

## COVID-19

### Provincial Guidance for Aerosol Generating Medical Procedures (AGMPs)

As the COVID-19 situation evolves and more data becomes available this guidance will be modified as the new evidence is reviewed. This document has several updates, the most significant are outlined in Table 1 **Medical Procedures Considered To Be AGMPs** and Point 5 **Updates to the Original Provincial Guidance: COVID-19 Provincial Guidance for Aerosol Generating Medical Procedures (AGMPs)**.

#### BACKGROUND

Aerosol generating medical procedures (AGMP) are any procedure carried out on a patient/resident/client that can induce the production of aerosols of various sizes, including droplet nuclei.

Medical procedures that generate aerosols or droplet nuclei in high concentration present a risk for opportunistic airborne transmission of pathogens not otherwise spread by the airborne route (e.g., SARS, influenza) and increase the risk for transmission of organisms known to spread by the airborne route (e.g., *Mycobacterium tuberculosis*).

The [Public Health Agency of Canada](#) (PHAC) guideline (adhered to by Manitoba Health, Seniors and Active Living) outlines precautions for the prevention of transmission of infection in the health care environment.

Droplets are produced in various ways (e.g. sneezing, coughing, singing) and they vary in size. Large droplets (> 5 µm) are most of the volume of expelled respiratory droplets (> 99%); these tend to fall rapidly to the ground, usually within a distance of 1 meter or less. Droplets smaller than 5 µm (e.g. droplet nuclei) may remain suspended in the air for significant periods of time and move with air currents. Respiratory viruses, including COVID-19 are usually transported in large particle droplets. As enveloped viruses, they are usually not viable in small droplet-nuclei. When patients cough, sneeze, or vomit, droplets are created and land on nearby surfaces, however medical procedures that induce coughing, sneezing, or vomiting are not in themselves AGMPs.

Droplet transmission occurs when bacteria or viruses travel on relatively large respiratory droplets that people sneeze, cough, or exhale (by talking or heavy breathing). They travel only short distances (less than 2 meters) before settling onto nearby surfaces. These droplets may be loaded with infectious particles and can infect another person if the bacteria/viruses directly contact the eyes, nose or mouth of another individual prior to settling onto nearby surfaces. Once they fall onto surfaces, they may be transferred onto someone's hands and infection may occur if the eyes, nose or mouth are touched by contaminated surfaces (e.g. hands).

Airborne transmission occurs when bacteria or viruses travel in droplet nuclei that become aerosolized. Healthy people can inhale the infectious droplet nuclei into their lungs. Recent systematic reviews have concluded that in the clinical environment there is no compelling evidence that N95 respirators were superior to procedure or surgical masks with eye protection for protecting health care workers (HCWs) against droplet borne respiratory infections. For these reasons and consistent with recommendations from the PHAC and World Health Organization (WHO), **health care workers are recommended to wear a procedure or surgical mask with eye protection as well as gloves and gown for most care** for a person confirmed or suspected to have COVID-19.

**AGMPs are the exception.** AGMPs generate aerosols and small droplet nuclei *in high concentrations*. These droplet nuclei may contain bacteria or viruses that could present a risk for opportunistic airborne transmission of pathogens not otherwise able to spread by the airborne route (e.g., SARS-CoV1, SARS-CoV2, influenza). While there is no conclusive evidence that opportunistic airborne transmission occurs after all AGMPs, enhanced safeguards are recommended when performing AGMPs to reduce the likelihood of transmission to health care workers.

### STRATEGIES TO REDUCE RISK FROM AGMPs

1. Carefully analyze risks and benefits to AGMPs; avoid performing unnecessary AGMPs.
2. Consider alternative to AGMPs.
3. Anticipate and plan for AGMPs.
4. Depending on the procedure, sedation may be appropriate for the person requiring the AGMP, to minimize excessive and/or prolonged and/or forceful coughing etc.
5. Paralytics to minimize the risk of aerosolization (for intubation or if the patient's breathing is already supported by mechanical ventilation) can be used when appropriate.
6. Use closed endotracheal suction systems whenever possible.
7. Use the minimum required number of staff in the room when performing an AGMP.
8. Ensure appropriate PPE is worn by all staff present in the room during the procedure.
9. Choose an appropriate space for an AGMP. Identify and label AIIR for AGMPs so staff are easily aware. Refer to section below ***Airborne Infection Isolation Rooms and Private Rooms with Doors Closed*** and ***AGMP Environmental Controls*** and COVID-19 Specific Disease Protocol – Acute & Community Settings ([Winnipeg](#) and [Provincial](#)).
10. It is not mandatory for AGMPs to occur in airborne infection isolation rooms (AIIR) which have “negative pressure” (meaning that air from the room is exhausted out of the facility). Note: there are risks associated with transferring patients to/from AIIR (increased risk of contaminating other patients, HCW and other hospital environments). These must be balanced with the small theoretical benefit of using AIIRs for AGMPs.
11. When an AIIR is not used for AGMPs: use a single room and keep door closed until air clearance is achieved (refer to Section 4 below: ***AGMP Environmental Controls***). Staff may leave the AIIR or single room after the AGMP is completed but movement in and

