Maternity care for mothers and babies during the COVID-19 pandemic
Queensland Clinical Guideline: Maternity care for mothers and babies during the COVID-19 pandemic

Document title: Maternity care for mothers and babies during COVID-19 pandemic (formerly titled Perinatal care of suspected or confirmed COVID-19 pregnant women)
Publication date: 22 November 2021
Document number: MN21.63-V7-R26
Document supplement: The document supplement is integral to and should be read in conjunction with this guideline.
Amendments: Full version history is supplied in the document supplement.
Amendment date: November 2021
Replaces document: MN20.63-V6-R25
Author: Queensland Clinical Guidelines
Audience: Health professionals in Queensland public and private maternity and neonatal services
Review date: November 2026
Endorsed by: Queensland Clinical Guidelines Steering Committee
Statewide Maternity and Neonatal Clinical Network (Queensland)
Contact: Email: Guidelines@health.qld.gov.au
URL: www.health.qld.gov.au/qcg

Cultural acknowledgement
We acknowledge the Traditional Custodians of the land on which we work and pay our respect to the Aboriginal and Torres Strait Islander Elders past, present and emerging.

Disclaimer
This guideline is intended as a guide and provided for information purposes only. The information has been prepared using a multidisciplinary approach with reference to the best information and evidence available at the time of preparation. No assurance is given that the information is entirely complete, current, or accurate in every respect.

The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances, may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making, including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

Queensland Health disclaims, to the maximum extent permitted by law, all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs incurred for any reason associated with the use of this guideline, including the materials within or referred to throughout this document being in any way inaccurate, out of context, incomplete or unavailable.


© State of Queensland (Queensland Health) 2021

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives V4.0 International licence. In essence, you are free to copy and communicate the work in its current form for non-commercial purposes, as long as you attribute Queensland Clinical Guidelines, Queensland Health and abide by the licence terms. You may not alter or adapt the work in any way. To view a copy of this licence, visit https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en

For further information, contact Queensland Clinical Guidelines, RBWH Post Office, Herston Qld 4029, email Guidelines@health.qld.gov.au. For permissions beyond the scope of this licence, contact: Intellectual Property Officer, Queensland Health, GPO Box 48, Brisbane Qld 4001, email ip_officer@health.qld.gov.au

Refer to online version, destroy printed copies after use
Flowchart: Location and precautions if SCOVID or COVID-19

Peripartum woman (+/- baby) requiring in-patient hospital care

Confmed COVID-19
or international arrival in quarantine

Suspected COVID-19
or in quarantine/isolation (not international arrival)

Active labour or urgent care required?

Yes

Rapid PCR test result?

Positive

Clinically safe to transfer?

No

Transfer to COVID-19 designated hospital

No PCR or result pending

COVID-19 precautions (pending results or quarantine/isolation release)

No

Currently in quarantine or isolation?

Yes

Non-COVID (usual) care

Negative

No

Clinically safe to transfer?

Yes

Confmed COVID-19 or international arrival in quarantine

SCOVID: suspected COVID-19 positive

Flowchart: F21.63-8-V1-R26
Flowchart: Care of SCOVID or COVID-19 peripartum woman

Peripartum woman (+/- baby) with SCOVID or COVID-19

Perform clinical assessment

In-patient hospital care indicated?

Yes

Refer to Flowchart Location and precautions for care

No

Self-isolation (SCOVID or COVID-19)
- Advise to return home using personal transport (not public transport or ride sharing options)

Ongoing antenatal care
- Arrange alternate mode of antenatal care (e.g. telehealth) if care cannot be delayed
- Resume usual antenatal care after release from self-quarantine or self-isolation
- Advise to telephone maternity service if concerned

COVID-19
- Provide advice about:
  - Standard hygiene precautions
  - COVID-19 signs/symptoms/management (e.g. fact sheet)
  - Emergency contact information
  - Isolation/quarantine precautions, requirements and testing and release processes

Vaccination
- Recommend vaccination for family and close contacts (if not already vaccinated)

Admission requiring COVID-19 precautions

Universal care and:
- Isolate in COVID-19 ward (as defined by COVID-19 Hospital Network Direction)
- Alert midwifery/obstetric/neonatal/infectious diseases/anaesthetic teams
- Limit visitors
- Symptomatic treatment as indicated

Antenatal
- Perform necessary medical imaging
- Fetal surveillance as clinically indicated
- Maternal surveillance and SpO2

Birth
- Negative pressure room (if possible)
- Mode of birth not influenced by COVID-19 unless urgent delivery indicated
- Lower threshold for escalation of clinical concerns

Co-location of mother and baby
- Co-location recommended (if both well)
- Discuss risk/benefit with parents
- Determine need on individual basis

Feeding (breastfeeding or formula)
- Support maternal choice
- Breastfeeding recommended– not contraindicated

Risk minimisation strategies
- Inform about hand hygiene, sneeze and coughing etiquette, face mask use, close contact, social/physical distancing and precautions during baby care, sterilisation
- Recommend vaccination for family and close contacts (if not already vaccinated)

Quarantine or isolation
- Isolate a suspected/confirmed case
- Quarantine a close contact of a suspected/confirmed case
- Refer to criteria for release

If returning to defined restricted area
- Follow Human Biosecurity and Local Council requirements

SCOVID: suspected COVID-19 positive, SpO2: peripheral capillary oxygen saturation

Flowchart: F21.63-1-V5-R26
Flowchart: Neonate of SCOVID or COVID-19 mother

Baby born to SCOVID or COVID-19 mother
(maternal COVID-19 is not itself an indication for nursery admission)

**Preparation for birth**

- Neonatal team as per usual clinical indications
- Consider resuscitation in a room outside of birthing room/theatre (to minimise staff exposure)
- Only essential equipment on resuscitaire
  - Store other equipment in accessible closed container that can be cleaned

**Resuscitation**

- Airborne and contact precautions
- All usual neonatal resuscitation procedures as indicated

**Co-location with mother**

- In isolation (if possible)
- Routine neonatal observations
  - Maintain awareness for symptoms of infection (e.g. fever, tachypnoea)
- Support maternal feeding choice (including breastfeeding)
- Support risk minimisation during usual mother-baby interactions
- Aim for prompt discharge

**Newborn Bloodspot Screening Test**

- Collect as per usual processes/timeframes
- If discharge into quarantine/isolation before 48 hours of age, collect NBST at discharge
- After release from quarantine/isolation collect another NBST at the earliest opportunity

**Risk minimisation strategies for family**

- Hand hygiene before and after contact
- Cough or sneeze into elbow
- Face mask during baby care
- Visitor restrictions
- Cleaning/sterilising equipment and surfaces
- Vaccination of eligible family members

**Perform clinical assessment**

- If required care can be safely provided while baby co-located with mother
- Transport in a closed system between locations in the facility
- First test within 12–24 hours of birth or at ID direction
- Then as per routine close contact protocols

**Assess**

- Advise mother about importance of risk minimisation strategies
- Visitors as per public health directives and local protocols

**Transfer**

- Airborne and contact precautions
- All usual neonatal resuscitation procedures as indicated

**After care**

- Nurse in incubator
- In designated SCOVID/COVID-19 area
- Airborne and contact precautions
- All usual clinical care as indicated
- One-to-one nurse/midwife care if possible
- Support maternal feeding choice

**Admit to nursery**

- Prior to discharge, seek expert advice from Public Health Unit or ID Physician
- Consider usual clinical criteria for discharge
- Provide advice about:
  - When to seek assistance
  - Expected clinical course
  - Follow-up for routine screening (e.g. NBST)
- Notify community healthcare providers (e.g. GP, child health services, health workers) of discharge and follow-up actions required

**Discharge**

- Advise family about requirements for quarantine at home
- Routine follow-up via telehealth/telephone until release from quarantine

---


Flowchart: F21.63-2-V5-R26
Flowchart: GDM screening and testing when local risk of COVID-19 is elevated

**ELEVATED local risk of COVID-19**
- Applies to: Pregnant women regardless of COVID-19 status
- Rationale: To support social distancing and minimise blood collection time (i.e. not based on new evidence)

**Risk factors for GDM**
- BMI > 30 kg/m² (pre-pregnancy or on entry to care)
- Ethnicity (Asian, Indian subcontinent, Aboriginal, Torres Strait Islander, Pacific Islander, Maori, Middle Eastern, non-white African)
- Previous GDM
- Previous elevated BGL
- Maternal age ≥ 40 years
- Family history DM (1st degree relative or sister with GDM)
- Previous macrosomia (BW > 4500 g or > 90th percentile)
- Previous perinatal loss
- Polycystic ovarian syndrome
- Medications (corticosteroids, antipsychotics)
- Multiple pregnancy

**Assess all women for risk factors**

**Risk factors or GDM clinical concerns?**
- Yes
  - First trimester (only) HbA1c
  - HbA1c ≥ 41 mmol/mol (5.9%)?
  - Yes
    - GDM care
  - No
    - HbA1c < 41 mmol/mol
    - OGTT one or more of:
      - Fasting ≥ 5.1 mmol/L
      - 1 hour ≥ 10 mmol/L
      - 2 hour ≥ 8.5 mmol/L
    - OGTT not required
    - If FBG 4.7–5.0 mmol/L
      - OGTT recommended
        - If COVID-19 suspected or confirmed seek expert clinical advice
        - OGTT advice for women
          - Fast (except for water) for 8–14 hours prior to OGTT
          - Take usual medications
    - If FBG ≤ 4.6 mmol/L
      - OGTT not required
      - Routine antenatal care
        - Unless clinical concerns

**Check FBG**
- At 24–28 weeks gestation or
- If clinical concerns after first trimester

**If FBG 4.7–5.0 mmol/L**
- OGTT recommended
  - If COVID-19 suspected or confirmed seek expert clinical advice
  - OGTT advice for women
    - Fast (except for water) for 8–14 hours prior to OGTT
    - Take usual medications

**If FBG ≥ 5.1 mmol/L**
- OGTT not required

**If FBG < 4.6 mmol/L**
- OGTT not required

**GDM diagnosis**
- HbA1c first trimester only
  - ≥ 41 mmol/mol (or 5.9%)
  - OGTT one or more of:
    - Fasting ≥ 5.1 mmol/L
    - 1 hour ≥ 10 mmol/L
    - 2 hour ≥ 8.5 mmol/L

