These Guidelines are based on recommendations from the Society of Obstetric Anesthesia and Perinatology, the Society of Obstetricians and Gynaecologists of Canada, Obstetric Anaesthetists Association UK, as well as information on measures being taken by maternity units around the country. As information becomes updated, these guidelines may be subject to alteration. (Draft No. 8, March 3, 2021).

Latest changes will be identified in BLUE.

Definitions: For the purpose of this document, definitions are used in accordance with Shared Health.

COVID-Non-suspect (green zone patient) are patients who do not meet criteria for testing AND/OR those deemed “recovered” by Public Health or by Infection Prevention and Control (if an inpatient)

COVID-Suspect (orange zone patient) are patients who meet criteria for COVID-19 testing OR as deemed by clinician judgment. In general these patients should be referred for testing or are patients who have been tested and the results are pending (with the exception of patients awaiting results from voluntary asymptomatic COVID testing. See below.)

COVID-Positive (red zone patient) are patients who have been tested and have a positive test result AND who have not been deemed “recovered” by Public Health or by Infection Prevention and Control (if an inpatient).

For the latest information on the ED/UC COVID Screening Algorithm and other updates, please refer to the Shared Health link:
https://sharedhealthmb.ca/covid19/providers/

Rapid testing for COVID-19

Where available, rapid testing for COVID-19 should be considered for admitted antepartum patients where labour or delivery is anticipated to occur within the next 24 hours, to assist with decision-making as it relates to PPE and cohorting for both the mother/infant dyad and infants requiring NICU admission. Where local epidemiology suggests uncontained community transmission, consideration should be given to asymptomatic screening of laboring patients. A suggested algorithm for use in conjunction with an asymptomatic screening protocol for laboring patients can be found in Appendix A.

General Considerations for Patients in the setting of the COVID-19 Pandemic

- **Orange** and **Red Zone** patients are asked to wear a procedural mask during labour and delivery to further reduce the risk of droplet transmission between patient and staff providers.

- In regions or periods of significant community transmission of COVID-19, it is reasonable to require all laboring patients, regardless of zone, to wear a procedure mask during labour and delivery.
• If possible, a labour room should be designated for Orange or Red Zone patients. An airborne infection isolation room is not required. Patients should be admitted to this room and the door kept closed.

• Visitor restrictions may be imposed on health care facilities to reduce the transmission of COVID-19. Essential Care Partner access, however, will be supported in obstetrical patients. Please refer to information on Essential Care Partners at https://sharedhealthmb.ca/files/covid-19-inpatient-visit-principles-level-red.pdf

• For Orange or Red Zone patients, regardless of the type of anesthesia, partners are asked not to enter the OR for Cesarean Section. In exceptional circumstances, the team may choose to allow one essential care partner into the OR.

• When travel or residence outside of Manitoba will necessitate the patient being deemed orange for a period of 14 days, the following should be taken into consideration:
  - A negative COVID swab will allow the patient to be considered green for the purposes of an AGMP using the same day/next day rule (as long as there are no other COVID risk factors that require clearance by Infection Prevention and Control [IP&C]).
  - If the patient’s essential care partner is also from outside of province, that partner is also considered orange for a 14 day period. The partner must don a procedure mask and team members must maintain orange zone PPE (procedure mask, eye protection, gown and gloves, N95 masks per point of care risk assessment).
  - In exceptional circumstances, an essential care partner who is orange because they are from out of province may accompany the patient into the operating room, IF the operating room team is in agreement.

Neuraxial Anesthesia and Analgesia in the setting of COVID-19

• General anesthesia should be avoided if at all possible, to avoid intubation and aerosolization of the virus.

• Neuraxial anesthesia is appropriate in patients with COVID-19 and should be used, provided not otherwise contraindicated.

• Epidural analgesia may reduce exacerbation of respiratory symptoms in labouring patients with COVID-19.

• For labouring patients, epidural analgesia may reduce the need for general anesthesia for emergent cesarean sections.

