Regional Guidelines for Anesthesia During the COVID-19 Pandemic

Definitions

Low risk patients - this group includes those with:

1) No symptoms of cough, fever, respiratory distress or malaise
2) No infectious contacts
3) NO self-isolating
4) No confirmed or pending COVID-19 swab result
5) Coming from an area of low community transmission or prevalence

Highest risk patients – this group includes those with:

1) Positive test for COVID-19
2) Symptoms consistent with infection and/or those with a known positive contact
3) Under investigation (PUI) for COVID-19

Fitted respirator - a device that is tested and certified by procedures established by testing and certification agencies recognized by the authority having jurisdiction and is used to protect the user from inhaling a hazardous atmosphere. Types of respirators used in health care facilities are tight fitting N95 (disposable) respirator and Elastomeric (reusable) Respirator and loose fitting Powered Air Purifying Respirator. If utilizing a respirator that is not a N95 (most common) it must be an appropriate alternative providing **equivalent** respiratory protection.

Fitted respirator instructions for use:

- N95 respirators are doffed between cases and must not be reused.
- Used N95s to be placed in the purple bag on the unit for reprocessing unless the respirator is visibly soiled.
- Makeup should not be worn when using an N95 as this soils the respirator and it cannot be reprocessed.
- Elastomeric respirators can be reused after doffing as long as proper cleaning protocol is followed between usage.

Introduction

Airway manipulation including intubation and manual ventilation during General Anesthesia constitute Aerosol-Generating-Medical-Procedures (AGMPs).
AGMPs carry the highest risk of transmission. Only experienced practitioners should be managing airways in high-risk patients.

List of AGMPs requiring a fitted respirator as defined above for COVID-19 patients and those under investigation (as per BCCDC interim guidelines):

- Bag valve mask ventilation
- CPR with bag valve mask ventilation
- Bronchoscopy and BAL
- CPAP or BiPAP
- Intubation and Extubation
- Nebulized therapy
- Open airway suctioning
- Sputum induction

In addition to these, high flow nasal oxygen (e.g. Optiflow) is not currently recommended in the OR/ PACU.

Droplet and contact precautions should be used by all healthcare workers providing any direct care to any patient anywhere in the hospital, whether suspected of COVID-19 or not. (Provincial Health Officer 25 March 2020).

All patients coming to the OR should wear a surgical mask.

Airborne PPE including fitted respirator, face shield, surgical hat, gown, non-sterile gloves and shoe-covering or non-permeable waterproof washable shoes as per local and provincial PPE are mandatory for all AGMPs in known or high-risk COVID-19 patients. It is recommended that airborne precautions, with a fitted respirator are used by everyone in the OR when there is a COVID-19 positive ventilated patient in the room with a risk of a ventilator circuit disconnect. Surgeons should use their own guidelines and recommendations for PPE use in the OR.

The anaesthetists at their discretion in known or high-risk COVID-19 cases, if available, can wear neck protection. If the anaesthetists chooses to use neck protection – pay special attention during doffing
(Please note – The use of neck protection is not consistent with the provincial or NH infection control guidelines)

Training in the safe donning and doffing of PPE is essential. Use only respirators for which the user has been successfully fit tested as required by regulation.

Low Risk Group: those not identified as high risk of COVID-19

General Principles:

This group includes those with:

1) No symptoms of cough, fever, respiratory distress or malaise
2) No infectious contacts
3) Not self-isolating
4) No confirmed or pending COVID-19 swab result
5) Coming from an area of low community transmission or prevalence

The BCCDC currently recommends a fitted respirator be worn by all OR staff for all procedures (except those performed under spinal or local anesthetics) until July 7th, when these guidelines are likely to change. This extensive use of fitted respirators in asymptomatic patients is unlikely to be sustainable with ongoing challenges in PPE supply.

If there is not enough fitted respirators for all OR staff to use for **high-risk patients**, then follow the posted signage on OR door of wait time (frequency of air changes at the local facility OR) required that should be allowed after intubation before other team members enter the OR with droplet and contact precautions.

If a waiting period post airway management is not possible or impractical based on the urgency of the procedure or O.R. efficiency time pressure, the whole team should wear a fitted respirator. Each facility should weigh the use of PPE against optimal O.R. efficiency with the overall guiding principle of staff safety.

