COVID-19 – NEWBORN INFANTS BORN TO WOMEN WITH SUSPECTED, PROBABLE OR CONFIRMED COVID-19

This Local Operating Procedure is developed to guide safe clinical practice in Newborn Care Centre (NCC) at The Royal Hospital for Women. It is largely based on guidance developed by NSW Health for pregnant women and their newly born infants in response to the COVID-19 pandemic. Individual patient circumstances may mean that practice diverges from this Local Operating Procedure. It is ***interim advice, and subject to change as new evidence becomes available.***

1. AIM

- To provide safe and optimal care to newborn infants born to women with suspected, probable or confirmed COVID-19

2. PATIENT

- Newborns

3. STAFF

- Medical and nursing staff

4. CLINICAL PRACTICE

General Principles

Issue	Consideration
Babies of women who are NOT suspected nor confirmed to have COVID-19	Newborn babies of women NOT suspected nor confirmed to have COVID-19, should receive routine care.
Babies of women with a partner/support person who is a returned traveler in quarantine	Newborn babies should receive routine care. Infants requiring admission to the nursery do not need to be admitted to COVID-19 designated areas. Mothers should be nursed with standard precautions. The partner/support person should not enter the nursery until the 14 day quarantine period has elapsed. The end of quarantine date should be documented in the mother's medical record.
Babies of ASYMPTOMATIC women who are in self-isolation due to recent travel or close contact with a confirmed case	Newborn babies should receive routine care. Infants requiring admission to the nursery do not need to be admitted to COVID-19 designated areas. Mothers should be nursed with contact and droplet precautions. In these cases, mothers should not enter the nursery until the 14 day quarantine period has elapsed. The end of quarantine date should be documented in the mother's medical record.
Essentials of care	The following are essentials of care: • Immunisation for both mother and baby • Anti D • Vitamin K • Physical assessment of well neonate • Newborn blood spot screening • SWISH screen • Newborn cardiac screen • Maternal physical and mental health assessment

LOCAL OPERATING PROCEDURE – CLINICAL

Approved Quality & Patient Safety Committee 18/6/20
Review Monthly

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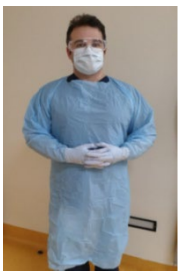
Infection Prevention and Control (IPC) practices	Standard precautions: • Should be used for all patients at all times to protect and prevent spread of infection Transmission based precautions: • Contact precautions – physical contact with patient and environment • Droplet precautions – protect nose, mouth and eyes mucosa from droplets produced by the patient's coughing and sneezing • Airborne precautions - protect respiratory tract from very small and unseen airborne droplets that become suspended in the air Detailed guidance on resources for staff is available on the CEC IPC webpage.
Personal Protective Equipment	Contact and Droplet precautions in addition to Standard precautions must be in place while caring for, or in contact with a symptomatic suspected or confirmed COVID-19 case: • Eye protection goggles or faceshield • Surgical mask • Gown or apron • Gloves  Airborne precautions, in addition to Contact and Droplet precautions, are required for aerosol generating procedures (AGPs): • Eye protection goggles or faceshield • P2 or N95 mask • Gown • Gloves • Hair net in operating theatre • Shoe cover in operating theatre 
Guidance – current rationale	Within NSW, the number of maternity patients with locally acquired suspected, probable or confirmed COVID-19 is very low. While these numbers remain low we will be following NSW Health guidance, which will be phased according to the evolving situation: • Number of suspected or confirmed maternal or neonatal cases of COVID-19 within the hospital • Number of suspected or confirmed maternal or neonatal cases of COVID-19 within the local health district • Increasing community spread of COVID-19 affecting maternity patients • Changes to NSW Health response measures • Changes to international or national evidence for assessment and/or management of maternity or neonatal patients with suspected or confirmed COVID-19 • Significant adverse events or complaints related to maternity or neonatal patients with suspected or confirmed COVID-19 notified into IIMS

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Risk Management

Issue	Consideration
Risk assessment	A baby born to a woman with suspected or confirmed COVID-19 is a ***close contact***. The baby requires precautions (not necessarily separation) in the acute healthcare setting or at home for a minimum of 14 days after birth. If the baby is co-located with the mother, the 14 day isolation period for the baby commences on the last day the mother is considered infectious and therefore will be longer than the minimum 14 days after birth. When mother and baby are separated, the baby requires precautions for 14 days after separation. This advice applies to asymptomatic babies. The duration of isolation for a baby with potential symptoms of COVID-19 and who is tested should be assessed on an individual basis. Consult with clinical microbiologist or infectious disease specialist on case by case basis.
Care planning	It is recommended that the following specialities convene to regularly review the plan for birth, postnatal care and discharge of an admitted woman with suspected or confirmed COVID-19 and her baby/babies: • Obstetrics/Midwifery • Neonatal/Paediatrics • Clinical Microbiologist/Infectious Disease Physician • IPC staff • Social Worker as required This plan should involve shared decision making with the woman and her partner or support person and provide identification of an alternative family member who may need to take responsibility as primary caregiver of the baby.
Partner/support person	It is recommended that the following guidelines are followed: • One consistent support person present (i.e. not rotating visits between multiple people) • Compassionate exceptions to be managed on an individual basis • Must be asymptomatic • Should not be in self-isolation due to recent travel or close contact with a confirmed case

Care at Birth

Issue	Consideration
Room requirements for a woman during labour and birth	Requirements: • Dedicated single room with ensuite bathroom (door closed) [Delivery Room 3] • Dedicated Operating Theatre room [Operating Theatre 5] • A defined area for staff to don and doff PPE • A sign on the door of the room to alert healthcare workers of the level of PPE required • Regular spot cleaning of the birth room needs to be undertaken during the time spent in the room
Neonatal team attendance at birth	Unless indicated by fetal heart rate monitoring or from a clinical decision, a neonatal or paediatric team is not required to routinely attend the birth of a baby from a mother with suspected, probable or confirmed COVID-19.

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Resuscitation	At birth the baby is considered a close contact and not a case. Refer to CEC document 'Management of COVID-19 in Healthcare Settings'. The neonatal team should be given sufficient notice at the time of birth, to allow them to attend and don required PPE before entering the room/theatre. The team should be limited to essential staff experienced in neonatal advanced life support. Minimise equipment open on the resuscitaire to essential items. Other items may be available but keep uncontaminated (use double plastic bags where possible). Follow standard neonatal resuscitation and clinical assessment recommendations: • Health Workers are advised to use standard precautions plus contact and droplet precautions when caring for women during labour and birth with suspected or confirmed COVID-19 • The neonatal team should wear as a minimum whatever staff looking after the mother are wearing (minimum Contact and Droplet precautions) • If Airborne precautions are being undertaken for the mother, then these will be required by all present in the room • Airborne precautions are only required when performing Aerosol Generating Procedures (AGPs) • IPPV, CPAP and intubation of the infant at birth are NOT regarded as aerosolising procedures because the newborn baby is classed as a close contact, but not a suspected or confirmed case (PPE guidance is for resuscitation at birth only) • If no resuscitation is anticipated, the neonatal team may wait outside the delivery room • Delayed cord clamping is appropriate (shared decision with mother) • Skin to skin contact is appropriate for well mothers, providing their baby is also well • Respiratory hygiene measures for the mother: includes wearing a face mask, washing hands, chest and abdomen after birth to remove any respiratory secretions before holding baby skin to skin • Place newborn on resuscitation bed for assessment by neonatal team if required • If facilities are available, consider having the resuscitaire and neonatal team in a separate adjoining room to protect neonatal team (this is often not possible due to geographical layout in delivery areas)

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Postnatal Care

Issue	Consideration
Co-location	Acknowledging the current limited evidence, a mother and healthy newborn baby can be kept together in the immediate, post-partum period. This is recommended during this phase of the pandemic. Co-location or separation of mothers and infants is a joint decision between the medical team and families. The well term baby of a woman with suspected or confirmed COVID-19, who can care for her baby/babies, should be co-located with the mother in a single room with own bathroom. When deciding suitability for co-location consider: maternal preference, how sick the mother is with COVID-19, ability to provide care and responsibility for the baby, ability to understand and manage respiratory etiquette and hand hygiene, ability to wear a surgical face mask if less than 1.5 metres from their baby, capacity of the maternity ward, breast feeding choices, current evidence regarding COVID-19, other individual clinical decisions from the team. Support establishment of breastfeeding where appropriate.
Separation	Separation may be appropriate if the mother is too unwell or unable to care for her baby. Consider the following options: • Neonatal unit admission until discharge planning is finalised • Care on the postnatal ward in a single room by a suitable alternative primary caregiver who is not a close contact or a suspected case until discharge planning is finalised Review the ongoing suitability of the location for the baby daily where separation from the mother is unavoidable. Support expressed breastmilk feeds to the baby if mother's clinical condition allows.
Reduce transmission risk	Babies are at risk of infection from the mother's respiratory secretions after birth. The mother should practice hand and respiratory hygiene and wear a surgical face mask during feeding or other close mother-baby interactions. Between interactions the mother should maintain a physical distance of at least 1.5 metres from the baby.

Admission to Newborn Care Centre

Issue	Consideration
Admission to the Neonatal Unit	Suspected or confirmed COVID-19 maternal infection is not itself an indication for the baby to be admitted to a neonatal unit. The usual NCC admission criteria should be followed.
Location in the neonatal unit	Admitted babies should be cared for in closed incubators (humidicribs) and, when available in a single room. Where a single or separate room is not available, neonatal units where possible should identify 3 separate areas to cohort babies: 1. Proven neonatal COVID-19. 2. Suspected neonatal COVID-19 (i.e. tests pending in woman and/or neonate) 3. No risk or suspicion of COVID-19 If necessary 1 and 2 could be combined, with a separate area for 3. The CEC recommends that bed spacing should be greater than 2 metres in cohorted patients where there is a risk of respiratory droplet transmission.

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Parental access to baby	Women who have suspected or confirmed COVID-19 are NOT able to visit their baby on the neonatal unit until they are released from isolation. Consult with clinical microbiologist or infectious disease physician to determine when this can occur. During the time the woman and her partner are unable to visit the baby other methods of contact should be explored, including photos and video.
Transport	Where feasible, transport baby in a closed incubator between locations in the facility. Where a closed system is neither available nor feasible, an open cot can be used, but care should be taken to ensure the transfer time is kept to a minimum Plan the transport route in advance and consider use of a dedicated elevator/a runner to open doors and clear obstacles to ensure transfer is achieved with minimal contact with others.
Visitors	Visitors should not be allowed In extenuating circumstances a single visitor (e.g. both parents suspected or confirmed COVID-19) may be allowed if they fulfil ALL of the following criteria and they must wear PPE: • No acute respiratory symptoms or fever AND • No overseas travel in past 14 days AND • No close contact with a confirmed case (including the mother)

Neonatal resuscitation on postnatal ward

Issue	Consideration
Initiating resuscitation	Call 2222 neonatal resus/rapid response, postnatal room xx, COVID positive. Don PPE prior to entering room (including N95/P2 mask, protective eyewear, gown, gloves). One Midwife to commence suction and oxygen administration via bag and mask in mother's room.
Preparation	Before neonate is brought into Arrival's lounge, second Midwife to remove as much equipment as possible from Arrival's lounge: notes, trolley, EBP (electric breast pumps), BGL machine, red resuscitation equipment trolley. Ensure all draws are closed of filing cabinet etc. Third midwife to prepare neonatal resuscitaire: Turn on resuscitaire; collect neonatal COVID resus equipment tool box out of drawer underneath resuscitaire. Third Midwife or neonatal team (if arrived) to don PPE to receive newborn infant from mother's room door from first Midwife and to take to Arrival's lounge to assist neonatal staff.
Transfer	When newborn infant leaves Arrival's lounge (either to NCC or return to mother's room) dispose or terminally clean all equipment (NB. The equipment in the blue tubs has been double bagged – remove the outer plastic bag, replace with a clean second plastic bag and clean the blue tubs). See transport in "Admission to Newborn Care Centre" Table.

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Feeding Choice

Issue	Consideration
Breastfeeding	Support maternal feeding preferences. Encourage breastfeeding and expressing breast milk.
Expressing breastmilk	Mothers should be encouraged and supported to express breast milk. The mother should wash her hands before touching any pump or bottle parts and follow recommendations for proper pump cleaning before and after each use. She should wear a surgical mask while expressing and while handling the equipment as there is an unknown risk of transmission associated with the use of expressed breast milk. The bottle of expressed milk should be wiped on the outside with a disinfectant wipe and placed into a specimen bag for transfer to the Neonatal Unit's isolation area. On arrival the bag should be discarded, the bottle exterior should be disinfected again and the milk decanted into a clean bottle, clearly labelled, prior to storage or giving to the newborn infant. Consider testing the breast milk for the presence of SARS-CoV-2, in consultation with Clinical Microbiologist. A single test will only detect early post-natal viral excretion in the milk. It is not feasible to test every batch of milk to assess contamination of the milk by respiratory secretions. Advice about breastfeeding and expressing can be found at COVID-19 - Frequently asked questions

Testing of infants

Issue	Consideration
Routine testing	Routine testing is **not** recommended. Routine testing should not be used to determine (1) the appropriate location of care for the baby and (2) infection control precautions to be used.
Indications for testing	Testing is indicated if babies become symptomatic within the isolation period, in the acute healthcare setting or at home. Symptoms of neonatal COVID-19 may be respiratory or non-respiratory in nature. A high index of suspicion for illness in the baby should be maintained during the incubation period. Consult with clinical microbiologist or infectious disease specialist on a case by case basis regarding testing procedures. Cord blood collection: At the Royal Hospital for Women, cord blood is sent to the laboratory for testing for the purposes of investigating for evidence of vertical transmission. Specimens should be sent with forms requesting "Cord blood for serology for SARS-CoV-2". This should be written by hand on blank forms and marked as attention to Zin Naing and Prof Rawlinson. The ideal tube for the specimen is a "gold-top" SST tube but a "purple top" EDTA tube is acceptable. No special precautions are required in collecting the swabs in addition to standard precautions.

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Discharge Planning

Issue	Consideration
Discharge planning	Care planning should be individualised. Families should be included in the planning, and all the essentials of postnatal care should be considered. Postnatal ward to arrange a multidisciplinary team, including midwifery support groups and postnatal/SCN staff to conduct a regular review of the newborn and mother via telephone/video daily until the self-isolation of 14 days is complete. Provide parent information aid on warning symptoms/signs of COVID-19 infection. The discharge plan should include assessment and potential re-admission of mother or baby where required.
Discharge	Do not discharge mother and baby for at least 48-72 hours after birth. When the baby is ready for discharge home and the mother remains unwell a suitable primary caregiver may be appointed.
Discharge prior to 14 days	Clinical monitoring of the baby should continue until at least the end of the 14 day incubation period. If the baby is co-located with the mother, the maximal 14 day incubation period for the baby would commence on the last day the mother is considered infectious, and therefore will be longer than 14 days after birth. Local capacity and individual circumstances should determine the method of monitoring. Telehealth and home visiting may be options.
Appropriate caregiver	The mother, if well enough for discharge, and temporary separation period has either been completed or is not occurring OR Alternative caregiver. This should be determined on a case by case basis, but they would ideally meet the following criteria: • No acute respiratory illness or fever AND • No overseas travel in the past 14 days AND • Not a close contact of a confirmed case A risk assessment can be conducted in discussion with local public health unit, infection control and/or infectious diseases if required.

Readmission of Infants

Issue	Consideration
Initial triage	Initial triage to determine location of assessment should be undertaken by telephone. The current readmission policies will apply: • If a non-urgent non-COVID problem is identified during the first 14 days, parents to approach staff for assessment and advice • If the baby is noted to have symptoms/signs suggestive of sepsis – parents to seek immediate assistance at the nearest Emergency Department Health workers should give clear instructions to the family about attendance, and in all circumstances should wear appropriate PPE when providing care.
Babies well enough not to warrant admission	Where possible, the baby should be managed at home. Close monitoring of the baby's condition must continue according to NCC protocols. The baby should remain in isolation as a close contact of the mother until the isolation period post birth is complete, or until the mother is released from isolation and the baby has completed the resulting isolation period, whichever is longer. Consult with clinical microbiologist or infectious disease specialist.

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Babies requiring management as in-patient, but not requiring NCC admission (e.g neonatal jaundice requiring phototherapy)	The baby and mother should be co-located and isolated in a single room with own bathroom, preferably on the postnatal or paediatric ward. A risk assessment should be conducted to assess whether the mother is well enough to care for the baby. The baby must be re-admitted under the care of a neonatologist. The mother and baby must continue to be isolated unless both have received medical clearance for de-isolation. Clearance for de-isolation in the community will be directed by the local public health unit in line with New South Wales Health/CDNA guidelines. De-isolation of inpatients should be guided by the ID team. Maternal feeding preferences should be supported.
Infants requiring management in the NCC	The baby must continue to be isolated on the unit as per local arrangements until de-isolation is agreed by clinical microbiology or an infectious diseases specialist. Consult with infectious diseases physician to determine if testing for COVID-19 is indicated. The mother cannot visit the baby until she has received medical clearance to leave isolation. The mother should be supported to express breastmilk for her baby if this is her preference.
Discharge Planning	Local criteria for discharge should be followed. Information should be given to parents about monitoring and follow up, and how to seek advice if concerns. Isolation measures to continue as directed until released from isolation.

5. EDUCATIONAL NOTES

Neonatal COVID-19 Advisory group

- The Neonatal COVID-19 Advisory group has provided advice for NSW Neonatal Services based on a combination of available evidence, good practice and recent clinical guidelines.[1-7] The priorities are the provision of safe care to newborn infants, born to mothers with suspected/confirmed COVID-19 and the reduction of onward transmission to clinical staff and the broader community. The approach is intentionally cautious because of the limited evidence available on the true extent of transmission and impact of the infection on pregnant women and their newborn infants.
- The Neonatal COVID-19 group guideline was prepared with input from NSW and ACT clinicians and the NSW/ACT NICUS SPRING group. It focuses on management in the health care setting.
- Centralised neonatal care of babies of women with suspected or confirmed COVID-19 (e.g. centralised designated hospitals) is not recommended at this stage of the pandemic in Australia. Tiered perinatal networks should consider the capability of the neonatal units within their networks and describe processes for escalation in their operational plans when this is required.

Definitions

- COVID-19: coronavirus disease 2019, the name of the disease caused by the virus SARS-CoV-2.
- SARS-CoV-2: severe acute respiratory syndrome coronavirus 2. The formal name of the coronavirus that causes COVID-19.
- RT-PCR Test: Reverse Transcriptase Polymerase Chain Reaction Test.

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Testing recommendations for newborn infants

- **Routine nose/throat swab testing of asymptomatic infants is not recommended:**
  - Newborn infants born to mothers with suspected/confirmed COVID-19 are considered close contacts.
  - As in any other **asymptomatic** contact of suspected/confirmed COVID-19, well and asymptomatic newborn infants do not require testing. A negative test should not be used to de-isolate the baby, or to determine the appropriate location and infection control precautions used.
  - Because newborn infants of mothers with COVID-19 are considered close contacts (even when separated from the mother from birth), 14-day self-isolation and appropriate infection control precautions apply to infant (being a close contact). Isolation can be done by co-location with the mother if the mother is deemed well enough to take care of the infant.
- **Indications for testing for SARS-CoV-2 in the neonatal period may include:**
  - **Symptomatic** newborn born to suspected/confirmed COVID-19 mother raising the suspicion of congenital infection/vertical transmission (e.g. to rule out congenital pneumonia in an infant born to a mother with suspected/proven COVID-19). In this scenario, combined nose/throat swab testing is to be performed at around 24 hours of age, to avoid detection of transient viral colonization and to facilitate detection of viral replication.
  - Suspected horizontal transmission leading to symptomatic infection (e.g. fever, acute respiratory illness not otherwise explained) from a COVID-19 positive parent/ caregiver/household contact, healthcare worker, or where transmission is suspected in a particular setting such as a ward cluster.

What is known about risk to the mother and her newborn infant?

- It does not appear that pregnant women are at increased risk of becoming severely unwell from COVID-19 infection.[2]
- A recent systematic review and meta-analysis published in AJOG has demonstrated higher rates of preterm birth < 37 weeks 41.1% (14/32 – 95% CI 25.6-57.6) and < 34 weeks 15% (4/32 - 95% CI 3.9-31.7) to women with COVID-19.[8] There was also a higher rate of perinatal death 7% (2/41 – 95% CI 1.4-16.3). It must be noted that this review may overestimate these outcomes as it has reviewed outcomes for hospitalised pregnant women. Whether the preterm births were spontaneous or iatrogenic is not stated in the review.
- It remains unclear if SARS-CoV-2 is vertically transmitted from mother to fetus antenatally via maternal viraemia and transplacental transfer.[9-11]
- Recent case reports include a newborn infant testing positive for SARS-CoV-2 at 36 hours of life despite swift separation and strict isolation, and another newborn with elevated antibody and cytokine levels at 2 hours of age suggesting that vertical transmission cannot be ruled out.[12,13]
- To date there is no evidence that SARS-CoV-2 causes congenital abnormalities if the mother is infected during pregnancy.[9,11]
- There is no evidence so far that the virus is found in breast milk, however, very few women have been tested.[2]
- Perinatal exposure may be possible via maternal stool based on the previous experience with SARS-CoV-1 and Middle Eastern Respiratory Syndrome coronavirus (MERS-CoV).[14-16]
- Newborn infants are at risk of infection from a symptomatic mother's respiratory secretions after birth, regardless of delivery mode.[17-19]
- Most reported cases of neonatal COVID-19 to date have been mild, with no neonatal deaths confirmed to be secondary to COVID-19 to date.[20]

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- It is unknown whether newborn infants with COVID-19 are at increased risk for severe complications. Transmission after birth via contact with infectious respiratory secretions has been documented.[11,19,21,22] To date, there have been no reported neonatal deaths confirmed as due to COVID-19.
- It is unclear whether preterm infants have increased susceptibility to infection including more complications.

6. RISK RATING

- High (to be reviewed monthly)

7. NATIONAL STANDARD

- Standard 1 Clinical Governance
- Standard 2 Partnering with Consumers
- Standard 3 Preventing and Controlling Healthcare Associated Infections
- Standard 5 Comprehensive Care
- Standard 6 Communicating for Safety
- Standard 8 Recognising and Responding to Acute Deterioration

8. ABBREVIATIONS

COVID-19	Coronavirus Disease 2019	SST	Serum-Separating Tube
NCC	Newborn Care Centre	EDTA	Ethylenediaminetetraacetic Acid
IPC	Infection Prevention and Control	CDNA	Communicable Diseases Network of Australia
CEC	Clinical Excellence Commission	NSW	New South Wales
AGPs	Aerosol Generating Procedures	ACT	Australian Capital Territory
PPE	Personal Protective Equipment	NICUS	Neonatal Intensive Care Units
IPPV	Intermittent Positive Pressure Ventilation	SPRING	Sepsis Prevention in Neonates
CPAP	Continuous Positive Airway Pressure	RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
EBP	Electronic Breast Pumps	SARS-CoV-1	Severe Acute Respiratory Syndrome Coronavirus 1
BGL	Blood Glucose Level	MERS-CoV-	Middle Eastern Respiratory Syndrome Coronavirus
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2		

9. REFERENCES

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10. AUTHORS

Primary	7.4.2020	Interim guideline drafted based on advice provided by the Neonatal COVID-19 Advisory group for NSW and ACT
Revision	15.6.2020	S Bolisetty (Lead Clinician), E Jozsa (NE), T Schindler (Staff Specialist), A Taylor (ME), C Johnson (CME), E Milton (CMUM), J Carlile (CNC), J Coleman (MUM); Based on guidance developed by NSW Health for pregnant women and their newly born infants in response to the COVID-19 pandemic

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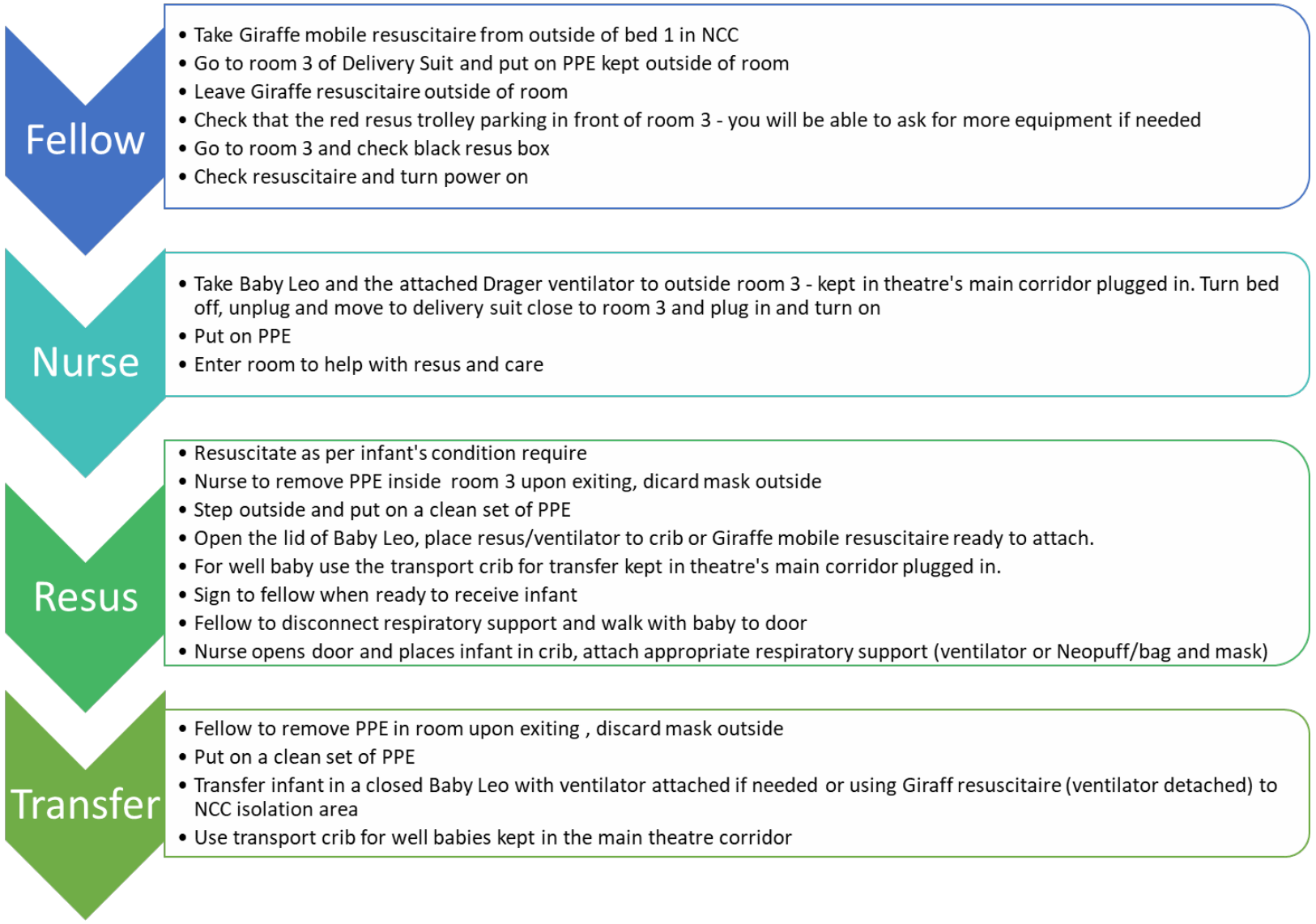
Endorsed Neonatal Services Division LOPs group April 2020

