COVID-19: SOP for Neonates

In case of conflict with JIPMER SOP, the JIPMER SOP takes precedence.

Introduction

This SOP outlines standard procedures to be followed for neonates:

- Diagnosed with COVID-19 (e.g. referred with the diagnosis).
- At risk because of exposure (most commonly mother with suspected or confirmed COVID-19).

Common scenarios and their management are discussed. Issues not covered in this SOP can be discussed with the on-call consultant.

Summary of current evidence

- COVID-19 during pregnancy might increase the risk of severe illness (as per CDC, USA, based on limited evidence) and preterm labor.
- No reported risk for IUGR or congenital anomalies due to COVID-19.
- Risk of fetal compromise is not clear (Neonatology team should be prepared).
- Antenatal management is like that of COVID-negative pregnant women. No restriction for the usage of antenatal steroids or $MgSO_4$.
- Delayed cord clamping can be practiced.
- Transmission during pregnancy/delivery is rare but possible, based on a few reports.
- Most neonatal infections are probably acquired postnatally from the mother (droplet spread).
- Mother should wear a mask, especially while feeding the baby, and practice cough hygiene and hand hygiene.
- Breastfeeding and rooming in with mother are recommended, even if mother is COVID-positive.

Mother with suspected or confirmed COVID-19

Delivery

- Neonatology SRs posted in COVID rotation should actively enquire about new antenatal admissions to SLR and ward 51.
- No specific choice for mode of delivery.
- Conducted in a place with minimum risk of contact with other patients. Currently delivery occurs in SLR (COVID isolation) area for asymptomatic women with pending COVID reports and in SSB ward 51 for women with confirmed or clinically suspected infection.
- Ideally, resuscitate in a physically separate adjacent room earmarked for the purpose. Currently not feasible, so physically separate the warmer from mother's delivery area by at least 2 meters.
- In case of identified antenatal risk factors (either maternal medical or obstetric complications), senior resident should be available for resuscitation in SLR
- All the health care workers (HCW) attending the delivery in Ward 51 should wear appropriate PPE as in Table 1
- PPE should be donned/doffed in the designated area in ward 51.

RESUSCITATION

- A single resident should be attending all deliveries of mothers with suspected/confirmed COVID-19. More residents will be needed for multiple births.
- Duty SR/JR maintains an equipment check list and checks the availability and working condition of all necessary equipment in OT or labor room resuscitation area.
- Equipment should be separate for each delivery (Table 3).
- A dedicated warmer should be used for receiving the baby and cleaned after every resuscitation.
- Initial steps and resuscitation of the baby should be as per JIPMER Neonatal resuscitation protocol
- Delayed cord clamping should be practiced unless contraindicated
- Baby can be cleaned and dried as usual.
- For heart rate monitoring of newly born infant, cord pulsation, Pulse ox meter, Hand held doppler or ECG tracing (if multipara monitor available) can be used.
- Oxygen should be provided using nasal prongs if oxygen saturation is below target range or if cyanosis is noted. If a pulse oximeter is not available, manage clinically. In such neonates, use an oxygen hood to decrease aerosol spread
- Do not use intra-tracheal adrenaline
- Disinfection of the equipments should be done as per JIPMER guideline (Table 2)

Table 1: PPE guidelines (modified from JIPMER HICC recommendations)

Area	**Activity/location**	**Risk**	**Mask**	**Gloves**	**Gown**	**Goggles**	**Face shield**
COVID ICU/HDU	All HCW working inside the ICU/HDU	High	N95	Yes	Yes	Yes	Yes
COVID ICU/HDU	Outside corridor, nursing station if located outside	Low	3-ply	-	-	-	-
COVID OT	Within operating room	High	N95	Yes	Yes	Yes	Yes
COVID OT	Outside operating room	Low	3-ply	-	-	-	-
COVID isolation room or ward	Near patient zone	Moderate	N95	Yes	Yes	Yes	Yes
COVID isolation room or ward	Near patient zone during aerosol generating procedures	High	N95	Yes	Yes	Yes	Yes
COVID isolation room or ward	Outside corridor, nursing station if located outside	Low	3-ply	-	-	-	-
COVID screen area/ triage	Managing unstable/SARI/ ventilator patients	High	N95	Yes	Yes	Yes	Yes