**Postnatal follow-up**
- Delay OGTT for 6 months or
- If concerned about type 2 diabetes:
  - Continue self-monitoring
  - HbA1c at 4–6 months
  - Notify GP

**BGL: blood glucose level, BMI: body mass index, DM: diabetes mellitus, FBG: fasting blood glucose GDM: gestational diabetes mellitus, GP: general practitioner, HbA1c: glycated haemoglobin, OGTT: oral glucose tolerance test, greater than or equal to, >: greater than**

Flowchart: F20.63-7-V1-R25
Table of Contents

Abbreviations ................................................................................................................................. 8
Definitions ........................................................................................................................................ 8
1 Introduction .................................................................................................................................... 9
  1.1 Background ............................................................................................................................ 9
  1.2 Clinical standards ................................................................................................................ 10
  1.3 Data collection ...................................................................................................................... 10
2 Peripartum risk management ........................................................................................................ 11
  2.1 Risk factors for severe COVID-19 ....................................................................................... 12
  2.2 Signs and symptoms during pregnancy .............................................................................. 12
  2.3 Vaccination .......................................................................................................................... 13
  2.4 Infection control and prevention ......................................................................................... 14
3 Maternity care during COVID-19 pandemic (for all women) ...................................................... 15
  3.1 Principles of maternity care ................................................................................................. 15
  3.2 Perinatal mental health (for all women) .............................................................................. 16
  3.3 Domestic and family violence (for all women) .................................................................... 16
  3.4 Visiting in-patient mothers and babies ............................................................................... 17
  3.5 Home visiting during COVID-19 pandemic (for all women) .............................................. 17
  3.6 Recommendations affecting routine maternity care (for all women) ................................. 18
4 In-hospital maternity care (if SCOVID or COVID-19) ................................................................. 19
  4.1 Clinical course in pregnancy and postpartum ...................................................................... 19
  4.2 Labour and birth (if SCOVID or COVID-19) ...................................................................... 20
    4.2.1 Water immersion and waterbirth (if SCOVID or COVID-19) ...................................... 21
  4.3 Postnatal care (if SCOVID or COVID-19) ........................................................................... 22
5 Newborn care ............................................................................................................................... 23
  5.1 General principles (for all babies) ....................................................................................... 23
  5.2 Initial care (baby of SCOVID or COVID-19 mother) .......................................................... 24
  5.3 Neonatal respiratory support (if SCOVID or COVID-19) .................................................... 24
    5.3.1 Neonatal filters (if SCOVID or COVID-19) ................................................................. 25
  5.4 Discharge preparation (following SCOVID or COVID-19) ................................................ 26
References ......................................................................................................................................... 27
Appendix A: Modified schedules for low-risk women during COVID-19 ...................................... 30
Appendix B: Recommended nitrous oxide circuits ....................................................................... 32
Appendix C: Neonatal filter use .................................................................................................... 33
Acknowledgements ....................................................................................................................... 34

List of Tables
Table 1. COVID-19 ........................................................................................................................ 9
Table 2. Clinical standards ............................................................................................................ 10
Table 3. Perinatal data collection ................................................................................................. 10
Table 4. Adverse outcomes associated with COVID-19 .............................................................. 11
Table 5. Risk factors for severe COVID-19 ................................................................................ 12
Table 6. Frequency of reported signs and symptoms .................................................................. 12
Table 7. Vaccination .................................................................................................................... 13
Table 8. Risk assessment ............................................................................................................. 14
Table 9. Principles of determining care ...................................................................................... 15
Table 10. Perinatal mental health ............................................................................................... 16
Table 11. Domestic and family violence ...................................................................................... 16
Table 12. Hospital visiting ........................................................................................................... 17
Table 13. Home visiting during COVID-19 pandemic ................................................................. 17
Table 14. Specific considerations for maternity care ................................................................. 18
Table 15. In hospital maternity care ............................................................................................ 19
Table 16. Clinical course in pregnancy ....................................................................................... 19
Table 17. Labour and birth .......................................................................................................... 20
Table 18. Water immersion and birth ......................................................................................... 21
Table 19. Postnatal care ............................................................................................................... 22
Table 20. General principles ....................................................................................................... 23
Table 21. Baby of SCOVID or COVID-19 mother ....................................................................... 24
Table 22. Respiratory support management ............................................................................... 25
Table 23. Neonatal filters ............................................................................................................ 25
Table 24. Discharge ...................................................................................................................... 26
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGP</td>
<td>Aerosol generating procedure</td>
</tr>
<tr>
<td>COVID-19</td>
<td>Positive COVID-19 case</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous positive airway pressure</td>
</tr>
<tr>
<td>DFV</td>
<td>Domestic and family violence</td>
</tr>
<tr>
<td>GDM</td>
<td>Gestational diabetes mellitus</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive care unit</td>
</tr>
<tr>
<td>MSG</td>
<td>Message</td>
</tr>
<tr>
<td>NBST</td>
<td>Newborn bloodspot screening test</td>
</tr>
<tr>
<td>OGTT</td>
<td>Oral glucose tolerance test</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal protective equipment</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe acute respiratory syndrome</td>
</tr>
<tr>
<td>SCOVID</td>
<td>Suspected COVID-19 positive case</td>
</tr>
<tr>
<td>SpO₂</td>
<td>Peripheral capillary oxygen saturations</td>
</tr>
<tr>
<td>VOC</td>
<td>Variant of concern</td>
</tr>
<tr>
<td>VTE</td>
<td>Venous thromboembolism</td>
</tr>
</tbody>
</table>

### Definitions

<table>
<thead>
<tr>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airborne versus droplet</strong></td>
<td>In this document airborne is used to mean very small particles which, rather than falling to the ground (as larger droplets do), can flow through the air, remain suspended for long periods or evaporate before hitting the floor leaving the solid particulate free to float long distances, and spread more widely. Dispersion is affected by more than just particle size (e.g. also by air movement/flow, humidity, temperature)</td>
</tr>
<tr>
<td><strong>Close contact</strong></td>
<td>Refer to definition in current *Communicable Diseases Network Australia (CDNA) National Guidelines for Public Health Units Coronavirus Disease 2019 (COVID-19)*¹</td>
</tr>
<tr>
<td><strong>Cohorting</strong></td>
<td>Placement of patients with similar/same condition in the same physical location.²</td>
</tr>
<tr>
<td><strong>COVID-19</strong></td>
<td>In this guideline used to mean a person confirmed as being COVID-19 positive according to national guidelines case definition¹</td>
</tr>
<tr>
<td><strong>Exposure location</strong></td>
<td>Term used to describe a venue that a person with COVID-19 has been. Health advice is provided according to the contact category assigned to the location³</td>
</tr>
<tr>
<td><strong>Hotspot</strong></td>
<td>Hotspots are where health officials have found a lot of people with COVID-19. Hotspots are legally listed so that people travelling from high-risk areas into Queensland can be identified.⁴</td>
</tr>
<tr>
<td><strong>Neonatal unit</strong></td>
<td>In this guideline, used to refer to the admitted baby unit of the facility (i.e. neonatal intensive care unit and/or special care nursery).</td>
</tr>
<tr>
<td><strong>Isolation</strong></td>
<td>Used to separate ill people from those who are healthy until they are declared recovered.</td>
</tr>
<tr>
<td><strong>Quarantine</strong></td>
<td>Used to restrict the movement of a well person who may have been exposed for the period when they could become unwell (duration 14 days for COVID-19).</td>
</tr>
<tr>
<td><strong>SCOVID</strong></td>
<td>In this guideline used to mean a person suspected or with increased likelihood of current SARS-CoV-2 infection according to national guidelines case definition¹ (i.e. COVID-19 positive, close contact)</td>
</tr>
<tr>
<td><strong>Standard precautions</strong></td>
<td>Follow standard precautions for infection prevention and control at all times. This is additional to other transmission precautions required during COVID-19 (e.g. contact, droplet, airborne precautions).</td>
</tr>
<tr>
<td>Standard precautions³</td>
<td>Standard precautions consist of hand hygiene, appropriate use of personal protective equipment, safe use and disposal of sharps, routine environmental cleaning, reprocessing of re-usable medical equipment and instruments, respiratory hygiene and cough etiquette, aseptic technique, waste management, appropriate handling of linen.</td>
</tr>
</tbody>
</table>
1 Introduction
Information is current at the time of publication, but new information is emerging, and this may affect recommendations. This guideline applies to women who do not require critical care.

1.1 Background

Table 1. COVID-19

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| **Coronavirus**            | • COVID-19 is the disease caused by SARS-CoV-2  
• SARS-CoV-2 is the name of the virus (a type of coronavirus) first identified in late 2019  
• Coronavirus is the broad name for a type of virus. There are different kinds of coronaviruses (e.g. Severe Acute Respiratory Syndrome (SARS), Middle Eastern Respiratory Syndrome (MERS))  
• New variants of concern (VOC) of SARS-CoV-2 have emerged (e.g. alpha, beta, gamma, delta); are expected to continue to emerge, and some may disappear |
| **Delta VOC**              | • Delta is currently the predominant VOC in Australia and worldwide  
• Compared to previous VOC, delta VOC is  
  o Twice as contagious  
  o More likely to cause severe illness, hospitalisation, and death  
• After two doses of vaccine  
  o Effectiveness against delta VOC is comparable (although slightly less) than against alpha VOC  
  o Breakthrough infection remains possible although compared to partially or unvaccinated people, mean viral RNA load is lower and duration of illness shorter |
| **Transmission of COVID-19**| • Human to human transmission occurs predominately through respiratory droplets and aerosols from close contact with an infected person as  
  o Inhalation of very fine droplets and aerosol particles  
  o Deposition of droplets and particles onto exposed mucous membranes (e.g. mouth, nose, eye)  
  o Touching mucous membranes with hands soiled by exhaled respiratory fluids containing virus or from touching inanimate surfaces contaminated with the virus |
| **Vertical transmission**  | • Evidence of vertical transmission is not well established but may be possible  
  o Therefore, treat babies of mothers with positive COVID-19 (COVID-19) or suspected COVID-19 (SCOVID) as close contacts  
  o Estimates of 2.6–3.7% reported (mainly following third trimester infection)  
  o There is a paucity of data about rates of transmission in early pregnancy  
• No evidence of congenital malformation following maternal COVID-19 infection  
• Not affected by mode of birth or delayed cord clamping |
| **Physiology of pregnancy and COVID-19** | • Pregnant women do not appear at greater risk of contracting COVID-19 than the general population  
• Physiological changes of pregnancy related to the immune system may be associated with more severe disease  
• Mechanisms underlying associations with adverse outcomes are unclear  
  o COVID-19 may share a common pathway with pre-eclampsia or create a proinflammatory state that produces systematic endothelial dysfunction  
  o May lead to renin-angiotensin system dysfunction and vasoconstriction by binding to angiotensin-converting enzyme 2 receptors  
  o Placental fetal vascular malperfusion may contribute to fetal growth restriction, stillbirth and preterm birth |
## 1.2 Clinical standards

