



CLINICAL GUIDELINE

Respiratory Management of Neonates with Suspected or Confirmed COVID-19

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|-----------------------|------------------------------|
| Scope (Staff): | Nursing and Medical Staff |
| Scope (Area): | NICU KEMH, NICU PCH, NETS WA |

This document should be read in conjunction with

[COVID-19 Guidance for Neonatal Services](#)

[HDWA Identification and Use of Personal Protective Equipment in the clinical setting during the COVID-19 Pandemic Policy](#)

KEMH site specific

- [Coronavirus Disease \(COVID-19\) Interim Policy](#)

And this [DISCLAIMER](#)

Aim

This guideline will focus on the respiratory management of babies who are born to mothers who have confirmed or suspected COVID-19.

Any baby born in such a situation is suspected to have COVID-19 until proven otherwise.

Background

Coronaviruses are a large family of viruses that cause respiratory infections ^[1, 2].

Coronavirus (SARS-CoV-2) causes coronavirus disease (COVID-19).

Few neonatal cases have been described. It is unlikely that trans-placental passage will occur but cannot completely be excluded.

A bigger risk for newborns from COVID-19 is the delivery at premature gestation. It is reported in two reviews the preterm birth in COVID-19 mothers is 30-42% ^[3,4].

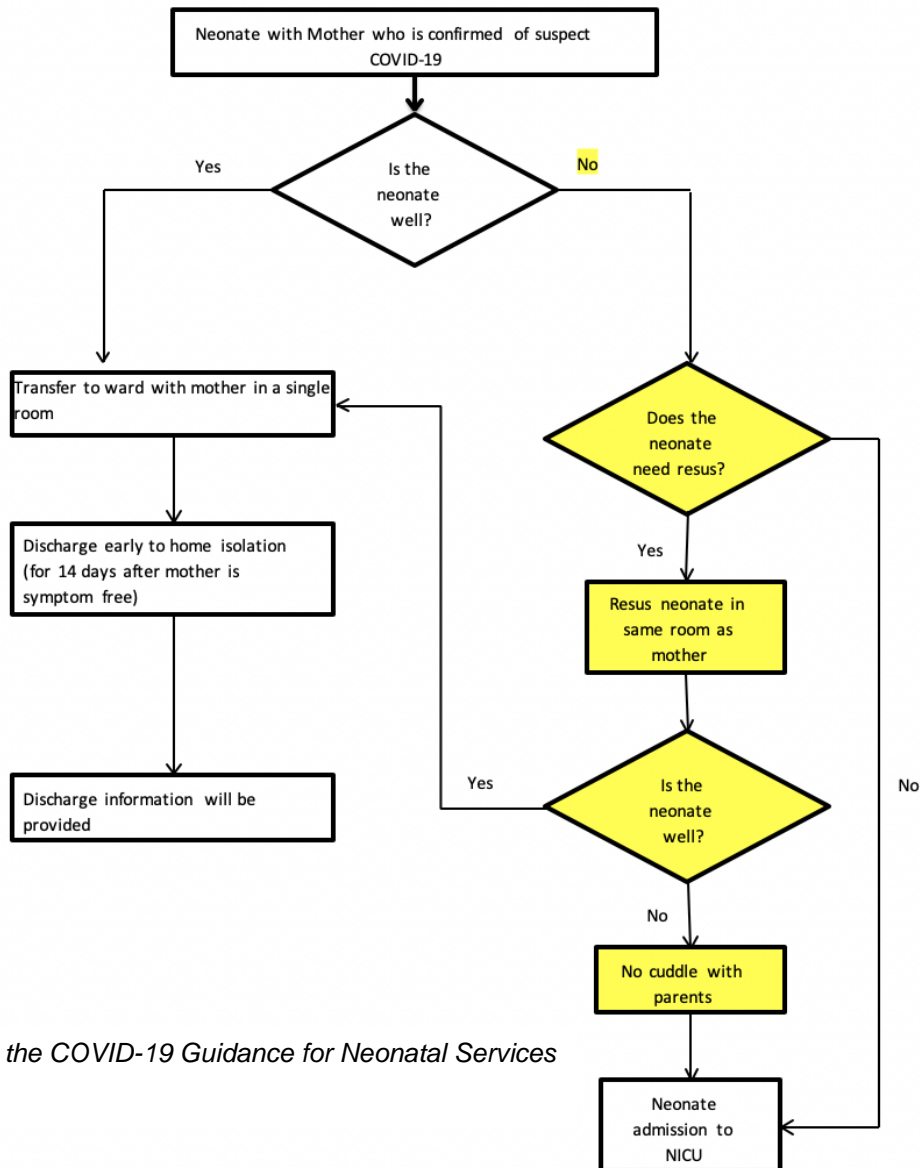
Most transmission to neonates occurs from maternal droplet after birth.

The Newborn

The following guidance should be considered for newborn babies whose mother is suspected or confirmed to have COVID-19.

The highlighted portion of the flow diagram below.

Neonate at delivery – vaginal or caesarean with proven or suspect COVID-19



Adapted from the COVID-19 Guidance for Neonatal Services

General Principles of Management

In the absence of evidence, it is reasonable to treat the baby's respiratory illness in the same way as if they were not potentially exposed to COVID-19. The evidence in favour of early intubations is limited to adults and older children.

- All babies requiring respiratory support should be nursed in an incubator.
- A register must be kept of all staff entering the room.
- While status is uncertain or when COVID-19 is confirmed, clinical investigations should be minimised whilst maintaining standards of care.
- Senior input is recommended when deferring routine investigations and in prioritisation of work. Consider ways to reduce unnecessary investigations.
- Micro/Infection Prevention team must be consulted.

Testing of patients for SARS-CoV-2 should as guided by Infection prevention.

Resuscitation after Birth

- Resuscitation should proceed as per standard NRP guidelines.
- A viral filter should be added to the Neopuff circuit directly before the mask.
- Staff should be wearing PPE as described in KEMH site specific Deliveries SUSPECT or CONFIRMED COVID.
- **Aerolising generating procedures include oral suction, intubation, CPAP and open suction of ETT tube.**
 - Intubation is an aerosolising generating procedure (AGP) if this is considered necessary the number of staff performing the procedure should be kept to a minimum (possibly 2).
 - Other staff caring for the mother should be informed of the intubation is occurring and should be wearing appropriate PPE.
- If CPAP support is needed then this should be provided via facemask and the baby enclosed using a perspex cover as soon as clinically possible or in an incubator.

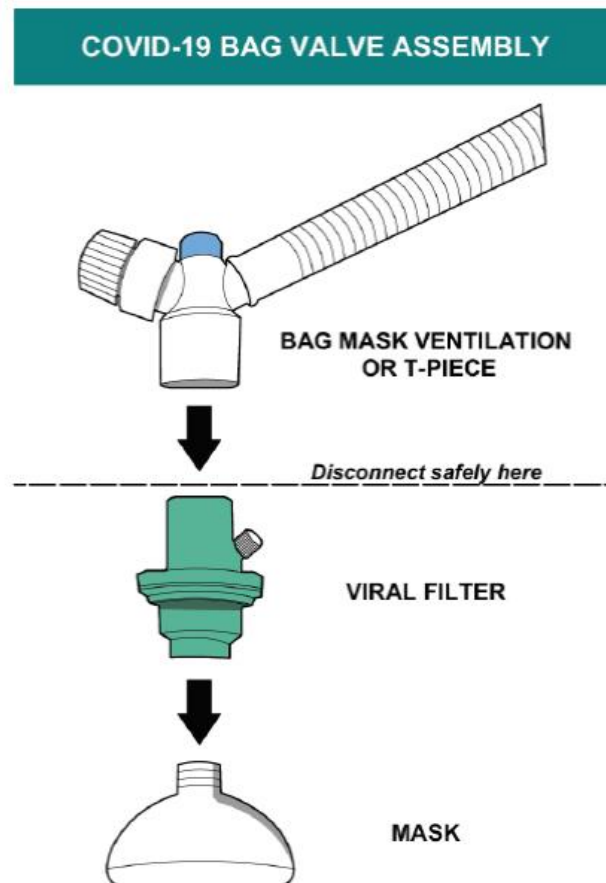


Figure 1: Set up for initial neonatal resuscitation and stabilisation during COVID-19 pandemic