Table 2: Disinfecting commonly used equipment and instruments

Equipment/ instrument	**Disinfectant**	**Method**
Tubings connected to monitor & patient	Alcohol Spray (Bacillol 25) or Alcohol wipes (Wettask Wipes)	Wiping method
Wires	Alcohol wipes (Wettask wipes)	Wiping method

Pulse oximeter probe	Clean by alcohol wipes but disinfect by 2% glutaraldehyde	Clean by alcohol wipes and disinfect by 2% glutaraldehyde (find attachment)
Laryngoscope handle	Alcohol wipes (Wettask wipes)	Remove blade from laryngoscope, disinfect with Wettask wipes
Laryngoscope blade	As per CDC, semi-critical items- 2% Glutaraldehyde	Remove blade, pre-wash (enzymatic cleaning), then soak in 2% Glutaraldehyde
Instrument trolley	Alcohol Disinfectant/ Bacillocid Extra/ Alcohol wipes (Wettask wipes)	
Self-inflating bag	Clean with detergent and water; then dried and sterilized with: • Immediate use- glutaraldehyde at least 20 minutes • Next day use-ETO	

Table 3: List of equipment for delivery areas

EQUIPMENT	**NUMBER**
Warmer Clean; spread sterile linen- 3 numbers Provide sterile plastic apron to receive preterm babies Switch on 20-30 minutes before delivery (100% heater output; manual mode)	1
RESPIRATORY SUPPORT	
Self-inflating bag 500 ml	1
Mask (size 0, 1, 2) for use with bag	1 each
Oxygen reservoir bag or corrugated tubes	1
Suction catheter (sizes 8, 10)	2 each
Nasogastric tube (sizes 6, 8)	2 each
Endotracheal tubes uncuffed (sizes 2.5, 3.0, 3.5)	1 each
Laryngoscope with blades 00, 0, 1	1
Adrenaline 1:10000 prepared for each delivery Dilute 1 ml of adrenaline in 9 ml of NS in 10 ml syringe. From this use 1 ml in 1 ml syringe for injection. Provide 2 ml saline flush.	1
Adhesive Tape	For ET, OG tubes
SAMPLING AND VENOUS ACCESS	
Intravenous cannula # 24 G	2
Disposable needles 23, 24, 26	1 each
Syringes 1 ml, 2 ml, 5 ml	1 each
Tegaderm	1
PMO line with 3 way	1 each
Umbilical venous catheter 3.5 Fr, 5 Fr or feeding tube 5 Fr for emergency UVC	1 each
Umbilical cord clamp, surgical blade and suture material	1 each
10 ml syringe	1

Testing neonates for COVID-19

Whom to test, when to test, and how to test.

WHICH NEONATES SHOULD BE TESTED FOR COVID-19?

- Infants from containment zone
- Mother COVID positive within 14 days of birth.
- Direct and high-risk contact with a confirmed case (mother or a relative)
- Unexplained severe acute respiratory infection lethargy, vomiting, loose stools, GI bleed or apnea presenting after 48 hours of birth.
- Symptomatic outborn infants who are less than 48 hours and without an evident cause like RDS, MAS, TTN or asphyxia, even if sepsis due to another organism is identified.

WHEN SHOULD THE RT PCR BE DONE?

- Symptomatic infants: at presentation/admission
- Asymptomatic infants (mother positive): at 24-48 hours of life. If negative, retest at 5-7 days of life.
- Asymptomatic infants (positive contact in postnatal period): at presentation.