• If the patient chooses epidural analgesia, early epidural insertion is advisable.

• It is important to ensure a well-functioning epidural, and to maintain communication with the obstetrical, nursing, and midwifery teams to anticipate emergencies and avoid any crash cesarean sections, particularly under general anesthesia.

• COVID positive inpatients are likely to have received VTE prophylaxis, and this must be assessed prior to any neuraxial procedure – see corresponding section below in this document
• A complete blood count to assess for thrombocytopenia should be considered in COVID positive patients. Various rates of thrombocytopenia in COVID-19 have been reported of studies in the general population, with a range of 5-41% reported. Thrombocytopenia is usually mild. More profound hematologic abnormalities have been associated with more severe disease.

• However, if there is no time for a platelet count, the benefit of neuraxial block in this setting may outweigh the risk of proceeding with neuraxial block, barring any other contraindications.

• Neuraxial anesthesia may be associated with exaggerated hypotension in COVID positive patients.

• The epidural cart should be kept outside the room of orange and red patients, with only the items required for the procedure brought into the room.

**Nitrous Oxide in the Setting of COVID-19**

• Nitrous oxide may be used for labour analgesia for any patient who requests it, regardless of their zone designation. A N95 (or higher) filter must be used on nitrous tanks. *NB – this represents a change in practice since the outset of the pandemic. The use of nitrous oxide had temporarily been suspended early in the pandemic while further information about transmission was being acquired. Given that there is no positive pressure involved in the nitrous oxide delivery system used on labour units, this form of analgesia is not considered an aerosol generating medical procedure. As such, the staff in the room need no additional PPE beyond what is routinely recommended (determined by patient zone). This recommendation applies to patients of all zones and regardless of type of exhaust scavenging system available on the laboring unit.*

**Venous Thromboprophylaxis in Obstetrical Patients with COVID-19:**

• Literature suggests that COVID-19 is a procoaguble disease. Obstetrical patients may be at further risk of thromboembolism due to the hypercoagulable state of pregnancy and potential for limited mobility if admitted to hospital for a prolonged period of time.

• For COVID-positive and suspect patients admitted to hospital for either respiratory or obstetrical indications, consideration should be given to initiating venothromboembolism (VTE) prophylaxis.

• The choice of anticoagulant and duration of therapy should be assessed on a case-by-case basis with input from a multidisciplinary team including, but not limited to, Anesthesia and Obstetrics.

• Proper communication, documentation, and handover should occur so the on-call anesthesiologist is aware of any inpatient who has received anticoagulant medications.

• VTE prophylaxis could significantly impact the ability for the provision of safe neuraxial anesthesia. A regimen should be chosen with the goal of prevention of thromboembolic events, while ensuring patients will still be eligible for neuraxial techniques. *The likelihood of needing neuraxial analgesia should be a primary consideration in the choice of anticoagulant.*

• ASRA Guidelines must be followed for patients on heparin who receive regional procedures.
• Options for VTE prophylaxis include low-molecular weight heparin (LMWH) and unfractionated heparin (UFH). The use of UFH will better facilitate the use of neuraxial techniques given its pharmacologic profile. Conversely, LMWH has a better bioavailability in pregnant patients, with more predictable dosing. LMWH may be an option for patients who have more severe complications from COVID-19 or who are expected to be hospitalized for a prolonged period of time. Transition from LMWH to UFH, or cessation of VTE prophylaxis altogether, will be required as the patient gets closer to delivery.

• A platelet count should be performed to assess for heparin-induced thrombocytopenia if a patient has been on UFH for more than four days.

• **Anticoagulant therapy should be discontinued upon the onset of labour to facilitate neuraxial anesthesia and analgesia.**

• **Anticoagulant therapy should be held as per ASRA guidelines before an elective procedure.**

• In the event of unforeseen labor or urgent cesarean delivery, the choice of analgesia and/or anesthesia should weigh the risks of general anesthesia and benefits of neuraxial anesthesia in the setting of the anticoagulant type, dose, time of administration, and pertinent laboratory values.

