**IPC Recommendations for Suspected or Confirmed COVID-19 Patients Requiring Surgery**

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| **Applicability**     | • These recommendations:                                                                                       
|                       |   o apply to healthcare workers (HCWs) working in the surgical suite with patients who have suspected or confirmed COVID-19 who require surgery                                                                 |
|                       |   o are based on both the currently available scientific evidence and current epidemiology in Alberta                                                               |
|                       |   o are subject to revision as further evidence emerges and as local and provincial epidemiology evolves                                                                |
|                       | • This document does not replace clinical judgement based on a point-of-care risk assessment (PCRA). HCWs should make their best clinical decisions about the most appropriate Infection Prevention and Control (IPC) measures, including personal protective equipment (PPE), to use in a particular situation. |
| **COVID-19 transmission** | • SARS-Coronavirus-2 (SARS-CoV-2), the virus that causes COVID-19, is transmitted primarily by respiratory droplets and direct and indirect contact. It is not an airborne infection; however, opportunistic airborne transmission can occur due to aerosolized respiratory droplets during aerosol-generating medical procedures (AGMPs). |
|                       | • Variant strains of SARS-CoV-2 have recently emerged globally (i.e., variants of concern [VOCs]). VOCs are more transmissible due to alterations in the surface glycoprotein layer. Like non-variant COVID-19, transmission is by respiratory droplets and direct and indirect contact (i.e., not airborne); therefore, IPC recommendations are the same. |
| **COVID-19 risk assessment** | • The acute care testing and additional precautions strategy is summarized in the AHS Acute Care COVID-19 Expanded Testing Algorithm. |
|                       | • All patients except neonates and surgery outpatients are to be initially assessed for symptoms and risk factors associated with respiratory communicable diseases using Form #21615 Communicable Disease (Respiratory) Initial Screening. This includes admitted inpatients, Emergency Department/Urgent Care Centres, Day Surgery, Obstetrics, inter-facility transfers, and direct admissions. |
|                       | • For Surgery outpatients, use Form #21666 Ambulatory Care Communicable Disease (Respiratory) Screening. |
|                       | • The AHS Acute Care COVID-19 Expanded Testing Frequently Asked Questions is available as a guide to the algorithm. |
|                       | • Complete ongoing assessment of admitted patients using Form #21616 COVID-19 Symptom Identification and Monitoring. |
| **Pre-operative COVID-19 testing** | Routine pre-operative COVID-19 testing is not recommended at this time for the following reasons: |
|                       |   • The burden of virus in the nasopharynx may be below the detection threshold at the time of the swab; any test is a snapshot of what is occurring at the time of specimen collection. This is true regardless of the turnaround time between swabbing and reporting of the test. |

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| **Pre-operative COVID-19 testing (cont.)** | - There is a **significant risk of false reassurance from a negative test**, which may in turn lead to less stringent adherence to the symptom and risk factor assessment and any required additional precautions and PPE.  
- With the increased availability of COVID-19 point-of-care (POC) testing, it is important to note that a negative POC test is not adequate.  
- The Point-of-Care Risk Assessment remains critically important using the [AHS Acute Care COVID-19 Expanded Testing Algorithm](https://www.ahs.ca) and/or [Form# 21615 Communicable Disease (Respiratory) Initial Screening](https://www.ahs.ca) and/or [Form #21666 Ambulatory Care Communicable Disease (Respiratory) Screening](https://www.ahs.ca).  

**Routine pre-operative COVID-19 testing of previously positive COVID-19 patients within 90 days of the initial positive COVID-19 test is not recommended.**  
- No repeat testing within 90 days as “proof of negativity”.  
  - Clearing of COVID-19-positive status is based on days since symptom onset and resolution of symptoms, not negative test(s)  
  - COVID-positive individuals will continue to test positive for many weeks (up to 12 weeks, and possibly more, depending on severity of illness, patient’s underlying co-morbidities). This usually represents non-viable virus  
- Patients do not receive certificates/cards/letters from Public Health or IPC when they are cleared.  
- If surgery is elective and it is clinically feasible and safe, delay until patient is cleared of COVID-positive status.  