COLLECTING DIAGNOSTIC RESPIRATORY SPECIMENS

- Always confirm with most recent JIPMER guideline.
- Wear N-95/FFP-2 respirator (If N95 is not available, we should not take samples), eye protection, gloves, and gown. Obtaining an oro-nasopharyngeal sample is an aerosol generating procedure. Hence precautions for personal protection should be adhered to)
- HCW other than the one obtaining sample should be at least 2 m away during sample collection
- Only essential staff should be present; close the room during testing.
- Clean surfaces promptly after specimen collection.
- Take sample first from oropharynx and then from nasopharynx using the same swab.
- If intubated, collect endotracheal aspirate.

Procedure for swab collection:

Oropharyngeal swab: insert swab into the oral cavity. Hold the neonate with the head end up slightly (~ 30 degrees). The swab should be used to take sample from posterior pharynx and tonsillar areas. This invariably elicits a gag reflex. So, it is advisable not to sample immediately after a feed.

Nasopharyngeal swab: insert the same swab into one of the nostrils parallel to the palate until resistance is encountered. Gently rub and roll the swab. Leave the swab in place for several seconds to absorb secretions. Remove the swab slowly while rotating it.

The swab should be placed in viral transport media and transported to the laboratory immediately without delay. Follow JIPMER SOP for handling the specimen

Postnatal management

WELL INFANTS (MOTHER SUSPECTED OR CONFIRMED COVID-19)

Also refer to flowchart (figures 1, 2)

- Room in and bed in with mother both in postnatal ward/ ward 51. Keep with mother if mother is asymptomatic, and discharge early or when mother is discharged.
- If mother needs intensive care or prolonged stay: Keep the infant in the NICU/ Ward 51 as per the COVID status
- Until attenders are available, baby can be briefly kept in NICU isolation ward (previously used for Kangaroo Mother Care) if mother's report is pending, or in Level 1 NICU if mother is negative. Shift to mother side ASAP.
- Examine before discharge; test for COVID-19 if symptomatic.
- Discuss hand hygiene, breast hygiene and danger signs with the mother.
- OAE screening should be planned for a later date.
- Discuss precautions to limit spread to the baby if mother is positive (table 4).

Breastfeeding

Exclusive breastfeeding is advised with precautions mentioned in table 4. In case of difficulties in breastfeeding, contact duty SR.

Table 4: Precautions to reduce spread of infection to the baby.

Wash hands before and after touching the baby
Manual expression is recommended over breast pump use
Mother (or caregiver) should wear a face mask while feeding, expressing milk, or caring for the baby
Avoid coughing or sneezing on the baby
No masks should be applied on the baby's face
Clean paladai and feeding utensils with soap and water etc. after every use
Clean surfaces routinely

INFANT REQUIRING ADDITIONAL CARE AT BEDSIDE

Also refer to flowchart (figures 1, 2)

- Telephonic enquiry of the baby's condition can be done, with mother. Report from staff nurse can also be taken before deciding on personal rounds.
- IV antibiotics for asymptomatic at-risk infants can be given with the baby at the mother's side.
- Reassessment and glucose monitoring should be done at the bedside.
- Any interdepartmental consultations, if required, should be done at the bedside.
- Investigations which cannot be done at the bedside like ultrasonography and echocardiography should be delayed if possible until COVID-19 reports are available, but can be done in emergencies.
- Investigations can be planned after discussing with the consultant in charge.
- Infants requiring phototherapy
    - Mother's COVID-19 reports awaited – NICU isolation ward
    - Mother COVID-19 Positive – Ward 51
- Infants requiring exchange transfusion
    - Mother COVID-19 reports awaited – NICU isolation ward
    - Mother COVID-19 Positive – COVID ICU in Ward 51 (discuss with consultant)

INFANTS REQUIRING INTENSIVE CARE

Also refer to flowchart (figures 1, 2)

Extramural (outborn) infants

- Discuss referral requests with the on-call consultant. If COVID positive neonate, admit to ward 51. Communicate with ward 51 team and arrange bed before accepting transfer.
- For neonates presenting to emergency, a thorough history should be obtained including place of residence, symptomatology, and recent contact history. If requires COVID testing, swab is taken from the casualty or triage area.
- Admit to NICU isolation ward until reports are available
- Management is otherwise like that of intramural infants.

