# Section 1

## Common issues in care of normal and high risk newborns

1. Care of normal neonates
2. Thermal care
3. Antenatal steroids
4. Golden hour management of high risk babies
5. Lactation management
6. Intrapartum monitoring of fetal distress

# 1 Care of Normal Neonates

Normal neonate for the purpose of this protocol has been defined as:

- Birth weight of 2500 g or more and gestation of 37 weeks or more
- No major malformations or birth trauma
- Birth weight between 10th to 90th percentile as per AIIMS intrauterine growth charts[1]
- Absence of maternal illness or intrapartum event that may put a neonate at risk of illness (e.g, gestational diabetes, antepartum hemorrhage etc)
- Normal Apgar scores; no need for resuscitation at birth
- No postnatal illness such as respiratory distress, sepsis, dyselectrolytemia, hypoglycemia or polycythemia

## Care at birth

**Personnel and equipment to be present at delivery[2,3]:** One health provider (physician or nurse) trained in neonatal resuscitation must be physically available at the time of birth of all infants irrespective of their risk status (high or low). It is not good enough to have someone on call.

If the delivery is anticipated to be high risk because of presence of risk factors identified before birth, more advanced neonatal resuscitation may be required. In these cases, two persons should be present solely to manage the baby. The goal should be to provide a 'resuscitation team', with specified leader and an identified role of each member. There should be separate teams for multiple births.

The resuscitation corner must be physically located in the delivery room itself. The health professional designated to care for the baby at birth should check for the "Resuscitation Preparedness" at the birthing place well in time before the baby is delivered (Table 1.1). One may refer the 'Neonatal Resuscitation Programme' for details of resuscitation.[3]

The Neonatal Resuscitation Programme guidelines are based on the American Academy of Pediatrics (AAP) and American Heart Association (AHA) guidelines for cardiopulmonary resuscitation and emergency cardiovascular care of the neonate.4 The evidence based guidelines published in 2015 are based on the international Liaison Committee on Resuscitation (ILCOR) consensus on science statement. The evidence-based worksheets, prepared by ILCOR, can be viewed in the science area of NRP Web site at www.aap.org/nrp.

**Table 1.1. Checklist for "Resuscitation Preparedness"**

| | |
|---|---|
| **For providing warmth** | Preheat the warmer by turning on manual mode for at least 20 minutes At least 3 prewarmed towels and a blanket should be available |
| **Thermoregulation** | Plastic bag or plastic wrap, heated mattress and cap for small babies |
| **For positioning** | The shoulder rolls 2 cm thickness should be prepared and kept of ready |
| **For clearing airway** | 10 to 12F suction catheter attached to wall suction set at 80-100 mm Hg, mucos sucker |
| **For ventilation** | Check for the availability and the functioning of the self inflating bags piece resusetator & blades<br>Check for availability of all sizes of the masks 00, 0, and 1<br>8F feeding tube and 20 mL syringe |
| **For oxygen delivery** | Oxygen tubing or T piece resuscitator that can deliver free flow oxygen<br>Pulse oximeter<br>Option for providing varying concentration of oxygen (blender, air, oxygen) |
| **For intubation** | Laryngoscope with blades of sizes 0 and 1<br>Endotracheal tubes, sizes- 2, 2.5, 3.0, 3.5 |
| **For medication** | Access to 1:10,000 epinephrine and normal saline<br>Supplies for administrating medications and placing emergency umbilical venous catheter<br>Neonatal case record sheet for documentation |
| **For Transportation** | The transport incubator should be stationed in the birthing place for the transportation in all high-risk deliveries |

**Time of birth:** The attending physician/nurse should record the time of birth. It is important to call out the time of birth loudly.

This helps in accurate recording of the time and alerts other personnel in case any help is needed.

**Standard precautions and asepsis at birth:** The personnel attending the delivery must exercise the universal/standard precautions.[5] All fluid products from the baby/ mother should be treated as potentially infectious. Gloves, masks and gowns should be worn while resuscitating the newborn. The protective eye wear or face shields should be worn during procedures that are likely to generate droplets of blood or other bodily fluids.

It is important to prevent infection at birth by observing five cleans:[6]

(1) **Clean hands:** appropriate hand-hygiene and wearing sterile gloves

(2) **Clean surface:** use clean and sterile towel to dry and cover the baby

(3) **Clean cut:** the umbilical cord should be cut with a clean and sterile blade/scissor

(4) **Clean thread:** the cord should be clamped with a clean and sterile clamp or tie

(5) **Clean cord:** one should not apply anything to cord

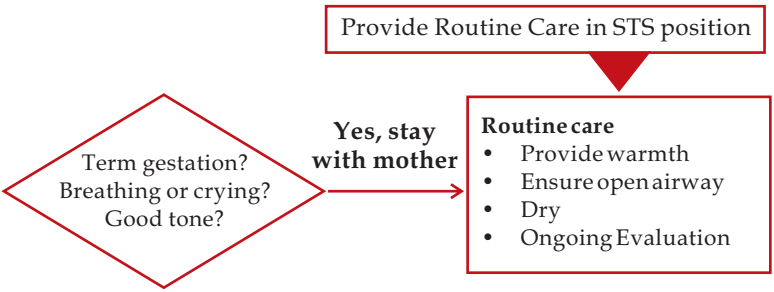
**Prevention and management of hypothermia:** Immediately after birth the newborn is at maximum risk of hypothermia. This may have a detrimental effect on the health of the infant as the admission temperature of non-asphyxiated newborns have been shown to be a strong predictor of mortality at all gestational ages.[3] Special care should be taken to prevent and manage hypothermia. It should be ensured that the ambient temperature of the delivery room is $25^0$ to $28^0$ C and it is free from draft of air. The pediatrician should receive the baby directly *(no middle person should be allowed)* in a pre warmed sterile linen. The infant should be dried thoroughly including the head and face areas.[7] Any wet linen should not be allowed to remain in contact with the infant.

**Skin to skin contact (STS):** Any infant born vaginally and requiring only routine steps should be placed on the mother's

abdomen or chest immediately after the birth for initial one hour of life to ensure early skin-to-skin (STS) contact with the mother.[8] This will not only maintain the newborns temperature, but also promote early breast feeding and decreases the pain and bleeding in the mother. The mother-baby dyad should not be left alone and observed for breathing, color and temperature every 15 minutes.

## Skin-to-skin (STS) contact at birth in term babies

- Assess the baby as per neonatal resuscitation guidelines:
  - The babies that are delivered vaginally and eligible for Routine Care must receive STS contact with their mother for initial one hr of life.
- Rarely, a baby in STS contact may show a sign of illness (respiratory distress) or develop some complication (smothering). DO NOT leave the mother and baby dyad alone. MONITOR them during this period.




- Delay the cord clamping for at least 60 seconds
- While drying remove the wet towel and cover baby with another dry towel
- If there is any respiratory difficulty: shift the baby to the radiant warmer in the newborn corner, assess and take appropriate step

- Continue STS for one hr in the birthing room
- Perform quick examination for obvious malformation
- Show the baby to the mother and counsel her
- Apply identity band
- Initiate breastfeeding
- Do not leave the mother-baby dyad alone and monitor breathing and color q 15 minutes

- If mother has to be shifted to postnatal ward: shift with baby in STS
- After 1 hour: weigh the baby and give injection vit K and initiate rooming-in

**Delayed clamping of umbilical cord:** Umbilical cord clamping must be delayed for at least 60 seconds WHO[3] in order to allow transfer of additional amount of blood from placenta to the infant. This delayed cord clamping is associated with improved hematologic status, iron status and clinical anemia at 2 to 6 months in term born infants.[9]

**Cleaning of baby:** The baby should be dried and cleaned at birth with a clean and sterile cloth. The cleaning should be gentle and should only wipe out the blood and the meconium and not be vigorous enough to remove the vernix caseosa. The vernix protects skin of the infant and helps maintain temperature. This gets absorbed on its own after sometime.