Regardless of above, anesthesia provider and their airway assistant should use a fitted respirator or equivalent for all AGMPs during the COVID-19 pandemic.

In LOW RISK PATIENTS, the OR team may use elastomeric respirators that can be reused after doffing as long as proper cleaning protocol is followed between usage.

Anesthesia specific considerations:

- Consider neuraxial or regional technique if appropriate. All patients coming to the OR should wear a surgical mask. Patients for neuraxial or regional blocks should wear a surgical mask for the duration of the procedure. Supplement O2 can be delivered under these masks.

- Minimize staff in OR during intubation and extubation or LMA removal – ideally only anesthesia provider and assistant is in the OR with a runner immediately available outside the OR.

- Avoid BVM if possible. If BVM necessary, use 2- handed technique +/- OPA with assistant to bag with low tidal volumes.

- Use single-use LMAs if available.

- Always have HMEF attached directly to tube or LMA distal to elbow.

- Connect gas sample line to elbow attachment rather than HMEF.

- Keep HMEF on tube/ LMA or clamp tube before circuit disconnection and pause gas flow prior to any circuit disconnection.

- Avoid nasopharyngeal/ oropharyngeal temperature probes

- Remove LMA/ETT before transfer to recovery. For patients who need additional airway support after extubation, nasopharyngeal airway may be preferable to oropharyngeal airway as they are less likely to cause gag or cough.

- Post extubation and moving to the recovery area, there needs to be a period of 30-45 minutes before preparing the OR for the next OR case if the same room is going to be used allowing for airflow clearance of potential particles.

- Recommended by the BCCDC that cleaning staff wear airborne precautions.

Highest risk group: Patient has positive test for COVID-19, symptoms consistent with infection and/or has a known contact, or the patient is under investigation (PUI) for COVID-19

If a patient has symptoms but no confirmed diagnosis and surgery can be delayed, the patient should be swabbed for COVID-19, and the result obtained before proceeding or surgery should be delayed for 14 days from symptom onset if no testing is available and it is feasible to wait for 14 days.

Preparation for OR:

- Dedicated COVID-19 OR to be identified if possible.
  - Airflow exchanges should be posted on each OR so staff/physicians are aware as local airflow exchange rates that will impact wait times for clearance. Facility Management staff can provide airflow exchange rates for each OR, with this information see airflow guidance at the end of this document.

- Prepare OR with all surgical and anesthetic equipment prior to patient arrival in OR. Cover the anesthetic machine with a surgical drape that can be discarded later.

- Donning (putting on) - should occur outside OR if there is no anteroom or changing area, with a checklist (ideally) and a spotter checking proper application.

- High-risk patient should wear surgical mask (not a fitted respirator) for transfer to and from the OR.

- Patient should be transferred directly to OR. They should not be checked into Day Surgery or usual check in place first. Seen in OR by nursing, surgeon, and anesthesia.

- Contact and droplet precautions are recommended for non-aerosol generating procedures (patient assessment, IV insertion, monitor attachment). Scrub nurse stays with patient while anesthetist and assistant don PPE.

- Full briefing, introductions and role identification of all team members outside OR prior to induction.

- Anesthetist and dedicated airway assistant (RN) don airborne PPE outside OR. Dedicated PPE observer for donning and doffing is ideal. Make sure you have a PPE checklist to work from for safe practice.

- Anesthesia equipment checklist completed (see below).

- Anesthesia cart to be kept outside the OR and drawers removed from anesthetic machine.

- Dedicated runner should be available outside OR door.

Anesthesia specific considerations for high-risk patients:

- Plan to hand- off cellphone. It is difficult to use in PPE.

- Consider neuraxial or regional anesthesia to minimise AGMP. Regional technique will require contact and droplet precautions as a minimum. Use adjustable table and pillows to optimise position and reduce risk to support person.

- Only anesthetist and assistant in OR during induction/intubation and extubation. Assistant should stay with anesthetist throughout the case.

- Avoid bag valve mask (BVM) ventilation if possible. Consider iGel or LMA if rescue oxygenation needed. If BVM necessary for rescue oxygenation, use 2-handed technique with assistant delivering low-pressure ventilation.

- Always have HME filter (HMEF) attached directly to tube distal to elbow.

- Connect gas sample line to elbow attachment rather than HMEF.