COVID-19 positive infant

- Shift in the designated incubator or trolley to ward 51 ICU. Follow current JIPMER protocol. Generally, inter-hospital transfers are made in an ambulance. For neonate, a DRL or COVID negative attender plus a doctor (if the baby is sick) accompanies in an ambulance. Wear N95 mask, gown, double gloves and goggles when transporting.
- If ICU care is anticipated, ICU team should be informed prior to delivery and arrangements for transportation of the baby should be made. A transporting resuscitation kit should be available.
- If shifting from SLR, the transporting corridors should be cleared.
- Resuscitation team should doff before shifting the baby and wear a new set of appropriate PPE.
- The COVID duty team should receive the baby in the ICU.
- Preterm babies should be shifted with plastic wrap to reduce hypothermia.
- When possible, the outside surface (handles, portholes, doors and dials) of the transport incubator should be wiped with disinfectant prior to leaving the theatre/labor room.
- Vitamin K can be given as usual.
- Inform on-call consultant before shifting and COVID consultant ASAP after shifting.
- Respiratory support
    - If required, shift with nasal prongs O_2 with flow < 2L/min or self-inflating bag ventilation.
    - Intubation should be performed with the use of appropriate PPE.
    - No evidence for early intubation in newborns (unlike adults and children).
    - Nebulization should be avoided if possible.
    - CPAP and HFNC can be used as per NICU protocol.
    - Ventilator in the NICU isolation ward can be used to provide non-invasive (or invasive) ventilation.
    - Use disposable ventilator tubing.
    - Respiratory distress syndrome should be treated as in babies without COVID-19.
- No contraindication for standard neonatal procedures including therapeutic hypothermia.
- If any infant tests positive for nCOV-19, it should be notified to JIPMER COVID task force.
- SRs to communicate with mother / father telephonically to update status every day.
- Before transfer to or from COVID ward, write transfer summary and inform consultants (COVID area & NICU isolation ward) and nurses (NICU/ NICU isolation ward).