Table 2. Clinical standards

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wellbeing and workforce</td>
<td>• Recognise the emotional and physical impact on clinicians providing care during the pandemic(^\text{20,21})</td>
</tr>
<tr>
<td></td>
<td>• Support access to employee assistance, mental health advice and cultural support services</td>
</tr>
<tr>
<td></td>
<td>• Encourage, facilitate, and model collegial communications and support</td>
</tr>
<tr>
<td></td>
<td>• Support debriefing, reflections and learning as required</td>
</tr>
<tr>
<td>Information</td>
<td>• Provide evidence-informed information</td>
</tr>
<tr>
<td></td>
<td>• Support attendance at information sessions and upskilling related to COVID-19 (e.g. personal protective equipment (PPE) use, vaccination information)</td>
</tr>
<tr>
<td></td>
<td>• Communicate frequently and regularly about current/changing requirements for care delivery and reporting</td>
</tr>
</tbody>
</table>

## 1.3 Data collection

To help inform future care and understanding of the COVID-19 disease, data is needed. Specify COVID-19 related codes in the Perinatal Data Collection. Refer to [Statistical Services Branch website for details of agreed codes](#).\(^\text{22}\)

Table 3. Perinatal data collection

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal online (PNO)</td>
<td>• Codes to facilitate data collection have been added to the <em>Medical Conditions</em> and <em>Neonatal Morbidity</em> sections in the data collection form</td>
</tr>
<tr>
<td></td>
<td>• Select the most appropriate set of codes</td>
</tr>
<tr>
<td>Other electronic data collection systems</td>
<td>• Facilitate modification to code sequence as per the Queensland Perinatal Data Collection COVID-19 requirements as soon as possible</td>
</tr>
<tr>
<td></td>
<td>• If system modification is delayed, manually add details to file extract where possible</td>
</tr>
<tr>
<td>Paper collection (MR63d)</td>
<td>• Record maternal details at <em>Medical conditions viral infections</em></td>
</tr>
<tr>
<td></td>
<td>• Record neonatal details at <em>Neonatal morbidities</em></td>
</tr>
</tbody>
</table>
2 Peripartum risk management

Although pregnant women are not more likely to contract the infection than the general population, COVID-19 infection during pregnancy is associated with a higher risk of severe illness and other adverse pregnancy outcomes.\textsuperscript{17,19}

Table 4. Adverse outcomes associated with COVID-19

<table>
<thead>
<tr>
<th>Outcome</th>
<th>OR</th>
<th>CI (95%)</th>
<th>No. studies (No. women)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-eclampsia\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>1.33</td>
<td>1.03 to 1.73</td>
<td>13 (424,344)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>4.16</td>
<td>1.55 to 11.15</td>
<td>5 (521)</td>
</tr>
<tr>
<td>Preterm birth\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>1.82</td>
<td>1.38 to 2.39</td>
<td>18 (425,357)</td>
</tr>
<tr>
<td>Symptomatic versus asymptomatic COVID-19</td>
<td>2.29</td>
<td>1.49 to 3.53</td>
<td>9 (4233)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>4.29</td>
<td>2.41 to 7.63</td>
<td>10 (1393)</td>
</tr>
<tr>
<td>Caesarean birth\textsuperscript{19}</td>
<td></td>
<td>1.0</td>
<td>13 (121,650)</td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>1.0</td>
<td>0.82 to 1.23</td>
<td>22 (429,366)</td>
</tr>
<tr>
<td>Symptomatic versus asymptomatic COVID-19</td>
<td>1.57</td>
<td>1.32 to 1.85</td>
<td>9 (4233)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>2.58</td>
<td>1.64 to 4.06</td>
<td>8 (1138)</td>
</tr>
<tr>
<td>Stillbirth\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>2.11</td>
<td>1.14 to 3.9</td>
<td>6 (413,122)</td>
</tr>
<tr>
<td>Admission to ICU\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>4.78</td>
<td>2.03 to 11.25</td>
<td>5 (409,737)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>15.46</td>
<td>5.79 to 41.23</td>
<td>5 (757)</td>
</tr>
<tr>
<td>Mechanical ventilation\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptomatic versus asymptomatic COVID-19</td>
<td>16.29</td>
<td>3.88 to 68.47</td>
<td>3 (1062)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>19.31</td>
<td>9.38 to 39.72</td>
<td>5 (962)</td>
</tr>
<tr>
<td>Admission to NICU\textsuperscript{19}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With versus without COVID-19</td>
<td>3.69</td>
<td>1.39 to 9.82</td>
<td>10 (565)</td>
</tr>
<tr>
<td>Severe versus mild COVID-19</td>
<td>3.95</td>
<td>1.43 to 10.95</td>
<td>5 (729)</td>
</tr>
<tr>
<td>Maternal death from any cause\textsuperscript{17}</td>
<td>Number</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>With confirmed COVID-19</td>
<td>339</td>
<td>0.02%</td>
<td>59 (41,664)</td>
</tr>
</tbody>
</table>

No significant difference in outcome between with versus without COVID-19\textsuperscript{19}

Gestational diabetes
Fetal distress
Chorioamnionitis
Low birth weight
Caesarean birth
Postpartum haemorrhage

Odds ratio (OR) approximates risk ratio (RR) when the outcome is rare (less than 10%). OR increasingly overestimates RR as outcomes exceed 10%
2.1 Risk factors for severe COVID-19

Table 5. Risk factors for severe COVID-19

<table>
<thead>
<tr>
<th>Risk factor for severe COVID-19</th>
<th>OR</th>
<th>CI (95%)</th>
<th>No. studies (No. women)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased maternal age</td>
<td>1.83</td>
<td>1.27 to 2.63</td>
<td>7 (3,561)</td>
</tr>
<tr>
<td>Higher BMI</td>
<td>2.37</td>
<td>1.83 to 3.07</td>
<td>5 (3,367)</td>
</tr>
<tr>
<td>Any pre-existing co-morbidity</td>
<td>1.81</td>
<td>1.49 to 2.20</td>
<td>3 (2,634)</td>
</tr>
<tr>
<td>Chronic hypertension</td>
<td>2.0</td>
<td>1.14 to 3.48</td>
<td>2 (858)</td>
</tr>
<tr>
<td>Pre-existing diabetes</td>
<td>2.12</td>
<td>1.62 to 2.78</td>
<td>3 (3,333)</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>4.21</td>
<td>1.27 to 14.0</td>
<td>4 (274)</td>
</tr>
</tbody>
</table>

2.2 Signs and symptoms during pregnancy

Table 6. Frequency of reported signs and symptoms

<table>
<thead>
<tr>
<th>Sign/symptom</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>40.4</td>
</tr>
<tr>
<td>Fever</td>
<td>32.4</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>31.9%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>20.6</td>
</tr>
<tr>
<td>Loss of sense of smell/taste</td>
<td>17.8</td>
</tr>
<tr>
<td>Muscle or joint pain</td>
<td>16.0</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>15.8</td>
</tr>
<tr>
<td>Headache</td>
<td>13.1</td>
</tr>
<tr>
<td>Sore throat</td>
<td>9.0</td>
</tr>
<tr>
<td>Nausea/vomiting</td>
<td>5.2</td>
</tr>
<tr>
<td>Other (sputum production, nasal congestion headache, loss of appetite, rash, nausea)</td>
<td>8.8</td>
</tr>
</tbody>
</table>
2.3 Vaccination

Advise women that vaccination reduces the risk of adverse perinatal outcomes associated with COVID-19 including against the delta VOC. Pregnant women are a priority group for vaccination with mRNA vaccines.

Table 7. Vaccination

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Vaccine type      | - Recommend mRNA vaccines (e.g. Pfizer (Comirnaty) or Spikevax (Moderna))  
                    - If first dose was Astra Zeneca vaccine, either of the mRNA vaccines or the AstraZeneca vaccine can be given for the second dose |
| Safety            | - Good real-world evidence that vaccination is safe for women who are  
                    o Pregnant  
                    o Breastfeeding  
                    o Planning pregnancy  
                    o Undergoing IVF  
                    o Known to have had COVID-19 in the past  
                    - No evidence that vaccination increases risk of:  
                    o Spontaneous miscarriage  
                    o Adverse pregnancy outcomes  
                    - No evidence that vaccination adversely affects fertility  
                    - No side effects specific to pregnant women or their babies have been identified (although it is possible very rare side effects may still emerge)  
                    - Vaccine elicited antibodies have been found in neonatal cord blood following administration of the vaccine and in breast milk and passive immunity may be conferred |
| Contraindications | - Anaphylaxis to a previous dose of mRNA COVID-19 vaccine or any component of the vaccine, including polyethylene glycol (PEG)  
                    - Myocarditis and/or pericarditis attributed to a previous dose of mRNA COVID-19 vaccine |
| Timing of administration | - Recommend at any stage of pregnancy  
                        o The optimal time to have the vaccine during pregnancy is not known  
                        - Follow Australian Technical Advisory Group on Immunisation (ATAGI) recommendations for dosing intervals  
                        - Recommend at least a 7 day interval between a dose of COVID-19 vaccine and other vaccines, including:  
                        o Seasonal flu vaccine  
                        o Whooping cough  
                        - Seek specialist advice about the timing of vaccination for women with heart conditions (e.g. rheumatic heart disease, history of pericarditis or myocarditis)  
                        - If history of COVID-19 infection, defer vaccination for up to six months |
| Recommendation    | - Routinely recommend vaccination at the earliest opportunity to women who are planning a pregnancy, are already pregnant or who are lactating |
## 2.4 Infection control and prevention