- Plan for modified RSI even in fasted patients, with rocuronium or succinylcholine in dosing appropriate for RSI.

- Use of video-laryngoscopy may limit distance from patient and is recommended.

- Pass ETT 1-2cm beyond cords. Auscultation is not possible in full PPE. Capnography is mandatory as per CAS guidelines.

- After intubation, assistant holds ETT in place and cuff is inflated immediately. ETT secured. (Consider 2% lidocaine for cuff inflation).

- Anesthetist to remove outer gloves before touching bag or ventilator. Patient NOT to be ventilated until cuff is inflated.

- Use outer glove to cover laryngoscope blade to minimize contamination from secretions. Inner gloves should be sanitized with alcohol get and clean outer gloves donned as soon as possible.

- Tape HMEF to ETT to reduce the risk of accidental disconnection. Check all connections are tight.

- After intubation, airborne PPE required for all staff entering a room with a ventilated COVID-19 patient in case of ventilator disconnection.

- Surgeons should follow their own guidelines on PPE use in OR.

- Clamp ETT and pause gas flow whenever disconnected from circuit, e.g. for positioning or transfer. Clamp needs to be available throughout case. Any disconnections that take place should leave HMEF attached to ETT.

- If ETT suctioning required, inline closed suction unit is mandatory.

- Avoid nasal/oral temperature probe.

- In case of difficult airway, follow standard difficult airway algorithm. If emergency ront of neck access is needed, use #10 scalpel, bougie, #6.0 ETT cricothyroidotomy technique. Use rocuronium to paralyse patient if doing a surgical airway.

- Extubation is also an AGMP. Consider deep extubation at the end of case in airborne PPE. Limit the number of people in the OR. For extubation, only the anesthetist and airway assistant in the room.

- Consider remifentanil or lidocaine IV as adjuncts to reduce the risk of coughing on extubation. Turn the patient's head away from operator or provide a screen to block potential droplet particles during extubation if possible.

Recovery

- All high-risk patients should be recovered in the OR, not in PACU.

- Dedicate an area in the OR for doffing (taking off) dirty PPE after patient is recovered. Remove all PPE inside the OR apart from the fitted respirator that should be removed OUTSIDE the OR. Scrubs should be changed as soon as possible. Shower in changing room if available or as preferred.

- Post extubation wait appropriate amount of time before anyone enters the OR for cleaning and preparation for the next case in that room.
  - *Be aware of local airflow exchange rates that will impact wait times for clearance. See airflow guidance at the end of this document

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Obstetrics - anesthesia for confirmed or high risk COVID-19 patients

Drafted by Dr Jamil Akhtar Head of Anesthesia UHNBC and Dr Robin Johnson Head of Obstetrics UHNBC. Guidelines are based on expert opinion and published recommendations from the WHO and CDC.

Some general considerations for LDR: To be implemented during pre-hospital screening

- For elective procedures (e.g. planned cesarean delivery, elective induction of labor, cerclage). Patients should be phoned the night before to screen for symptoms consistent with COVID-19. Screening of the planned support person(s) should be included in this call by the LDR Nurse

Staff, Training & Equipment

- Plan and minimize who will be in the room to care for the COVID-19 patient during labor and at delivery and cesarean delivery. In COVID-19 positive or suspected positive a decision around presence of spouse should be discussed early and consideration should be given to not allow spouse in the room.

- Simulate scenarios for the care of a COVID-19 patient, including the donning and doffing of PPE, transport to the OR, and patient arriving in LDR with symptoms concerning for COVID-19.

- Create COVID-19 Carts with all equipment including drugs for labor analgesia and cesarean delivery that would minimize the risks in LDR as well as in Operating Room. Recommend epidural carts remain in the hallway during epidural procedures to prevent contamination in a patient room for COVID-19 positive or person under investigation (PUI) patients

- Limit visitors/support people for suspected and confirmed COVID-19 patients per hospital policy

Anesthesia Specific Considerations

These general recommendations are for women who have tested positive for COVID19 or who are suspected.

- Admit to isolation room if possible, preferably a negative pressure room, and limit the number of care providers to the strictest minimum

- All healthcare workers should implement droplet and contact precautions with eye protection upon entering delivery room (gown, gloves, mask, and face shield)

- Donning and doffing takes time. Avoid crash situations by anticipating needs

- Early epidural analgesia may reduce the need for general anesthesia for emergent cesarean delivery

- COVID-19 diagnosis itself is NOT considered a contraindication for neuraxial anesthesia. Ensure platelet count is adequate.

