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Canadian Anesthesiologists' Society

COVID-19 Recommendations during Airway Manipulation

Preamble

COVID-19 a novel corona virus, of which there are now seven known strains that affect humans. It was first diagnosed in Wuhan province, China in December of 2019 and subsequently spread. As of March 11, 2020, 88 countries worldwide were involved, infecting over 126,000 individuals (44,067 outside China). The case mortality rate is estimated at 2 – 4%. (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/

This guidance focuses on the management of the airway (also open suctioning of respiratory tract, bronchoscopy, and cardiopulmonary resuscitation) for patients with known or suspected COVID-19. Screening, contact precautions and general care of these patients prior to the need for airway manipulation are dealt with at length in other reports and we suggest reviewing the following:

- **Centres for Disease Control (CDC)** https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html? CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Finfection-control.html
- **Public Health Agency of Canada (PHAC)** https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html
- **World Health Organization (WHO)** (https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected

Preparing to Manage Patients with Known or Suspected COVID-19

All anesthesiologists who may anticipate caring for patients with COVID-19 should ensure that their health care facility has appropriate equipment to manage airborne precautions including appropriate N95 masks, full length gowns, face shields, gloves and surgical hats. ***In addition, team members should be properly N95 mask fit tested to ensure proper N95 mask selection and fitting. It is crucial this testing be completed well in advance of patient care.***

A designated area for the management of selected COVID-19 patients should be discussed and decided prior to treating any of these patients. ***The proper donning and doffing of Personal Protective Equipment (PPE) should be practised prior to the treatment of any patients***. Simulation of a COVID-19 patient in acute respiratory distress and requiring intubation may be warranted in either a high fidelity or low fidelity simulator.

Prior to Intubation

- The goal is to ensure that emergency intubation is avoided, that equipment and supplies for intubation, including Personal Protective Equipment (PPE) are accessible, and that the patient is in an appropriate room for intubation (avoid open areas, hallways etc.) including, if available, an Airborne Infection Isolation Room (AIIR), or a negative pressure room. Nasal cannula at 5l per

minute or less maybe used to provide supplemental oxygen to the COVID-19 patient in respiratory distress. There may be a risk of aerosolization using High flow nasal cannula (HFNC) or non-invasive positive pressure ventilation (NIV), but the risk posed by these devices is unclear5l oxygen by nasal cannula

- Appropriate room to intubate (isolation room, or isolated area)
- No Non-invasive ventilation, HFNC

Intubation

The goal is to minimize the time aerosolized virus can enter the room by minimizing/eliminating bag mask ventilation, and the time prior to securing the airway. Ensure PPE equipment is properly worn so any particles in the room do not contact health care workers directly.

- Wash hands- use an alcohol-based hand cleaner (over 60% alcohol) or soap and water if hands are visibly soiled.
- Place appropriate PPE including 1) Hat 2) Gown 3) N95 Mask 4) Face shield 5) Double gloves 6) Neck covering before entering the room - consider having a spotter to guide you during the donning and doffing procedure. The principal is to have no skin exposed during the intubation procedure and ensure when donning, consideration be given to ease of doffing to minimize the risk of contamination. A ANSI/AAMI level 3 or higher gown is suggested. (https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/medical-gowns)
- Ensure a minimal number of people are present.
- The person performing the intubation should be the most skilled available.
- Perform airway assessment with PPE on.
- Anticipate that visualization of the glottis may be impaired by the glare created by room lights on the face shield.
- Pre-oxygenate for 5 minutes on 100% oxygen when possible with patient spontaneously breathing (flows <5l minute, 100% oxygen)
- Avoid bag mask ventilation if possible, if not, use small tidal volumes and hold the mask with a two-handed technique. The principle is to minimize the leak around the mask which may aerosolize virus.
    - A quantitative CO2 monitor should be available to indicate adequate bag seal.
- Plan for modified rapid sequence induction (RSI) even in fasted patients
    - Rocuronium should be used to prevent coughing or bucking if a second look is necessary, using dosing appropriate for RSI (1.2mg/kg).
    - Consider induction with ketamine, or have vassopressors in the room (anticipate hemodynamic instability and limit movement into and out of the room during intubation)
    - Some guidelines suggest anti-emetics to reduce the risk of vomiting during airway manipulation.
    - Have suction available.
    - Plan for **NO** bag mask ventilation prior to intubation if possible, small tidal volume breaths if patient desaturates.
- ***Consider video laryngoscope for first attempt as it allows for an increase in distance between operator and patient.***
- If difficult airway suspected have adjuvants available.