**Note:** With the emergence of variant COVID-19 strains, testing guidance may change. If there is concern about infection due to a variant COVID-19 strain, please consult IPC. |
| **COVID-19 vaccine** | - All initial and ongoing symptom and risk factor assessments and all PPE recommendations must be followed as above, regardless of patient or HCW COVID-19 vaccination status.  
- If post-vaccine symptoms develop, refer to [Interim IPC Recommendations for COVID-19](https://www.ahs.ca).  
- Surgeries do not need to be re-scheduled or delayed due to vaccination dates.  
  - The clinical team may want to wait until 48 hours post-vaccine dose in case post-vaccine symptoms develop.  
  - COVID-19 vaccines do not cause COVID-19 infection.  
  - Individuals typically mount a protective immune response by day 14 after the second dose (after the 1st dose for single dose vaccines), but the symptom and risk factor assessments remain the same. The assessments will direct any necessary testing and/or additional precautions.  
  - There is currently no data or evidence to suggest any adverse surgical outcomes specifically related to COVID-19 vaccination. |
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| General Infection Prevention and Control (IPC) principles | Rescheduling/delays of elective or non-elective procedures due to suspected or confirmed COVID-19 is a surgical and/or operational decision, not an IPC decision. IPC will provide recommendations and measures to prevent transmission in these situations.  
- All HCWs should continue to use Routine Practices.  
- The decision to operate should not be made based on a patient’s COVID-19 status. Surgical decisions should be made based on usual practices in conjunction with the Alberta Coding Access Targets for Surgery (ACATS).  
- For patients who have not tested positive for COVID-19 and have no risk factors for exposure and are asymptomatic, a careful PCRA is undertaken to screen for any COVID-19 symptom.  
- **Note that a PCRA in this context is broader than only a symptom history.** It needs to incorporate all elements of potential higher risk exposure such as travel, contacts, lack of social distancing, and exposure to a continuing care facility or another type of congregate setting with respiratory virus activity. See [AHS Acute Care COVID-19 Expanded Testing Algorithm](https://www.ahs.ca/care-covid-19-acute-care-expanded-testing-algorithm) and/or [Form# 21615 Communicable Disease (Respiratory) Initial Screening](https://www.ahs.ca/care-covid-19-acute-care-expanded-testing-algorithm), and/or [Form #21666 Ambulatory Care Communicable Disease (Respiratory) Screening](https://www.ahs.ca/care-covid-19-acute-care-expanded-testing-algorithm).  
- If the patient does not have symptoms or risk factors of COVID-19, or has not tested positive for COVID-19 in the last 14 days (21 days if in Critical Care), then Contact and Droplet Precautions for COVID-19 are not required for the surgical procedure.  
- **All patients must be screened for symptoms and risk factors at each encounter with a healthcare worker.** HCWs should wear additional personal protective equipment (PPE) based on the symptom and risk assessment.  
- **All HCWs should maintain good practices during the COVID-19 pandemic:**  
  - complete the Fit for Work assessment  
  - self-monitor for the development of any new symptoms (respiratory, gastrointestinal [GI], expanded)  
  - continuous mask and eye protection  
  - meticulous hand hygiene  
  - practice good preventive health practices both when at and outside of work |
| Asymptomatic transmission | The risk of transmission of COVID-19 from an asymptomatic patient is low but not zero.  
- The COVID-19 symptom and risk factor assessment are key. |
| Operating Rooms (OR) theatres | Any OR theatre should be capable of managing a patient on additional precautions regardless of the indication.  
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| Operating Rooms (OR) theatres (cont.) | • Any procedure performed on a suspected or confirmed COVID-19 patient may be carried out in any OR theatre provided that the appropriate processes are in place (i.e., maintain Contact and Droplet precautions, PPE available, signage, extra equipment/supplies not stored in theatres, etc.).  
  • Designate lead surgical suite staff and a lead surgeon from each sub-specialty service plus lead anesthesiologist to maintain and update relevant care pathways.  
  • OR staff and physician leads should engage in simulations as feasible; these should include donning, doffing and changing of PPE. To preserve equipment, no actual non-expired PPE should be used in these simulations.  
  • Educational materials about donning and doffing should be provided at PPE stations outside the OR theatres.  
  • Appropriate additional precautions signage should be placed at the entrances to the OR theatre when in use.  
  • Only required HCWs should be present in the OR theatre during the surgical procedure.  
  • Traffic into and out of the theatre should be controlled and doors to the OR theatre should be kept closed to maintain adequate air exchanges and the laminar airflow.  
  • Check site policy to determine if vendors are permitted. If vendors are permitted, they must:  
    o undergo site entrance screening similar to any visitor  
    o adhere to PPE policy in OR  
  • Patient chart may be brought into theatre. |

