Protocol for Perioperative Management of Urgent Surgical Procedures in Suspected or Confirmed COVID-19 Patients

Guiding Principle: While we continue to care for patients with urgent surgical issues, we must take every precaution to protect the safety and wellbeing of our staff during the transport to and from the OR suite, and during the case itself.

This document addresses perioperative management of patients who are KNOWN or SUSPECTED (i.e. rule-out) COVID-19 positive and need urgent surgery. Patients who do not fall into those categories will continue to be managed in the usual fashion.

1. Posting of cases and case urgency
   a. Cases will be done in order of urgency; however, rapidly transferring a patient to the operating room (i.e. as we typically do for a Level 1 case) is not consistent with safe care for the staff. Every case will need some time to appropriately manage the infectious risk, particularly the donning of PPE. To the extent that it is possible, cases should be posted early in the course of the surgical problem, not at the last minute.
   b. Cases may be aggregated as required for efficient room and staff utilization, cognizant of patient, faculty and staff needs.
   c. Every effort should be made by the surgical service when posting cases to clearly communicate the precise procedure and any requested equipment. This will reduce the need to enter/re-enter the operating room and reduce staff exposure.
   d. Minimally Invasive Surgery procedures requiring pneumoperitoneum should NOT be posted for COVID positive or COVID suspected patients.
      i. At present, MIS cases will be allowed for patients that do not meet the clinical criteria for suspected COVID infection. This may change as community prevalence of the virus changes.
      ii. Specific precautions for all MIS cases will be followed as detailed below.

2. Designated Operating Rooms
   a. Two ORs shall be used as COVID rooms on each platform. OR 5 will be the primary COVID room on the Duke North Platform and OR 47 will be the primary COVID room on the DMP platform. OR 56 is primary COVID room for cardiac patients. OR 4 and OR 48 will be backup COVID rooms if needed. These rooms have the appropriate anteroom that will be needed for donning/doffing PPE. ORs 6 and 8 will be the designated COVID rooms at DRAH. These rooms have a substerile room for donning and doffing PPE, though it will not accommodate a bed. OR 2 will be the primary designated COVID OR at DRH. It has an anteroom. The secondary will be determined based on ongoing engineering assessments, as most ORs at DRH do not have an anteroom.
      i. Cases requiring hybrid capability that can be performed in a COVID room using a C-arm will be performed in a COVID room with a C-Arm.
      ii. For complex cases that require a hybrid room (e.g. aortic dissection or ruptured AAA) for a COVID positive or suspected patient, DUH room 33 will be used with all COVID precautions observed.
b. Special airborne/contact precaution signs will be hung on all entrances to these ORs to alert staff that appropriate PPE is required.

c. In general, patients originating from the DN patient care floors will be done in ORs 5 and 4, and those from the DMP done in ORs 47 and 48, in order to reduce transport distance and the risk of exposure.

3. Room/Equipment Preparation

a. Each room will have one or more portable HEPA filter units based on the size of the OR (DN = 1, DMP = 2).

b. Built-in wall cabinets will be emptied of all supplies.

c. To the extent possible, equipment that is not essential to carrying out the case will be removed from the OR. Case carts should be kept out of the OR if possible.

d. The anesthesiology team will set up a pack of equipment, fluids and medications for each case posted that will be sufficient for that case. Eliminating the anesthesia cart/Omnicell in the room reduces contamination and potential exposure.

   i. The adult airway equipment pack will include: McGrath videoscope with blades, disposable laryngoscope, LMA 3/4/5, cricothyroidotomy kit.

   ii. The pediatric airway equipment pack will be constructed by the pediatric team on a case by case basis prior to initiating patient transport and based on patient age/size.

e. Ambu disposable fiberoptic scopes (3.8mm Storz scopes) will be available outside these ORs in case airway emergency.

f. Disposable equipment will be used whenever possible.

g. The anesthesia machines are already pre-fitted with HEPA filters for circuits on both inspiratory and expiratory limbs. Anesthesia machine covers will be available 4/20/2020.

h. The surgical table/instruments should be prepared, then covered with a drape, anticipating aerosolization of virus during airway management. Scrub tech and circulator should set up. The scrub tech should retreat to anteroom (or substerile room at DRAH or the hall at DRH) prior to entry of patient into the OR. The circulating nurse will interview the patient in the OR upon their arrival and may remain in the OR if there is a clinical need. There will be a delay following airway management for the room to undergo sufficient air exchanges that aerosolized material is no longer present (30 minutes), during which time the anesthesiology team member (+/- circulating nurse) should be the only people in the room, providing that the patient is stable. Surgeons should remain outside the room for 30 minutes after airway management for all but the most emergent cases.