    - Having an LMA or other supraglottic device available may be warranted as a supra glottic device is inferior to intubation but may be superior to bag mask for patients in the can't intubate can ventilate or can't intubate can't ventilate category.
- Have an end tidal CO2 monitor available (quantitative preferable) to ensure appropriate placement of ET tube.
- Use of hydrophobic/HEPA filter between the ET tube and ventilator/Laerdal bag.
- Consider taping the filter to the ET tube to reduce the risk of accidental disconnection.
- Immediate inflation of the cuff following ETT placement.
- When switching between methods of ventilation (when transferring to transport ventilator) consider clamping the ETT to limit aerosolization of respiratory secretions.
- Using one outer glove on one hand (for double glove technique only) cover the blade of the intubating device to limit aerosolization of the secretions.

Following intubation

- Dispose of any consumables in appropriate bins.
- Remove PPE as described below. Remember these items are now heavily contaminated and care must be taken not to transfer the contaminated surfaces to your skin, hands or face. We recommend washing hands at least twice as outlined below, and any time the hands are thought to be soiled.
- Always wash hands following the final removal of all PPE items, using alcohol-based cleaners, unless the hands are visibly soiled - soap and water should then be used. Ensure you do not touch your clothes skin or face with your hands prior to the final hand washing.

Uncertainties

As with any developing disease for which little information is available, approaches and guidelines/ recommendations may differ between groups. Several differences in recommendations are apparent as follows:

1. The use of an AIIRS or negative pressure room to perform intubations. This is recommended by the CDC and suggested by the WHO and PHAC. People with PPE equipment should be protected with or without negative pressure. The airflow out of a room, however, should determine the time required to reduce the risk from air contact precaution to droplet precaution. For positive pressure operating rooms the time to clear aerosol is unclear and ranges from 2-3 hours to 30 minutes depending on the number of air exchanges per hour. Thus, use of N95 masks in a patient room may still be warranted immediately after intubation and for a period after until it is felt that the risk of airborne particles is gone. https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1.

2. The Anesthesia Patient Safety foundation suggests the use of Powered Air-Purifying Respirators (PAPRs), given that, for the SARS outbreak, health care workers using N95 masks were infected. While this is true, subsequent studies suggested that proper use of N95 masks may not have been universal and contact with infected patients may have occurred prior to wearing PPE. (see Br J Anaesth. 2020 Feb 27. pii: S0007-0912(20)30098-2. doi: 10.1016/j.bja.2020.02.008. [Epub ahead of print). Both CDC, WHO, and PHAC all suggest N95 masks are sufficient to prevent spread and is included in this recommendation. ***This however highlights the need to be***

properly mask fit tested for N95 masks, and practise proper donning and doffing techniques along with proper handwashing techniques.

Proper Donning and Doffing of PPE

Public Health Ontario suggests that when using a surgical hat, placing and removing the hat would occur with Step 4) Face mask/eye protection https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf

References

As new information becomes available, we will update our recommendations. We also strongly suggest the following References:

1. (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/)
2. https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhcp%2Finfection-control.html
3. https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html
4. (https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected
5. https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-occupational-health/coronavirus
6. https://www.apsf.org/news-updates/perioperative-considerations-for-the-2019-novel-coronavirus-COVID-19/
7. Br J Anaesth. 2020 Feb 27. pii: S0007-0912(20)30098-2. doi: 10.1016/j.bja.2020.02.008. [Epub ahead of print]
8. Lancet Respir Med. 2020 Feb 24. pii: S2213-2600(20)30084-9. doi: 10.1016/S2213-2600(20)30084-9. [Epub ahead of print]
9. Caputo KM, Byrick R, Chapman MG, Orser BJ, Orser BA (2006) Intubation of SARS patients: infection and perspectives of healthcare workers. Can J Anaesth, 53(2):122-9. https://link.springer.com/content/pdf/10.1007/s12630-020-01591-x.pdf
10. https://www.cdc.gov/coronavirus/2019-ncov/index.html
11. https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1
12. https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf
13. https://www.anesthesia.utoronto.ca/news/coronavirus-and-safety-precautions
14. https://www.publichealthontario.ca/-/media/documents/lanyard-removing-putting-on-ppe.pdf?la=en
15. https://www.publichealthontario.ca/-/media/documents/rpap-recommeded-ppe-steps.pdf?la=en