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NYP Guidelines for Cardiopulmonary Resuscitation of Suspected or Confirmed COVID-19 Patients (as of March 26, 2020)

Principals

- **Be aware that prolonged CPR will unlikely result in successful return of spontaneous circulation (ROSC) but requires significant utilization of resources, PPE, and potential risk to providers.**
- Primary teams should continue to have **comprehensive discussions** regarding goals of care and DNR status with patients/surrogates on admission/transfer.
- Emergency response is activated as usual: Rapid Response, STAT intubation, Code Blue, ED Notification.
- **Proper PPE is essential, even if it delays resuscitation.** Entry and exit cannot be rushed.
- **CPR is a high risk aerosolizing procedure and all personnel in the room during code blues must observe airborne/droplet/contact precautions (N95)** whether or not the patient is intubated. There is a high risk of dislocation of the endotracheal tube and aerosolization of secretions.
- **If risk factors or history cannot be adequately assessed the patient should be considered PUI.**
- ECPR (Extracorporeal Cardiopulmonary Resuscitation) will not be utilized during the COVID-19 crisis for any patients.

Changes to existing cardiac arrest workflow

- **Everybody** in the room must have **adequate PPE** and observe airborne/droplet/contact precautions (including **N95**).
- **Only health care workers (HCWs)** with a defined role **should enter the room** (see roles below).
- New roles of "**PPE Observer**" and "**Relay**" are designed to provide crowd control and facilitate communication/supply transport within the confines of strict PPE precautions (details below, in red).
- There is no need for pulse check if an arterial catheter is in place.

Airway

(also see: NYP Guidelines for Airway Management of Suspected or Confirmed COVID-19 Patients)

For Intubated Patients

- Patients should **remain on the ventilator** if intubated to minimize disconnects**. Do not use an Ambu bag for ventilation during CPR**.
- Set FiO2 on the ventilator to 100%.
- If disconnection is necessary, initiate and await full pause on ventilator or turn off before disconnecting ETT to minimize aerosolization

NYP Guidelines for Cardiopulmonary Resuscitation of Suspected or Confirmed COVID-19 Patients (as of March 26, 2020)

- Use only closed in-line suction.

For Non-Intubated Patients

- Place a **HEPA filter** between **mask and Ambu bag**.
    - If the ventilator is ready, **do not use Ambu bag to ventilate the patient once intubated but connect directly to ventilator.**
    - If the ventilator is **not** ready, **make sure there is a HEPA filter between Ambu bag and ETT once intubated**
- **Avoid bag-mask ventilation** if feasible and consider **immediate intubation** using video-laryngoscopy.
    - **HFNC and NIV are not recommended** peri-intubation as they can increase the risk of aerosolization. Shut off HFNC or NIV before removing it. **Consider using a non-rebreather (or bag-mask ventilation)**
    - Supraglottic devices (LMA, King tube) can be used before intubation to avoid bag-mask ventilation.
- To minimize risk of aerosolization **pause chest compressions during intubation**. The compressor should follow instructions by the intubator (not the code leader) at that point.

Personnel and their roles

- **Only essential personnel should enter the patient's room (staff permitting, variable by site and other needs).**
- The number of required personnel will vary depending on if the airway needs to be secured or the patient is already intubated. In general, **two people (at least) will be required to secure the airway** and intubate, and **two to four people in the room to administer CPR and coordinate the resuscitation.**
- Personnel **outside the room** should not enter the room unless requested by the personnel inside the room.
- Once all **providers and equipment are in the room**, **the doors should be closed**. Trips in and out of the room should be minimized.

Weill Cornell Medicine | NewYork-Presbyterian | Columbia

NYP Guidelines for Cardiopulmonary Resuscitation of Suspected or Confirmed COVID-19 Patients (as of March 26, 2020)

Essential personnel inside the patient room (need to wear PPE/N95):

Role	Filled by	Description
Code Leader	Designated code MD / APP/ ED attending or first responding MD / APP	Directs the team. **This role may be handed off to ICU fellow or attending if available.** If so, the previous code leader should remain in PPE and assist with compressions and other roles as needs arise.
Code Assistant	(Bedside) RN, MD / APP	Administer drugs
1st Compressor	Any qualified HCW	First chest compressor. When compressors approach fatigue, report to "Relay/Recorder" to request additional personnel.
2nd Compressor	Any qualified HCW	Second chest compressor. Transfers drugs and equipment from outside personnel to code assistant or code leader upon entry. Makes sure administred treatments are relayed to the personnel outside the room. Will take over compressions when 1st compressor fatigues.

Additional personnel for non-intubated patients:

Role	Filled by	Description
Intubator	First or most experienced anesthesiologist	Intubation, airway management. Also assist with vascular access.
Airway assist	RT and/or anesthesiology personnel	Assists with intubation, makes sure suction is available and HEPA filter is attached to mask or ETT, secures ETT after intubation. If this role is filled by RT, that same person initiates the ventilator as below.
Ventilator Initiator	RT	Connects patient to and initiates mechanical ventilation.

NYP Guidelines for Cardiopulmonary Resuscitation of Suspected or Confirmed COVID-19 Patients (as of March 26, 2020)

Essential personnel outside the patient room (do not need to wear PPE/N95):

Role	Filled by	Description
PPE Observer and Relay	RN or MD / APP	Observe all donning/doffing and limit access to only those with defined roles. Manage supplies going into the room and labs handed out of the room to lab staff. Should stay by the door but not enter.
Code cart manager	PharmD or RN or MD / APP	Will pass medications/drips, equipment in batches to minimize handoffs. Ensure code cart remains outside the room.
Code Recorder	RN	Will record all treatments administered as relayed by one of the standby compressors in the room and will keep track of time, and call out time for pulse checks.
Runners	Any qualified HCWs	On standby.

Logistics

- If multiple providers arrive together, PPE should be donned in the following order:
    1. Compressors
    2. Code Leader
    3. Airway team
    4. Code Assistant
- If another responding MD / APP begins leading the code before the designated code leader arrives, s/he should not handoff mid-arrest unless this is clearly communicated by the designated code leader.
- PPE observer and relay should stay by the door and control entry/exit while supervising PPE donning/doffing.
- Code cart should remain **outside** the room (or in anteroom).
    - Pharmacy and floor nursing will relay **equipment/defibrillator/meds** into the room via PPE Observer. If possible, send medications in batches (e.g. multiple doses of epinephrine with multiple flushes) to minimize handoffs.
- Labs will be passed to the relay nurse, who will deliver outside to PPE Observer / Relay

NYP Guidelines for Cardiopulmonary Resuscitation of Suspected or Confirmed COVID-19 Patients (as of March 26, 2020)

After the code

- Timeout to identify all contaminated equipment and discuss disinfection
- All disposable equipment in the room should be discarded (e.g. unused medications, one time use airway equipment) even if they are unused.
    - Take care that disposable equipment is not left on the bed (e.g. yankauer, laryngoscopes).
- Recorder should transcribe the paper documentation into EMR.
- All staff who were in the room should self-monitor for symptoms.
    - Staff who believe they have breached PPE should report to their supervisor immediately.
- Debriefing is a valuable process both from a psychological support and quality improvement perspective.

Specialty Equipment Checklist: *note that responsible providers for equipment differ by site*

Equipment	Other notes
Code cart	New plastic bags to batch medications and airway equipment. Cart to remain strictly outside the room.
HEPA virus filter for bag mask ventilation	Additional HEPA filter located in airway bag.
PPE	See separate NYP COVID guidelines for description of PPE kit. Additional PPE is outside of patient's room.