Purpose

An aerosol generating procedure (AGP) is an artificial manipulation of a person's airway that may generate aerosols. In British Columbia, there is a provincial process for including procedures on the accepted list of AGPs. For further details, please refer to the COVID-19 AGMP Decision Framework on the BCCDC. This document stratifies the risks associated with AGPs by both patient category and procedures, and specifies the protective measures required in all cases. It will be used to determine the patient room/bed placement and the personal protective equipment (PPE) required for the AGP. **Prior to conducting AGPs, complete the** COVID-19 Risk Assessment Tool (Appendix 1) to determine the patient category for AGPs**. Note:** The term 'patient' in this document refers to any patient, client or resident receiving care within a health care setting.

Scope

This document provides direction for the management of all patients undergoing AGPs in the Emergency Department, all inpatient units, all critical care units, outpatient areas, including Ambulatory Day Care and Medical Imaging, as well as Long-Term Care and Assisted Living facilities. For AGPs performed in perioperative areas, including the operating rooms, please refer to the BCCDC Infection Prevention and Control (IPC) Protocol for Surgical Procedures for further guidance. This document does not apply to the maternity and pediatric populations. For a comprehensive list of AGPs, please refer to the Aerosol Generating Medical Procedures page on the BCCDC.

High-Risk AGPs

Whereas there are many procedures that result in the generation of aerosols, only a subset of these procedures have been shown to increase the risk of transmission of microorganisms. The list of AGPs classified as high-risk are in Table 1 below.

Table 1. High-Risk AGPs

High-Risk AGPs
Autopsy[1]
Bag valve (manual) ventilation
Bronchoscopy and bronchoalveolar lavage (diagnostic and therapeutic[2])
CPAP and BiPAP[3]
CPR (with manual ventilation)
Endotracheal tube intubation (and related procedures including manual ventilation)
Sputum induction with inhalation of nebulized saline[4]

[1]Use of an elastomeric half-face respirator with combination P100 and formaldehyde cartridges is recommended for Autopsy.

[2]Therapeutic bronchoscopies are recognized as being lower risk than diagnostic, however in order to ensure consistent precautions, all bronchoscopies are classified as high-risk AGPs.

[3]In LTC, follow "Low Risk Category" of AGPs for residents on routine practices and no respiratory symptoms. Follow "High Risk Category" during Enhanced monitoring, outbreaks and when residents are on droplet precautions. Please complete COVID-19 Risk Assessment Tool (Appendix 1) for newly admitted residents requiring CPAP/BiPAP.

[4]To protect staff from patients with undiagnosed tuberculosis (TB), sputum induction procedures should be performed in a negative pressure room or a single occupancy room with the door closed if a negative pressure room is not available.

Low-Risk AGPs

Low-risk AGPs are those AGPs for which there is inconclusive evidence for the transmission of microorganisms. Table 2 below provides the list of low-risk AGPs.

Table 2. Low-Risk AGPs

Low-Risk AGPs
Breaking the integrity of the ventilator circuit while in operation (e.g., circuit changes, filter changes in a Heat and Moisture Exchanger, in tracheostomy care)
Open-circuit ventilator with no filter
Extubation
Non-Heated Humidified high flow O_2 (yellow or green top nebulizer with attached water bottle, wide bore tubing and aerosol mask or "Star Wars" mask)[1]
Nasopharyngeal aspirates and washes
Nebulized therapies including Methacholine Challenge
Cough Reflex Testing
Mastoidectomy
Tracheotomy
Upper endoscopy
Flexible/fiber optic endoscopic evaluation of voice and swallowing

[1]Low-flow O_2 (1-6 L/min on nasal prongs, or up to 15 L/min on a non-rebreather or simple mask) is not considered an AGP (see the COVID-19 Oxygen Delivery and AGPs [Guidelines]).

*Oral and nasal suctioning procedures are not considered AGPs.

Patient Category and AGP Requirements

Best practice guidelines recommend the use of negative pressure rooms for AGPs. However, it is recognized that there are competing needs for negative pressure and single occupancy rooms, and they are not always available for all patients who require AGPs. The table below stratifies the risk by patient and procedure, and identifies IPC best practices, and where applicable, alternatives for each category. Consult with Infection Prevention and Control if you have questions.

