

**Slide 1**

Good morning everyone. COVID-19 has spread worldwide with substantial consequences for public health. Information regarding neonatal outcomes is scarce, and optimal management of the mother and neonate is evolving. Let us now try and understand how does one optimize care for neonates during this pandemic.

**Slide 2**

We shall first look at the general flow that is how does one approach a neonate born to a suspect mother or a neonate suspected with COVID-19. We shall then understand the basic do's and don't's of neonatal resuscitation. Then we shall understand the management of stable and sick neonates. And address the issue of testing. Thereafter we shall learn about discharge policy and discontinuation of isolation.

**Slide 3**

Now let us look at this algorithm starting with an admitted mother or baby suspected with COVID-19. From hereon three points to be noted. First: Isolation of mother-baby dyad, Second: Testing for both mother and baby. Third: care for other exposed dyads to be isolated together in same area and no new admission to be allowed in that area. This cycle may take at times 6 to 12 hours

**Slide 4**

Mother with suspected or confirmed COVID-19 should be in an isolation facility with separate entry and exit and donning area at entry and doffing area at exit. Basic principles of resuscitation remain the same irrespective of the model of delivery.

**Slide 5**

The resuscitation corner should be located in a separate isolated room (preferably with negative pressure); if not possible, then in the same room but at least 6ft from mother with a physical barrier (e.g., curtain). A designated senior member of the neonatal team should be assigned to attend suspected/confirmed COVID-19 deliveries. If it is anticipated that the baby might require advanced resuscitation, appropriate number of skilled neonatal team members-wearing PPE-should be present at delivery. WHO recommends delayed cord clamping, and skin to skin contact to be done in these neonates.

**Slide 6**

PPV may be given using a Self-inflating bag and mask /T-piece resuscitator with disposable tubing with a small viral/bacterial filter between the T-piece resuscitator or anesthesia bag and the mask or in the expiratory limb (before the PEEP valve) of a self-inflating bag. Since filter adds significant dead space, smallest available filter should be used and prolonged ventilation using this should be avoided. Disposable parts should be discarded. Routine suction is not indicated. Inline suction should be used during mechanical ventilation and one should avoid endotracheal administration of medications. Plexiglass boxes with access portholes may potentially minimize aerosol spread.

**Slide 7**

Drying and standard thermoregulatory measures for preterm baby (plastic bag) as usual. Bathing not recommended in view of risk of hypothermia and hospital acquired infections.

**Slide 8**

After stabilization at birth: if STABLE, shift neonate to mother's room; if SICK neonate transferred using the same warmer (used for resuscitation) to Neonatal Isolation Facility. The transport team: should be the same as resuscitation team and the transport route should be through a dedicated COVID doorway

**Slide 9**

Mothers should be encouraged to initiate or continue to breastfeed. Benefits of breastfeeding substantially outweigh the potential risks for transmission  
Rooming-in should be practiced with skin-to-skin contact, including kangaroo mother care. A healthy willing family member who is asymptomatic may be allowed in the room to provide support for breastfeeding and helping in taking care of the neonate.

**Slide 10**

Mothers should perform hand hygiene frequently, including before and after breastfeeding and touching the baby. Mothers should wear a mask while breastfeeding and providing other care to the baby. High touch surfaces should be routinely cleaned and disinfected. Mothers can express milk (only when indicated) if possible by a dedicated breast pump should be provided. If not, it should be decontaminated as per protocol. This expressed milk can be fed to the baby without pasteurization.

**Slide 11**

Neonates who are symptomatic/ sick should be managed in separate isolation facility which should be separate from the usual NICU/SNCU with a transitional area in-between. This isolation facility should preferably have single closed rooms.

In case enough single rooms are not available, closed incubators (preferred) or radiant warmers could be placed in a common isolation ward for neonates.

The neonatal beds should be at a distance of at least 1 meter from one another and there should be separate areas for suspected and confirmed positive patients.

Negative air borne isolation rooms are preferred for patients requiring aerosolization procedures (respiratory support, suction, nebulization). If not available, negative pressure can also be created by exhaust fans driving air out of the room.

Isolation rooms should have adequate ventilation. If room is air-conditioned, ensure 12 air changes/ hour and filtering of exhaust air. These areas should not be a part of the central air-conditioning.

**Slide 12**

The doctors, nursing and other support staff working in these isolation rooms should be separate from the ones who are working in regular NICU/SNCU. The staff also needs to be trained for safe use and disposal of PPE and should be provided with adequate PPE.

