UCSF Health

Anesthesia Adult and Pediatric Perioperative/Obstetric Guidelines for the Care of Confirmed/Suspected Patients with SARS-CoV2/COVID-19 at UCSF

Last Updated: 5/31/20

Disclaimer:

As the SARS-CoV-2 pandemic evolves, there will likely be changes to these protocols based on new understanding of the virus and the risks posed to healthcare workers (HCWs).
We have done our best to present a uniform message with our approach to the situation and will be regularly updating these guidelines to reflect current standards of practice.

Personal Protective Equipment:

Proper hand hygiene is one of the single most important steps in protecting yourself and your patients. Pay special attention during the doffing process, and if at any point you are concerned about contamination - stop and perform hand hygiene before continuing doffing.

Current UCSF Guidelines are in line with the CDC and WHO:

- Confirmed/suspected COVID-19 patients will be treated with **droplet** and **contact** precautions (*respiratory illness isolation*) outside of any aerosol-generating medical procedure (AGMP). Please also see the UCSF Permissive Use of N95 on Respiratory Isolation Unit Guidelines.
- For any AGMP, health care workers (HCWs) must use **airborne** (N95 + face shield/goggles or PAPR), **droplet** and **contact** precautions (*novel respiratory isolation*)
- Examples of AGMPs: Intubation, extubation, airway suctioning/induced sputum, nebulizer medications, chest PT, endoscopy, TEE/ERCP, ECT, CPR, CPAP/BIPAP, Hi-Flow NC, any procedures on the airway, throat, mouth, nose or sinuses (otologic surgery with drilling, bronchoscopy, tracheostomy, glossectomy, laryngoscopy…etc), thoracic surgery/procedures.
- The Society of Maternal Fetal Medicine and the Society of Obstetric Anesthesia and Perinatology believes it is “reasonable” to consider airborne precaution use for HCWs caring for patients with suspected or confirmed COVID-19 in the second stage of labor, including specifically HCWs with significant and prolonged exposure to such patients.

Please also see **UCSF Universal Surgical Mask Policy**.

Please see the Anesthesia COVID Box folder to review current Infection Control guidance for safe reuse of PPE: http://tiny.ucsf.edu/covid

Please ensure that you are up to date on your **N95 fit testing** (e-mail tyler.chernin@ucsf.edu for info on available sessions) and have appropriately trained in **PPE donning and doffing** techniques (https://infectioncontrol.ucsfmedicalcenter.org/novel-coronavirus-covid-19-videos or watch our dedicated Anesthesia Grand Rounds from 3/18/20 https://lecture.ucsf.edu/ets/Catalog/Full/f20671f24e204359a3fe7d19070f04e721).

PLEASE KEEP IN MIND THAT CHANGES MAY OCCUR TO PPE REQUIREMENTS

Please access the following google spreadsheets to record your compliance with these measures:

Fit Testing:
https://docs.google.com/spreadsheets/d/1YWIxoSpc0t7NWMg_LSbrd1CO09LCdLOUSgPXQ5Ob99M/edit?usp=sharing

PPE: https://docs.google.com/spreadsheets/d/1P67AIHVocZ8lS_koS5csnbEEa-WBcxPfBRSUaaboSic/edit?usp=sharing

COVID-19 Confirmed/Suspected Patients for Surgery:

Hopefully, surgical procedures in this population will be rare. When possible, procedures should be delayed until official results of COVID-19 testing are available (for suspected patients) or the patient clinically recovers. Whenever possible, procedures should be done at bedside in a negative-pressure ICU room. Staffing in these cases should be kept to a minimum and relief for breaks only as necessary. At all sites, the case should be scheduled as a “last case” whenever possible.

All staff should familiarize themselves with the appropriate procedures to follow if a surgical procedure in the O.R. becomes necessary. There are many important steps to follow and being familiar with them will help to avoid error.

1-Pre-Patient Arrival:

- Ensure that all members of the surgical, nursing and anesthesia teams are aware that a patient with confirmed/suspected COVID-19 is booked for a procedure.
- A pre-procedure huddle must occur between all members of the surgical team to ensure that all requirements and preparations are in place before transporting a patient. Anesthesia personnel will lead the discussion of any planned AGMPs.

- Inform the anesthesia techs about the case and confirm the use of a dedicated COVID-19 O.R., depending on site (1 at ML with sub-sterile as ante-room, 12 at MB, 11 at MZ)
    - Currently, none of the O.R.s at either site provide a negative pressure environment. It is important to keep the doors closed as much as possible.
- All entry points to the O.R. and ante-room must have clear signage on the doors to avoid inadvertent entry by staff not wearing appropriate PPE.

