The following are guidelines for the care of an infant born at HUP to a mother with confirmed or suspected COVID-19.

- It remains unclear if SARS-CoV-2 is vertically transmitted from mother to fetus antenatally via transplacental infection. Prior published experience with coronaviruses would suggest this is unlikely, but for SARS-CoV-2 this has not been ruled out.
- Perinatal exposure may be possible at the time of vaginal delivery based on the detection of virus in stool and urine.
- Newborns are at risk of infection from a symptomatic mother’s respiratory secretions after birth, regardless of delivery mode.

**Personal Protective Equipment (PPE) Definitions**

Enhanced Droplet Precautions:
- Gown
- Gloves
- Surgical mask
- Eye protection
  - Standard procedural mask with built-in face shield, or
  - Reusable goggles; these are not disposable. Goggles should be wiped down with disinfectant wipes between uses. Personal eyeglasses are not adequate protection.

Special Respiratory Precautions:
- Gown
- Gloves
- N95 respiratory mask or PAPR (powered air-purifying respirator)
- Eye protection as above

**Delivery Room Considerations**

- Every attempt should be made to limit the number of pediatric providers in attendance
  - Recommend 2 team members (RN and advanced airway provider) for routine delivery indications
  - Recommend 3 team members (RT, RN, and most advanced airway provider) for preterm and high-risk deliveries
- Pediatric delivery room team will use Special Respiratory Precautions (with N95 masks) and eye protection
- Usual neonatal resuscitation measures (NRP) should not be altered for newborns delivered to mothers with suspected or proven COVID-19
• Airway stabilization and infant identification procedures should be achieved prior to leaving the delivery room. All other procedures and newborn care (including footprints, vitamin K, and erythromycin eye ointment) should be deferred to the receiving unit if clinically appropriate.

• Infant will be transported to Silverstein 8 or ICN in a closed isolette unless PPV is being provided via endotracheal tube.
  - Viral filtration devices should be used for infants transported on any respiratory support as this is considered an aerosol-generating procedure

• Please see the appendix for additional information regarding delivery room equipment, personnel, and infant transport.

All infants
• Mother and infant will be separated immediately at birth to minimize postnatal exposure to COVID-19. The risks and benefits of temporary separation of the mother from her infant should be discussed with the mother by the healthcare team (including the pediatric team via telephone or videoconference) and documented in the maternal chart.

• The decision to discontinue separation should be made when the mother meets the CDC’s recommendations for suspending precautions, and in consultation with clinicians, infection prevention and control specialists, and public health officials: see below under Visitation.

• Every attempt will be made to assign a designated, limited set of caregivers to the infant

• Infant should be bathed as soon as is reasonably possible after birth
  - Vitamin K and erythromycin eye ointment should be administered on Silverstein 8. Footprinting should also occur on Silverstein 8.

• Newborns will be tested for perinatal viral acquisition following AAP guidance:
  - Molecular assay testing will be done on 2 samples:
    • Do not test before ~24 hours of age, to avoid detection of transient viral colonization and to facilitate detection of viral replication
    • For each test, use a separate swab to sample the throat and the nasopharynx
    • Swabs should be transported to the lab in viral medium
    • For term infants who are well-appearing; test at ~24 hours of age and again at 48 hours of age before anticipated discharge to home
    • For preterm or sick infants, test at ~24 hours and 48 of age.
      - Newborn will be designated as uninfected if both tests are negative and may be removed from isolation at that time.
      - If infant is positive and hospitalization is anticipated to be prolonged, retest infant at 72 hour intervals until two negative results at least 24 hours apart are obtained
- The number of tests done and timing of such tests may be adjusted to accommodate laboratory requirements