If the facilities of isolation intensive care are not available, the sick newborn should be immediately shifted to the closest state designated COVID hospital with complete safety, PPE policies and precautions being followed during transport.

**Slide 13**

All neonates requiring respiratory support should be nursed in an incubator (if available). If the neonate is able to accept enteral feeds provide expressed breastmilk (EBM). A register must be kept for recording the details of all healthcare providers and others entering the isolation facility.

**Slide 14**

Specific guidance for respiratory management of COVID-19 in neonates is not yet available as positive infants who needed some support were either premature or affected by comorbidities. CPAP and NIPPV with filter in expiratory limb appear to be safe in neonates if used in adequately ventilated room, with proper protection measures, careful fitting of the interface, and addition of hydrophobic filter between the interface and water reservoir (bubble CPAP) or exhalation port of ventilators (CPAP or NIPPV).

The area of dispersion is much lower in neonates due to lower airflow and smaller tidal volumes.

However, a poorly fitting mask can enhance air-leak

There are no clear data to support any specific mode of ventilation to treat viral pneumonia/ARDS in neonates or decrease aerosol dispersion

**Slide 15**

Specific anti-COVID-19 treatment - antivirals or chloroquine/hydroxychloroquine - is NOT recommended in symptomatic neonates with confirmed or suspected COVID-19.

Use of adjunctive therapy such as systemic corticosteroids, intravenous gamma globulin and convalescent plasma is NOT recommended in symptomatic neonates with confirmed or suspected COVID-19.

**Slide 16**

*Neonates with history of exposure to COVID-19 positive adult (Irrespective of symptoms) or Mother had COVID-19 infection within 14 days before birth should be tested.*

Irrespective of history of exposure neonates presenting with pneumonia or SARI that requires hospitalization without any other underlying illness should also be tested  
Test is RT\_PCR done for the infant at ~24 hours after birth/symptomatic; If initial test results are negative, or not available, testing should be repeated at 48 hours of age.  
For asymptomatic neonates expected to be discharged at <48 hours of age, a single test can be performed prior to discharge, between 24-48 hours of age.  
Serologic testing is not recommended at this time to diagnose acute infection in neonates.

**Slide 17**

Upper respiratory nasopharyngeal swab (NP) for routine sampling and tracheal aspirate sample should be collected and tested as a lower respiratory tract specimen in addition to NP swab  
Clinicians should wear appropriate personal protective equipment during sampling.  
Neonates awaiting test results: isolate (preferable)/ cohorted in the same isolation room in incubators/ rooming in with the mother (if tested for mother being positive/ suspect)

**Slide 18**

For an asymptomatic neonate; suspected to start with and tested and now tests negative; isolation can be safely discontinued  
However; if the neonate was not- Tested/ tested for potential exposure prior to 96 hours of exposure; and Hospital stay <=4 days or less: this neonate can be discharged but continued on home isolation for 14 days  
If the neonate is currently admitted best is to test and decide

**Slide 19**

If a symptomatic neonate meets the listed criteria, isolation can be discontinued.

If test is not done then all the listed criteria have to be met before isolation is discontinued.

**Slide 20**

A neonate if asymptomatic should be discharged early as feasible and safe preferably be discharged with a healthy attendant; OR mother if attendant not available with home isolation for 14 days since the time of last contact.

**Slide 21**

A symptomatic neonate is discharged after the listed criteria are met. One option is to send two consecutive samples taken at least 24 hours apart negative for SARS-CoV-2 and another option is if first 3 criteria are met but in that case the neonate should be continued on home isolation

**Slide 22**

If mother was discharged before being declared infection free, consider her infective she meets the listed criteria.

**Slide 23**

Some infection prevention measures at home  
Mother should wear a medical mask and practice hand hygiene  
Telephonic follow-up/home visit by a designated nurse.  
If neonate becomes unwell (any danger signs) during home isolation, he/she should be taken to a designated hospital facility for assessment and testing  
Mothers should practice respiratory hygiene and wear a mask while breastfeeding and providing other care to the baby; they should routinely clean and disinfect all the surfaces.  
If the discharged neonate is positive for COVID-19, uninfected individuals >60 years of age (e.g. grandparents) and those with comorbid conditions should not be assigned to provide care if possible

**Slide 24**

- ▶ Neonatal resuscitation: Do's and Dont's
- ▶ Management of stable and sick neonates
- ▶ Testing: when, what sample, time
- ▶ Principles of isolation of newborn
- ▶ Important considerations of discharge
- ▶ Precautions to be observed at home