A dedicated **COVID** anesthesia cart will be in the O.R. and a **regular**, fully-stocked anesthesia cart will be placed outside the room and ante-room:

- Start by removing all the supplies **and meds** you anticipate to need for the case from the **regular** cart and bring them inside the O.R. and place on a table or Mayo stand.
- The **COVID cart** will have usual supplies (**minus meds**) but with far fewer of each, all of which will be thrown out after the case while the cart is cleaned.
- Also remove what you will need from the anesthesia machine drawers and avoid re-opening them.
- Every effort must be made to avoid repeated entry to the O.R. throughout a case – so plan ahead.
    - Anesthesia techs should not be entering the O.R. unless absolutely necessary and must don full PPE so please think ahead and when in doubt, ask for it ahead of time.
    - The ante-room will be used to shuttle additional surgical supplies into the O.R. as needed.
    - In a worst-case scenario, the regular anesthesia cart can be accessed after full doffing and donning procedures are followed or a dedicated "runner" assistant can bring them inside the ante-room in full PPE.
    - **Note that the ante-room is considered "contaminated" once the patient enters the adjoining O.R.**
- Any unused supplies in the OR are considered contaminated and will need to be discarded at the end of the case.
- **Keep drug box locked to the regular cart in the clean area. Remove all necessary controlled meds in advance:**
    - Every attempt will be made to keep the drug box and the medication trays out of the COVID O.R.s
    - If either goes into a COVID O.R., it should be cleanly bagged and labeled before returning to pharmacy.
    - All medications, including narcotics, will be wasted in the COVID O.R. or in the patient's ICU room.
    - Waste must occur with another licensed provider (RN, CRNA, MD or pharmacist):
        - Account for the narcotic waste on the CSAR narcotic sheet in mcg/mg only, as is standard CSAR documentation requirements.
        - Second licensed provider must sign legibly.
        - In rare exceptions, if unable to obtain signature, write their name and credentials (MD, CRNA, RN…etc) on the CSAR narcotic sheet.

Make sure your **circuit**, **suction** and anesthesia **workspace** are prepared in the following way:

- Ensure that the anesthesia circuit has a high-efficiency filter at **BOTH** the wye piece and the expiratory limb.
  - Filters add resistance. If this becomes a problem, you can consider removing the expiratory limb filter during a case only.
- Also make sure that the in-line ETT suction is set up and ready for use (see images).
  - The goal is to limit circuit disconnects when at all possible.
  - Can consider clamping ETT briefly between changes.
- Ensure that the gas sampling line is on the filtered end of the circuit.
- **If it is necessary to disconnect the circuit for patient positioning, turn off the ventilator, pause gas flow, and leave the distal filter attached to the ETT during the disconnect and consider briefly clamping the ETT**
- The Yankauer suction should be kept in an empty saline bottle between uses to avoid contaminating the environment.
- Ultrasounds and other devices should be sheathed and kept as clean as possible.
- Do your best to limit contamination of the environment and other re-usable equipment:
  - Leave unnecessary personal items outside (bags, fanny packs…etc).
  - Use O.R. telephone in speaker mode.
  - Pens and sharpies should be disposed of after each case.
  - Avoid stethoscope use, but if necessary, use disposable only.
  - Safely sanitize pagers, cell phones and other devices that are brought into room.

<u>2-Patient Transport:</u>

Bring the necessary PPE from the O.R. supply to the ICU/floor for donning in ICU/floor.
Please see specific section on **Patient Transport and Disposition** for further details.

<u>3-Intraoperative Management:</u>

All members of the O.R. team must don full **contact**, **droplet** and **airborne** PPE (*novel respiratory isolation*) throughout the procedure. PAPRs are preferable over N95 when available, but both are fully appropriate forms of protection for COVID-19 patients. Perform frequent hand hygiene and wear double gloves. Remember to limit repeated entry/exit from the O.R. during a case.