**Clamping of the cord:** The umbilical cord should be clamped at 2-3 cm away from the abdomen using a commercially available clamp. The stump should be away from the genitals to avoid contamination. When the commercial clamps are not available, a sterile rubber band could be a better option than a sterile thread, as once cord starts shriveling; the rubber band would still maintain its grip while the thread might loosen up. Inspect the cord every 15-30 minutes for initial few hours after birth for early detection of oozing from the cord.

**Routine stomach wash:** Performing routine stomach wash in the babies to prevent gastritis (amniotic fluid or meconium) should not be done.

Patency of esophagus should be ascertained at birth in following circumstances:

1. Presence of polyhydramnious.
2. Antenatally suspected esophageal atresia or diaphragmatic hernia.
3. Excessive froathing
4. Presence of vertebral or anorectal anomalies (VACTERL association)

A review by Puieg J et al (2007)[9] found that skin-to-skin contact between the mother and her baby immediately after birth reduces crying, improves mother-infant interaction, keeps the baby warm, and helps the mother to breastfeed successfully. No important negative effects were identified.

A meta-analysis including 15 trials (1912 neonates) 10 showed that delayed cord clamping was associated with benefits at 2 to 6 months:

- Improved hematocrit (WMD: 3.7 g/dL, 95% CI 2.00 –5.40)
- Improved iron status measured by ferritin concentration (WMD: 17.89, 95% CI 16.58 - 19.21)
- Clinical anemia (RR; 0.53; 95% CI, 0.40 –0.70)

**Care of the eye:** At birth both the eyes of the neonates should be cleaned with separate swabs. Sterile water or normal saline may be used for this purpose. The swipe to clean the eyes should be gentle and should be done from the inner to the outer canthus. There is insufficient evidence to recommend the routine antibiotic prophylaxis for prevention of opthalmianeonatorum in Indian setting. Routine cleaning of eyes on a daily basis is not recommended.

**Placement of identity band:** The birthing places with high birth rates should take utmost care to ensure the identity of the mother-baby dyad by an appropriate method as per the hospital policy. Each infant must have an identity band containing name of the mother, hospital registration number, gender and birth weight of the infant. Reliability of the foot prints for identification has not been investigated.

**Recording of apgar scores:** The Apgar scores should be recorded at 1 minutes and 5 minutes of birth. This score has a limited value in guiding for resuscitation and initial stabilization. The prediction of the subsequent outcomes by Apgar scores is also poor. However; Apgar scores may help deciding the need for nursery admission.

**Care of baby during the initial few hours after birth**

**Weight:** The baby should be weighed after stabilization and the temperature is documented to be normal. A sterile preheated

sheet (or a single use paper towel) should be placed on 5 to 10 gm sensitivity weighing machine. Zeroing of the machine should be performed. The baby is then gently placed on the weighing machine and the weight recorded.

**Initiation of breastfeeding:** Breastfeeding should be initiated at the earliest possible opportunity, preferably during STS contact within one heart of birth. The health provider should actively assist the mother to put the baby on breast irrespective of the mode of delivery. Breastfeeding counseling alone without any proactive support is unlikely to result in successful breast-feeding. Time of initiation of the breast feeding should be documented.

**Vitamin K administration:** Vitamin K1 should be administered to all the babies (0.5 mg for babies less than 1000 grams and 1 mg for babies more than 1000 grams).[11] It is preferable to administer K1, however if not available, vitamin K3 may be administered.[12] This should be administered as an IM injection using the 26G (1/2 inch) needle and a 1 mL syringe on the anterolateral aspect of the thigh.

**First examination:** The baby should be thoroughly examined and the findings should be recorded in neonatal record sheet. Examine midline structures for malformations (e.g, cleft lip, neck masses, chest abnormality, omphalocele, meningocele, claocal abnormality, etc). Special attention should be given to identify and document the anal opening. There is no need for routine passage of catheter in the stomach, nostrils and the rectum for detection of esophageal atresia, choanal atresia and ano-rectal malformation, respectively. The baby should be examined for presence of birth injuries in cases of difficult extraction. The axillary temperature of the baby should be recorded before the baby is shifted out from the birthing place.