Adapted from Queensland Children's Hospital Paediatric Consensus Statement Paediatric Intubation Guideline during COVID 19 outbreak.

Respiratory Support in the NICU

- All staff should be mindful that a patient on respiratory support patient will generate aerosolised droplets.
- The baby should be nursed in an incubator.
- Staff should be wearing appropriate PPE.

Intubation and Extubation

- Intubation, bag and mask ventilation and extubation are Aerosol Generating Procedures (AGP). Airborne precautions and minimizing number of staff involved are paramount.
- CAHS has an intubation policy for those patients who are COVID positive. This is focused on protecting healthcare staff and improving intubation first pass rate.
- An adapted version of this guideline is in preparation.

Extubation

- Should be undertaken in a negative pressure room if possible, with a reduced number of people present.
- PPE as for any AGP should be worn.

CPAP

- It is likely that viral filtration is necessary on CPAP and would likely use the DAR™ (Medtronic) filter. [See appendix 1](#)
 - It is possible that the filter may be incorporated into the Bubble CPAP or Ventilator system.
 - The addition of a filter into the system is not straightforward and other factors need to be considered in terms of safety.
 - The use of filters is likely to be more transparent in ventilator systems than bubble CPAP but it is appreciated that deviation from current practice is of concern. Further information is likely to become available in this matter and this guideline will be updated accordingly.
- Prongs should be as tight fitting as possible. A chin strap should be considered to maintain the best possible seal.
- Once the baby is negative for COVID-19 change to normal CPAP practice should occur.

Intubated Patients

- For babies >2.8Kg a cuffed ETT should be considered to reduce the risk of aerosolisation.
- Inline TracMac® should be used for surfactant administration.
- Inline suction with endotracheal tubes should be used, where possible.
- A filter (as described above) should be present on the expiratory port on the Drager and Fabian ventilators. [See appendix 1](#)

Humidified High Flow Nasal Oxygen (HHF)

- Owing to the risk of aerosolisation this mode of non-invasive respiratory support should be avoided if possible.
- If CPAP is not tolerated or unavailable, HHF remains preferable to intubation and ventilation.
- HHF should be used in keeping with [current unit guideline](#).

Low Flow Nasal Oxygen

- These patients should be managed on oxygen in the first instance via a [head box](#).

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- Further escalation should be considered carefully and discussed with the consultant on-call. Further escalation increases the risk of aerosolisation.
- A degree of increased work of breathing may be tolerated but consultation with senior staff as to parameters for escalation should be discussed and documented in the medical notes.
- Aim to maintain oxygen saturations in the 'normal' range for age and corrected gestation as per [Monitoring and Observation Frequency](#) guideline.
- If escalation of respiratory support is required consider CPAP rather than high-flow and use as above.

Postnatal Infants

International anecdotal evidence suggests that newborns may present with COVID-19 at 7 – 10 days of life.

Ex-preterms remain a high-risk group for developing viral respiratory disease in NICU. The effect of COVID-19 on these patients is unknown.

It is uncertain what degree of respiratory support is required in such infants. The burden of disease is thought to be low.

Consideration of transfer of suspected or positive patients to PCH prior to the need for escalated respiratory support.

Older infants may present in a non-specific way:

- Increased frequency of desaturations
- Apnoea
- Cough ^[5]
- Pyrexia ^[6]
- Increased work of breathing
- Lower baseline saturations
- Increased aspirates
- Loose stools

These patients should be tested in line with CAHS interim COVID 19 testing guidance.