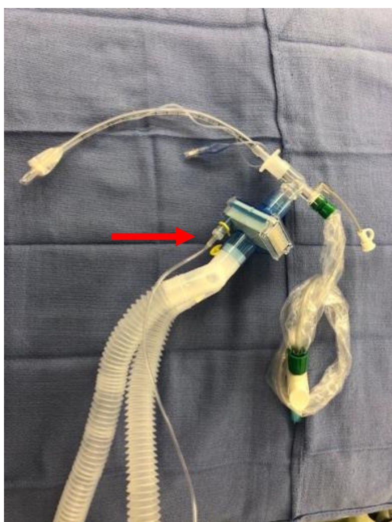
The **type of anesthetic** required will depend on the patient's clinical status and the nature of the procedure. However, some important considerations are as follows:

- Avoid LMA, deep sedation or awake fiberoptic techniques.
- Avoid any type of sedation that may lead to obstruction/hypoventilation requiring unanticipated/emergent intubation.
- If amenable, regional/local techniques can be employed:
  - Patient should wear nasal cannula at lowest possible flow and surgical mask throughout.
- Employ a lung-protective ventilation strategy:

- **Low tidal volumes** = ≤ 6 cc/kg ***PBW*** (vs. 12)
    - http://www.ardsnet.org/files/pbwtables_2005-02-02.pdf
- **Permissive hypercapnia** = pH ≥ 7.25
- **High PEEP** (>10, up to 20 cm H_2O as hemodynamics allow)
    - if severe hypoxemia (FiO2 ≥ 0.6, PEEP ≥ 10 with PaO2/FiO2 < 150)
- Consider continuous neuromuscular blockade if refractory hypoxemia/hypercapnia or high airway pressures.
- Target SpO2 88-92%

For **intubation**, two anesthesia providers or an anesthesia provider and a circulating nurse should be in the O.R. while the remainder of the team waits outside the O.R. **until 15 minutes after airway secure (ML/MB/MZ)**, unless surgical team is involved in airway management and donning the appropriate PPE. Anesthesia providers must double glove before any airway/oropharyngeal contact.

- Support staff in full, clean *novel respiratory isolation* PPE should be available for assistance while waiting outside the O.R. and should be keeping an eye on the O.R. during induction and emergence for safety reasons
- Ensure filter is in place between mask and circuit (see images).
- Perform a full 5min pre-oxygenation. Patients with COVID-19 have been known to desaturate quickly and profoundly, so maximizing reserve is essential.
    - Avoid mask ventilation. If necessary, two-handed seal and small tidal volumes.
- Recommend video laryngoscopy to avoid proximity to face and confirmation of ETT.
- Once ETT secure, remove outer gloves and use them to sheath soiled airway equipment.
    - Do not interact with the environment until outer gloves removed.
- Place soiled airway equipment in sealed double bags for cleaning.
- Perform hand hygiene and don new double gloves.



Examples of in-line ETT suction and optimal locations of HME filters and gas sampling

Only consider **extubation** if the patient meets criteria and does not have or need ICU bed.

- Extubation is considered an AGMP, so only anesthesia staff should be present in O.R.
    - Consider temporary barrier methods over patient's face as ETT is removed.
- All other team members should wait to re-enter O.R. **until 15 minutes (ML/MB/MZ)** have passed since extubation.
- At **ML**, PACU staff will follow the procedure guidelines: **ML PACU COVID-19 POSITIVE SUSPECTED OR CONFIRMED INFECTION OPERATING ROOM RECOVERY PROCEDURE**
    - Once the patient is stabilized, not coughing or vomiting, a PACU RN can enter O.R. to complete recovery process in **contact**, **droplet** and **airborne** PPE (*novel respiratory isolation*).
    - The patient should be moved to the transport bed and wear a surgical face mask for recovery phase.
- At **MB**, patients will be recovered in the negative pressure room in PACU (total of 3 negative pressure rooms: 1 adult side and 2 pedi side)
- At **MZ**, patients will be recovered in the negative pressure room (Room 10) in the PACU
- Once outside the O.R. environment with a stable, extubated patient, providers can use **contact** and **droplet** PPE (*respiratory illness isolation*).

If the patient is **returning to ICU intubated**, make sure to properly doff and then don a **new gown and gloves** for transport.

- Use dedicated COVID transport supply bag or assemble necessary supplies in plastic bag and discard after patient dropped off.
- Follow the same principles for transport for return to ICU.

