safety through the entirety of the pandemic is a priority, which includes being thoughtful in who is N95 fit tested. The COVID Code Blue working group discussed and has developed principles for consideration related to N95 fit testing:
    - Each unit/location will identify a most responsible person to take the lead in the event of a cardiac or respiratory arrest on each shift on a unit, outside of the Code Blue team. These identified leads should be part of the priority group for N95 fit testing.
    - Every attempt should be made to minimize the number of individuals who will assume lead responsibility and subsequently require fit testing for N95 respirator use.
    - Shared responsibility across units in close proximity whereby response times can be met is strongly encouraged.

Appendix 3: ICU COVID Code Blue Pathway:

COVID (suspected and known) Code Blue Pathway for ICU

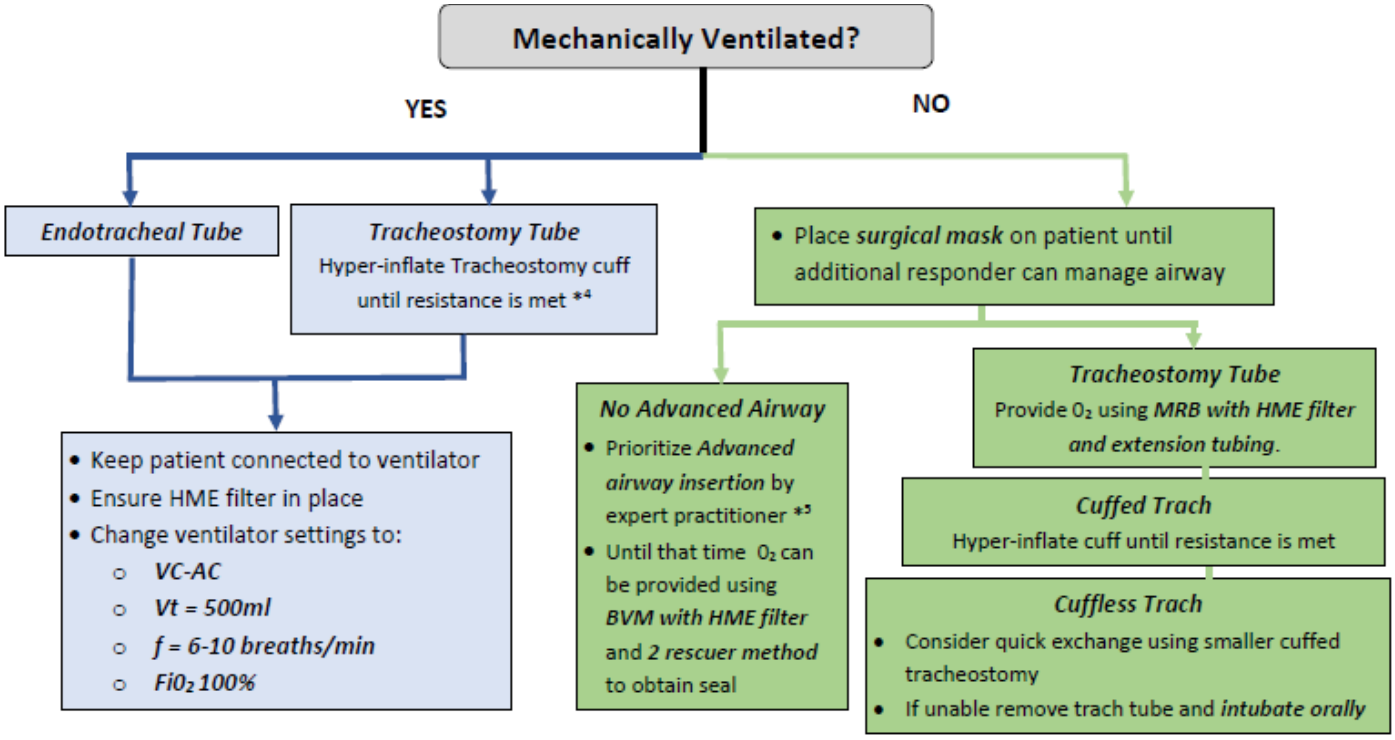
Code Blue in a patient **WITHOUT** COVID or acute respiratory illness – Follow ***Standard*** Code Blue Protocol.

Team members (5-6 people in room at max):	**Equipment required:**
• Compressors (1-2) • Medication (ICU RN #1) • Defibrillator (ICU RN #2) • Team Lead (Physician, ACLS provider) • Airway (RRT, Anesthesia, AA)	• Mini-Resus medication bag • Multifunction pads/ECG electrodes (3) • Defibrillator • CPR Backboard • Walkie-Talkies (place in plastic bag)

Reassess resuscitation after 3 rounds of CPR or maximum 10 minutes.

Code status: Full Code

RESPONDER #1 ICU RN Defibrillator	**RESPONDER #2 ICU RN Compressions**	**RESPONDER #3 ICU RN Gatekeeper**
• **Don AIRBORNE PPE** • Assess pulse (no more than 10 seconds) • Call for help • Bring Defibrillator into room • Attach pads/connect to defibrillator • **Analyze and shock** if required • Begin compressions*[1] (all HCP in room must have **airborne PPE**)	• Obtain Crash cart and place outside room with multifunction pads and Defibrillator easily accessible to Responder #1 • Obtain Mini-Resus Bag*[2a] and Walkie-Talkie *[2b] • **Don AIRBORNE PPE** • Enter room with *Mini-Resus Bag*, *back board* and *1 Walkie-Talkie* • Alternate role of compressor, med nurse, defibrillator	• **Don AIRBORNE PPE** • Call for additional help based on unit/site protocol • Ensure door remains shut *[3] • Supervise donning (outside room) and doffing (inside room) of PPE • Limit number of people in room to 6 maximum • Communicate with team via walkie-talkie (channel 1-3) • Act as runner additional supplies


Mechanically Ventilated?
YES
NO
Endotracheal Tube
Tracheostomy Tube
Hyper-inflate Tracheostomy cuff until resistance is met *4
• Place surgical mask on patient until additional responder can manage airway
• Keep patient connected to ventilator
• Ensure HME filter in place
• Change ventilator settings to:
○ VC-AC
○ Vt = 500ml
○ f = 6-10 breaths/min
○ Fi02 100%
No Advanced Airway
• Prioritize Advanced airway insertion by expert practitioner *5
• Until that time O2 can be provided using BVM with HME filter and 2 rescuer method to obtain seal
Tracheostomy Tube
Provide O2 using MRB with HME filter and extension tubing.
Cuffed Trach
Hyper-inflate cuff until resistance is met
Cuffless Trach
• Consider quick exchange using smaller cuffed tracheostomy
• If unable remove trach tube and intubate orally

COVID (suspected and known) Code Blue Pathway for ICU

Code Blue in a patient **WITHOUT** COVID or acute respiratory illness – Follow ***Standard*** Code Blue Protocol.

1	***Compressions***	• CPR is an Aerosol Generating Medical Procedure (AGMP) • Compressions 100-120/min, 5 centimeters deep, allow full chest recoil • If proned ***DO NOT*** flip the patient back to supine. Proceed with CPR/defibrillation with the patient in prone position.
2a	***Mini-Resus Bag***	• Mini-Resus bag includes medication for approximately 10minute resuscitation attempt • Also includes accessories such as flushes, IV start supplies, etc.
2b	***Walkie-Talkie***	• Walkie-talkie that enters room should be placed in a plastic bag • Gatekeeper outside room will communicate with team member in room via walkie-talkie on Channel 1-3
3	***Shut door***	• Minimize opening the door during AGMP procedures (CPR, intubation)
4	***Tracheostomy***	• Hyper-inflating the cuff will help prevent aerosolized particles from leaking around the cuff • Tracheostomy should be considered after 14 days of intubation • Ideally COVID-19 swab should be negative prior to inserting tracheostomy • Cuffed tracheostomy tube should be used for the entirety of a COVID-19 patient's hospitalization
5	***Advanced Airway***	• Placement of an advanced airway by an expert practitioner should be prioritized to minimize aerosols generated when utilizing BVM

Legend

BVM	Bag Valve Mask
MRB	Manual Resuscitation Bag (ambu bag)
HME Filter	Heat and Moisture Exchange filter

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