### Steroid Therapy for Patients with COVID-19

• In keeping with the RECOVERY trial, steroid therapy is indicated once supplemental oxygenation is required for patients with COVID-19.

• Oxygen saturation targets are modified in pregnancy to titrate supplemental oxygen to a saturation of at least 95%

• Data supports dexamethasone as the steroid of choice, delivered in a ten-day course. Since dexamethasone crosses the placenta, consideration may be given for alternative steroids with less placental transfer (e.g., prednisolone, hydrocortisone) in parturients with COVID-19. Choice of steroid will be on a case-by-case basis, taking into account indication for antenatal corticosteroid for lung maturity, and response of the patient to the chosen steroid. In the postpartum period, steroid administration should mirror non-pregnant treatment with a 10-day course of dexamethasone.

• Perioperative stress dose steroids are not indicated for any dose of glucocorticoid when the duration of therapy has been less than three weeks.

• Consideration should be given to following glucose levels for patients on steroid therapy.

### Additional Medical Considerations in the Obstetric Patient with COVID-19

• Carboprost – Consider avoiding use of carboprost as there have been case reports of severe bronchospasm in COVID patients.

• Magnesium - Caution is advised with magnesium administration in COVID-19 patients with renal failure, as it can cause accumulation and toxicity. Magnesium can also have respiratory depressant effects and its use should be carefully considered in COVID positive patients.
Operating Room Setup for COVID-19

- Every effort should be made to communicate with staff from all disciplines early on to prepare for case set up and PPE requirements.
- If possible, an operating room, preferably a negative pressure room, can be designated as a room for COVID-19 positive or suspect cases.
- The Anesthetic machine should be prepared with N99 filters on both limbs and a closed suction on the circuit. In-line suctioning should be available.
- A videolaryngoscope should be immediately available and should be used if an orange or red zone patient requires endotracheal intubation.
- A COVID drug kit or cart that contains all routine drugs and airway equipment should be made available, so as to avoid contaminating the entire drug cart and minimizing traffic in the room.

For General Anesthesia in patients who are Red Zone, Orange Zone, or Green Zone WITHOUT a COVID negative swab in the acceptable time frame, the following procedures should be followed:

- The doors should not be opened within 30 minutes* of Maternal AGMP, the only exception being for transfer of the infant out of the room to the care of the neonatal team, or transfer of neonatal resuscitation equipment into the room if resuscitation is to take place in the Operating Room

  (*There is variation in the province with regards to the amount of air exchanges per hour in operating rooms. The time for door opening after a Maternal AGMP can be decreased to 15 minutes for facilities with air exchanges of 20 per hour.)

- For any neonatal AGMP, door opening is allowed with no requirement for air clearance. Refer also to PPE considerations for Obstetric and Neonatal Patients below in the document.
- If the case begins with a general anesthetic for an orange or red zone patient, all staff that are required to be in the room for the case should be present during intubation to minimize the doors being opened after the AGMP (intubation).
- If the patient is converted to GA, any staff not wearing an N95 mask must exit the room prior to intubation, and doff and don with an N95 before re-entry. Every attempt should be made to re-enter PRIOR to the intubation to avoid opening the door to the operating theatre following the AGMP.
- Before extubation, everyone should leave the room except the anesthesiologist and an assistant, so that the patient can be extubated and the doors kept closed for 30 minutes*. Anyone who stays in the room must have the appropriate N95 mask and must remain in the OR for 30 minutes*. (*There is variation in the province with regards to the amount of air exchanges per hour in operating rooms. The time for door opening after an AGMP can be decreased to 15 minutes for facilities with air exchanges of 20 per hour.)

PPE Considerations For Obstetric and Newborn Patients During COVID-19

- A PPE cart should be kept immediately outside the operating room. It should NOT be taken into the operating room or any other room.
• A team huddle before the case should occur before entry into the operating room if possible. The team huddle is to outline staff roles (including assigning the assistant to anesthesia should conversion to GA occur), review PPE requirements, and to discuss anticipated need for any equipment or medication that needs to be brought in before any AGMP occurs. PPE for all staff members should follow Shared Health/WRHA/IP&C recommendations. Anesthesia will lead the briefing.