i. Special Considerations for MIS procedures (note, MIS techniques will be avoided in COVID patients)

   i. No laparoscopic or robotic procedure are to be done using AirSeal Mode, which relies upon an AirSeal access port (valveless port) and thus allows free gas exchange through the abdominal wall.

   ii. All cases should utilize either AirSeal “smoke evacuation” mode or Stryker “PneumoClear” insufflation units. This will give greatest risk reduction during a case. Each hospital has access to these units.

   iii. If unable to utilize the above due to resource limitation, the next recommendation is to use filtered plume evacuators (ConMed /Stryker
/Medtronic available) connected to wall suction during a case to redirect aerosolized particles to the filtered suction device.

iv. Refrain from standard single direction insufflation units during this time.

v. Smokeless (smoke evacuating) electrocautery should be used for all cases.

4. **Perioperative Protection for HCWs**
   
a. PPE for **all OR staff** involved in COVID positive or COVID suspected (PUI) cases includes: 2 pairs surgical gloves, N95 mask, face shield or goggles, gown, shoe covers. For open airway cases (including sino-nasal, middle ear, oral and pharyngeal cases), ENT surgeons should wear PAPRs. For non-PUIs, a PAPR is not required.
   
i. For truly Level 1 emergencies where a 30-minute wait cannot be accommodated, surgeons and scrub personnel should wear the above PPE PLUS wear a Stryker Helmet/hood over that to prevent aerosolized virus attaching to your neck/face skin. Note that the fan should not be turned on.
   
ii. Operative staff who follow PPE guidelines when operating on a COVID-19 patient are NOT considered exposed and do not need to be quarantined.

b. The exception to this:
   
i. The anesthesiologist, due to their role in managing, and proximity to, the airway. They will wear a PAPR with surgical mask underneath to prevent sterile field contamination rather than the N95 mask.
   
ii. During specific airway cases (rigid bronchoscopy, laryngoscopy, tracheostomy) where a member of the surgical team may also need to wear a PAPR.

c. OR staff should be limited to just those who are absolutely required to safely carry out the procedure. Learners and extra assistants who are not essential should be excused.

   Recommended numbers:
   
i. 1 anesthesiologist at a time (one on deck for relief) and 1 CRNA/resident/fellow
   
ii. 1 surgeon if possible
   
iii. 1 circulating nurse in the OR
   
iv. 1 circulating nurse outside the OR (in the core as a runner)
   
v. 1 scrub nurse/tech

d. Refer to appendix for guidance on N95 reuse to conserve supplies.

5. **Patient transfer**

   a. Universal time-out (blue hat) will be done on the floor/ICU/ED.
   
b. The anesthesiology team will make a case-by-case determination at the bedside as to the risk/benefit of securing the airway in the negative pressure environment of the patient room first (when applicable), followed by transport to the OR, versus transport with a surgical mask and intubation in the OR.

   c. The anesthesiologist will be wearing a PAPR unit and will proceed directly into the OR without pausing in the anteroom.

   d. The circulating nurse will interview the patient in the OR upon their arrival (unless patient is intubated on the floor). He/she may remain in the room for intubation if there is a clinical need.

   e. Once the patient is intubated, surgeons/nurses/techs **will wait 30 minutes** to allow for room ventilation, then enter via anteroom (if one is present). After this time, additional staff may transfer equipment as needed into the room via the sterile core as is the case.
with airborne (e.g. TB) precautions. However, the staff in the room should be kept to a minimum.

f. The patient’s bed/stretcher should remain in the OR throughout the procedure, if possible. If not possible, it should be placed in the anteroom, or if no anteroom the adjacent hallway and labeled as COVID positive, and wiped down with bleach wipes.

g. If possible, the staff should not be relieved unless the duration of the case makes this impractical.

h. Specimens (if applicable) should be passed out the door into a clean double bag. A COVID sticker should be affixed to the specimen and the lab made aware that the specimen is on the way.

i. At the conclusion of the case, the patient should be transferred to the bed/stretcher prior to extubating. The surgeons/nurses/techs will exit via the anteroom (at DRAH the sub-sterile room, at DRH, the hallway with PPE disposed of in the OR at the door) and proceed with doffing as per protocol. This may be done at the same time, or in sequence, depending on the size and configuration of the anteroom. Sufficient time should be taken for this step—there is no rush.

