CODE BLUE GUIDING PRINCIPLES during COVID-19 Pandemic

Key changes and rationale:
• With this update of the Code Blue Guiding Principles, chest compressions in the absence of an airway intervention are not considered to be an aerosol generating medical procedure (AGMP). There is some debate about what procedures have the potential to be AGMPs and the evidence around chest compressions being AGMPs is very weak. In a meta-analysis authored by Tran et al (2012), pooled estimates of 3 observational studies did not find that chest compressions represented an AGMP. More recently, Couper et al. (2020) said that very little evidence exists that either chest compressions or defibrillation are AGMPs. Ng et al reported that none of 41 health care workers (HCW) participating in an intubation developed COVID-19, 85% of them wearing a surgical mask. The infection prevention and control guidelines for many provinces (BC, AB, SK, MB, ON) explicitly state that chest compressions alone are not an AGMP. Compression-only cardiopulmonary resuscitation is thought to be a low risk procedure and can be safely initiated with the patient’s mouth and nose covered.
  o A procedure/surgical mask must be placed over the patient’s mouth and nose before starting chest compressions.
  o The minimum PPE for the initial responders is Droplet PPE (procedure/surgical mask and eye protection) to initiate chest compression. Additional PPE requirements are based on Point of Care Risk Assessment .
• The PPE for AGMPs is more extensive than for non-AGMPs and, therefore, likely to result in a delay in initiating life saving measures such as chest compressions.

Purpose
During the COVID-19 pandemic, we are committing to balance the risk to healthcare teams with provision of timely interventions during resuscitative measures. These guiding principles are based on the following parameters:
• Early initiation of CPR can lead to decreased mortality and morbidity.
• Airway management, including bag-valve mask ventilation (BVM) and intubation, is considered an aerosol generating medical procedure (AGMP).

The goals of this document are:
1. Minimize the risk to healthcare workers, physicians, and patients and provide timely, safe, evidence informed interventions.

Standards of Care related to Resuscitation:
1. Teams should strive to have early goals of care discussion with patients and families at admission to hospital.
   Rationale: The healthcare team is to inform patients and families about the risks and benefits of CPR in the event of a cardiac or respiratory arrest. The patient’s choice regarding resuscitation must be clearly documented in the patient’s chart.

2. All patients must have a COVID-19 Risk Assessment completed at initial point of contact and updated with patient’s status changes.
   Rationale: Early identification mitigates risk to those within the healthcare environment, including healthcare professionals, patients, and the public, and allows for procedure preparation and early patient intervention.
3. Utilize an evidence informed approach to early identification of patients who are at risk of acute deterioration.  
   **Rationale:** 80% of in-hospital cardiac arrest patients have abnormal vital signs documented in the 8 hours preceding the event (Heart and Stroke, 2015). Utilizing an early warning signs tool, such as MEWS (Modified Early Warning Signs, [MEWS Scoring System](#)), minimizes the probability of respiratory and cardiac arrest.

4. Patients with COVID-19 (known or a high clinical suspicion) who have a deteriorating health status should receive immediate intervention by healthcare teams. 
   **Rationale:** Patients with COVID-19 can deteriorate very rapidly.

5. Patients with COVID-19 should be moved to a negative pressure room at the earliest opportunity when airway interventions are anticipated. Inpatients will not be moved to a negative pressure room in the middle of a Code Blue. 
   **Rationale:** [Airway Management Guidelines for Patients Requiring Intubation for Suspected COVID-19](#).

6. Performing CPR and advanced resuscitation interventions requires point of care risk assessment to determine risk of contact with body fluids to assist in decisions regarding appropriate PPE, regardless of COVID-19 status. 
   **Rationale:** Personal Protective Equipment is required to protect healthcare teams as per Infection Prevention and Control standards ([Point of Care Risk Assessment](#)).

**Guiding Principles for Health Care Teams during Code Blue:**

1. NS Health COVID Network and Code Blue Working Group is regularly reviewing local COVID-19 epidemiology and current evidence to ensure alignment with the Guiding Principles.
2. Clinicians must use the [COVID-19 Risk Assessment](#) and [Point of Care Risk Assessment](#) to determine appropriate precautions including PPE.
3. Airborne precautions are required for airway management (including BVM and intubation) for patients with identified COVID-19 risk as per the COVID-19 Risk Assessment Form.
4. Site leadership must review the Code Blue Guiding Principles document and prepare a site-specific protocol based on APPENDIX A, taking into consideration local roles and resources. It is recommended teams simulate their Code Blue responses.
5. A procedure/surgical mask must be placed on the patient before starting chest compressions, covering the nose and mouth (nasal prongs should be applied under the patient’s mask).
6. The minimum PPE for the first responder is Droplet PPE (surgical mask and eye protection) to initiate chest compression. Additional PPE requirements are based on [Point of Care Risk Assessment](#).
7. Team debriefings should occur following each Code Blue.

