

This Guideline has been reviewed and adjusted to reflect Southern Health-Santé Sud protocols and policies – May 1, 2020.

## COVID-19

### Adult Emergency Medicine – Guidelines for Code Blue

#### Guidelines for Protected Code Blue (Adult)

The urgency to resuscitate must be balanced with the need for staff to don the appropriate Personal Protection Equipment (PPE). The time required to perform hand hygiene and don PPE may result in a delay to CPR. This is acknowledged as inevitable to protect staff.

**DO NOT INITIATE CARE UNTIL PPE donning has occurred.**

NOTE: A Code Blue call in and of itself is not an AGMP, as not all Code Blue calls are for cardiac arrests or involve AGMP procedures such as ventilation or airway interventions. Providers should assess the clinical situation and determine the level of PPE required. **In an emergency situation where clinical assessment is not possible, the highest level of protection (AGM P PPE with a N95 mask) should be used.**

#### **A. PLANNING CONSIDERATIONS - well in advance of Code Blue situations.**

Key Principles - If possible avoid Code Blue events in COVID-19 PUI and Positive patients by frequent monitoring; slow and controlled activity are required for all procedures.

##### ***Patient Specific:***

1. **ACP status** documented. All patients should have a reasonable discussion of goals of care, recognizing the potential benefits of CPR (or lack of CPR) in each patient's case.
2. **COVID screening** documented
3. **AIRWAY assessment** documented for difficult airways (in ED, ICU, etc.)
4. **PPE precautions** clearly identified

##### ***Unit specific***

Be cognizant of context and ability to properly allocate available resources.

- As much as possible, consider appropriateness, futility, and patient wishes prior to proceeding with intubation.
- **Early consultation** with Health Sciences Centre (HSC) **enhances** timely meaningful interventions that may alter the patient's deteriorating course – call **1-204-787-2071** (same number for both options listed).
  - If patient is in early stages of deterioration/not a code blue, contact HSC Medicine attending
  - If patient intubation is anticipated or has occurred, contact HSC MICU
    - If barriers to transfer to HSC encountered, call Dr. John Sockel
- When staffing numbers are limited (e.g. smaller sites; night shifts), consider including allied healthcare supports trained in Basic Life Support (BLS).

1. **AGMPs:** aerosol-generating medical procedures (see Shared Health list of AGMPs; link at end of this document)
  - a. **Where** should AGMPs be performed in the event of a Code Blue
    - airborne infection isolation room (AIIR) / negative pressure room
    - single room with door closed
    - remove other patients from same space to ensure that other patients and staff are at negligible risk of exposure to aerosols (review with IPC, facilities management, and administration is recommended)
    - at location of Code Blue ONLY if others can be removed to a safe distance
      - ☒ do not perform an AGMP at the location of Code Blue if it will expose others to risk of aerosol
  - b. **Transfer Process**
    - how a patient is to be moved to the appropriate space
    - identify routes and roles to be assigned to minimize exposure of staff or public
  - c. **Setup** of spaces where AGMPs may be performed
    - required equipment and supplies
    - ready access to PPE
    - *consider* minimizing equipment and supplies in the assigned space: unused supplies are considered contaminated after an AGMP (unless covered/protected)
    - *consider* need for dividers, curtains, or HEPA air scrubbers
    - *consider* time needed to clear 99.9% of viral pathogens from air
    - *consider* setting up designated PPE doffing area outside of and close to space (if no anteroom)

**Air clearance:** the time required for a 99.9% dilution of any aerosol.

    - Assume air clearance time to be 3 hours unless confirmed with site Facility Management; otherwise 3 hours is based upon a minimal 2 air changes per hour [ACH].
    - Typical air clearance times in newer ventilated spaces are:
      - Inpatient room: 69 minutes (6 ACH)
      - Airborne infection isolation room (negative pressure): 35 minutes (12 ACH)
      - Operating Theatre: 21 minutes (20 ACH)
    - Where a supplemental HEPA scrubber is used, air clearance times must be determined with site Facility Management.
  - d. **PPE precautions** - consider training in buddy & monitor system for donning/doffing
  - e. **Code Response**
    - i. roles & responsibilities of each team member during response to COVID case
    - ii. minimize staff to in space to only those essential to reduce exposure
    - iii. site or region specific overhead code call

## **B. CODE BLUE:**

**Providers should assess the clinical situation and determine the level of PPE required.**

**In an emergency situation where clinical assessment is not possible, the highest level of protection (AGMP PPE with a N95 mask) should be used.**