### Table 8. Risk assessment

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information for families</strong></td>
<td>• Provide information about:</td>
</tr>
<tr>
<td></td>
<td>o Infection prevention and control practices that can prevent transmission of COVID-19(^1) (e.g. hand washing, coughing/sneezing, social distancing, masks)</td>
</tr>
<tr>
<td></td>
<td>o Importance of risk minimisation strategies for postnatal baby care</td>
</tr>
<tr>
<td></td>
<td>o Importance of vaccination for household and close contacts</td>
</tr>
<tr>
<td><strong>Designated COVID network hospital</strong></td>
<td>• If COVID-19, provide care in a designated COVID network hospital within an internal location as per schedule 2 of the Designated COVID-19 Hospital Network Direction(^35)</td>
</tr>
<tr>
<td></td>
<td>o Engineering and heating, ventilation, and air-conditioning (HVAC) controls are essential to prevent spread(^35,36)</td>
</tr>
<tr>
<td></td>
<td>• If cohorting of COVID-19 cases is required, follow Queensland Health guidance and recommendations for patient placement(^2)</td>
</tr>
<tr>
<td><strong>PPE</strong></td>
<td>• Follow Australian Infection Control Expert Group Guidance on the use of personal protective equipment (PPE) for health care workers in the Context of COVID-19(^37)</td>
</tr>
<tr>
<td></td>
<td>• Follow PPE escalation guidance(^38) during periods of low, moderate and high risk of community transmission of COVID-19 (as defined in the guidance)</td>
</tr>
<tr>
<td><strong>If self-quarantine/isolation</strong></td>
<td>• Refer to Queensland Health COVID-19 self-isolation requirements(^39)</td>
</tr>
<tr>
<td></td>
<td>• If healthcare cannot be delayed, individually assess need for hospital admission(^16)</td>
</tr>
<tr>
<td></td>
<td>• Recommend mother and baby remain co-located in the home during self-quarantine/isolation</td>
</tr>
<tr>
<td></td>
<td>• Advise:</td>
</tr>
<tr>
<td></td>
<td>o If any concerns, to contact a health professional (provide contact details 13HEALTH (13 43 25 84) and for local maternity service)</td>
</tr>
<tr>
<td></td>
<td>o To keep in touch with family and friends via non-direct contact methods (e.g. telephone, video telephony applications) to minimise feelings of isolation</td>
</tr>
<tr>
<td><strong>Testing</strong></td>
<td>• Follow testing requirements as per Public Health directives(^40,41)</td>
</tr>
<tr>
<td></td>
<td>• Follow PPE recommendations for specimen collection(^37)</td>
</tr>
<tr>
<td></td>
<td>• Use a single swab to collect oropharyngeal and bilateral deep nasal swab (3 sites of collection)(^42)</td>
</tr>
<tr>
<td></td>
<td>• If productive cough, collect sputum (contains highest viral loads)(^42)</td>
</tr>
<tr>
<td></td>
<td>o Rate of viral coinfection in SARS-CoV-2 has been negligible in Australia(^42)</td>
</tr>
<tr>
<td></td>
<td>• Serology only at public health unit direction (rarely indicated)</td>
</tr>
<tr>
<td><strong>Point of care testing</strong></td>
<td>• Rapid antigen Point of Care (POC) testing is part of the Australian strategy against COVID-19(^43)</td>
</tr>
<tr>
<td></td>
<td>o Requires TGA approval for use</td>
</tr>
<tr>
<td></td>
<td>• Follow local protocols for criteria for use and implementation</td>
</tr>
</tbody>
</table>
### 3 Maternity care during COVID-19 pandemic (for all women)

A key principle for maternity and neonatal services is to meet the needs of the woman and her family in a manner that supports public health safety requirements and minimises the risk of community transmission. Vigilant adherence to infection prevention and control recommendations is essential for maintaining low risk of transmission in the community.

#### 3.1 Principles of maternity care

Table 9. Principles of determining care

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| **Assumptions**               | • Decisions about local service delivery (type, mode, or model of care) in response to COVID-19 are best made at the local level and require consideration of more than just risk of contagion  
  • Definitions of “low risk” and “elevated risk” are not universal or agreed  
  • Risk occurs on a continuum  
  • Different aspects of maternity care may carry different levels of risk, so some care may be “old normal” and some care may be a “new normal” |
| **Risk of community transmission** | • Alter care delivery in response to changing risk of community transmission  
  • National and state directives relevant to COVID-19  
  • Visitor restrictions for inpatient care  
  • Public gatherings and social distancing requirements  
  • Border closures and travel restrictions  
  • Human biosecurity requirements/restricted access to remote communities  
  • HHS pandemic plans and associated declared pandemic tier status  
  • The presence of local clusters or known cases  
  • The characteristics of the local maternity population that may increase or decrease risk (e.g. high levels of obesity, smoking, co-morbidities, indigenous populations)  
  • Emerging evidence that affects recommended care delivery |
| **Individual woman’s risk**   | • The COVID-19 status of the woman (e.g. SCOVID, COVID-19 or a contact of a SCOVID/COVID-19 case)  
  • Obstetric clinical condition–women with high risk conditions may require more frequent encounters and be better suited to face-to-face encounters  
  • Language/cultural needs in relation to type, mode or model of care  
  • Woman’s tolerance/appetite for risk and individual preferences for type, mode, or model of care  
  • Digital capability (ability to engage via technology) if this is the preferred type, mode, or model of care |
| **Community expectations**    | • The need to offer certainty of care provision to women and their families  
  o Facilitates care planning and expectation management  
  o May assist to alleviate anxiety and fear around pregnancy and birth during the COVID-19 pandemic  
  • The emotional, cultural, and physical wellbeing, and safety of staff  
  o Fear of transmission to self and family  
  o Emotional fatigue and exhaustion from heightened awareness and sustained exposure  
  o Personal risk factors influencing desire and ability to provide care  
  o Increased exposure to occupational violence and community fear |
| **Model of care**             | • Resourced appropriately for safe care delivery (human and technological)  
  • Physical infrastructure is appropriate (e.g. supports social/physical distancing requirements)  
  • Incorporates an ongoing assessment of clinical risk to promote safety for the woman and her baby  
  • Promotes continuity of care for the woman  
  • May include  
  o Hybrid and mixed modes of delivery and partnerships (e.g. shared care via private-public arrangements, use of telehealth in combination with face-to-face encounters)  
  o Hospital or community-based delivery of care  
  • Has potential to be scaled up or down in response to changing circumstances |
### 3.2 Perinatal mental health (for all women)

#### Table 10. Perinatal mental health

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context</strong></td>
<td>Pregnant women and their families experience heightened anxiety and stress from COVID-19 which may be related to(^44-48): o Increased social isolation and reduced support from family and friends associated with physical distancing and travel restrictions o Financial impact of economic downturn (e.g. loss of income) o Changes or uncertainty about expected healthcare delivery (e.g. less face-to-face encounters, visitor restrictions during hospitalisation) o Evolving and changing estimates of risk for the pregnancy and baby • Effect can be assumed irrespective of personal COVID-19 status (negative, SCOVID or COVID positive)</td>
</tr>
<tr>
<td><strong>Strategies</strong></td>
<td>• Provide consistent, evidence-based information (as is current and known at the time) as this may help alleviate stress(^45) • Maintain awareness of that women already at increased risk for mental health issues may require additional support during the pandemic (e.g. women who are younger, without social support, experiencing financial hardship, history of anxiety or depression)(^45,47) • Adhere to usual/standard care recommendations (e.g. woman-centred care, respectful communication, consent, and informed decision making) o Refer to Queensland Clinical Guideline: Standard care(^49)</td>
</tr>
<tr>
<td><strong>Model of care</strong></td>
<td>• Support models of care that maximise continuity (e.g. midwifery continuity of care, case management, midwife navigator, general practitioner (GP), private practice midwives) • Involve cultural supports as required (e.g. Indigenous Health Worker, Aboriginal Medical Service or Aboriginal Community Controlled organisations)</td>
</tr>
<tr>
<td><strong>Follow-up</strong></td>
<td>• Offer referral to perinatal mental health support (e.g. social work, mental health teams, peer support groups, health worker or cultural supports) • Liaise with community health practitioners (e.g. general practitioner, midwives, health worker) throughout the perinatal period • Refer to perinatal mental health resources (e.g. Beyond Blue(^50), Centre of Perinatal Excellence (COPE)(^51))</td>
</tr>
</tbody>
</table>

### 3.3 Domestic and family violence (for all women)

#### Table 11. Domestic and family violence

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context</strong></td>
<td>Maintain awareness that domestic and family violence (DFV) may increase in association with social isolation(^52) • Includes psychological, emotional, and financial abuse and control as well as serious physical risk of harm and sexual abuse</td>
</tr>
<tr>
<td><strong>Risk management</strong></td>
<td>• Refer to COVID-19: Domestic and family violence fact sheet(^53) • Conduct conversations in a manner that maximises safety for the woman, especially when utilising telehealth modes of care—for example ask: o Is it a good time to talk or when would be a good time to call? o What mode of communication is preferred by the woman? (e.g. text, email, telephone) • Provide an opportunity for women to identify any changed circumstances—for example ask: o What has changed for you at home during COVID-19? o How have the changes affected you and your family?</td>
</tr>
<tr>
<td><strong>Screening and referral</strong></td>
<td>• Screen all pregnant women for DFV • If concerns identified, refer to social work and/or specialist DFV services</td>
</tr>
</tbody>
</table>
3.4 Visiting in-patient mothers and babies