• Donning PPE is time consuming (when done properly it takes approximately 2 minutes) and will impact on decision to delivery time for STAT caesarean delivery.

• Precautions outlined with intubation for any COVID-19 patient should be undertaken. Minimal staff (only essential personnel) should be present during both intubation and extubation.

• There are reports of vertical transmission of COVID-19 in the literature and, at this point, we cannot predict which infants may be born positive for COVID-19.

• PPE in the peripartum period must balance risk of exposure from mother and infant being cared for in the same physical space.

• An AGMP (e.g. positive pressure ventilation or intubation) is often required as part of newborn resuscitation and, this too, is unpredictable. Given that neither newborn COVID-status nor need for resuscitation at birth is predictable, where appropriate, these recommendations account for the newborn of an orange or red zone mother being potentially born COVID-19 positive and potentially require resuscitation involving an AGMP.

• Thus for all orange or red zone patients, all staff present for delivery should don EDCP with an N95 mask.

• For neonatal AGMP when the mother is a green patient without a negative COVID swab, staff within 6 feet of the resuscitation should don EDCP with an N95 mask.

• For a green patient without a confirmed negative COVID swab, routine PPE precautions including procedural mask and eye protection are adequate for neonatal AGMP for any staff that are greater than 6 feet of the resuscitation.

• For any neonatal AGMP, there is no need to allow for air clearance and the doors can be opened at any time, provided there has been no concurrent maternal AGMP (see also Operating Room Set up in this document).

**Point of Care Risk Assessment:**

• Physicians and staff may assess that the risk of AGMP is low, based on independently exercised professional judgment. Furthermore, based on support staff availability, they may be confident that in the event of a newborn AGMP, they can maintain a 2 metre distance during such an intervention. The following guidance (per the PPE chart to follow) is intended to inform a minimum appropriate protection for the provider making the point of care risk assessment.

• Alternatively, the point of care risk assessment may be deferred and an extended-use N95 respirator utilized for all settings EXCLUDING green zone patients with negative COVID results using the same day/next day rule. As a result, staff in the same setting may wear differing
PPE based on whether they performed a PCRA or not, and may be confident that they are each appropriately protected.

- Please also refer to the Shared Health Website at:
## Personal Protective Equipment for Obstetric Patients During COVID-19 Pandemic:

<table>
<thead>
<tr>
<th>Clinical Encounter</th>
<th>GREEN ZONE NEGATIVE COVID TEST</th>
<th>GREEN ZONE COVID TEST PENDING</th>
<th>ORANGE ZONE</th>
<th>RED ZONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidural Insertion &amp; Routine patient care (antepartum/triage/labour and postpartum)</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>EDCP (Procedural mask)</td>
<td>EDCP (Procedural mask)</td>
</tr>
<tr>
<td>Vaginal Delivery/Anticipation of Imminent Delivery</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>EDCP with N95 if within 6 feet of neonatal AMGP</td>
<td></td>
</tr>
<tr>
<td>Cesarean Section with Regional anesthesia and low risk of conversion to GA</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>EDCP with N95 if within 6 feet of neonatal AGMP</td>
<td>EDCP (N95 mask) For all Staff</td>
</tr>
<tr>
<td>Cesarean Section with high-risk of conversion to general anesthetic</td>
<td>Routine Care (procedural mask) plus eye protection</td>
<td>EDCP with N95 mask for all staff</td>
<td></td>
<td>For considerations re possible Neonatal AGMP and/or Maternal AGMP</td>
</tr>
</tbody>
</table>

**AND General Anesthesia**

- Concern of inadequate epidural top-up
- Insufficient time for epidural top-up
- Inadequate spinal block
- Concern for massive intraoperative blood loss (>1.5L)
- Transverse fetal lie

* EDCP defined as surgical (procedural) mask, eye protection, gown, and gloves

Doors should be closed during air clearance times for Maternal AGMP for red, orange, and green without a COVID swab (limited door opening is allowable for neonatal resuscitation considerations).