For **donning and doffing**:

- Before the patient arrives, staff not involved in transport may don (and scrub) in ante-room.
- **Once the patient is in the O.R., the ante-room is considered "contaminated"**
    - Donning must then occur outside ante-room and no one should doff respiratory protection in the ante-room.
- For **doffing**:
    - Doff gloves and gown in O.R., perform hand hygiene.
    - Exit O.R. and ante-room, perform hand hygiene.
    - If intubated patient is to be **immediately transported**:
        - Keep N95/face shield/goggles/PAPR on and don new gown and gloves.
    - If **clinical duties are complete**:
        - If wearing a face shield and N95 respirator, perform hand hygiene then carefully remove face shield by holding the elastic band and place on a designated "dirty" table for subsequent cleaning. Repeat hand hygiene, then carefully remove the N95 respirator and store if being reused or discard. Repeat hand hygiene. Wearing non-sterile gloves, use

disinfectant wipes to clean the face shield and place in designated "clean" area. Remove gloves and repeat hand hygiene.
    - If wearing a PAPR, perform hand hygiene then carefully remove the PAPR. Detach the PAPR face shield and place on a "dirty" table for subsequent cleaning. Repeat hand hygiene. Wearing non-sterile gloves, use disinfectant wipes to clean the outer surface of the PAPR and the PAPR face shield. Remove gloves and perform hand hygiene.

*****Specific considerations for OR 1 at ML*****

- The entrance to the ante-room is too small to transport a patient through, so patients will need to be moved in and out through the main double doors, unlike at MB and MZ
- In order to limit the potential spread of aerosol, **providers must wait 15 minutes** after the last AGMP before exiting with the patient through the double doors
    - This would likely only be relevant for patients who are remaining intubated, as extubated patients will recover in the OR for a period of time undoubtedly longer than 15 minutes in most cases
    - However, if an extubated patients requires an AGMP post-extubation, that timing must be considered before exiting through the double doors
    - Providers should exit as quickly as possible to limit the amount of time the doors are left open

4-Postoperative Management:
Once the **patient leaves**, the OR must be left unoccupied for **one hour** and then undergo a high level clean:

- The amount of time depends on the number of air changes per hour to achieve 99.9% turnover.
- Techs/Environmental service workers need to don PPE in accordance with their protocols for room cleaning.

Transportation and Disposition for COVID-19 Confirmed/Suspected Patients:

Do not transport any patient until the pre-procedure huddle is complete. Patients with known or suspected COVID-19 should never be brought to holding areas or PACUs:

- Always consult with staff at destination to ensure they are prepared to receive the patient directly.
- Only transport patients for procedures or imaging studies that are deemed **absolutely** necessary.
    - When in doubt, pro-actively consult with care team to discuss risk/benefit scenario.

Clean stretcher handles and IV pole surfaces with wipes prior to exiting ICU room or O.R.

- When leaving a location, one team member wearing **clean** PPE (see below, based on situation) is designated to interact with the environment (elevator buttons, door controls…etc) but will **NOT** come in contact with the patient.
- The other team members will also don **clean** PPE before transport and attend to the patient and avoid contacting environmental surfaces.
- Ensure that patient bed is wiped down before it is moved to hallway for definitive cleaning while patient in O.R. (exact procedures vary by site)

For **intubated ICU patients**, consider switching to a portable ventilator in the negative pressure ICU room (clamping ETT briefly during switch):

- Providers don **contact**, **droplet** and **airborne** PPE (*novel respiratory isolation*) for direct contact with patient during transport.
- Providers interacting with the environment only will wear N95 with face shield/goggles or PAPR and will maintain at least a 6 foot distance from patient.
- Use dedicated COVID transport supply bag or assemble necessary supplies in plastic bag and discard after patient care complete.
- Ensure a high efficiency hydrophobic filter is in place between the ETT and Ambu bag/Jackson-Reese or ventilator to avoid releasing infectious droplets to the surroundings.
- Do not use the single-limb transport ventilator.
- **Consider using the portable ventilator in the OR with TIVA to avoid disconnects.**

Non-intubated patients should wear a surgical face mask during transport:

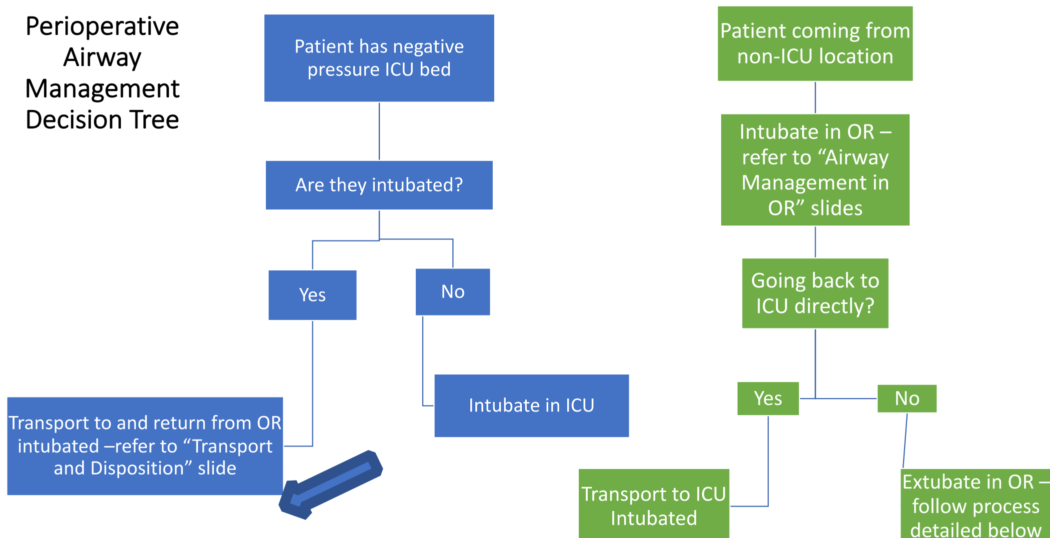
- Providers don **contact** and **droplet** PPE (*respiratory illness isolation*) for direct contact with patient during transport. Please also see the UCSF Permissive Use of N95 on Respiratory Isolation Unit Guidelines.
- Team members interacting with the environment-only will wear surgical mask.

At **MB** and **MZ**, providers should bring the patient to the designated O.R.s **through the ante-room**, allowing each door to close sequentially before the next door is opened. At **ML**, providers will need to bring the patient through the double doors (see specific considerations for O.R. 1 above for transporting the patient at the end of a procedure).

- At **MB and MZ**, the patient transport bed will then remain in the O.R. for cleaning.
- At **ML**, the bed/gurney linens should be pulled and tossed into the soiled linen container and the bed/gurney wiped clean prior to moving into the hallway.
- This should occur before the patient is unmasked and ventilated (if not already intubated).

When at all possible, efforts should be made to **intubate and extubate patients in the ICU**:

- Please refer to Perioperative Airway Management Decision Tree figure below



Obstetric Anesthesia for COVID-19 Confirmed/Suspected Patients:

1-Pre-Delivery:

- All providers should don **contact** and **droplet** PPE.
- All patients and family are screened in the lobby of MB.
- COVID-19 suspected patients will be isolated in triage, transported to delivery location with surgical mask.
- All care team members will be notified of case and location of delivery.
- Location should have clear signage at every entrance.

2-Labor Process:

- **As per SOAP and Obstetric Anaesthetists' Association, analgesia placement and management can occur per routine with contact and droplet PPE in place.**
- Given several variables unique to childbirth, including the length of patient contact, repeated and prolonged exhalations, and often substantial exposure to body fluids, it is reasonable to consider airborne PPE use for HCWs caring for patients with suspected or confirmed COVID-19 during the second stage of labor.
- Labor analgesia at certain timepoints in labor may justify airborne PPE.
- Early neuraxial is encouraged to reduce likelihood of general anesthesia.
- **DO NOT** bring the epidural cart into the patient's room (apply similar principles relating to the cart as in the OR).
- There is currently insufficient information about the cleaning, filtering, and potential aerosolization when using nitrous oxide in labor analgesia systems in the setting of COVID-19. As such, we have suspended its use till further notice.

3-Operating Room Delivery:

- All providers must don full **contact, droplet** and **airborne** PPE even if GA not planned**.**
- All OB O.R.s are positive pressure environments.
- All care teams (OB, Anesthesia, Nursing, ICN, Code Team) notified of case and location of delivery.
- A similar workflow as the General O.R. relating to the anesthesia carts will be employed (see previous).
- Patient transported to delivery operating room with regular surgical mask on. Oxygen therapy NOT recommended for abnormal fetal heart rate.
- For **neuraxial anesthetic**, oxygen should be provided via nasal cannula at the lowest flow possible, if necessary:
    - Patients should wear a surgical mask over the NC if feasible.
- If **general anesthesia** and **intubation** is required:
    - Follow same procedure as General O.R.
    - Extubated patients will recover in O.R.
    - Once stable, not coughing or vomiting, can transport with surgical mask on patient.
    - Patients with ICU beds should stay intubated and then extubated in ICU per protocol.

4-Post-Delivery & Transport to NICU:

- Strict adherence to proper doffing procedures upon exiting location (see previous).
- Fresh PPE should be worn during transport of infant to ICN (**contact**, **droplet** and **airborne** PPE).
- Infant should be transported in closed isolette to ICN.

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