- Avoid emergent cesarean deliveries as much as possible. Proactively communicate with obstetrical and nursing teams. For respiratory distress, intubate early using appropriate PPE

- Minimize the number of personnel in the room.

- Neonatal resuscitation team should be outside the OR, ready to receive neonate and take to a dedicated area for assessment and resuscitation

- Prior to entering the operating room, regardless of the type of anesthesia, Anesthesia providers and necessary assistants should implement droplet and contact precautions with eye protection and ideally airborne precautions in the light of the risk of converting to a general (gown, gloves, and ideally a fitted respirator with face shield).

- Use donning and doffing checklists and trained observers. Double glove for ALL procedures and replace the outer layer of gloves after epidural/spinal placement or intubation.

- If GA indicated, ALL personnel in the OR at the time of intubation should wear airborne PPE with fitted respirator. Minimize to only essential personnel during intubation and use your best judgement, while making sure you have some assistance readily available.

- Pre-oxygenation should occur with a circuit filter on mask.

- Avoid BVM if possible.

- Use a closed suction system (if possible). Consider using a video laryngoscope if available to minimize being too close in contact with patient's face.

- Extubation is an equally, if not more significant risk therefore minimize personnel, utilize fitted respirator and PPE precautions. Limit the number of people in the OR. For extubation, only the anesthetist and airway assistant in the room.

- If proceeding with extubation at the end of case, extubate in the OR, keep PPE (including fitted respirator) on until after extubation. If possible, turn patient's face away from direction of operator or provide a barrier to block potential droplets on extubation.

- Antiemetic should be administered to prevent vomiting in patients undergoing cesarean delivery. However, due to potential risks of steroids in the setting of COVID-19 infection, avoid the use of dexamethasone for PONV prophylaxis in PUI/COVID-19 positive patients.

- There is currently insufficient information about the cleaning, filtering, and potential aerosolization of nitrous oxide in labor analgesia systems in the setting of COVID-19. Aim to avoid the use of N2O2 in all patients due to COVID-19 until further notice.

APPROPRIATE PPE FOR CARING FOR SUSPECTED/CONFIRMED COVID PATIENTS

CONTACT AND DROPLET
(no aerosol-generating procedures)

- **GOWN**
- **PROCEDURE MASK**
- **FACE SHIELD or GOGGLES**
- **GLOVES**

OPTIONAL: BOUFFANT (HEAD COVERING)

April 28, 2020

APPROPRIATE PPE FOR CARING FOR SUSPECTED/CONFIRMED COVID PATIENTS

AIRBORNE

(Aerosol-Generating Medical Procedures):

- **GOWN**
- **FITTED RESPIRATOR (N95 or EQUIVILANT)**
- **FACE SHIELD or GOGGLES**
- **GLOVES**
- **BOUFFANT (HEAD COVERING)**

April 28, 2020

Anesthesia equipment checklist

- ❑ Machine check

- ❑ IV access-cannula, tegaderm, alcoswab, gauze

- ❑ IV fluid and giving set

- ❑ DRUGS-should be prepared outside OR

- ❑ Induction agents
- ❑ Paralytics
- ❑ Vasopressor/ Vagolytic
- ❑ Narcotics
- ❑ Antiemetic
- ❑ Lidocaine

- ❑ Infusion pump

- ❑ Video-laryngoscope - Empty drawers before taking into OR
- ❑ Standard laryngoscope with MAC 3 and 4 blades
- ❑ Bougie
- ❑ ETT x2 in appropriate sizes
- ❑ Syringe and cuff pressure monitor
- ❑ Lubricant
- ❑ SGA (preferably second generation, single use e.g. I-gel) in appropriate size
- ❑ Face masks, OP and NP airways
- ❑ Elbow, gas sampling tube, HMEF in configuration as described above
- ❑ Tapes/ ties for tube fixation
- ❑ Scissors

- ❑ Tube holder

- ❑ Clamp (non-serrated) for use if disconnecting circuit

- ❑ 4x4 gauze

- ❑ Yankauer and suction unit

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *

ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8