Neonatal resuscitation in suspected or confirmed cases of COVID-19

COVID-19 update 15 May 2020

Who should read this?

This document has been developed for healthcare workers, managers and hospital administration who are providing respiratory support and therapies to neonates during the COVID-19 pandemic.

What is this document about?

This guidance provides recommendations on respiratory support and therapies for **neonates born to women suspected or confirmed to have COVID-19**.

Key messages

- Effective ventilation is the mainstay of neonatal resuscitation. **The underlying principles of neonatal resuscitation and the established neonatal resuscitation algorithm remain unchanged.**
- Staff safety is paramount and as such **a considered approach to the use of personal protective equipment** (PPE) and an increased appreciation of **the relative risks of resuscitative interventions** should help to minimise risks to responders.
- **Anticipation, preparation and team communication** is important in order to minimise the risk to the team, while achieving the best outcomes for the infants we care for.
- **Simulated emergency situations** that include birthing areas, postnatal wards and newborn nurseries should be considered by health services to identify local challenges.

Resuscitation of the newly-born infant in birth suites/ operating theatres where the woman has suspected or confirmed COVID-19

Current evidence suggests that the risk of vertical transmission of COVID-19 to the newly-born infant is very low. However, healthcare workers involved in neonatal resuscitation born to women suspected or confirmed to have COVID-19 are at an increased risk of exposure. This is especially true for those performing aerosol generating procedures (AGP) including suctioning, positive pressure ventilation, chest compressions and intubation. The woman with suspected or confirmed COVID-19 who is birthing should also be considered a potential source of aerosolisation. As the application of appropriate PPE may delay initiation of resuscitation, it is essential that increased attention is directed towards anticipating and preparing for neonatal resuscitation as well as optimising team communication in order to minimise these delays.

Recommendations

- Health services should develop communication processes to ensure that the paediatric/neonatal team is informed of a suspected or confirmed COVID-19 woman at least 30 to 60 minutes prior to birth
- Contact and airborne PPE should be worn by healthcare workers involved in the resuscitation of a newly-born infant
- Wherever possible, dedicated COVID-19 resuscitation equipment should be available (for example, equipment stored in a separate grab-bag). Any unused equipment should be discarded to prevent cross-contamination

VICTORIA State Government | Health and Human Services

- Follow the current Australian and New Zealand Committee on Resuscitation (ANZCOR) guidelines on newborn resuscitation (see Appendix 1). Initial steps including drying, stimulation, thermoregulation, assessment of heart and placement of saturation probes and ECG leads are not AGP
- Positive pressure ventilation using a T-piece device or self-inflating bag with an appropriately sized mask should be performed as per the ANZCOR guidelines alongside the use of supplemental oxygen to maintain targeted saturations

Risks associated with Aerosol Generating Procedures (AGP) should (where possible) be minimised by:

- Limiting team members in the room to only those who are essential to patient care. Some health services may have the capacity to enable neonatal resuscitation to be undertaken in an adjacent room
- Allocating the most experienced clinician to manage the airway
- Addition of heat moisture exchangers (HME) viral filters (where available) to airway circuits (for example, T-piece device, self-inflating bag)
- Avoiding routine suctioning, including in both the vigorous and non-vigorous infant born through meconium stained liquor
- Maximising face-mask seal (consider two-person technique where feasible)
- Consideration of manual ventilation with a laryngeal mask airway (LMA) if intubation is delayed
- Minimise circuit disconnections and turn oxygen off before disconnection to reduce aerosolisation
- Post-resuscitation transfer to a higher acuity area such as the special care nursery should be performed in a closed incubator wherever possible
- The resuscitation/ transferring team should be escorted by a “clean” colleague during the transfer to minimise contamination of doors/ lift buttons etc. during the transfer
- At least one or two members should be in contact and airborne PPE in case of need to perform AGPs during transfer; new PPE should be applied for the transfer

Resuscitation and airway management of an infant under COVID-19 precautions in the postnatal ward or neonatal unit

See COVID-19 Maternity and neonatal care guidance for clinicians

Mask ventilation and cardiac compressions are considered AGPs in all age groups outside the immediate newborn period. There is no published evidence to date that resuscitative measures during postnatal collapse are associated with increased risk of infection.

Nevertheless, due to the heightened concerns of cross infection, full contact and airborne precaution PPE should be used whenever possible if attending a postnatally collapsed baby in these circumstances. Decisions on providing breathing support in the absence of full contact and airborne PPE need to be made with the understanding that there may be a small but as yet, undefined risk of COVID-19 exposure.

See COVID-19 PPE for maternity and neonatal services

Positive pressure ventilation (PPV) default positive end expiratory pressures (PEEP) / peak inspiratory pressures (PIP) and O_2 concentration settings outside the delivery room may be different depending on baseline condition. This may be specified in local guidelines.

