RÉSEAU DE SANTÉ Horizon HEALTH NETWORK

Infection Prevention and Control Guidance: Aerosol Generating Medical Procedures (AGMPs) During COVID-19 Pandemic

Date Issued: June 5, 2020
Revised: February 24, 2023
Version 3.0

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Note: this guidance may be modified as new evidence is reviewed.

BACKGROUND:
COVID-19 is contracted primarily by close person-to-person respiratory transmission with entry points confined to the mouth, nose, and eyes. Understanding the transmission dynamics of respiratory infection has evolved significantly over the COVID-19 pandemic. Most viral respiratory infections were thought to be transmitted by large droplets (> 5 microns) landing on mucous membranes over short distances. while some respiratory pathogens (measles, varicella, mycobacteria) were spread by inhalation of small particles (< 5 microns), defined as aerosols, which remain infectious and suspended in the air over long distances and time. It is now recognized that this framework was overly simplistic, and that most transmission of respiratory viruses occurs through inhalation of respiratory particles with a wide continuum of particle sizes. Risk of transmission increases with the concentration of aerosol particles, with increased particle concentrations seen with loud talking, singing, coughing, sneezing, and increased respiratory rate. Risk of transmission also increases with proximity (particularly within a two-metre radius), and with duration of exposure. Although respiratory particles can remain suspended for long time periods, particle infectivity appears to rapidly decline over time. Most infections therefore occur by short range inhalation of a wide range of particle sizes, while long range 'airborne' transmission is not a major transmission pathway.

An AGMP is a medical procedure that typically involves manipulation of the respiratory tract and has the potential to generate large numbers of respiratory particles. The list of procedures categorized as AGMP's has evolved during the pandemic and these changes are reflected in this guidance document. This list includes procedures where epidemiologic studies involving patients with SARS-CoV-1 or SARS-CoV-2, have supported an increased risk (tracheostomy surgery, airway suctioning, bronchoscopy, intubation, manual ventilation, and nebulizer use). The other listed procedures are based upon expert opinion. Because AGMP's are associated with increased aerosol particle concentrations, Full Precautions (gown, gloves, eye protection and a fit-tested N95 respirator) are required during these procedures and must continue until the air clearance time has elapsed for the room in which the procedure has occurred. Air clearance time is defined as the time required for 99% aerosol dilution. AGMP's may be performed in an airborne infection isolation room, a single room with the door closed, or failing this, a single stretcher/bed with the curtains drawn. Because long-range airborne transmission of COVID-19 is not a major transmission pathway, bi-directional traffic can occur in a room where an AGMP has occurred prior to air clearance time, as long as Full Precautions are followed within the room. The number of persons entering such a room should be minimized to reduce the number of persons exposed, not because of the risk of long-range aerosol distribution outside of the room in question.

While the potential risk of long-range airborne transmission of COVID-19 has been clarified as unlikely during the pandemic, the risk of short-range aerosol transmission has been highlighted. Medical grade face masks have generally performed well during the routine management of patients with respiratory viral infection, with five randomized controlled trials concluding that medical masks were non-inferior to N95 respirators. The lack of a tight seal on medical masks may make them inadequate in settings where there are high respiratory particle concentrations. Given this uncertainty, the Public Health Agency of Canada now recommends that a fit-tested

N95 respirator not only be used during AGMP's, but also in settings where AGMP's are frequent (e.g., critical care areas, COVID-19 units etc.) and "may be considered in other circumstances under which the risk of exposure to aerosolized virus may occur". This permissive approach to N95 respirator use has been adopted in New Brunswick healthcare facilities as a precautionary measure since February of 2022 IPC Guidance: Continuous Use of N95 Respirators/ Face Masks and Eye Protection in Healthcare Settings During COVID-19 Pandemic (All Phases).

Transmission can also occur when hands become contaminated with respiratory secretions through direct contact with another person, or through indirect contact with contaminated surfaces (fomites), followed by inoculation when touching one's eyes, nose, or mouth. The potential for inoculation of mucous membranes through contact or respiratory particles highlights the importance of hand hygiene and ocular protection, in addition to a medical grade face mask or N95 respirator.

STRATEGIES FOR AGMP RISK REDUCTION:

1. Avoid performing unnecessary AGMPs.
2. Anticipate and plan for AGMPs.
3. Use sedation/paralytic agents to minimize the risk of aerosolization during some AGMPs such as intubation.
4. Utilize closed endotracheal suction systems for intubated patients and avoid opening the ventilator circuit.
5. Utilize an antibacterial/antiviral filter between the resuscitator bag and the endotracheal tube and on the expiratory circuit of ventilators.
6. Minimize number of HCWs in the room during an AGMP and ensure all HCWs follow Full Precautions (which include an N95 respirator, gloves, gown, and eye protection (goggles/ face shield/gasketed prescription eyewear).
7. Clearly identify room entry sites with a Full Precautions isolation sign, if there is a possible or known risk of an AGMP for a patient admitted with COVID-19. Isolation signage is not to be removed until the room has been cleaned.
8. Ensure signs describing appropriate donning and doffing of PPE are visible at the entryway for all rooms with COVID-19 patients and ensure a buddy system is used to confirm safe doffing of PPE.
9. Ensure point of care risk assessment (PCRA) is performed prior to every patient contact.
10. During an emergency situation where clinical assessment is impossible, an N95 respirator should be utilized for patients that may require an AGMP.

AGMP ENVIRONMENTAL CONTROLS:

1. Patients with suspect/confirmed COVID-19 should be cared for in a single room. The use of an Airborne Infection Isolation Room (AIIR) is the recommended standard of care when performing an AGMP. If an AIIR is not available, a single room with the door closed should be used for the procedure. Transferring a suspect/confirmed COVID-19 patient to an AIIR can be associated with increased risk to the patient under care, HCW's, other patients and the healthcare environment.
2. When a single room is unavailable and an AGMP is urgently required on a suspect/confirmed COVID-19 patient, draw privacy curtains, remove shared equipment, and minimize HCW entry.
3. After an AGMP is performed, avoid when possible opening doorway until 99% aerosol dilution has occurred. This will vary from room to room and Facilities Engineering & Property Management (FEPM)

should be contacted to determine air clearance time. Where unable to confirm, assume this is a 3-hour time period. Air clearance time may vary from 15 minutes to 3 hours depending upon ventilation system. When a supplemental HEPA scrubber is used the air clearance time must be determined by FEPM.

4. Do not enter or leave the room, unless necessary, until the number of air changes required per hour to remove airborne microorganisms following the AGMP have elapsed. If HCWs must enter/leave the single room before airway clearance is achieved, they must open and close the door slowly to minimize air drag and follow Full Precautions.

AGMP List*:

(Full Precautions and the use of an Airborne Infection Isolation Room (AIIR) is the standard of care when performing an AGMP for suspect/confirmed COVID-19 patients. A single room with the door closed is an acceptable alternative.)

- endotracheal intubation/extubation/supraglottic airway and related procedures (e.g., open endotracheal suctioning)
- bag mask ventilation
- bronchoscopy/bronchoalveolar lavage
- surgical airway (tracheotomy)
- tracheostomy tube/laryngectomy tube with procedure/manipulation
- non-invasive positive pressure ventilation (BiPAP and CPAP)
- post-mortem procedures on respiratory tissue.
- nasopharyngeal endoscopy /laryngoscopy procedures with irrigation or high-pressure suction
- sputum induction/nebulizer therapy/aerosolized medication administration
- high-flow nasal cannula (OPTIFLOW, AIRVO or equivalent)
- specific dental procedures such as high-speed drilling
- oropharyngeal, trans-sphenoidal and chest surgery
- high frequency oscillatory ventilation
- cardiopulmonary resuscitation (CPR) when accompanied by intubation or manual ventilation. (CPR and defibrillation NOT an AGMP)
- mechanical cough assist device, mechanical insufflation/exsufflation, breath stacking, cough assist or deep suctioning)

*This list of AGMPs is not exhaustive and will be modified as data evolves.

Examples of procedures that are not AGMPs**:

- collection of nasopharyngeal or throat swab
- chest tube removal/insertion (except in setting of pneumothorax)
- coughing/sneezing
- oral suctioning/hygiene
- colonoscopy
- laparoscopy
- cardiac stress test
- procedures done under regional anesthesia

- bronchial artery embolization
- percutaneous biopsy of lung mass
- low-flow oxygen (e.g., nasal prongs at 1-6L/min, OxyMask at 1-15L/min)
- oropharyngeal dysphagia procedures
- cough reflex testing
- bone marrow aspiration
- open wounds of the airway (including face, neck and/or chest)
- nasogastric tube insertion
- upper GI endoscopy
- transesophageal echocardiography
- nasopharyngoscopy/laryngoscopy procedures
- mechanical ventilation with filtered air and closed system

**N95 respirators are strongly recommended while caring for suspect/proven COVID-19 patients when the PCRA indicates a high risk of transmission (e.g., close contact over a prolonged period with a patient with frequent coughing, respiratory distress etc.).

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