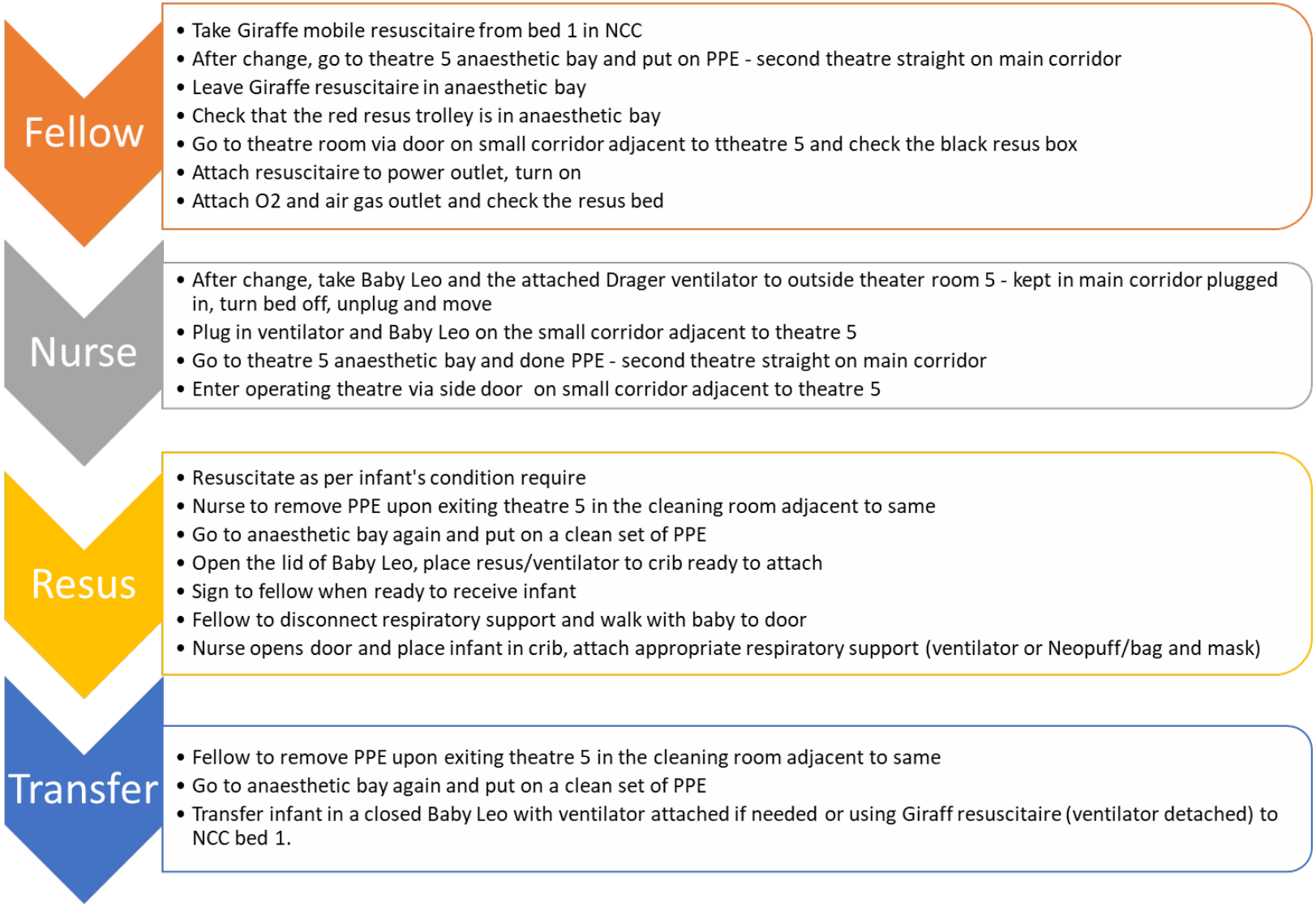
FOR REVIEW : MONTHLY (NEXT REVIEW JULY 2020)

…../Appendices

Appendix. COVID-19 delivery in Delivery Suite Room 3



Appendix. COVID-19 delivery in Theatre Room 5



Appendix. COVID Nurse suggested workflow