| Personal Protective Equipment (PPE) | Refer to PPE Table for Surgical Suites during COVID-19. PPE is effective if no breaches have occurred. All team members working in the OR theatre should wear:  
  • gloves (as appropriate)  
  • gown - either surgical gown or isolation gown (as appropriate)  
  • eye/face protection  
  • mask - either surgical mask (with ties) or an N95 respirator (as appropriate)  
  • N95 respirators - Use of an N95 respirator should be considered if there is the potential for an anticipated or unanticipated Aerosol Generating Medical Procedure (AGMP) in a suspected or confirmed COVID-19 pt. AGMPs include (but are not limited to):  
    o endotracheal intubation and extubation  
    o laryngeal mask airway (LMA) insertion and removal  
    o bronchoscopy  
    o cardiopulmonary resuscitation (CPR)  
    o respiratory or airway suctioning when using an open system  
    o accidental disconnection of a ventilation system |
### Personal Protective Equipment (PPE) (cont.)

All HCWs in surgical suite should ensure their current N95 respirator fit testing is up-to-date. Team leads should ensure that appropriate PPE has been donned by all team members prior to entering the OR and that the correct steps of PPE donning and doffing are followed by all members of the team. For proper OR donning and doffing procedures, HCWs should follow existing established OR guidelines including those for removal of contaminated gloves or gowns.

**Notes**

1. Head covers are designed to confine shedding of the healthcare provider’s hair (which protect the sterile field) and should be used in accordance with existing OR practices.
2. Doubling up of PPE (e.g., double masking, double gloving, double eye protection) is not routinely required or recommended for Contact and Droplet Precautions; however, double gloving is recommended during surgery at high risk of glove perforations as it minimizes the risk of exposure to blood during surgery. See [Glove Use and Selection](#).

### Pre-operative management of suspected or confirmed COVID-19 patients

- The patient should be on **Contact and Droplet precautions**.
- The need for additional/isolation precautions in the surgical suite should be communicated via the surgeon at the time of surgical booking and noted on the OR schedule or communicated via the nursing unit.
- The OR should notify the Post-Anesthesia Care Unit (PACU) in advance of all patients requiring isolation precautions to ensure appropriate staffing post-operatively.
- **Consider the following for patient transport to the OR:**
  - For stable patients who will not require intervention during transport (usually transported by a porter): IPC routine practices including continuous masking with additional PPE as indicated by the PCRA.
  - For ventilated patients or unstable patients who may require intervention: gloves, surgical gown, N95 respirator, eye/face protection.
  - **Note:** Mechanical ventilation is a closed system and is not considered an AGMP. Due to accidental disconnections that may occur during transport, an N95 respirator may be worn by staff within a 2m radius.
  - During transport:
    - Non-ventilated patient must wear procedure mask (with ear loops).
    - Ventilated patient does not require mask.
- The patient may be transported to the OR by patient porter services. Sites may consider a team member or Protective Services to clear the path to the OR in their own bed. Sites should ensure that they have a clear process for patient transport.
- If patient goes to pre-operative holding area, 2m radius or barrier between patients must be maintained. If either of these cannot be maintained, bypass the holding area and transport directly into the OR theatre.
- The OR theatre should maintain positive pressure airflow and at least 15 air exchanges per hour.
  - The risk of a surgical site infection due to disruption of laminar airflow due to negative pressure is greater than the risk of infection due to aerosolized respiratory droplets during AGMPs.
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<td><strong>Induction and intubations</strong></td>
<td><strong>For ALL patients undergoing surgery</strong></td>
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|                                  |  - The number of HCWs in the OR theatre should be kept to an absolute minimum during intubation and extubation at all times, not only for patients with suspected or confirmed COVID-19.  
  1. Refer to PPE Table for Surgical Services during COVID-19.  
  **Room setup**  
  - Only essential equipment should be present with a separate mayo stand for the anesthesiologist to place intubating equipment, drugs and a separate container for laryngoscope blade and face mask. The use of in-line suction is recommended.  
  **For induction**  
  - The anesthesiologist and an induction helper (respiratory therapist [RT] and/or nurse) should be the only personnel in the room. If possible another 'clean' helper should be immediately available outside the room in case of emergency. Bag mask ventilation is to be avoided when possible. For intubation, a video laryngoscope (if available) should be used for the first attempt by the most experienced provider to minimize failure to capture the airway.  
  - Plan to remove the patient’s mask in the OR just prior to induction and place face mask on immediately for pre-oxygenation (pre-oxygenate at 6L O₂/min).  
  - Once intubated, inflate cuff and immediately hook up the anesthetic circuit.  
  - If a planned disconnect is to occur, then either clamp the endotracheal tube or disconnect with filter still connected. Turn off the ventilator prior to disconnect.  
  - No settle time is required between intubation and other HCWs entering the OR as this virus is not airborne.                                                                                                                                                                                                                                                                                                                                                     |
| **Spinal and regional anesthesia** | **The patient should wear a surgical mask throughout procedure.**  
  **Refer to the PPE Table for Surgical Suites during COVID-19.**  
  **An N95 respirator is not required; however, if there is a potential for rapid conversion to general anesthesia, an N95 respirator should be worn.**                                                                                                                                                                                                                                                                                                                                                                   |
| **Post-operative protocols**      | **The patient will be extubated and recovered either in the OR theatre or PACU.**  
  **Extubation in the OR theatre (preferred):**  
  - As with intubation, minimal personnel should remain in the theatre.  
  - Extubate directly to face mask. Once airway stable (i.e., no coughing) place procedure mask (with ear loops) on patient followed by simple oxygen mask. Remove oxygen as soon as feasible.  
  **Recovery in PACU:**  
  - A curtain should be pulled or a 2m radius should be maintained around patient’s bedspace.  
  - Curtain/2m radius also applies if patient is to be extubated in PACU.                                                                                                                                                                                                                                                                                                                                                   |
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| **Post-operative protocols (cont.)** | - HCWs not required for extubation or post-operative recovery should leave the theatre/curtained bed space before extubation and may re-enter post-extubation.  
  - After recovery criteria are met, ensure the patient is wearing a procedure mask (with ear loops) during transport to an isolation room on an inpatient unit.  
  - The patient may be transported from the OR by patient porter services.  
  - Sites may consider a team member or Protective Services member to clear the path from the OR in their own bed.  
  - Sites should ensure that they have a clear process for patient transport.  
  - If the patient is to remain intubated or is to be transported to the Intensive Care Unit (ICU):  
    - Ensure a tight connection between all elements of the circuit to reduce the risk of disconnection.  
    - Ideally, clean PPE is worn for transport from the OR to the ICU. This can be achieved by the OR team doffing used PPE and donning clean PPE, or by use of a separate team with newly donned PPE. Note that repeated doffing increases the risk of an exposure due to a doffing breach/error.  
    - If neither of these options are possible, then the anesthesiologist and RT from the OR may transport the patient to the ICU and remain in their existing PPE. In this instance, a team member should clear the path.  
    - All HCWs involved with transport should wear PPE (including an N95 respirator) as there is a possibility of a circuit disconnect.  
    - Once handover is complete, members of the team can doff PPE.  
  - It is essential to ensure that the proper **doffing** process for PPE is followed. Use of a **doffing checklist** with a doffing buddy is highly recommended. |

