

Aerosol-generating Medical Procedures

April 23,
2020

Analysis

Due to the SARS-CoV-2 pandemic, several procedures that were previously not considered as aerosol-generating medical procedures (AGMPs) per se are now classified as such by various medical societies. Evidence-based studies are not available to classify many of these procedures as AGMPs, although the rationale for doing so is quite strong. Because of how AGMPs affect the required type of personal protective equipment (PPE)—especially N95 masks—and access to negative pressure chambers and COVID-19-dedicated operating rooms, Comité sur les infections nosocomiales du Québec (CINQ) proposes the following classification. The classification is primarily based on the evidence review conducted by Unité d'évaluation des technologies et des méthodes d'intervention en santé (UETMIS) at CHU de Québec-Université Laval.

Classification

The following AGMPs are associated with a **recognized risk**¹ of transmission of infectious aerosols:

- Bronchoscopy
- Tracheal intubation and extubation
- Cardiopulmonary resuscitation²
- Manual ventilation before intubation
- Open airway suctioning of an intubated or tracheotomy patient's airway secretions
- Sputum induction
- Nasopharyngeal suction in children
- Autopsy
- Any nasal or oropharyngeal surgery in confirmed cases of COVID-19

¹ The term "recognized risks" refers to interventions that have been listed for several years as being associated with an increased risk of transmission of airborne infections such as tuberculosis, and are recognized as such by the medical community.

² Based on a UETMIS analysis, chest compressions performed as part of cardiopulmonary resuscitation have been classified as an AGMP associated with an uncertain and poorly documented risk.

The following AGMPs are associated with a possible risk of transmission of infectious aerosols:

- Non-invasive, positive-pressure ventilation with a facemask (e.g., BiPAP, CPAP)
- Tracheotomy and tracheostomy care³

The following AGMPs are associated with an uncertain or undocumented risk of transmission of infectious aerosols:

- High-flow nasal oxygen therapy (e.g., Optiflow)
- Digestive endoscopy procedures
- Transesophageal echography
- Insertion of a thoracic drain
- Ophthalmological procedures
- Laryngoscopy
- Nebulization treatments (controversial as to the possibility of increasing the risk of infectious transmission)

The following AGMPs are associated with a low risk of transmitting infectious aerosols:

- Conventional oxygen therapy with a face mask (e.g., Ventimask).
 - It appears unlikely that surgical procedures or procedures where the site of entry does not contain virus (e.g., thrombectomy via the groin, laparoscopy without entry into the intestine) will generate infectious aerosols of COVID-19, as opposed to known sites containing high concentrations of virus (e.g., nasopharynx, oropharynx). However in the case of laparoscopies, there are recommendations on CO₂ insufflation and evacuation pressure, smoke evacuation pressure, etc. They are available for consultation on the INSPQ website <https://www.inspq.qc.ca/covid-19> (UETMIS document [French only]: *Risque de transmission virale par voie aérienne en chirurgies abdominales et thoraciques par laparoscopie*).

Nasopharyngeal swabbing is not an AGMP in either adults or children.

Recommendations

Because of the impact that AGMPs have on the type of personal protective equipment (PPE) required, especially N95 respirators, and on access to negative pressure chambers and COVID-19-dedicated operating rooms, Comité sur les infections nosocomiales du Québec proposes the following AGMP risk scale based on the work by UETMIS:

- AGMPs with a recognized risk or possible risk of transmission of infectious aerosols require additional airborne/contact precautions, including eye protection.
- AGMPs with an uncertain, undocumented, or low risk of transmission require additional droplet/contact precautions including eye protection, but an assessment of the aerosolization risk must be made locally on a case-by-case basis and according to the type of AGMP.

³ Percutaneous tracheotomies should be performed rather than open tracheotomies: possible risk, but poorly documented according to the data review.

Given the possibility of increased transmission during these procedures:

- Only perform procedures that are absolutely necessary.
- Attempt to delay AGMPs until the patient can no longer be contagious for COVID-19.
- When possible, schedule AGMPs in advance to avoid emergency procedures.
- Only permit experienced and essential healthcare workers in the room where the procedure is performed.
- In addition to the recommended personal protective equipment, wear a long-sleeved, disposable, waterproof, single-use gown.
- A visor is recommended as a first choice rather than goggles for AGMPs of known or possible risk (except nasopharyngeal aspiration in children).
- Wait the required amount of time (number of air changes/hour for a removal level of 99.9%), depending on how the room is ventilated, before entering the room without PPE.

Scope of recommendations

These recommendations apply to AGMPs conducted on patients with suspected or confirmed cases of COVID-19. In situations of ongoing community transmission, a risk assessment should be conducted to determine whether the recommendations can also be applied to AGMPs performed on individuals not known to be infected with COVID-19 or who are asymptomatic.

References

Public Health Agency of Canada, Canadian Thoracic Society, and Canadian Lung Association. Canadian respiratory guidelines.

L'Espérance, S., Asselin, G., Nourrissat, A., Rhainds, M. (2020a), *Interventions médicales générant des aérosols (IMGA)* Unité d'évaluation des technologies et des modes d'intervention (UETMIS), CHU de Québec-Université Laval, March 30, 2020.

L'Espérance, S., Asselin, G., Nourrissat, A., Rhainds, M. (2020b), *Interventions médicales générant des aérosols (IMGA): Traitement par nébulisation, trachéotomie et soins de trachéotomie.* Unité d'évaluation des technologies et des modes d'intervention (UETMIS), CHU de Québec-Université Laval, April 3, 2020.

Drolet, R., Larocque, B., S., Nourrissat, A., Rhainds, M. (2020), *Risque de transmission virale par voie aérienne en chirurgies abdominales et thoraciques par laparoscopie : Revue rapide de la littérature.* Unité d'évaluation des technologies et des modes d'intervention (UETMIS), CHU de Québec-Université Laval, April 6, 2020.

Asselin, G., Nourrissat, A., Rhainds, M. (2020a), *Interventions médicales générant des aérosols (IMGA) : Manœuvres de compressions thoraciques dans le cadre d'une réanimation cardiorespiratoire.* Unité d'évaluation des technologies et des modes d'intervention (UETMIS), CHU de Québec-Université Laval, April 17, 2020.

Morris SN, Nickles Fader A, Milad MP, Dionisi HJ. (2020), *Understanding the "scope" of the problem: Why laparoscopy is considered safe during the COVID1-9 pandemic.* Journal of Minimally Invasive Gynecology, April 1, 2020.

Comité sur les infections nosocomiales du Québec

PRODUCED BY

Comité sur les infections nosocomiales du Québec

EDITOR

Marie-Claude Roy
CHU de Québec-Université Laval

LAYOUT

Murielle St-Onge
Institut national de santé publique du Québec

© Gouvernement du Québec (2020)

Publication No.: 2905 92).