These patients should be managed in as low-intervention way as possible.

If required in the older patient with suspected viral infection. The baby should be cared for in an isolette, with appropriate AGP PPE, in isolation as per state wide guideline.

References and related external legislation, policies, and guidelines


[HDWA Identification and Use of Personal Protective Equipment in the clinical setting during the COVID-19 Pandemic Policy](#)

1. Zeng L, Xia S, Yuan W, et al. Neonatal Early-Onset Infection With SARS-CoV-2 in 33 Neonates Born to Mothers With COVID-19 in Wuhan, China. *JAMA Pediatr.* Published online March 26, 2020. doi:10.1001/jamapediatrics.2020.0878
2. Zeng H, Xu C, Fan J, et al. Antibodies in Infants Born to Mothers With COVID-19

Pneumonia. JAMA. Published online March 26, 2020. doi:10.1001/jama.2020.4861


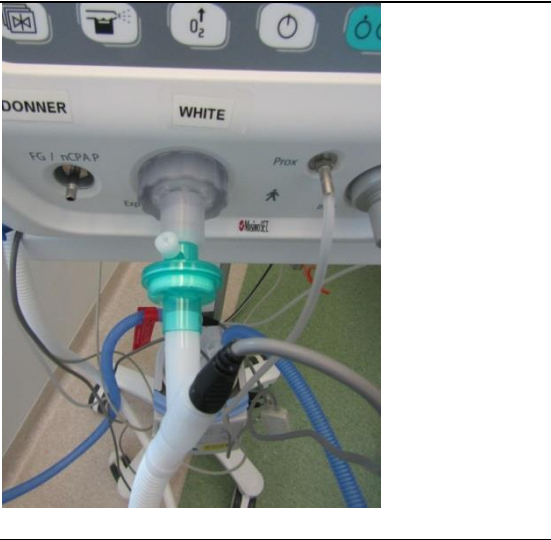

3. Di Mascio D, Khalil A, Saccone G, Rizzo G, Buca D, Liberati M, Vecchiet J, Nappi L, Scambia G, Berghella V, D'Antonio F, Outcome of Coronavirus spectrum infections (SARS, MERS, COVID 1 -19) during pregnancy: a systematic review and meta-analysis, American Journal of Obstetrics & Gynecology MFM (2020), doi: <https://doi.org/10.1016/j.ajogmf.2020.100107>.
4. Mullins E, Evans D, Viner R, et al. Coronavirus in pregnancy and delivery: rapid review. Ultrasound in Obstetrics and Gynaecology (In press) doi: doi: 10.1002/uog.22014
5. Yuxia Cui, Maolu Tian, Dong Huang, Xike Wang, Yuying Huang, Li Fan, Liang Wang, Yun Chen, Wenpu Liu, Kai Zhang, Yue Wu, Zhenzhong Yang, Jing Tao, Jie Feng, Kaiyu Liu, Xianwei Ye, Rongpin Wang, Xiangyan Zhang, Yan Zha, A 55-Day-Old Female Infant Infected With 2019 Novel Coronavirus Disease: Presenting With Pneumonia, Liver Injury, and Heart Damage, The Journal of Infectious Diseases, , jiaa113, <https://doi.org/10.1093/infdis/jiaa113>
6. Lu X, Zhang L, Du H, et al. SARS-CoV-2 Infection in Children [published online ahead of print, 2020 Mar 18]. N Engl J Med. 2020;NEJMc2005073. doi:10.1056/NEJMc2005073

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APPENDIX 1

- Place filter in the expiratory limb
- To be replaced 24hrly or if wet

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|---|---------------------------------|
|  | <p>Neopuff and bag and mask</p> |
|  | <p>Fabian Ventilator</p> |
|  | <p>SensorMedics</p> |

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Babylog ventilator



Bubble CPAP

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