out of the room should be for essential activities only the period afterwards where the air in the room is being “cleaned” by air exchange. Open and close the door slowly during this time to minimize “dragging” air from the room.

## ACCOMMODATION AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

To categorize risk and allocate appropriate inpatient accommodation for persons confirmed or suspected of being infected with COVID-19, a classification system has been created to designate the type of PPE required for interacting with patients, residents and clients who are receiving care/being assessed or managed in specific settings or specific zones. The specifics can be found in the [COVID-19 Personal Protective Equipment Supply Management and Stewardship Planning and Guidance Framework](#) and the [Provincial Personal Protective Equipment Requirements](#) document.

## PROCEDURE

### 1. Medical Procedures Considered To Be AGMPs

- The following medical procedures outlined in Table 1 have been considered as AGMPs after review of existing data and separated by potential risk of infection transmission:

**TABLE 1: Medical Procedures Considered to be AGMPs**

<p><b>For RED and/or ORANGE Zone Patients</b></p> <p><b>N95 REQUIRED and Airborne Infection Isolation Room (AIIR) OR Private Room with Door Closed</b></p>	Endotracheal intubation and extubation, manual bag mask ventilation
	Bronchoscopy and bronchoalveolar lavage
	Tracheostomy procedure (open or percutaneous)
	Laryngoscopy
	Non-invasive positive pressure ventilation (BiPAP and CPAP)
	High flow nasal cannula oxygenation (e.g. Optiflow) - should only be used in patients with COVID-19 following consultation with an Attending Intensivist * Note: Oxygen delivered via nasal prongs and/or non-rebreathe masks are not considered AGMP, regardless of flow rate
	Some dental procedures (e.g., high speed drilling, ultrasonic scalers etc.)
	Autopsy of lung tissue
	Sputum induction using hypertonic saline
	Cardiopulmonary resuscitation (with manipulation of the airway) *Note: Chest compressions are not considered AGMP
	Open deep suctioning via endotracheal tube/tracheostomy tube
	Administration of nebulizing medications, does not include administration of a metered dose inhaler (MDI)

*CLARIFICATION: Collection of nasopharyngeal swabs and/or nasopharyngeal aspirates are not considered AGMPs, There is no published literature documenting transmission of*

*respiratory infections, including TB, SARS, influenza, and COVID-19 by collection of these specimens.*

## **2. Airborne Infection Isolation Rooms and Private Rooms with Doors Closed:**

An AIIR is a single-occupancy patient care room used to isolate those with suspected or confirmed airborne infectious diseases. This type of isolation room provides a more rapid removal of airborne infectious particles from the patient care environment to the outdoors, and with the negative airflow/pressure into the room, reduces movement of aerosols out of the room to the hallway. When AGMPs are performed, high airflow rates and negative pressure airflow allows for a more rapid clearing of the particles that have been aerosolized and contains them within the room.

Following an AGMP in an AIIR that has 12 air changes per hour (ACH), staff should wear an N95 respirator when in the room AND the door should be kept closed for 35 minutes following completion of the AGMP.

Following an AGMP in a standard single (private) room that has less air exchanges per hour, staff should wear an N95 respirator when in the room AND the door should be kept closed for between 69 minutes and three (3) hours following completion of the AGMP (refer to section below on **AGMP Environmental Controls**).

## **3. Special considerations for all AGMPs in all Health Care Settings, regardless of patient infection status:**

All HCW should perform a point of care risk assessment (PCRA) prior to an AGMP to select the appropriate personal protective equipment (PPE) and environmental controls.