### **BEDSIDE PROVIDER - may be in DROPLET / CONTACT PPE**

1. **CALL CODE BLUE**
2. Consider instructing another provider to don AGMP PPE if ventilation or airway management is expected later in the resuscitation.
3. **CODE STATUS** - verify
4. **TRANSFER** to space identified for AGMP, if anticipated that resuscitation may involve AGMP
  - a. if transfer indicated by unit protocol
  - b. turn on HEPA scrubber, if applicable
5. **APPLY OXYGEN** (prongs or oxygen mask)
6. **APPLY MASK** (use towel if procedure mask is not readily available)
  - a. cover patient mouth / nares / prongs / oxygen mask
7. **COMPRESSIONS-ONLY-CPR**
8. **DEFIBRILLATE** - if AED or defibrillator on unit, apply pads and shock if indicated

### **CODE TEAM**

9. **Consider the appropriateness of starting and continuing resuscitation**
10. **PPE for AGMP** - buddy system - immediately don N95, eye protection, gown, gloves
11. **Huddle** - briefly outside of space to discuss roles and plan
12. **TRANSFER** - to space identified for AGMP, turn on HEPA scrubber if applicable
13. **STAFF** - limit personnel/equipment in the room to essential people/items only; staff in PPE outside room to support as necessary
14. **COMPRESSIONS**
15. **APNEIC OXYGENATION**
  - a. **do not ventilate with BVM before intubation** (if possible)
    - i. ensure viral filter between the mask and bag
    - ii. apply 2-hand seal with a BVM to achieve tight mask seal
    - iii. acceptable - apply oxygen and overlying procedure mask
  - b. should bagging be required, use small tidal volumes
16. **DEFIBRILLATE** - apply defibrillator pads and shock if indicated
17. **VASCULAR ACCESS** - if IV attempt unsuccessful, consider IO access
18. **AIRWAY; follow Southern Health-Santé Sud COVID-19 Intubation Flow Map**

The airway manager should be the most skilled person available. Consider designating an airway manager every shift.

  - c. ALWAYS pause chest compressions when placement attempted
  - d. sedate and paralyze unless crash airway
  - e. ETT is preferable
    - i. most experienced provider should do airway procedures



- ii. accept that oxygen saturation % will be low - avoid bagging
  - iii. use video laryngoscopy if available, direct is acceptable
  - iv. consider a bougie to improve first pass success
  - f. supraglottic device is acceptable
    - i. be aware that there is still an aerosol risk; N95 required while in-situ
    - ii. bag patient through device
  - g. place orogastric tube (if time permits)
  - h. if disconnecting at any time, clamp airway first
  - i. use of stethoscope may present contamination risk (follow IP&C cleaning processes).
19. **CAPNOMETER**
- a. use of end-tidal monitor is preferable to colorimetric
  - b. avoid auscultation if end tidal monitor used.
20. **ONGOING RESUSCITATIVE CARE**
- a. plan on hypotension with Return of Spontaneous Circulation (ROSC)
  - b. judicious use of IV fluids - aim for euvolemia (acute respiratory distress syndrome (ARDS) management - COVID patients are sensitive to fluid overload)
  - c. norepinephrine recommended (typical starting dose 0.1 mcg/kg/minute),
    - dopamine acceptable but switch to norepinephrine when available
    - push dose vasopressors acceptable
  - d. maintain paralysis and sedation
  - e. set tidal volume 6-8 mL/kg
  - f. consider taping all vent connections to reduce risk of circuit disruption with patient transfer
  - g. consider central line and arterial line, when necessary and time to transfer permits
  - h. if supraglottic device, consider later transition to ETT - follow COVID intubation process (note: when removing supraglottic device, gastric contents may be expelled - empty stomach contents prior to removal)
21. **DOFFING**
- a. staff may exit space before air clearing is completed
  - b. doff close to exit of space
  - c. buddy system
  - d. doff gloves and gown in the space (alcohol sanitizer required)
  - e. doff eye protection and mask outside of space, preferably in a designated doffing area
22. **CLEANING**
- a. opening of doors to negative pressure spaces is acceptable, but should be minimized during period to clear air in room
  - a. place sign on room with airborne precautions until air exchange is complete (record time of completion on sign)
  - b. follow IPC cleaning protocols
  - c. consider need to clean transfer route from initial code location to where care was provided.

**Note:**

- Staff may leave the AIIR or single room after the AGMP is completed but movement in and out of the room should be for essential activities only during the period afterwards where the air in the room is being “cleaned” by air exchange.
    - Open and close the door slowly during this time to minimize “dragging” air from the room.
    - Assume air clearance to be 35 minutes for AIIRs, 21 minutes for ORs, and 3 hours for all other areas unless confirmed otherwise.
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April 8, 2020

**Manitoba Shared Health - Provincial Guidance for Aerosol Generating Medical Procedures (AGMPs)** <https://sharedhealthmb.ca/files/aerosol-generating-medical-procedures-AGMPs.pdf>

Relevant to cardiac arrest (see link to access full list):

AGMPs:

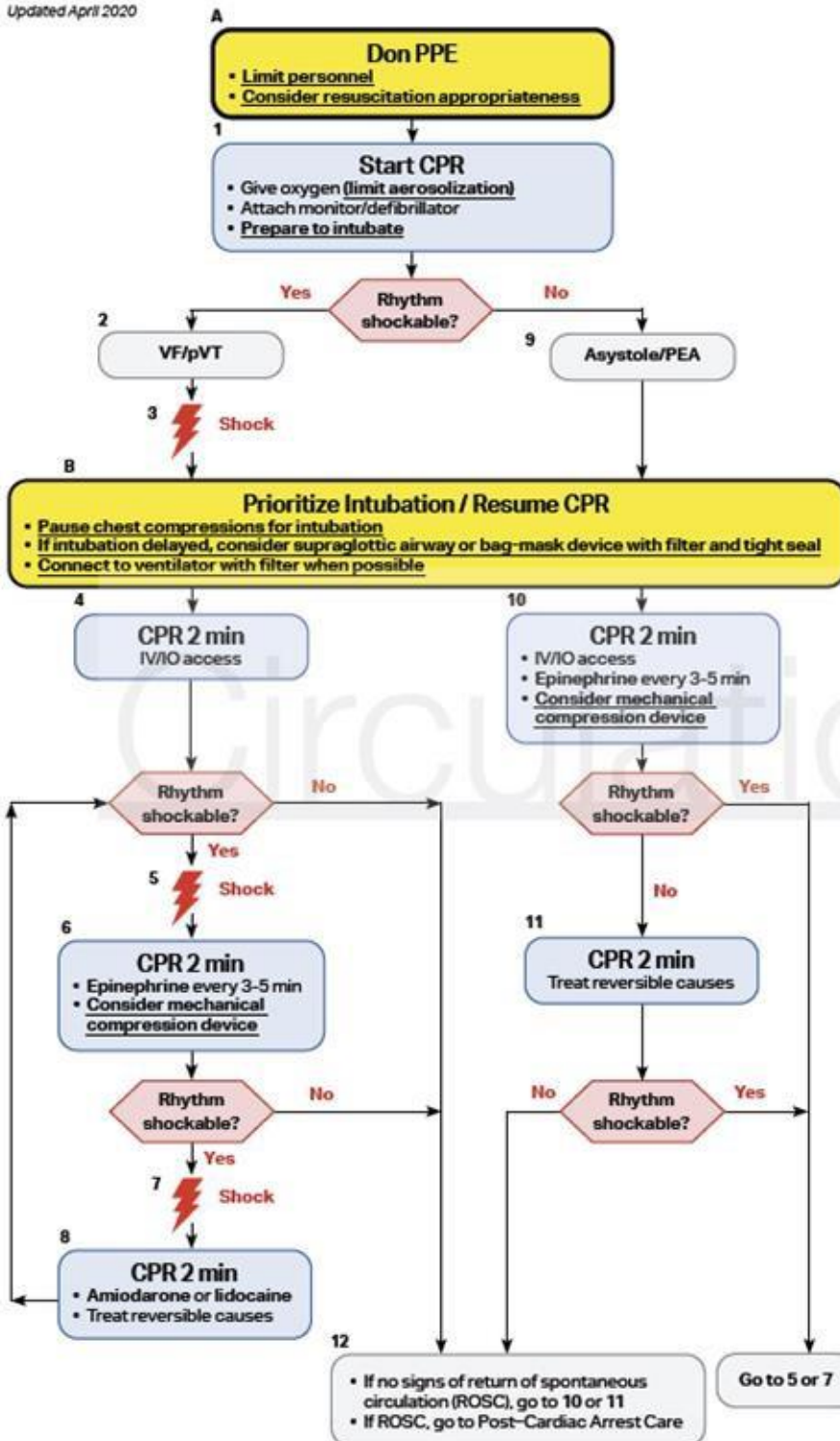
- Cardiopulmonary resuscitation (with manipulation of the airway)
- Endotracheal intubation and extubation, manual bag mask ventilation

Not AGMP:

- chest compressions (direction was provided by the RHA CMO's and Provincial Specialty Leads on April 16, 2020 - chest compressions without airway manipulation is not considered to be an AGMP)

## ACLS Cardiac Arrest Algorithm for Suspected or Confirmed COVID-19 Patients

Updated April 2020



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### CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If  $PETCO_2$  <10 mm Hg, attempt to improve CPR quality.
- Intra-arterial pressure
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

### Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

### Advanced Airway

- **Minimize closed-circuit disconnection**
- **Use intubator with highest likelihood of first pass success**
- **Consider video laryngoscopy**
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

### Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO doses:** First dose: 300 mg bolus. Second dose: 150 mg.
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

### Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in  $PETCO_2$  (typically  $\geq 40$  mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

### Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary