Practice Recommendations on Neuraxial Anesthesia and Peripheral Nerve Blocks during the COVID-19 Pandemic

A Joint Statement by the American Society of Regional Anesthesia and Pain Medicine (ASRA) and European Society of Regional Anesthesia and Pain Therapy (ESRA)

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Note: *The following represent current recommendations based on the best available evidence and expert opinion. These are not guidelines. Recommendations may change as the situation continues to evolve. This document was last updated on March 31, 2020.*

- The document assumes that anesthesia care will be needed only on urgent and emergent surgeries or surgeries that are lifesaving (such as cancer surgeries).
- All elective surgeries should be postponed to reduce the risk of exposure to COVID-19 and to conserve the capacity of the healthcare system, personnel, and resources for a possible increase in demand.

Background

General anesthesia (GA) with airway intervention leads to aerosol generation, which exposes the health care team to risk of transmission of COVID-19 both during intubation and extubation.[1] The odds of transmission of acute respiratory infection during tracheal intubation to a health care professional is known to be 6.6 times compared to those who are not exposed to tracheal intubation.[2]

The tracheal intubation for a COVID-19 positive patient is ideally performed in a negative pressure room, which may not be available in all places or situations.[3]

Avoiding GA is also beneficial for patients as regional anesthesia lowers the risk of postoperative complications, and this becomes more important in the context of ongoing respiratory infection.[4,5] Regional anesthesia should be preferred for providing anesthesia care wherever possible.

Careful consideration should be given to allow the surgery to be performed entirely under regional anesthesia. *An unplanned need for intraoperative conversion to GA is least desirable. If the duration or complexity of surgery means a high probability of conversion to GA, it is better to start with GA.* This requires good communication between the anesthesia and surgical teams.

Preparation and Planning

- *The first step in the planning of anesthesia for a patient during the COVID-19 pandemic is to ascertain if the patient is COVID-19 negative, COVID-19 positive, or suspected to be positive (PUI- patient under investigation).*[6]

COVID-19 negative patient

- If the patient is not COVID-19 positive, not suspected to be positive, or not PUI, then regional anesthesia can be provided following usual local institutional guidelines as before the pandemic.
- *Once the community spread of COVID-19 is significant, all cases may be presumed to be COVID-19 positive.*

COVID-19 Positive or PUI

- Both neuraxial anesthesia and peripheral nerve blocks are not considered aerosol-generating procedures; therefore, dealing with a COVID-19 positive or PUI requires regular contact and droplet precautions.[7] *This includes the use of a surgical mask, eye protection, surgical gown, and double glove for personnel involved in performing these procedures.*
- The use of N95 (FFP3) masks or similar powered air-purifying respirator (PAPR) is not generally needed but may be considered for prolonged close contact with a positive patient in a closed setting.[8] Given the shortage of respirator masks, the N95 or FFP3 mask should be conserved for aerosol-generating procedures such as tracheal intubation and extubation.[9; 10]
- Importantly, all patients should wear a surgical mask to restrict the droplet spread.[11]
- Avoid high-flow oxygen using nasal prongs as this can lead to the dispersion of droplets and possible aerosol generation.[12]
- If the patient needs supplemental oxygen, an oxygen mask should be preferred over the nasal prongs.
- The flow of supplemental oxygen should be kept to the minimum needed to maintain oxygen saturation, to reduce the risk of aerosolization.
- The surgical mask can be used over the oxygen mask to limit the dispersion of droplets.
- The regional anesthesia procedure for a COVID-19 or PUI patient should be performed in the operating room or labor room for an obstetric patient. The use of common areas, such as a block room or a holding area, should be avoided as it may lead to cross-infection.
- The most experienced person should perform the regional anesthesia technique. The donning of personal protective equipment should occur before entering the room.

Equipment

- The required equipment and drugs should be prepared and packed in a plastic bag before the procedure.
- The ultrasound equipment, including an ultrasound transducer, should be protected from contamination using plastic covers. Bringing a cart or trolley with drugs and equipment to the procedure room should be discouraged.
- The number of personnel present during the performance of the procedure should be minimized, but help should be readily available.

Spinal Anesthesia and Epidural Analgesia

- Although there is limited evidence, the use of spinal anesthesia is not contraindicated for a COVID-19 positive or PUI.[13] The routine indications and contraindications for spinal anesthesia apply when dealing with PUI or COVID-19 positive patients.
- Caution should be exercised when attempting to reduce the duration of the spinal anesthetic by using short-acting spinal anesthetics or reducing the dose of the spinal anesthetic agent as conversion to GA is least desirable.
- It is advisable to rule out thrombocytopenia as there is preliminary evidence to suggest that it might occur in patients with severe COVID-19 disease.[14]

- The routine asepsis technique should be followed. A laboratory study indicated that COVID-19 virus particles are viable for longer on plastic than cardboard; the change in practice to sterile paper drapes instead of plastic ones may be considered only if available.[15]
- As the virus has been isolated from cerebrospinal fluid (CSF) in patients who suffered from COVID-19 encephalitis, an attempt should be made to reduce contamination by not allowing the CSF to drip freely after lumbar puncture.[16]
- Currently, no dose adjustment of spinal anesthesia or adjuvant opioids is recommended. However, a change to the epidural infusion regimen may be needed to reduce the need for additional top-up doses that require frequent patient contact.
- Although we have not observed the susceptibility of COVID-19 positive parturient to hypotension following neuraxial technique, a single, small case series suggests the possibility of excessive intraoperative hypotension when prophylactic vasopressors were not used.[17]
- The anesthesia provider should be prepared with the strategies to deal with hypotension following neuraxial procedures.[18]
- If resources enable, care of COVID-19 positive patients should be provided in a negative pressure room.
- All the charting and electronic recordings should be accessible to do from outside the room if possible.
- The disposal of consumables used after the procedure should be carefully done to avoid any risk of transmission.

Management of PDPH

- There is currently no guidance available for the management of post-dural puncture headache (PDPH) in a patient with COVID-19. Conservative measures should be tried first.
- Nasal sphenopalatine ganglion block is likely an aerosol-generating procedure as it involves an injection/insertion into the nasal cavity and increases the risk of COVID-19 transmission to health care professionals. Therefore, it should be avoided in COVID-19 positive patients.
- There is obvious concern about injecting viremic blood in epidural space if an epidural blood patch is needed, especially during an active illness. It might be preferable to postpone the blood patch until recovery from the infection. However, if the headache is severe and debilitating, the epidural blood patch could be performed, balancing the risk of neurological complications associated with severe untreated headache against the theoretical risk of injecting viremic blood in the epidural space.

Peripheral Nerve Block

- The preparation and asepsis should be similar to that followed for the neuraxial procedure. If possible, attempts should be made to choose the block that is least likely to interfere with respiratory function. In other words, axillary or infraclavicular brachial plexus block should be chosen over supraclavicular brachial plexus block, and superior trunk block or other alternatives are preferred over interscalene block.
- The pre-procedural sedation dose may need to be reduced to avoid any respiratory compromise requiring supplemental oxygen.
- A safe dose of local anesthetics (LA) should be calculated and used; the blocks should be performed with ultrasound guidance to reduce the risk of local anesthetic systemic toxicity (LAST).[19]
- The benefit of perineural adjuvants must be balanced against the risks of possible immunosuppression (dexamethasone), sedation, bradycardia and hypotension (clonidine and dexmedetomidine), drug errors, and drug contamination.
- The decision to insert and maintain perineural catheters needs to be made on a case-by-case basis. While continuous catheter techniques can be labor and resource intensive and may require frequent patient contact, the opioid-sparing effect of regional anesthesia can be

beneficial to a patient with respiratory morbidity. Hence, the use of inpatient perineural catheters should be evaluated based on patient needs and available resources. Ambulatory perineural catheters may still be utilized with clear patient instructions.

- Similarly, the risk-benefit of analgesic peripheral nerve blocks and fascial plane blocks also should be evaluated on a case-by-case basis. If the block is performed under GA and requires repositioning of the patient, there is a risk of tracheal tube disconnection or dislodgement. Therefore, it may be advisable to choose a block that does not require patient repositioning (e.g. TAP blocks) over those that require repositioning (eg, erector spinae block), if appropriate.
- In general, any additional analgesic block procedures should be avoided if adequate analgesia can be achieved using alternate regimens such as systemic analgesia.

Monitoring and Conduct

- Both neuraxial anesthesia and peripheral nerve block should be thoroughly tested for block success before proceeding with surgery to minimize the need for conversion to GA. In the case of peripheral nerve block, extra onset time should be allowed to reduce the risk of conversion. If intraoperative conversion to GA is required, the emergency airway procedure should be followed, as described in the literature.[20]
- Excessive or deep sedation should be avoided to reduce the need for any airway manipulation or interventions.
- The patient should wear a surgical mask at all times throughout the procedure.

End of Case

- The patient should be monitored in the operating room until safe and before transfer to a COVID-19-designated area of the hospital, as per local guidelines.
- It has been shown that the risk of transmission is highest during the doffing of personal protective equipment (PPE). Extra time should be allowed for donning and doffing.
- The presence of an observer during the donning and doffing procedure is highly recommended. Simulation sessions should be conducted for training staff in donning and doffing of PPE.[6]
- Any reusable equipment utilized during the procedure should be disinfected as per institutional guidelines.

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