**Code Blue Additional Considerations:**

- Have a mechanism to initiate a Code Blue as per site specific protocol.
- Team must don appropriate PPE before entering room.
- Minimize the number of responders in the patient’s room.
- 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).
- If the room has a door, it must remain closed at all times. If there are other patients or visitors in the room, evacuate as possible.
- Inpatients will NOT be moved to a negative pressure room in the middle of a Code Blue.
- The Code Blue team members should carry appropriately fitted N95 masks with them to a code, to ensure they have ready access to their type of fitted N95.
• If any member of the healthcare team breaches PPE integrity (e.g.: mask/visor falls), they will doff PPE (using proper hand hygiene), leave the room, and don correct PPE prior to reentering; use the “buddy” system.
• Even in full PPE, contamination of your hospital attire is possible; all team members included in the Code Blue need to assess if they potentially contaminated their attire and consider the need to shower and change scrubs.

Airway Considerations
• Refer to the Airway Management Guidelines for Patients Requiring Intubation for Suspected COVID-19
• The most skilled airway management provider should be the lead for airway management. If BVM is used, utilize a two-handed BVM ventilation technique, with gentle BVM once a good seal is obtained.
• Chest compressions should be discontinued during tracheal intubation, if performed, and only resumed once the tube’s cuff is inflated.
• Secure an ETT with a commercial securing device.
• Minimize disconnections of ETT.
• Ensure a viral filter is used.

Equipment Considerations
• Readily accessible procedure/surgical masks to apply to patient
• Additions to crash cart during COVID-19 pandemic:
  o 6 N95 masks (2 of each variety)
  o 5 Gowns (level 3 or 4)
  o 5 Face-shields
  o Disposable stop clock
  o Bag mask valve with HME filter attached

Overall Code Blue Goals in patient with COVID-19 or patient presenting with a very high clinical suspicion of COVID-19:
• Recommend assessing efforts and consideration of termination 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
Appendix A

Recommended Protocol for Code Blue

Initial response

1st responder (local healthcare team member):
- Call Code Blue as per site protocol.
- Don procedure/surgical mask and eye protection (droplet precautions) if not already wearing universal pandemic precautions
  - Place a procedure/surgical mask on the patient
  - Initiate chest compressions and defibrillation as appropriate
- 1st responder should be excused once additional Code Blue resources arrive. The 1st responder, if not wearing a gown, assess level of contamination and change scrubs, or shower and change scrubs.

Gatekeeper:
- Ensure door is shut (if there is a door) and minimize opening of door once airway management strategies underway, for a patient requiring airborne precautions.
- Inform team members of PPE requirements as they arrive.
- Ensure appropriate PPE is being worn, and act as buddy for donning and doffing.
- Minimize people in the room (maximum 7).
- The Gatekeeper is NOT the runner.

Additional Responders:
- Additional PPE requirements are based on COVID-19 Risk Assessment and Point of Care Risk Assessment
  - Before airway management (including BVM and intubation) is initiated COVID-19 risk must be reviewed; if any COVID-19 identified risk, airborne PPE must be donned by all team members.

Upon resolution of the code:
- Preparation for transfer to ICU
  - Transferring team members doff resuscitation PPE and apply clean PPE.
  - Have a “clean” team member, remain clean throughout the transport (do not touch equipment or patient). This team member can open doors, push elevator buttons, etc.
  - Call security and supervisor as per site protocols (relay patient COVID-19 status) to facilitate transport including elevator procedures and public / traffic control.

- Debrief with team members.
- All team members need to assess if they potentially contaminated their attire and consider the need to shower and change scrubs.
- Room to be cleaned as per protocol and await appropriate time period after an AGMP has been done as per NSHA Airborne Precautions Policy IPC-RP-025.
All Code Blue
Procedure/Surgical Mask on Patient (nasal prongs?)
Minimum Requirement for PPE:
Eye protection & procedure/surgical mask

Is there a COVID-19 Identified Risk on the COVID-19 Risk Assessment Form?

‘Yes’ COVID-19 Risk
Airborne PPE for full team prior to airway mgmt

‘No’ COVID-19 Risk
Can proceed with airway mgmt. with droplet contact PPE unless another indication for additional PPE
**Appendix B Example of Mini Resuscitation Bag:**
Pharmacy Department (Central Zone)

**MINI RESUSCITATION BAG**
POSTING (mneumonic) RECORD

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

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

Filled: ________________________________  Costed Out: ________________________________
Checked: ________________________________  Expiry Date: ________________________________
References