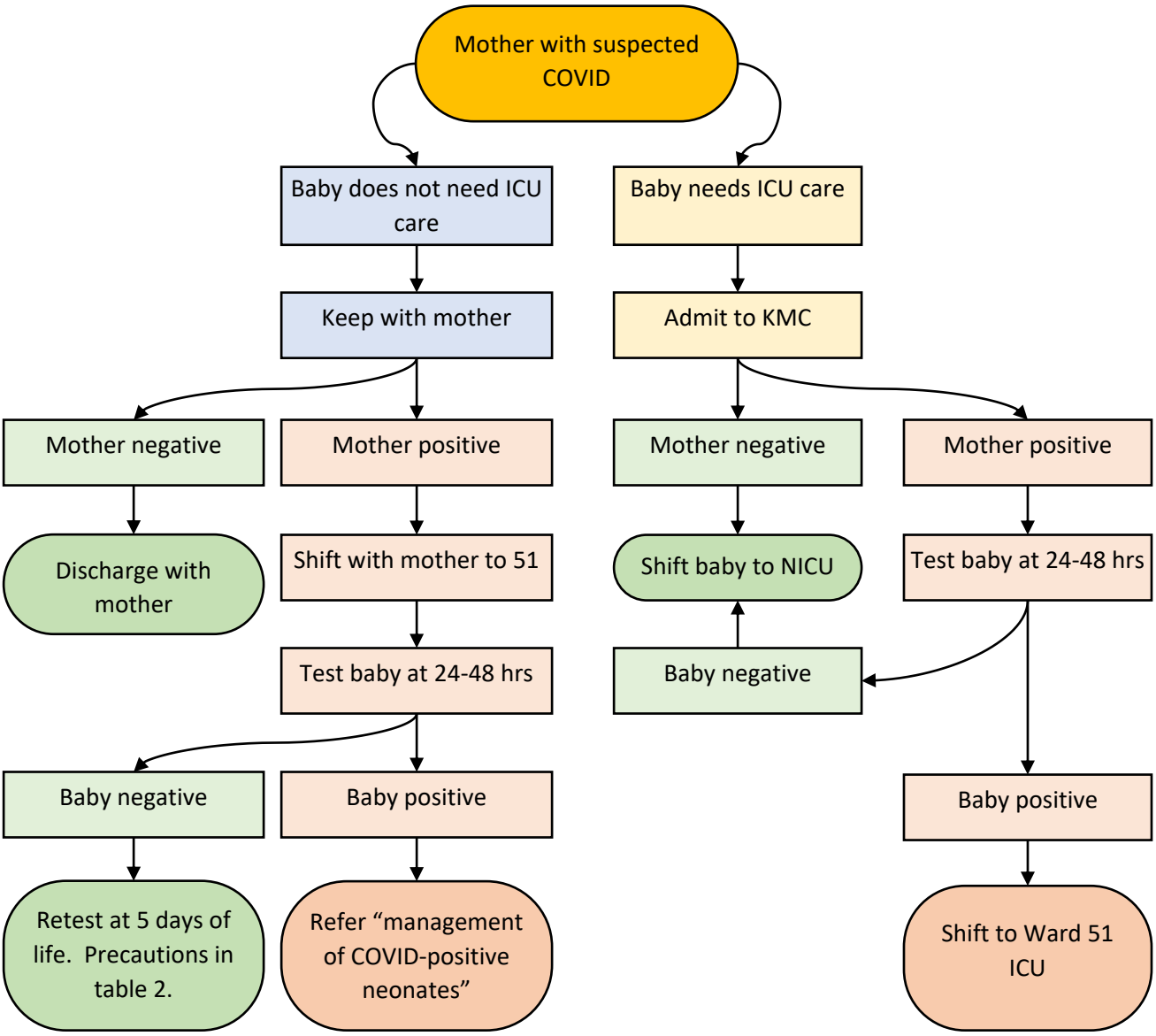

Figure 1: Management of infant born to a mother suspected to have COVID.

Note: Sick babies admitted in NICU should be shifted to the mother's side once the baby is fit for transfer, irrespective of the baby's or mother's COVID status.

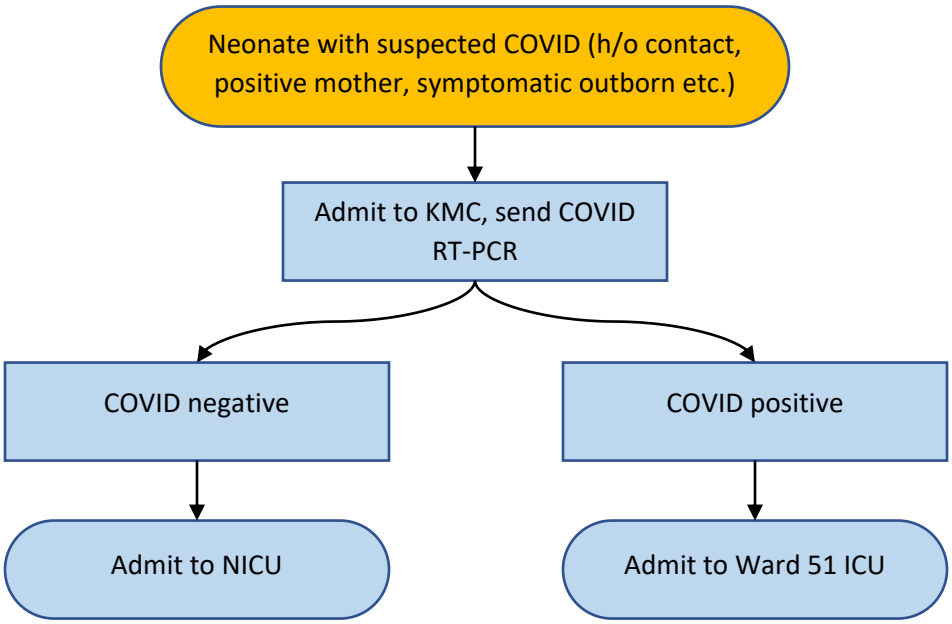

Figure 2: Management of infant suspected to have COVID.