Table 12. Hospital visiting

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Visitor restrictions        | • Refer to Queensland Health public health direction about hospital entry\(54\)  
  - The Chief Health Officer (in accordance with emergency powers arising from a declared public health emergency)\(55\) has the authority to restrict visitors to hospitals  
  - Follow local protocols for rapid antigen visitor testing                                                                                                                                     |
| Information for women/families | • Advise women about the need and rationale for visitor restrictions (if they are currently required) to facilitate advance planning and manage expectations for care  
  - Including restrictions to parental visiting if admission to the neonatal unit is required  
  - Provide information to women, their partners and other visitors about additional infection prevention and control measures (e.g. mask and gown use) if these are required  
  - Refer to Section 2.4 Infection control and prevention                                                                                                                                 |
| During labour and birth     | • Consistent with public health directions identified above, if visiting restrictions apply to the woman or her support people:  
  - Consider risk and benefit of individual circumstances  
  - Support the woman to identify an appropriate support person  
  - Requiring the woman to labour and birth without a support person not recommended                                                                                                                                 |

3.5 Home visiting during COVID-19 pandemic (for all women)

Table 13. Home visiting during COVID-19 pandemic

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| General principles          | • Use clinical judgement and consider individual circumstances when determining most appropriate model of healthcare delivery (i.e. is a home visit necessary)  
  - Hybrid models of care delivery (e.g. combination of telehealth, phone support and home visit) may assist in minimising contact duration  
  - Use advance planning to identify and:  
    - Prepare for the care likely to be required during the home visit  
    - Minimise equipment to be taken into the home  
    - Maintain infection prevention and control standards (e.g. hand hygiene, disposal of consumable, equipment cleaning)                                                                                              |
| Pre-visit assessment        | • Prior to entering the woman’s home, assess the clinical status and social circumstances of the woman and other residents at the home (e.g. by phone, telehealth)  
  - Use standard home visiting risk assessment tools and additionally ask:  
    - Do any residents or visitors have symptoms of COVID-19?  
    - Are any residents or visitors in self-quarantine/isolation?  
    - Are there additional safety issues for the healthcare provider and/or the woman that may arise/be exacerbated by the COVID-19 pandemic or the home visit (e.g. domestic and family violence, alcohol or substance use, high mobility of household residents)?  
  - If risk of transmission or safety concerns identified, postpone home visit  
    - Reschedule/make alternative arrangements as required                                                                                                                                       |
| During visit                | • Follow PPE escalation guidance\(38\) during periods of low, moderate and high risk of community transmission of COVID-19 (as defined in the guidance)  
  - Maintain physical (social) distancing (1.5 metre from the woman) during the visit where possible (e.g. ask other family members to leave the room during visit)  
  - Follow standard infection prevention and control recommendations as required for usual care                                                                                              |
### 3.6 Recommendations affecting routine maternity care (for all women)

#### Table 14. Specific considerations for maternity care

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| **Antenatal education**         | - If local risk assessed as low, offer online, face-to-face, or mixed mode antenatal education  
                                  |   o Face-to-face sessions may be preferred and more appropriate for some women  
                                  |   o Consider holding face-to-face sessions in community locations (rather than hospital settings)  
                                  |   o Maintain physical distancing/consider reduction in participant numbers during face-to-face sessions  
                                  | - If local risk assessed as elevated, recommend online antenatal education and consider additional supports, (e.g. group/individual sessions via online platforms, static web resources, email contact, support groups, telehealth appointments or mobile phone that can receive MSG documents) |
| **Antenatal schedule**          | - Assess the individual circumstances of each woman and tailor the number, type, and schedule of antenatal encounters  
                                  | - If local risk assessed as low, follow usual recommended schedule of antenatal care  
                                  | - If local risk assessed as elevated, reduce the number of face-to-face encounters  
                                  |   o Refer to Appendix A: Modified schedules for low-risk women during COVID-19  
                                  | - To avoid additional visitations, schedule/reschedule face-to-face encounters with multiple health care providers, to occur on the same day  
                                  | - Consider community-based locations (rather than hospital settings) for antenatal care services |
| (including lactation services)  |                                                                                                                                                                                                              |
| **Routine ultrasound**          | - If local risk assessed as low, follow usual recommended schedules according to clinical circumstances  
                                  |   o Refer to Appendix A: Modified schedules for low-risk women during COVID-19  
                                  | - If local risk assessed as elevated  
                                  |   o If clinical concerns, use clinical judgement and seek expert advice |
| **Routine vaccinations**        | - Irrespective of local risk status, recommend routine vaccinations for whooping cough and influenza to pregnant women |
| **Gestational diabetes mellitus** | - If local risk assessed as low, recommend oral glucose tolerance test (OGTT) as the gold standard for screening and diagnosis of GDM and for postnatal follow-up  
                                  |   o If local risk assessed as elevated, refer to Flowchart GDM screening and testing when local risk of COVID-19 is elevated  
                                  |   o These recommendations are consistent with the Australian Diabetes in Pregnancy Society (ADIPS) for use when local risk assessed as elevated  
                                  |   o Refer to the Queensland Clinical Guideline: FAQ GDM screening and testing during COVID-19 pandemic |
| (GDM)                           | - Optimise haemoglobin prior to birth to minimise morbidity associated with blood loss and the subsequent need for blood products (which may be in short supply during the pandemic)  
                                  | - Refer to Lifeblood Australian Red Cross Lifeblood Maternity Blood Management |
| **Maternal haemoglobin**        | - Women with co-morbidities (e.g. obesity, gestational diabetes, pre-eclampsia) are at increased risk for severe COVID-19 disease  
                                  |   o Seek expert clinical advice early in the pregnancy to plan care  
                                  |   o First Nations communities and other vulnerable groups may be more severely impacted due to social and cultural determinants of health  
                                  |   o Seek woman’s permission to involve cultural supports as required (e.g. at the first visit) |
| **Vulnerable women**            | - If symptomatic for COVID-19 (no matter how mild the symptoms), recommend immediate testing |
| **Symptomatic women**           |                                                                                                                                                                                                              |
4 In-hospital maternity care (if SCovid or COVID-19)

Refer to Flowchart: Location and precautions if SCovid or COVID-19 for in-hospital care decisions and precautions.

Table 15. In hospital maternity care

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Retrieval or transfer         | • If transport or retrieval required, follow usual protocols/processes/criteria to arrange care within a designated COVID network hospital  
                                  • Refer to Flowchart: Location and precautions if SCOID or COVID-19  
                                  • For women with SCovid or COVID-19, recommend VTE prophylaxis (antenatal and postpartum) unless there is a contraindication (e.g. risk of major bleeding)  
                                  • Continue prophylactic anticoagulants for at least 14 days after discharge or until COVID-19 related morbidity (e.g. shortness of breath, immobility, dehydration) has resolved  
                                  • Refer to Queensland Clinical Guideline: Venous thromboembolism prophylaxis (VTE) in pregnancy and the puerperium  
                                  • Do not delay medical imaging due to concern about fetal exposure  
                                  • Ultrasound scan for fetal wellbeing as indicated and after resolution of acute symptoms  
                                  • If COVID-19 in the first trimester, consider a detailed morphology scan at 18–24 weeks  
                                  • No evidence of congenital malformation with COVID-19 infection  
| Venous thromboembolism (VTE)  | • Apply radiation shield over the gravid uterus  
                                  • Oxygen therapy as indicated to maintain SpO2 95% or more  
                                  • Usual maternal and fetal observations/clinical surveillance, and SpO2  
                                  • Increase frequency of monitoring according to severity of illness  
                                  • Do not delay clinically indicated investigations/procedures  
                                  • Support the woman’s psychological and emotional needs  
| Medical imaging               | • Magnesium sulfate  
                                  • Consider need for conservative fluid management with COVID-19  
                                  • Low dose aspirin  
                                  • Tocolytics  
                                  • Postnatal ACE inhibitors for treatment of postpartum hypertension  
                                  • Carboprost or tranexamic acid (TXA) in treatment of PPH  
                                  • Consider potential for increased clotting with TXA  
| Usual care                    | • Alert obstetric/midwifery/neonatal/anaesthetic/infectious diseases teams of admission  
                                  • Care directed by signs and symptoms, and severity of illness  
                                  • Minimise maternal hypoxia  
                                  • Oxygen therapy as indicated to maintain SpO2 95% or more  
                                  • Usual maternal and fetal observations/clinical surveillance, and SpO2  
                                  • Increase frequency of monitoring according to severity of illness  
                                  • Do not delay clinically indicated investigations/procedures  
                                  • Support the woman’s psychological and emotional needs  
                                  • Rapid clinical deterioration can occur  
                                  • Maintain low threshold for escalation of care  
                                  • In the presence of risk factors/comorbidities  
                                  • If changes in vital signs (e.g. increased work of breathing, febrile, hypotension, altered mental status)  
                                  • Increasing oxygen supplementation to maintain target SpO2  
                                  • Worsening of signs and symptoms  
| Disease modifying treatments  | • A rapidly evolving area—refer to National COVID-19 Clinical Evidence Taskforce for latest information/recommendations  
                                  • If severe COVID-19 disease consult with multi-disciplinary experts and individualise care.  

4.1 Clinical course in pregnancy and postpartum

Table 16. Clinical course in pregnancy

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Clinical surveillance         | • Alert obstetric/midwifery/neonatal/anaesthetic/infectious diseases teams of admission  
                                  • Care directed by signs and symptoms, and severity of illness  
                                  • Minimise maternal hypoxia  
                                  • Oxygen therapy as indicated to maintain SpO2 95% or more  
                                  • Usual maternal and fetal observations/clinical surveillance, and SpO2  
                                  • Increase frequency of monitoring according to severity of illness  
                                  • Do not delay clinically indicated investigations/procedures  
                                  • Support the woman’s psychological and emotional needs  
| Escalation of care            | • Rapid clinical deterioration can occur  
                                  • Maintain low threshold for escalation of care  
                                  • In the presence of risk factors/comorbidities  
                                  • If changes in vital signs (e.g. increased work of breathing, febrile, hypotension, altered mental status)  
                                  • Increasing oxygen supplementation to maintain target SpO2  
                                  • Worsening of signs and symptoms  
| Severe COVID-19               | • If severe COVID-19 disease consult with multi-disciplinary experts and individualise care.  