Air clearance times for Neonatal AGMP are not applicable, and the doors may be opened, provided there is no concurrent Maternal AGMP.
Recovery of Patients during COVID-19

- Green zone patients can be recovered in PACU regardless of the type of anesthesia required.

- For the postoperative recovery of orange or red patients who had neuraxial anesthesia, recovery can occur in the operating room or a private labour room. They should NOT be recovered in PACU.

- For the postoperative recovery of an orange or red patient who had general anesthesia, the patient should be recovered in the operating theatre for 15-60 minutes depending on the air exchange in the OR before going to a private room. Staff should continue to wear N95 masks. Refer to extubation guidelines for further details.

Please refer to separate documentation regarding more specific and comprehensive recommendations on patient flow during their hospital stay.

Management of Patients who were previously infected with COVID-19

Please refer to the following Shared Health documents on guidance for COVID-19 (Red) Recovered Patients at the following sites:

Appendix A: PPE Algorithm for Obstetrical Operating Room During COVID-19

Obstetrical Anesthesia: Operating Room PPE Protocol

- **YES**
  - COVID screening questions negative AND Asymptomatic
    - **GREEN Zone OR C-Section**
      - Negative Swab (yesterday/today) or recovered
        - **YES**
          - Routine OR PPE per Shared Health guidelines for all anesthetics
        - **NO**
          - No Test Expired
        - **YES**
          - Regional with low risk conversion to GA
        - **NO**
          - GA or high risk conversion to GA
    - **ORANGE / RED Zone OR C-Section**
      - Negative Swab (yesterday/today) or recovered
        - **YES**
          - Routine OR Surgical Mask plus Shared Health green zone precautions
            - Exception: EDCP + N95 if within 6 feet of neonatal ACMP
        - **NO**
          - High risk conversion to GA
    - **RED Zone OR C-Section**
      - Negative Swab (yesterday/today) or recovered
        - **YES**
          - Routine OR Surgical Mask plus Shared Health green zone precautions
            - Exception: EDCP + N95 if within 6 feet of neonatal ACMP
        - **NO**
          - High risk conversion to GA

- **NO/No time to assess**
  - ORANGE / RED Zone OR C-Section
    - Negative Swab (yesterday/today) or recovered
      - **YES**
        - EDCP + N95 mask for all staff

**COVID SCREENING QUESTIONS FOR EXPOSURE: In the past 14 days have you:**
- Returned from travel outside of Manitoba OR
- Had exposure to a confirmed case of COVID where medical PPE was not being worn (confirm waiting and how individual was notified) OR
- Had exposure in laboratory working directly with specimens that contain COVID-19 where medical PPE was not being worn AND/OR
- Developed to self-isolate in the past 14 days?

**SIGNS & SYMPTOMS CITED:** In the past 14 days have you:
- ONE of the following: fever/chills, cough, sore throat, loss of taste/smell, shortness of breath, persistent dry cough, fatigue, conjunctivitis (eye), headache, chest or muscle pain, nausea, vomiting, diarrhea, severe abdominal pain or loss of appetite, poor feeding or infant fever

Patients unable to provide a reliable history are to be placed in "Orange" category (PEP/ACP Contact Precautions) until their status can be clarified.

*EDCP = Enhanced Dental Contact Precautions
References and further resources

- AGMP (Use of N95 respirator): https://www.youtube.com/watch?v=syh5UnC6G2k
  This video shows the procedure for donning and doffing PPE required for an AGMP
- https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5e6b63e3c92147436c169f6d/1584096230183/OAA-RCoA-COVID-19-guidance.pdf
- COVIDSurg Collaborative Lancet 2020; 396:27-38
- Ariunzaya Amgalan & Maha Othman (2020) Hemostatic laboratory derangements in COVID019 with a focus on platelet counts, Platelets, 31:6, 740-745