DIAGNOSIS

- Clinical features: respiratory distress, fever, lethargy, vomiting, GI bleed. Other symptoms are possible, since very few cases have been reported.
- Investigations for a symptomatic neonate: CBC (leucopenia and thrombocytopenia), LFT (elevated liver enzymes), RFT, CRP and oronasopharyngeal swab for RT-PCR for COVID-19.
- Chest X-ray may show unilateral or bilateral multiple lobular or subsegmental consolidation and ground glass opacification in severe cases.

TREATMENT

- Monitor vitals closely.
- Treatment for RDS, HIE and other neonatal problems, as per usual protocol.
- Antibiotics only if bacterial infection is suspected or confirmed.
- No specific drugs are currently recommended for COVID-19 in the newborn.

VISITATION AND COUNSELING

- Currently, other caregivers are only allowed if the mother is sick. Counselling can be done telephonically.
- Parents, if tested for COVID19, should not be allowed inside NICU unless shown to be negative
- In the NICU isolation area, visitation is strongly discouraged; any visitors should be actively screened for contact, travel, and symptoms of COVID-19.
- Only one attender can visit the infant at a time.
- Counseling is done with 1-meter distance between the attender and the resident
- Use a well-ventilated space.
- Only one attender should be allowed for counseling.
- Video of the baby may be shown to the attender during counseling session.
- No other healthcare worker should enter NICU unless absolutely necessary.

DISCHARGE AND FOLLOW UP

- COVID-19 positive neonates: if asymptomatic or clinical course is mild to moderate (symptoms and need of oxygen abate within 3 days), discharge from hospital after 10 days. In mild or moderate cases, a repeat testing is not recommended as per ICMR guidelines). In severe cases (neonates presenting with severe pneumonia or requiring more than oxygen support by prongs like non-invasive or invasive ventilation), a single negative RT-PCR should be demonstrated after resolution of symptoms, prior to discharge.
- Well COVID-negative infants can be discharged as early as possible after documenting the negativity of both the swabs along with the mother.
- Baby born to COVID-19 positive mother should be isolated at home for 14 days from the day the mother became asymptomatic or 14 days of life, whichever is later.
- Initial follow up should be done via telephonic/video consultation.
- Parents should be advised regarding minimizing the risk of infection
- Minor ailments after discharge can be treated at a nearby facility.
- After discharge, parents are advised to get birth vaccination in a nearby facility (or JIPMER) after quarantine. Further vaccination can be taken at local hospital.
- High risk clinic appointments: Parents can register with contact number given by JIPMER. Infants will be called to hospital if required.

Staff well-being

- Follow current JIPMER guidelines for hand hygiene and appropriate PPE use.
- Postnatal ward residents should wear face mask and gloves and follow social distancing.
- PPE should be properly discarded while exiting from the patient care area.

Preparedness

- Use earmarked areas (NICU isolation ward/ward 51) for admission of COVID-19 suspected and confirmed cases.
- Check neonatal equipment in these areas daily.
- Preparedness drills should be done regularly.

References

1. World Health Organization. Responding to community spread of COVID-19: interim guidance, 7 March2020. World Health Organization; 2020.
2. CDC Interim Considerations for Infection Prevention and Control of Coronavirus Disease 2019 (COVID-19) in Inpatient Obstetric Healthcare Settings.
3. Royal College of Obstetricians and Gynaecologists (RCOG). Coronavirus (COVID-19) infection in pregnancy: information for healthcare professionals V8. 17 April 2020.
4. Federation of Obstetric & Gynaecological Societies of India, National Neonatology Forum, Indian Academy of Pediatrics: Perinatal-Neonatal Management of COVID-19 Version 2.0, 07 May 2020.
5. ICMR Guidelines for management of pregnant women I COVID-19 pandemic. 14 April 2020.