| **Post-operative symptoms** | Patients may develop post-operative symptoms that are similar to COVID-19 symptoms. Recent anesthetic may not be sufficient to explain symptoms.  
- Patients with core respiratory or GI symptoms should be placed on Contact and Droplet Precautions. Use [Form #21624 Discontinuation of Contact and Droplet Precautions for Suspected or Confirmed COVID-19](#) to discontinue Contact and Droplet Precautions in acute care.  
- Patients with core respiratory, GI, or expanded symptoms should be tested for COVID-19 (plus any other relevant investigations as indicated). |

| **Environmental cleaning** | The usual environmental cleaning processes between cases should be followed.  
- Computer touch screens and keyboards in all theatres should be cleaned between cases as per site protocol/process. |

| **Monitoring of pressure differential, alarms and testing** | Room pressurization alarms for the OR should be incorporated into a central monitoring system to verify the alarms are working at all times through manual test or alarm and subsequent verification. |

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<td>• Testing and calibration should be setup in the Facility Maintenance and Engineering’s preventive maintenance program to be done quarterly. Test results should be recorded.</td>
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## Notes

1. Any patient with COVID-19 core respiratory or GI symptoms or risk factors should be managed with Contact and Droplet Precautions unless there is an obvious, strongly supported alternate diagnosis. If any risk factor is present, Contact and Droplet Precautions must be maintained regardless of an alternate diagnosis. Refer to [AHS Acute Care COVID-19 Expanded Testing Algorithm](#).

2. Any patient with unknown symptom or risk factor history (e.g., trauma) should be managed as a suspected COVID-19 patient. Refer to [AHS Acute Care COVID-19 Expanded Testing Algorithm](#).

3. Initiate or maintain other additional precautions as indicated by symptoms or history.

4. Ensure that specimens are appropriately labeled if COVID-19 is suspected or confirmed.
Selected references