Refer to online version, destroy printed copies after use
### 4.2 Labour and birth (if SCOVID or COVID-19)

#### Table 17. Labour and birth

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| In hospital location    | - Refer to Flowchart: *Location and precautions if SCOVID or COVID-19*  
- If COVID-19 not excluded, use negative pressure room for labour/birth  
  o If unavaiable, use single room with air purifiers and door closed and consult with infection control team  
  o Transport baby in closed incubator/cot  

| Mode of birth           | - Decision for mode or timing of birth not influenced by positive COVID-19 result (unless urgent birth indicated)61  
- Support the principles of normal birth67  
  o Refer to Queensland Clinical Guideline: *Normal birth*  
  o Discuss risks and benefits of care with the woman and her family  
  o Inform obstetric consultant and anaesthetic, theatre, and neonatal teams of admission to birth suite  

| Caesarean birth         | - No evidence that caesarean birth reduces risk of vertical transmission61  
- If elective caesarean has been planned, individually assess urgency  
- General anaesthetic (GA) for standard indications  

| Fetal monitoring        | - Discuss the options for fetal monitoring in labour with women  
  o Severity of COVID-19 disease and presence of maternal comorbidities impacts fetal outcomes68  
- If symptomatic, recommend continuous electronic fetal monitoring16  
- If asymptomatic, recommend continuous electronic fetal monitoring for usual indications (i.e. not indicated for COVID-19 alone)16,69  
- Apply fetal scalp electrode (FSE) and perform fetal blood sampling (FBS) for usual indications70  
  o If FBS or FSE is considered, weigh the possible (small but unquantifiable) risk of fetal transmission against known benefits of improved assessment of fetal wellbeing  

| Neuraxial blockade      | - Discuss neuraxial blockade with women before/early in labour71  
  o No evidence that neuraxial blockade is contraindicated in the presence of COVID-1972  
  o Minimises need for emergency GA if urgent birth required72 and the subsequent risk associated with GA and COVID-19 infection73  
  o Reduces clinician exposure to AGP associated with intubation and GA71  
- Consider coagulopathy in women who are unwell with SCOVID or COVID19, prior to neuraxial anaesthesia or analgesia72  

| Nitrous oxide           | - Insufficient and conflicting information about cleaning, filtering and AGP potential in the setting of COVID-1916,66,72  
- For reasons of healthcare provider protection, avoid use by women with SCOVID or COVID-19  
- If nitrous oxide is offered, recommend face mask rather than mouthpiece (to reduce exhalation dispersion) and use the following circuits recommended by Queensland Health Biomedical Technology Services74:  
  o Where a scavenger system is available, the Equinox® Advantage Analgesia Circuit–MC/4003  
  o Where a scavenger system is not available, the Equinox® Advantage Analgesia Circuit–MC/4001  
  o Refer to Appendix B: Recommended nitrous oxide circuits  

| Second and third stage  | - Routine maternal observations with addition of SpO₂16  
- Aim to maintain a neutral fluid balance in labour and avoid fluid overload16  
- Delayed cord clamping is supported as part of standard care independent of the presence of COVID-1991,75  
- Manage placental tissue as per usual infectious human tissue protocols  
  o Discuss restrictions with women prior to birth to assist management of expectation for care (e.g. if the woman was intending to bury/take the placenta home)  

| Clinical emergencies    | - Donning of PPE takes time, therefore, to facilitate a rapid response to a clinical emergency72  
  o Consider lowering the threshold for escalation of clinical concerns  
  o Have early and ongoing communication with multidisciplinary team72  

4.2.1 Water immersion and waterbirth (if SCOVID or COVID-19)

Table 18. Water immersion and birth

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>• Although SARS-COV-2 has been detected in faeces(^{76}), there is no evidence of faecal-oral transmission(^{77})</td>
</tr>
<tr>
<td></td>
<td>• There is a small (but unquantifiable) risk that water contaminated with faeces could pose an infection risk to the baby and/or to staff(^{78})</td>
</tr>
<tr>
<td></td>
<td>• Women who are symptomatic of COVID-19 and/or have co-morbidities require close surveillance (including vital signs and SpO2) and this may be better provided on land(^{16})</td>
</tr>
<tr>
<td></td>
<td>• The integrity of PPE can become compromised when wet(^{78})</td>
</tr>
<tr>
<td></td>
<td>• Follow usual protocols for individual risk assessment, infection prevention and control, and workplace health and safety procedures</td>
</tr>
<tr>
<td>Evidence summary</td>
<td>• There is insufficient evidence to make firm recommendations about water immersion/birth</td>
</tr>
<tr>
<td></td>
<td>• Professional organisations have differing recommendations(^{16,78-80})</td>
</tr>
<tr>
<td></td>
<td>o Focus is on differing populations (e.g. all women, symptomatic versus asymptomatic women)</td>
</tr>
<tr>
<td></td>
<td>o Have varying applicability/relevance to Queensland</td>
</tr>
<tr>
<td></td>
<td>o All opinion based due to paucity of evidence</td>
</tr>
<tr>
<td>Asymptomatic women</td>
<td>• Queensland consensus recommendation</td>
</tr>
<tr>
<td></td>
<td>o If waterbirth or water immersion is requested by a woman who is asymptomatic with SCOVID or COVID-19</td>
</tr>
<tr>
<td></td>
<td>▪ Perform a risk assessment (for the woman and the staff)-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>▪ Take into account individual circumstances and the preferences of the woman and the staff providing care</td>
</tr>
<tr>
<td></td>
<td>o If water immersion/birth is offered, waterproof PPE is required</td>
</tr>
<tr>
<td>Symptomatic women</td>
<td>• Queensland consensus recommendation (informed primarily by the need for close surveillance and the potential for rapid deterioration)</td>
</tr>
<tr>
<td></td>
<td>o For women who are symptomatic with SCOVID or COVID-19</td>
</tr>
<tr>
<td></td>
<td>▪ Water immersion is not recommended</td>
</tr>
<tr>
<td></td>
<td>▪ Waterbirth is not recommended</td>
</tr>
</tbody>
</table>
### 4.3 Postnatal care (if SCOVid or COVID-19)

Table 19. Postnatal care

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk minimisation</strong></td>
<td>• Provide information and education on risk minimisation strategies to use during usual mother-baby interactions (e.g. hand hygiene, mask wearing)</td>
</tr>
<tr>
<td></td>
<td>• No evidence to support washing of maternal or baby skin before initial contact or breastfeeding as a risk minimisation strategy</td>
</tr>
<tr>
<td></td>
<td>• If clinical condition (mother and/or baby) permits, recommend skin to skin care</td>
</tr>
<tr>
<td><strong>Co-location of mother and baby</strong></td>
<td>• Co-location (rooming-in) of well mother and well baby is recommended</td>
</tr>
<tr>
<td><strong>Breastfeeding</strong></td>
<td>• Breastfeeding is supported and is not contraindicated</td>
</tr>
<tr>
<td></td>
<td>o No human milk samples have showed active, replication-competent virus (infectious virus)</td>
</tr>
<tr>
<td><strong>Expressed breast milk (EBM)</strong></td>
<td>• Support expression of breastmilk (if feeding preference)</td>
</tr>
<tr>
<td></td>
<td>• Instruct and support adherence to standard infection prevention and control measures (e.g. hand hygiene, mask wearing)</td>
</tr>
<tr>
<td></td>
<td>o Wipe outside of EBM container with disinfectant wipe and allow to dry</td>
</tr>
<tr>
<td></td>
<td>o Equipment cleaning and sterilisation (use dedicated breast pump)</td>
</tr>
<tr>
<td></td>
<td>• Milk bank: pasteurisation reported to inactivate SARS-CoV-2</td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>• Consider usual clinical discharge criteria</td>
</tr>
<tr>
<td></td>
<td>• Prior to discharge</td>
</tr>
<tr>
<td></td>
<td>o Review release from isolation/quarantine requirements (e.g. negative COVID test requirements)</td>
</tr>
<tr>
<td></td>
<td>o Consider implications for public health/community transmission prior to discharge</td>
</tr>
<tr>
<td></td>
<td>o Seek expert advice from Public Health Unit/Infectious Disease Physician</td>
</tr>
<tr>
<td></td>
<td>• If women, their babies and/or support people are returning to defined restricted areas under the Human Biosecurity Act:</td>
</tr>
<tr>
<td></td>
<td>o Refer to Chief Health Officer public health directions</td>
</tr>
<tr>
<td></td>
<td>o Involve local cultural supports (e.g. health worker, Aboriginal and Torres Strait Islander Medical Services) to facilitate delivery of clinical and psycho-social postpartum care during self-isolation/quarantine</td>
</tr>
<tr>
<td></td>
<td>• Refer to Appendix A: Modified schedules for low-risk women during COVID-19</td>
</tr>
</tbody>
</table>
5 Newborn care
For babies born to mothers who are not SCoVID or COVID-19, provide usual recommended newborn care.

5.1 General principles (for all babies)

Table 20. General principles

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Risk assessment                       | - A baby born to a mother with SCoVID or COVID-19 is considered a close contact (even if separated at birth) and  
  - Requires quarantine and infection prevention and control precautions irrespective of any subsequent negative test result for the baby  
  - Baby can be co-located with mother who requires isolation/quarantine  
  - When mother is no longer considered infectious for COVID-19, the baby can be released from quarantine as per COVID-19 release from isolation/quarantine requirements |
| Organisation of neonatal unit areas   | - Nurse babies who are a close contact in an area separate from babies who are not a close contact  
  - If baby has COVID-19, isolation in a single room with negative pressure capabilities is required  
  - Refer to Section 2.4 Infection control and prevention |
| Visitor management                    | - Follow public health directives and local visiting protocols (including for exemptions, end-of-life care, and rapid antigen testing)  
  - Refer to Table 12. Hospital visiting |
| Supportive care                       | - Social distancing and wearing of face masks has impacted communication and interactions involving facial recognition\(^86\) between staff, family and baby  
  - Impact on parent-infant bonding and baby’s neurobehavioral and socio-emotional development is unknown\(^86\)  
  - Consider use of (as per local protocols)  
  - Clear plastic masks to improve facial interactions  
  - Smiling face of care provider self-attached to gown (may decrease parental anxiety and stress)  
  - Mask free interactions between awake baby and primary carer/s where there are no risk factors, low risk of community transmission and social distancing is possible  
  - Facilitate regular visual contact (e.g. face-time, video, photos) with separated family members to communicate updates and information on baby’s condition |
## 5.2 Initial care (baby of SCOVID or COVID-19 mother)