j. The anesthesiologist will extubate the patient alone in the OR if this is felt to be safe. If determined that the circulating nurse or surgeon should be present for patient safety, he/she can remain in the OR. The patient will then be recovered for at least 30 minutes while the air exchange occurs. If the patient is to be transferred to the ICU intubated, the patient can be transferred immediately.

k. Readiness for discharge will be per the White Fast-Track Score criteria.

l. The anesthesiology team will call report to floor nurse prior to transfer to the next unit.

m. Stretcher guard rails should be wiped down before transferring patient.

n. Once ready for transfer to floor/ICU/ED, the stretcher/bed will be pushed out into corridor, where a fresh anesthesiologist & surgeon (Transfer Team) with clean standard PPE (N95 and face shield) takes over and transfers the patient. The in-room anesthesiologist then exits via the anteroom (DRAH, the substerile room; at DRH, the hall) and begins the doffing procedure. If not intubated, the patient will wear a surgical face mask for transfer.

o. If transferring to/from the OR intubated, ensure adequate neuromuscular blockade to prevent coughing and use N99 filter on the BVM.

6. Anesthetic management

a. General anesthesia is recommended for patients with suspected/confirmed COVID to reduce the risk of coughing/bucking, which can generate airborne material and droplets. Other types of anesthesia can be selected dependent on the type of surgery and the individual patient’s need. If not intubated, a surgical mask must be applied to the patient throughout the length of stay in the operating room. If supplemental oxygen is required, an oxygen facemask should be applied over the surgical mask.

b. Always keep the HEPA filter connected to the endotracheal tube during patient transfer and disconnection from the BVM or anesthesia circuit. This isolates the patient from the outside environment and reduces contamination.

c. Spinal anesthesia is still recommended as the primary choice of anesthesia for cesarean delivery in a mother with COVID, unless respiratory compromise and/or other contraindications to a spinal. The mother must wear a surgical mask at all times.
d. Induction should only occur after complete satisfactory check of PPE. This should have occurred prior to patient transfer.
e. RSI should be used for induction
   i. Preoxygenation is critical for preventing desaturation as bag-mask ventilation is not recommended during induction.
   ii. Use sufficient neuromuscular blockade to prevent coughing/bucking. Succinylcholine is ideal. If there are any contraindications, rocuronium can be used, but should have sugammadex immediately available for a CI/CV situation.
   iii. Oral intubation with videoscope is preferred.
   iv. Immediately after intubation, remove outer gloves and dispose of them in “red-bag” trash bin. Then put fresh outer gloves on.
   v. Auscultation is not practical with PAPR. Rely on ETCO2, bilateral chest rise and, if necessary, ultrasonographic evidence of lung sliding on both sides of chest.
   vi. If anticipated difficult airway, FOBI after induction (“asleep fiberoptic”) is recommended to reduce the likelihood of coughing/shedding. Awake intubation should be avoided unless there is no other option. If awake intubation is indicated, ensure complete topicalization and sedation before proceeding.
f. If transferring to/from the OR intubated, ensure adequate neuromuscular blockade to prevent coughing and use N99 filter on the BVM.

7. Post-anesthesia Equipment Care and Medical Waste Disposal
   a. Independent of whether the patient was recovered in the OR or transferred intubated, the room should undergo a 30-minute HEPA air exchange, followed by a terminal clean and Tru-D UV light disinfection.
   b. The anteroom/substerile room should also be terminally cleaned following the case.
   c. All disposable supplies should be disposed of immediately per standard protocol.
   d. CO2 absorber canisters should be replaced between cases.
   e. Surface of the anesthesia machine/ventilator and any other surface should be completely wiped down with bleach wipes.
   f. All OR equipment will be wiped down with bleach wipes. All trash and linen will be handled per our normal process.

References:
1. Bowdle A, Munoz-Price LS. Preventing infection of patients and healthcare workers should be the new normal in the era of novel coronavirus epidemics. Anesthesiology 2020 (epub ahead of print)
Appendix:

Instructions for Extended Use and Conservation of N95 Respirators and PAPRs Hoods

Instructions for Extended Use of N95 Respirators and PAPR Hoods

*Note: The directions for the re-use of N95 respirators with contact precaution isolation are a deviation from our regular practices. These measures are being taken to conserve PPE as part of our COVID-19 response. This guidance may change. A contemporary version of the most current guidance can be found on the Intranet at:*