Recommendations

- **Delays to respiratory support should be minimised.**
- PPE should be used as per current advice: COVID-19 PPE for maternity and neonatal services
- Wherever possible, dedicated COVID-19 resuscitation equipment should be available (e.g. equipment stored in a separate grab-bag). Any unused equipment should be discarded to prevent cross-contamination.

Risks associated with AGPs should (where possible) be minimised by:

- Use of a negative pressure ventilation room with an antechamber (where available) for AGPs. Use a normal pressure room with closed doors where this is not possible
- Limiting team members in the room to only those who are essential to patient care/ airway management
- Preferentially allocating the most experienced clinician to manage the airway
- Addition of HME viral filters (where available) to all airway (T-piece device, self-inflating bag) and ventilator circuits
- Maximising face-mask seal (consider two-person technique where feasible)
- Using pre-medications for intubation (with aim of reducing duration of positive pressure face mask ventilation); pre-medications to be made up outside the room
- Minimising circuit disconnections to reduce aerosolisation (e.g. using end-tidal CO_2 monitor in circuit until endotracheal tube (ETT) secured) and clamping endotracheal tube during circuit disconnections
- Avoiding use of humidified nasal high flow or nebulisers
- Using in-line suction catheters (where available) for intubated patients.

Management of an acute deterioration of an intubated patient

- Consider leaving the patient on a mechanical ventilator with HME filter to maintain a closed circuit and reduce aerosolisation, and rule out causes of acute deterioration such as dislodged or obstructed endotracheal tube, pneumothorax or equipment failure
- Where chest compressions are required:
  - Increase the FiO_2 to 1.0.
  - Set the ventilator to an unsynchronised time-cycled pressure limited mode at a rate of 30 breaths per minute (to enable 3 compressions for each breath) inspiratory time 0.5 secs, PEEP5 and PIP at a level that provides appropriate chest rise.

Information about protecting yourself against COVID-19

During the COVID-19 pandemic, the Victorian Department of Health and Human Services will regularly update its guidance as new evidence becomes available. To find out general information about COVID-19, visit dhhs.vic.gov.au/health-services-and-general-practitioners-coronavirus-disease-covid-19

Where can I find out more information?

For Victorian updates: dhhs.vic.gov.au/novelcoronavirus

For national updates: health.gov.au/news/latest-information-about-novel-coronavirus

For international updates: who.int/westernpacific/emergencies/novel-coronavirus

WHO resources: who.int/health-topics/coronavirus

The information in this guidance aligns with the following references:

1. Brewster DJ, Chrimes NC, Do TBT, et al. Consensus statement: Safe Airway Society principles of airway management and tracheal intubation specific to the COVID-19 adult patient group. Med J Aust 2020; https://www.mja.com.au/journal/2020/consensus-statement-safe-airway-society-principles-airway-management-and-tracheal [Preprint, 1 April 2020].
2. Chandrasekaran et al. *Neonatal Resuscitation and Postresuscitation Care of Infants Born to Mothers with Suspected or Confirmed SARS-CoV-2 Infection.* Am J Perinatol. 2020 Apr 8. doi: 10.1055/s-0040-1709688. [Epub ahead of print]
3. Edelson DP et al. *Interim Guidance for Basic and Advanced Life Support in Adults, Children, and Neonates With Suspected or Confirmed COVID-19: From the Emergency Cardiovascular Care Committee and Get With the Guidelines®-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration with the American Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists: Supporting Organizations: American Association of Critical Care Nurses and National EMS Physicians.* Circulation. 2020 Apr 9. doi: 10.1161/CIRCULATIONAHA.120.047463. [Epub ahead of print]
4. European Resuscitation Council COVID-19 Guidelines. Section 5 Newborn Life Support. Accessed 7 May 2020 at https://erc.edu/covid
5. https://www.rcpch.ac.uk/resources/covid-19-guidance-neonatal-settings#neonatal-team-attendance-in-labour-suite – accessed 19th April 2020
6. Australian and New Zealand Intensive Care Society (ANZICS) COVID-19 Guidelines. Accessed March 27,2020 at https://www.anzics.com.au/wp-content/uploads/2020/03/ANZICS-COVID-19-Guidelines-Version-1.pdf
7. https://resus.org.au/guidelines/flowcharts-3/ - accessed 17th April 2020

APPENDIX 1 - ANZCOR Neonatal Resuscitation algorithm

COVID-19

Principles

- Appropriate *PPE including P2/N95 mask for AGPs (including T-piece device / self-inflating bag use, suctioning and intubation)
- Anticipate, prepare and communicate for births; minimise delays in PPE application

Recommendations

- Only essential team members in room
- Most experienced clinician managing airway
- HME viral filter between T-piece device and face mask / ETT
- Minimise aerosol generation:
    1. Optimise face mask seal; consider two-person hold
    2. Minimise circuit disconnections

*AGP = aerosol generating procedure
PPE = personal protective equipment
ETT = endotracheal tube