### Table 21. Baby of SCOVID or COVID-19 mother

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| **Context**                                 | • Babies of COVID-19 positive mothers may be affected by vertical or horizontal transmission and/or indirectly through maternal COVID-19 (e.g. preterm birth caused by maternal disease)⁸⁷,⁸⁸  
  • Definitive diagnosis of in-utero infection requires a positive diagnostic test near the time of birth that is confirmed with a second positive specimen, while definitive diagnosis of intrapartum infection requires a negative diagnostic test near the time of birth⁹⁸ |
| **Neonatal team attendance at birth**       | • Attendance at birth according to usual clinical indications⁹⁰ (i.e. not required for reason of SCOVID or COVID-19 mother alone)  
  • To minimise healthcare provider exposure  
    o Experienced/senior clinician to attend in the first instance  
    o Don PPE in an adjacent area and wait outside birthing area until/if required  
    o Consider if neonatal stabilisation/resuscitation in a room outside of the birthing room/theatre is appropriate |
| **Resuscitation**                           | • Follow standard newborn resuscitation recommendations  
  o Refer to Queensland Clinical Guideline: Neonatal resuscitation⁹¹  
  • Minimise equipment on resuscitation cot to essential items  
  o Place extra equipment anticipated to be required in sealed plastic bags  
  • The use of additional barriers (e.g. placing baby under plastic sheet) for the purpose of COVID-19 infection control, is not supported as may inadvertently increase the risk of transmission  
  o Follow usual indications for the use of plastic/polyethylene bags during neonatal resuscitation |
| **Well term baby and well mother**          | • Baby is well (term or near-term gestation) and mother is well  
  o Co-locate with mother in a single room OR  
  o Discharge home |
| **Admission to neonatal unit**              | • SCOVID or COVID-19 mother (i.e. no other neonatal criteria), is not itself an indication for admission to a neonatal unit⁹⁰  
  • Perform clinical assessment after birth as per usual assessment protocols  
  • Assess if required care can safely be provided during co-location with mother (preferred option)  
  • If admission required,  
    o Nurse baby of SCOVID or COVID-19 mother in an incubator in designated area  
    o Minimise number of staff having direct contact  
    o If possible, one-to-one nurse/midwife care |
| **Transport**                               | • Transport baby in a closed system between locations in the facility |
| **Timing of test**                          | • If testing is indicated due to SCOVID or COVID-19 mother  
  o First test within 12–24 hours of birth or as directed by Infectious Diseases expert  
  o Undertake subsequent testing as per COVID-19 testing requirements during and for release from quarantine/isolation  
  o Seek advice from Infectious Diseases expert  
  • Refer to Section 2.4 Infection control and prevention |
| **Clinical care**                           | • Limited data about the clinical course of newborn babies affected by SARS-CoV-2⁹⁷, particularly the delta VOC  
  • Maintain high index of suspicion for signs of sepsis/unwell baby  
  • Recommendations for care are essentially the same as for any unwell neonate and are guided by clinical presentation |
| **Routine care**                            | • No information to alter usual indications or recommendations for⁹²:  
  o Vitamin K  
  o Hepatitis B vaccination  
  o Hepatitis B immunoglobulin  
  • Consider infection prevention and control precautions when determining other routine screening and care (e.g. hearing screen) |
5.3 Neonatal respiratory support (if SCOVID or COVID-19)

Table 22. Respiratory support management

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Aerosol generating procedures (AGP) | • AGP in first day of life thought to be low risk due to combination of small tidal volume and low viral load on the first day of life\(^\text{90}\)  
  • To maximise healthcare provider protection, this guideline currently includes the following procedures as AGP\(^\text{90,93}\) (but not necessarily limited to):  
  o Intubation, extubation and related procedures (e.g. manual ventilation)  
  o Open suctioning of respiratory tract  
  o Surfactant therapy administration (Less invasive surfactant administration (LISA) or minimally invasive surfactant therapy (MIST))  
  o Non-invasive ventilation (e.g. continuous positive airway pressure (CPAP))  
  o Tracheotomy/tracheostomy procedures (insertion, open suctioning, or removal)  
  o High frequency oscillatory ventilation (HFOV)  
  o High flow nasal oxygen  |
| Risk minimisation                 | • Nurse babies requiring respiratory support in an incubator in a negative pressure room  
  o If unavailable, single room with door closed and air purifiers in place  
  • If used in current practice, use in-line suction with endotracheal tubes\(^\text{36}\)  
  • Avoid bubble CPAP  
  • Avoid use of nebulised agents (salbutamol, saline)\(^\text{36}\) although conflicting information about whether it is an AGP\(^\text{90,93}\) |

5.3.1 Neonatal filters (if SCOVID or COVID-19)

Table 23. Neonatal filters

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
</table>
| Filter function         | • On inspiration the filter membrane prevents microorganisms reaching the baby and causing cross infection  
  • On expiration the filter membrane prevents contamination of the external environment and equipment  |
| Risk assessment         | • During initial resuscitation immediately after birth, the risk of COVID-19 transmission is considered very low, even if mother has COVID-19  
  • Fisher & Paykel (F&P)\(^\text{94}\) recommend against filter use with F&P Neopuff™  
  • Familiarity with resuscitation equipment is an important component of safe and effective ventilation  |
| Recommendation          | • Initial resuscitation after birth  
  o Continue to use usual/familiar devices for initial neonatal resuscitation  
  o Preference familiar devices (e.g. Neopuff™) without a filter to unfamiliar equipment or methods with a filter  
  • Resuscitation/ventilation beyond initial stabilisation  
  o Follow local protocols  
  o Use a viral/bacterial filter during resuscitation  
  o Place a viral/bacterial filter in the expiratory line of the breathing circuit  
  • Refer to Appendix C: Neonatal filter use |
### 5.4 Discharge preparation (following SCOVID or COVID-19)

This section applies to the baby born to a mother with SCOVID or COVID-19, and/or to the baby who has SCOVID or COVID-19 after birth.

#### Table 24. Discharge

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Newborn bloodspot screening test (NBST)</strong></td>
<td>• Collect the newborn screening test according to usual processes and within usual timeframes whenever possible&lt;br&gt;• If baby is discharged from hospital into quarantine or isolation before 48 hours of age, collect an NBST at the time of discharge&lt;br&gt;• After release from quarantine or isolation has occurred, collect another NBST at the earliest opportunity&lt;br&gt;• Notify GP if follow-up actions required</td>
</tr>
<tr>
<td><strong>Criteria for discharge</strong></td>
<td>• Consider usual clinical criteria for readiness for discharge (e.g. wellness, laboratory test results)&lt;br&gt;• Prior to discharge&lt;br&gt;  o Review release from isolation/quarantine requirements (e.g. negative COVID test requirements)&lt;br&gt;  o Consider implications for public health/community transmission prior to discharge&lt;br&gt;  o Seek expert advice from Public Health Unit/Infectious Disease Physician</td>
</tr>
<tr>
<td><strong>Post discharge</strong></td>
<td>• Provide post discharge advice about indications for readmission and possible course of disease&lt;sup&gt;95&lt;/sup&gt;&lt;br&gt;  o Most reported are respiratory symptoms requiring readmission one to three weeks after discharge&lt;br&gt;• If local risk assessed as low, advise routine follow-up&lt;br&gt;• If local risk assessed as elevated, delay routine follow-up as required (e.g. hearing screen)&lt;br&gt;• Advise GP of the follow-up actions required (e.g. NBST)&lt;br&gt;• Refer to Child Health Services as per usual process</td>
</tr>
</tbody>
</table>
References


70. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). COVID-19 and fetal blood sampling and/or use fetal scalp electrodes. [Internet]. 2020 May 05 [cited 2021 September 17]; Available from: https://ranzcog.edu.au.


74. Email communication from Biomedical Technology Services Queensland Health. Nitrous oxide circuit and filter use for COVID-19 2020 April 09.


86. Email communication from Biomedical Technology Services Queensland Health. Nitrous oxide circuit and filter use for COVID-19 2020 April 09.


90. Email communication from Biomedical Technology Services Queensland Health. Nitrous oxide circuit and filter use for COVID-19 2020 April 09.


92. Email communication from Biomedical Technology Services Queensland Health. Nitrous oxide circuit and filter use for COVID-19 2020 April 09.


94. Email communication from Biomedical Technology Services Queensland Health. Nitrous oxide circuit and filter use for COVID-19 2020 April 09.
## Appendix A: Modified schedules for low-risk women during COVID-19

### General principles
- Facilitate continuity of care with known carer/s
- If unvaccinated for COVID-19, recommend vaccination at the earliest opportunity

### Modification of peripartum care schedules
- If local risk assessed as low, follow usual face-to-face (F2F) schedule and incorporate/replace encounters with telehealth as indicated for the circumstances
  - Add more F2F in the third trimester
- If local risk assessed as elevated reduce number/duration of face-to-face contacts (F2F)
  - Conduct F2F with minimum number of people (preferably woman only)
  - Minimise time in appointment waiting areas
  - Consider hybrid models (F2F and telehealth) (e.g. for booking in visit)
  - Schedule F2F around care that requires physical interaction/care (e.g. vaccination)
- During every F2F contact
  - Perform usual clinical assessments (e.g. blood pressure, fundal height, fetal heart, weight, urinalysis)
  - Ask about fetal movements, mental wellbeing, domestic violence

### Gestation | Contact type | COVID-19 recommendations for low risk woman
---|---|---
**<12 weeks** (or first visit) | F2F | - Recommend influenza vaccination  
- Consider dating scan (6–8 weeks) for dates, viability, location  
- Recommend nuchal scan (11–13 weeks) +/- NIPT (≥ 10 weeks)  
- Give referral for routine antenatal blood tests  
**Elevated risk**  
- Request GDM testing with HbA1c  
- Request ferritin with Hb assessment (assume blood stock low)

**12–18 weeks** | F2F or telehealth | - Recommend morphology scan (18–20 weeks)  
- Plan for hospital booking-in  
- Discuss antenatal classes  
**Elevated risk**  
- Hospital booking-in via telehealth  
- Antenatal classes online/virtual

**20–22 weeks** | F2F | - Recommend pertussis vaccination  
- Give referral for routine 26–28 week blood tests  
**Elevated risk**  
- Request GDM testing (at 24–28 weeks) as per screening and diagnosis during COVID-19  
- Request ferritin with Hb assessment (assume blood stock low)