It is also acknowledged that under some circumstances, AGPs will be performed in open bays or in multi-bed rooms (MBR). Table 3 specifies when this is acceptable. All laboratory-confirmed COVID-19 patients should undergo AGPs in a negative pressure room (ideal), in a single occupancy room with a closed door (acceptable), or in a MBR with one other laboratory-confirmed COVID-19 patient. Droplet and AGP Precautions are required for all laboratory-confirmed and suspect COVID-19 patients, regardless of AGP risk.

Table 3 identifies the AGP requirements for patients in relation to COVID-19. For those patients placed on multiple precautions (e.g. Droplet and Airborne Precautions), the protective measures specified by the higher level of precautions must be followed.

Visitors should be instructed to check with the unit staff before entering the room while an AGP is in progress.

For further guidance on patient placement review the Bed Placement for Admitted Patients in Acute Care [Assessment Tool] or consult with IPC if there are additional questions.

Note: There are exceptions for N95 respirator use. Refer to the N95 Respirator Clinical Protocol (Section 5.3) for details. Use a surgical mask instead if exceptions apply.

Table 3. AGP Requirements

Patient Category[1]	AGP Risk Category	Procedure Location	Is an Open Bay Acceptable?	PPE for all in the Room (or Bed Space in a MBR or Open Bay)	Risk Mitigation	Precautions Signage	Air Clearance Time Required?[2]
Laboratory-confirmed COVID-19	High or Low	Negative pressure (preferred), Single occupancy room with closed door (acceptable), or In a MBR with one other laboratory-confirmed COVID-19 Patient. Do not place more than two laboratory-confirmed COVID-19 patients in a MBR without consulting IPC.	No	N95 respirator or equivalent, gown, gloves, protective eyewear (face shield for a healthcare provider performing an intubation) All health care workers entering the room during an AGP for any patient must wear an N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around every bed in a MBR	Droplet, AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR
Patients with Airborne infections (e.g. TB)	High or Low	Negative pressure	No	N95 respirator or equivalent, gown, gloves, protective eyewear (face shield for a health care provider performing an intubation) for all entries into the room	N/A	Airborne, AGP	Yes for ≤ 1 hr post patient discharge, or Yes for ≤ 1 hr post procedure when the patient is not in the room
Suspect COVID-19	High	Negative pressure (preferred), Single occupancy room with closed door (acceptable), or In a MBR with other patients in the same patient category (acceptable)	**Only in life-threatening situations**	N95 respirator or equivalent, gown, gloves, protective eyewear (face shield for a healthcare provider performing an intubation)	Close the curtains around every bed in a MBR or an open bay	Droplet, AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay

Patient Category[1]	AGP Risk Category	Procedure Location	Is an Open Bay Acceptable?	PPE for all in the Room (or Bed Space in a MBR or Open Bay)	Risk Mitigation	Precautions Signage	Air Clearance Time Required?[2]
Suspect COVID-19	Low	Single occupancy room with a closed door (preferred), or In a MBR with other patients in the same patient category (acceptable)	**Only in life-threatening situations**	N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around every bed in a MBR or an open bay	Droplet, AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay
Low-risk of COVID-19 (with pending COVID-19 test)	High	Single occupancy room with closed door (preferred), or In a MBR with other patients in the same patient category (acceptable)	**Only in life-threatening situations**	N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around every bed in a MBR or an open bay	Droplet, AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay
Low-risk of COVID-19 (with pending COVID-19 test)	Low	In a MBR with other patients in the same patient category	Yes	N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around every bed in a MBR or an open	Droplet, AGP	Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay
Patients with respiratory illness requiring Droplet Precautions other than COVID-19	High	Single occupancy room with a closed door (preferred), or In a MBR with other patients in the same patient category (acceptable)	**Only in life-threatening situations**	N95 respirator or equivalent, gown, gloves, protective eyewear (face shield for a healthcare provider performing an intubation)	Close the curtains around every bed in a MBR or an open bay	Droplet, AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay
Patients with respiratory illness requiring Droplet Precautions other than COVID-19	Low	In a MBR with other patients in the same patient category	Yes	N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around every bed in a MBR or an open bay	Droplet, AGP	Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay

Patient Category[1]	AGP Risk Category	Procedure Location	Is an Open Bay Acceptable?	PPE for all in the Room (or Bed Space in a MBR or Open Bay)	Risk Mitigation	Precautions Signage	Air Clearance Time Required?[2]
Low-risk of COVID-19 (routine practices, no respiratory symptoms)	High	Single occupancy room with closed door (preferred), or In a MBR with other patients in the same patient category (acceptable)	Yes	N95 respirator or equivalent, gown, gloves, protective eyewear	Close the curtains around the bed space in a MBR or an open bay	AGP	Yes for ≤ 1 hr post procedure in the single patient room, or Yes for ≤ 1 hr post procedure for the bed space in the MBR or the bed space in the open bay
Low-risk of COVID-19 (routine practices, no respiratory symptoms)	Low	LTC Only: CPAP/BiPAP residents are managed under this category[3] In a MBR with other patients in the same patient category	Yes	Medical mask, protective eyewear	Close the curtains around the bed space in a MBR or an open bay	N/A	No

[1]Patient category refers to both SARS-CoV-2 and other pathogens with airborne or droplet transmission (e.g., TB).

[2]Air clearance time is the time where respiratory protection is required (e.g. N95 respirator or equivalent). This time may be shorter depending on air changes per hour (ACH) in that room/area. Contact your FMO for information on ACH. Refer to Table 4 to determine the length of time room must be vacated to remove at least 99% of airborne particles.

[3]In LTC, follow "Low Risk Category" of AGPs for residents on routine practices and no respiratory symptoms. Follow "High Risk Category" during Enhanced monitoring, outbreaks and when residents are on droplet precautions. Please complete COVID-19 Risk Assessment Tool (Appendix 1) for newly admitted residents requiring CPAP/BiPAP.

Table 4. Air changes per hour (ACH) and time required for airborne-contaminant removal efficiencies of 99% (Center for Disease Control Atlanta, 2005) in minutes.

Air Clearance Time (min) required for removal	
ACH[1]	**99% efficiency[2]**
2	138
4	69
6	46
8	35
10	28
12	23
15	18
20	14
50	6

[1]Values apply to an empty room with no AGPs. Contact your FMO for information on ACH.

[2]Fraser Health has adopted a standard 99% efficiency for air clearance time.

Appendix 1: COVID-19 Risk Assessment Tool to Determine Patient Category for AGPs

Purpose

The purpose of this document is to conduct a **COVID-19 Risk Assessment** to help determine the Patient Category for those patients requiring aerosol generating procedures (AGPs). The purpose of the tool is to trigger a review of a patient's COVID-19 risk factors prior to an AGP. The clinical care team is responsible for completing this COVID-19 Risk Assessment prior to an AGP to determine the Patient Category and AGP requirements.

Instructions

1. Complete all questions in the COVID-19 Risk Assessment below.

COVID-19 Risk Assessment (check all that apply)					
1. Does the patient have new or worsening COVID-19 like symptoms?					
☐	Fever	☐	Sore throat	☐	Body aches
☐	Cough	☐	Loss of sense of smell	☐	Nausea
☐	Difficulty breathing	☐	Loss of sense of taste	☐	Vomiting
☐	Headache	☐	Loss of appetite	☐	Diarrhea
☐	Chills	☐	Extreme fatigue or tiredness	☐	No
2. In the past 20 days, has the patient had a positive COVID-19 test?[1]					
☐	No	☐	Yes		
Date Tested:					

[1]Refer to the Admission, Testing and Clearance Guidelines for Laboratory-Confirmed COVID-19 Patients [Guidelines] for more details.

2. Determine the **Patient Category Determination** that will be used to inform the AGP requirements for the patient:

Patient Category Determination for AGPs	
☐	**Laboratory-confirmed COVID-19[1]** **YES** to a positive COVID-19 test result within the last 20 days
☐	**Suspect COVID-19** **YES** to any of the symptom and exposure questions; with/without a pending COVID-19 test or cannot answer the questions (unconscious, language barrier or dementia, etc.)
☐	**Low-risk of COVID-19** **NO** to all the symptom and exposure questions

[1]Refer to the Admission, Testing and Clearance Guidelines for Laboratory-Confirmed COVID-19 Patients [Guidelines] for more details.