**Admission**

- Suspected or confirmed infection with COVID-19 alone is not an indication for Pediatric team attendance at the delivery. Pediatrics should be called to delivery for usual indications.
- Infants born ≥35 0/7 weeks’ gestation who are well-appearing at birth will be admitted to the postpartum floor in a separate, designated area on Silverstein 8.
  - Infant will be cared for by hospital staff, and every attempt will be made to minimize the number of staff caring for the baby during the hospital stay
  - Staff will use Enhanced Droplet Precautions (gowns, gloves, eye protection, and standard medical procedure masks), as well as the use of an isolette for isolation
  - Infants will be kept >6 feet apart
  - COVID19+ infants and infants who are PUIs should be cared for in separate rooms
  - If the mother chooses to room in with her infant, the infant should be cared for at least 6 feet away from the mother, in an isolette. Decision making regarding rooming in for mother and baby should be clearly documented in the maternal and infant chart.
- Infants born ≤35 weeks’ gestation or otherwise requiring ICN care:
  - Infants with respiratory symptoms requiring CPAP, HFNC, or any form of mechanical ventilation will be admitted to the ICN negative pressure isolation room and will be cared for with Special Respiratory Precautions (even if respiratory symptoms could be attributed to prematurity), until infection status is determined as outlined above.
  - Asymptomatic infants can be placed on Enhanced droplet precautions (gowns, gloves, eye protection, and standard medical procedure masks) and placed in an isolette in a designated area of the ICN

**Breastfeeding**

- In addition to the known benefits of breastfeeding, mothers’ milk may provide infant protective factors after maternal COVID-19. Promoting breast milk feeding and supporting establishment of maternal milk supply may offer additional benefits to well and sick newborns.
- Mother should be encouraged to express breast milk (after appropriate hand hygiene) and this milk should be fed to the infant by designated caregivers.

- Breast pumps and components should be thoroughly cleaned in between pumping sessions using standard policies (clean pump with antiseptic wipes; clean pump attachments with hot soapy water)

**Visitation**

- Hospital-wide visitation policies may supersede those documented below.
- The non-maternal parent (or whomever is the designated, 2nd banded person) may visit the infant and participate in care if they are not a Person Under Investigation (PUI). If the non-maternal parent is being monitored for infection due to exposure to the mother, they may not visit the infant in the ICN or the well baby nursery.

- If the newborn is uninfected but requires prolonged hospital care for any reason, the mother with confirmed COVID-19 will not be allowed to visit the infant until she meets the AAP recommendations for suspending in-hospital precautions:
  - Resolution of fever, without use of antipyretic medication, for \( \geq 72 \) hours
  - Improvement in illness signs and symptoms
  - Negative results of molecular assay for COVID-19 from at least two consecutive nasopharyngeal/throat swab specimens collected \( \geq 24 \) hours apart

**Discharge**

- Infant will be eligible for discharge if the infant’s first SARS-CoV-2 test is negative; the second test is negative/pending/or decision is made to dispense with it; and the infant is otherwise medically-appropriate for newborn hospital discharge.

- Social work should be consulted on admission to assist the family in identifying an appropriate caregiver to whom the infant can be discharged.
- Infants determined to be infected, but with no symptoms of COVID-19, may be discharged home with appropriate precautions and plans for outpatient follow-up on a case-by-case basis that should be discussed with the pediatrician.
- Infants whose infection status has determined to be negative will be optimally discharged home when otherwise medically appropriate, to a designated healthy caregiver.
- Mothers will be advised to use a mask and meticulous hand-hygiene for home newborn care for at least 1 week after she is afebrile without use of antipyretics, and symptomatically improved. Cough resolution is not part of the definition of “symptomatically improved.”
- Non-maternal caregivers who are PUI’s will also be advised to use a mask and scrupulous hand hygiene until their period of observation is resolved.
- If the PUI becomes symptomatic, they should not be involved in direct newborn care.
**Disclaimer**
The Practitioner may deviate from these Guidelines based on clinical indication, if appropriate and documented, or in emergency or unusual circumstances. Any printed copy of this guideline is only as current as of the date it was printed; it may not reflect subsequent revisions. Refer to the on-line version for most current guideline. Use of this document is limited to University of Pennsylvania Health System workforce only. It is not to be copied or distributed outside the institution without administrative permission.

**Appendix: Pediatric Delivery Checklist for Infants Born to COVID-19 Positive or Suspected Mothers**

<table>
<thead>
<tr>
<th>Patient category</th>
<th>Respiratory Device Used</th>
<th>Monitoring</th>
<th>Equipment checklist in room</th>
<th>Personnel to Respond</th>
<th>In room for delivery</th>
<th>Available to assist as needed</th>
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</thead>
<tbody>
<tr>
<td>&lt;3 weeks gestation or High-risk delivery (including major anomalies, stillbirth, hydropic)</td>
<td>Nasal cannula</td>
<td>Pulse Oximeter with probe</td>
<td>Thermal mattress</td>
<td>Din, RN, 2 Medical providers</td>
<td>RN, RN, Most experienced medical provider</td>
<td>RN, Medical provider*</td>
</tr>
<tr>
<td>32-34 weeks gestation</td>
<td>Mucous-stained amniotic fluid</td>
<td>Pulse Oximeter with probe</td>
<td>Neonate mask, Small anatomical mask</td>
<td>Din, RN, 2 Medical providers</td>
<td>RN, RN, Most experienced medical provider</td>
<td>N/A</td>
</tr>
<tr>
<td>&gt;35 weeks gestation</td>
<td>Amniotic fetal distress</td>
<td>Pulse Oximeter with probe</td>
<td>Neoprene-designer facial mask</td>
<td>Resource RN (or designee), Fellow or FIC</td>
<td>RN and Fellow or FIC</td>
<td>RN</td>
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<tr>
<td></td>
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<td></td>
<td>Suction</td>
<td>Resource RN (or designee), Fellow or FIC</td>
<td>Fellow or FIC</td>
<td>RN</td>
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<td>RN</td>
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</tbody>
</table>

*Nasal cannula appropriate for minute of life, and sustained respiratory effort (for infants in room air or CPAP)
Pediatric Delivery Checklist for Infants born to COVID-19 Positive or Suspected Mothers

**Procedure for Transport of Infant from L&D to OR**
- Team member(s) in room, place infant in transporter or isolette.
- Doff gloves, replace with new purple gloves.
- Clean outside of transporter with peroxide wipes (green tool).
- Push transporter out of room to awaiting suite & team member in clean PPE (surgical mask, eye protection, gown, gloves).
- Resuscitation team to (off PPE) as follows:
  - Sanitize gloved hands.
  - Remove isolation gown and discard in room.
  - Remove gloves and perform hand hygiene.
  - Exit room.
  - Clean gloves.
  - Remove eye protection and disinfect.
  - Remove PAPR/HEM & disinfect as instructed.
  - Remove gloves & wash hands.
- Team members for transport:
  - Minimum of 3 member in clean PPE (surgical mask, eye protection, gown, gloves) to push isolette.
  - Consider 1 Clean assistant/observer: touch elevator buttons, doors, other clean surfaces. Carries wipes to immediately disinfect as needed.

**Procedure for Transport of Infant from L&D to NICU**
- Team member outside of room, don full clean PPE & push isolette into room or mobile suite.
- One team member in room, don dirty gloves and put on clean gloves. Secure incoming isolette & open side.
- Second team member place infant in transporter or isolette.
  - Infant requiring CPAP, place infant on RNM cannula with in line filter for transport to allow isolette doors to remain closed.
- Doff gloves, replace with new gloves.
- Clean outside of transporter & isolette with peroxide wipes (green tool). Take care to watch infant during this time.
- Push isolette with infant out to third team member in clean PPE
  - Doff gloves & gloves:
    - Sanitize gloved hands.
    - Remove isolation gown and discard in room.
    - Remove gloves and perform hand hygiene.
    - Exit room.
    - If going to assist in transport, do not remove eyewear or mask but don new gown and gloves.
    - If NOT assisting in transport, continue donning.
    - Don clean gloves.
    - Remove eye protection and disinfect.
    - Remove HEM & disinfect as instructed.
    - Remove gloves & wash hands.
- Team members for transport:
  - Minimum of 1 member in clean PPE to push isolette.
  - Consider 2-3 transport assistants. Minimum team in PPE when possible.
  - Consider 1 Clean assistant/observer: touch elevator buttons, doors, other clean surfaces. Carries wipes to immediately disinfect as needed.

*4.1.2020*