**24–26 weeks** | F2F or telehealth | - Routine antenatal care

**28 weeks** | F2F | - If indicated, RhD immunoglobulin (anti-D)  
- Give referral for routine 36 week bloods  
**Elevated risk**  
- Request ferritin with Hb assessment (assume blood stock low)

**31 weeks** | F2F or telehealth | - Routine antenatal care

**34–37 weeks** | At least one F2F  
**Remainder** telehealth | - If indicated, RhD immunoglobulin (anti-D)  
- Consider USS for growth and position  
- Routine antenatal care

**38 weeks** | F2F or telehealth | - Routine antenatal care

**41 weeks** | F2F | - Usual considerations for fetal well-being and birth planning
### Postnatal schedule

<table>
<thead>
<tr>
<th>Gestation</th>
<th>Contact type</th>
<th>COVID-19 recommendations for low risk woman</th>
</tr>
</thead>
</table>
| 0–6 weeks postpartum    | F2F or Telehealth | • Perinatal mental health check  
• Ask about domestic violence  
• Routine postnatal care  
**Elevated risk**  
• Delay GDM follow-up  
  o Refer to updated GDM postnatal follow-up recommendations |
| 6 weeks                 | F2F          | • Routine maternal and newborn assessment  
• Newborn vaccinations  
• Check completion of routine newborn follow-ups (e.g. NBST, hearing screen)  
**Elevated risk**  
• Newborn assessment: prioritise growth, eyes, hips, heart |

Antenatal and postnatal schedules adapted with permission: from an original by Dr Wendy Burton April 2020

### Ultrasound schedule if elevated risk

<table>
<thead>
<tr>
<th>Scan</th>
<th>Asymptomatic woman</th>
<th>Symptomatic woman</th>
</tr>
</thead>
</table>
| 11+0–13+6 weeks*                  | • Combined test    | • Reschedule combined test in 2 weeks if still within gestational-age window  
• Offer non-invasive prenatal testing (NIPT)  
• Offer NIPT/serum screening and detailed scan 3–4 weeks after quarantine |
| 18+0–23+0 weeks*                  | • Anatomical scan  | • Reschedule after quarantine in 2–3 weeks                                                  |
| Fetal growth scan in third trimester | • Reduce numbers of scans as clinically appropriate  
  o Perform only for standard clinical indications  
• If no clinical review in late pregnancy (no fundal height measurement; fetal heart rate auscultation), consider brief late gestation scan to confirm presentation and fetal wellbeing (biometrics and amniotic fluid volume measurement) |


F21.63-6-V3-R26
Appendix B: Recommended nitrous oxide circuits

Where a scavenger system is available, use Equinox® Advantage Analgesia Circuit–MC/4003
Where a scavenger system is not available, use Equinox® Advantage Analgesia Circuit–MC/4001

**MC/4003 Equinox® Advantage with Scavenger Limb**
3.0m Disposable Patient Circuit with Filter, Mouthpiece and 3.0m Pink Scavenger Tubing with 19mm M Connector

*Consisting of:*
A. MP-EX22P120 22mm ID Pink Expandable Tubing PP
B. M-HP Handpiece 22mm M/M with one-way valve (SY)(S)
C. 56000104-500 In-line Filter 22mm M/F (PP)
D. 56001 Mouthpiece 22mm F (HDPE)
E. PH70018 One-way valve 22mm M/F (PP) (S)
F. MP-EX22B120 22mm ID Blue Expanded Tubing (PP)
G. PH3200(D) Adaptor 22mm M to 19 mm M(PP)

**MC/4001 Equinox® Advantage Single Limb Circuit**
3.0m Disposable Patient Circuit with Filter and Mouthpiece

*Consisting of:*
A. MC-HP Handpiece 22mm M/M with one-way valve (SY)(S)
B. 56003104-500 In-line Filter 22mm M/F (PP)
C. 56001 Mouthpiece 22mm F (HDPE)
D. PH70018 One-way valve 22mm M/F (PP) (S)
E. MP-EX22B120 22mm ID Blue Expanded Tubing (PP)

*Replace mouthpiece with mask*

*Recommended by Queensland Health, Biomedical Technology Services for use by SCOVID or COVID-19 women*

F20.63-3-V2-R25
### Appendix C: Neonatal filter use

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Recommendation</th>
</tr>
</thead>
</table>
| **Filter use** | • Viral/bacterial filter may be used with:  
  o Self-inflating bags and flow inflating bags/circuits  
  o T piece (F&P recommend against use with Neopuff™)  
  o Ventilation circuits |
| **HME filter type** | • The viral/bacterial filter may or may not contain a heat and moisture exchanger (HME)  
  • There are a range of filters suitable for use—consider:  
    o Impact on tidal volume (number of mL added)  
    o Connection fit to existing equipment  
    o Need for humidification/suitability for humidification  
    o Availability of stock  
  **ONE Example:** (others may be suitable)  
  • Viral/bacterial filter with HME—humidifier is not required  
    o Medtronic DAR™ PAEDIATRIC NEONATAL Electrostatic Filter HME SMALL (catalogue number 355/5427) |
| **Filter placement** | • Refer to Figure 1 for circuit assembly |
| **Disconnection from circuit** | • Minimise disconnections (as far as possible) because this may increase aerosol dispersion  
  • Refer to Figure 1 and disconnect at the recommended point to minimise transmission |
| **Sourcing filters** | • Order filters through usual procurement processes  
  • Consider ordering one box (25) and sharing within Hospital and Health Service (to conserve supply)  
  • Stocks may be out or low—check at the time of ordering |
| **Humidification** | • Refer to individual product information as humidification not recommended with some filters |

---

**Figure 1:** Set up for neonatal resuscitation using viral/bacterial filter

Acknowledgements
Queensland Clinical Guidelines gratefully acknowledge the contribution of national clinicians and other
stakeholders who participated throughout the guideline development process particularly:

Working Party Co-Clinical Leads
Professor Rebecca Kimble, Pre-eminent Specialist, Obstetrician and Gynaecologist, Royal Brisbane and
Women’s Hospital
Dr Pieter Koorts, Director of Neonatology, Royal Brisbane and Women’s Hospital

QCG Program Officer
Jacinta Lee, Manager Queensland Clinical Guidelines

Consultation A working party was not formally convened. The following invited stakeholders
provided feedback into this version and/or previous versions

Ms Rukhsana Aziz, Clinical Midwifery Consultant, Thursday Island Hospital
Dr Pita Birch, Director of Neonatology, Mater Health, Brisbane
Ms Ann Bousfield, Clinical Midwifery Consultant, South West Hospital and Health Service
Dr Paul Bretz, Director of Obstetrics and Gynaecology, Mater Health, Brisbane
Dr Wendy Burton, General Practitioner, Morningside General Practice, Brisbane
Professor Leonie Callaway, Director of Research, Royal Brisbane and Women’s Hospital
Dr Jeremy Chin, Obstetrician, Northern Territory Health Services
Dr Lindsay Cochrane, Obstetrician and Gynaecologist, Caboolture Hospital, Brisbane
Dr Candice Colbran, Public Health Physician, Aboriginal and Torres Strait Islander Health Division
Ms Li-an Collie, Nurse Educator, Neonatal Retrieval Emergency Service Southern Queensland
(NeoRESQ)
Ms Eileen Cooke, Consumer Representative, Preterm Infant Parents’ Association
Ms Collen Clur, Chief Strategy Officer, West Morton Hospital and Health Service
Ms Vanessa Curnow, Executive Director, Aboriginal and Torres Strait Islander Health, The Children’s
Hospital and Health Service
Mr Ashley Currie, Aboriginal and Torres Strait Islander District Co-ordinator, Metro South Hospital and
Health Service
Ms Leah Hardiman, Consumer Representative
Dr Krispin Hajkowicz, Director Infectious Diseases Unit, Royal Brisbane and Women’s Hospital
Dr Graeme Jackson, Director of Obstetrics and Gynaecology, Redcliffe Hospital, Brisbane
Ms Belinda Jennings, Senior Midwifery Advisor, Northern Territory Department of Health
Professor Helen Liley, Senior staff Specialist, Neonatology, Mater Health, Brisbane
Ms Catherine Marron, Acting Nursing Director, Central Queensland Hospital and Health Service
Ms Linda Medlin, Principal Advisor, Aboriginal and Torres Strait Islander Community Health, Central
Queensland Hospital and Health Service
Professor Michael Nicholl, Senior Clinical Advisor, Obstetrics, New South Wales Health
Ms Amanda Ostrenski, Director Midwifery and Nursing, Logan Hospital
Dr Scott Petersen, Maternal Fetal Medicine Specialist, Mater Hospital, Brisbane
Ms Verity Powell, Registered Midwife, Northern Territory Department of Health
Ms Kate Reynolds, Coordinator of Midwifery, Western Australia Country Health
Dr Vijay Roach, President, Royal Australian and New Zealand College of Obstetricians and
Gynaecologists (RANZCOG)
Dr Naomi Runnegar, Infectious Diseases Physician, Co-Chair Statewide Infection Clinical Network
Ms Kelly Smith, Service Development Officer, Aboriginal and Torres Strait Islander, Chermside
Community Health Centre, Brisbane
Ms Patricia Smith, Nursing and Midwifery Director, Royal Brisbane and Women’s Hospital
Ms Rhonda Taylor, Clinical Midwife Consultant, The Townsville Hospital
Dr Jocelyn Toohill, Director of Midwifery, Officer of the Chief Nursing and Midwifery Office Queensland
Professor Ewan Wallace, Chief Executive Officer, Safer Care Victoria
Dr Lizelle Weber, Director Neonatology, Sunshine Coast University Hospital
Dr Jennifer Yan, Infectious Diseases Paediatrician, Northern Territory Health Services

Queensland Clinical Guidelines Team
Professor Rebecca Kimble, Director
Ms Jacinta Lee, Manager
Ms Cara Cox, Clinical Nurse Consultant
Ms Stephanie Sutherns, Clinical Nurse Consultant
Ms Emily Holmes, Clinical Nurse Consultant

Funding
This clinical guideline was funded by Healthcare Improvement Unit, Queensland Health