At minimum, eye protection (e.g., eye goggles, face shields, or safety glasses) and procedure/surgical masks are required for any staff member within two meters of procedures generating aerosols, regardless of the patient's infection status.

Patients should be carefully assessed for signs and symptoms of airborne infections (e.g. TB) and other acute respiratory infections (e.g. influenza, SARS, COVID-19) prior to performing an AGMP. **If there is clinical suspicion or confirmation of infection, an N95 respirator must be used.**

In an emergency situation where clinical assessment is not possible, the highest level of protection (N95 respirator) should be used.

Limit the number of HCW in the room to only those necessary for the procedure.

In response to the following question “**Do I need to wear an N95 respirator for ALL AGMPs?**” For patients designated as “**RED**” or “**ORANGE**” zone patients, the answer is **YES**.

However, for “**GREEN**” zone patients, N95 respirators are not required for AGMPs, unless:

- There is clinical concern of infection with an airborne pathogen such as *Mycobacterium tuberculosis*; OR
- The patient is demonstrating new onset of respiratory symptoms of an infectious nature and is being assessed for COVID-19 testing and as a result, their status is being changed to “**ORANGE**”.

#### 4. AGMP Environmental Controls

AGMPs should be performed in an AIIR or single room with the door closed.

- When an AIIR or single room is not available and the AGMP must occur in place, draw the privacy curtains and remove any shared equipment, supplies or linens from the immediate vicinity prior to performing an AGMP.

When AGMPs are anticipated, consult with management to identify appropriate rooms and/or environments for AGMP’s.

If AGMPs must be urgently performed prior to placing a patient in a single patient room, the following precautions should be taken:

- Maintain physical separation of spaces with curtains and draw close
- If present, HEPA filtration systems should be started prior to the start of any AGMP’s by clinical staff and remain on until a suitable (calculated) air clearance time has occurred. This time will vary depending upon the ventilation system characteristics, air volume of the HEPA unit, and space enclosed by the curtain. Clinical staff should limit their movement in/out of the curtain during this time to minimize airborne contamination of the adjacent spaces

Air clearance time is the time required for a 99.9% dilution of any aerosol:

- Assume air clearance time to be 3 hours unless confirmed with site Facility Management otherwise. (3 hours is based upon a minimal 2 air changes per hour [ACH])
- Typical air clearance times in newer ventilated spaces are:
  - Inpatient room: 69 minutes (6 ACH)
  - Airborne infection isolation room (negative pressure): 35 minutes (12 ACH)
  - Resuscitation Room: 28 minutes (15 ACH)
  - Operating Theatre: 21 minutes (20 ACH)
- Where a supplemental HEPA scrubber is used, air clearance times must be determined with site Facility Management.

## 5. Updates to the Original Provincial Guidance: COVID-19 Provincial Guidance for Aerosol Generating Medical Procedures (AGMPs):

As the COVID-19 pandemic has evolved and more data has become available, guidance has been modified following review of the new evidence. Since the first iteration of “COVID-19 Provincial Guidance for Aerosol Generating Medical Procedures (AGMPs)”, the list of AGMPs has been carefully reviewed with local experts and specialty leads in the context of available national and international data.

This review has resulted in the conclusion that the following procedures **ARE NOT** deemed AGMPs:

- Breaks in the ventilator circuit
- Oral suctioning in intubated and ventilated patients
- Upper gastrointestinal endoscopy and/or nasogastric/nasojejunal tube placements
- Transesophageal echocardiography
- Routine tracheostomy care such as dressing changes, application of acetic acid soaks, cleaning the neck area or the tracheostomy, changing the inner cannula
- Flexible nasopharyngolaryngoscopy

Out of an abundance of caution, for the procedures specified above only, **use of an N95 respirator is** recommended for patients with **suspected** or **confirmed** COVID-19 disease (**ORANGE** or **RED** zone patients).

A **COVID-19 suspect** is defined as a person who has been tested and the result is pending **OR** a person who, based on clinical symptoms or exposure history, needs to be tested for COVID-19. Exposure history includes: **close contact in the last 14 days with a known COVID-19 positive patient OR laboratory exposure to the virus in the last 14 days OR travel outside of Manitoba in the last 14 days (excluding travel to Western Canada, the Territories or Ontario west of Terrace Bay)**. Patients who have had Asymptomatic COVID-19 Surveillance tests submitted to the provincial Public health laboratory are **not** considered COVID-19 suspects.