**Communication with the family:** Before leaving the birthing place, the health professional should communicate with the mother and the family members. The following facts should be clearly told to the family: (1) gender of the baby (2) birth weight

(3) well-being of the baby. Ensure that the family gets to witness the gender and the identity number of the baby.

**Rooming in:** Under no circumstances, a normal newborn should be separated from the mother. In the initial few hours of life, the baby is very active, and the closeness of the baby to the mother will facilitate the early breastfeeding and bonding. Studies have shown that any separation during these initial hours may have an adverse impact on exclusive breastfeeding rates at discharge.[13]

**Care of the cord:** The umbilical stump should be kept dry and devoid of any application. The nappy of the baby should be folded well below the stump to avoid any contamination.[14, 15] Recent evidence supports the application of 4% chlorhexidine in community settings with high NMR and unhygienic cord practices.[16-18]

**Oil massage:** The benefits of the oil application have been described for the low birth weight babies in both the developed and the developing countries. However, a paucity of data still exists for the oil application and/ or massage in the term babies. Oil massage is a lowcost traditional practice that is well ingrained in different culture, with no reported adverse outcome. The same may be allowed in a gentle way and with clean hands. Care should be taken not to use oils with additives or the irritant oils (such as mustard oil) for this purpose.

**Exclusive breastfeeding:** A systematic approach should be followed to initiate, support and maintain breastfeeds. The advantages of the breast feeds should be discussed with the mother. Availability of a dedicated lactation nurse or councilor would significantly increase the chances of successful breastfeeding.

**Bath:** The routine dip baths should be avoided till the baby is in the hospital premises as this increases the risk of hypothermia.[19] The sponging of the baby should be done once a day with clean water, as per the requirement. The dip bath may be undertaken once the cord has fallen and the baby is discharged from the hospital.

**Talcum powder application:** should be avoided.

**Position of sleep:** No Indian study has addressed the issue of relation of sleep position to occurrence of sudden infant death syndrome (SIDS). There is substantial evidence in the literature from developed countries of an association of prone position and SIDS independent of the other variables. Healthy term newborns should be preferably made to sleep on their back.

**Traditional practices that should be discouraged:** The application of kajal/ surma in the eyes, putting oil in the ear or applying the cow-dung on cord must be discouraged.[20]

**Timing of discharge in a normal newborn:** The mother and baby must stay in hospital for at least 48 to 72 hours (for establishment of breastfeeding and observation for morbidities jaundice). However, an early discharge within 24 to 48 hours may be considered for the non-primigravida mothers who have a history of successful breastfeeding.

The following criteria should be met prior to discharge of a body:

- The routine formal examination of the newborn has been documented
- The newborn has received the immunization as per schedule
- The mother is confident and trained to take care of the neonate
- The newborn is not having any significant jaundice or other illness requiring close observation.
- The newborn is breastfeeding adequately. The adequacy of feeds can be determined by
  - Passage of urine 6 to 8 times in 24 hours
  - Baby sleeping well for 2-3 hours after feeds
  - There is no excessive weight loss (normally babies do not lose more than 8 to 10% in initial 3 to 4 days)

- The mother has been counseled regarding routine newborn care and her queries are answered.
- Follow-up advice should be communicated to the mother of the baby. Babies should have a follow up visit at 48 hours of discharge if discharged before 48 hours or if there was feeding or other issues at discharge. The breastfeeding and the jaundice in these babies should be evaluated.

## Advice on discharge: normal newborn

1. **Exclusive breastfeeds:** All mothers should be advised to exclusively breastfeed the babies till 6 months of age.
2. **Immunization:** The mother should be explained the schedule of the immunization and the date of the next immunization should be mentioned on the discharge card.
3. The follow-up date for the babies discharged early (within 48 hrs) for assessment of jaundice should be communicated to the parents.
4. Vitamin D supplementation in dose of 400 IU/day until 1 yr of age.
5. The danger signs should be documented and mother should be educated to recognize the same and report early when they are recognized 21-23
   a. Difficulty in feeding
   b. Convulsions
   c. Lethargy (movement only when stimulated)
   d. Fast breathing (RR > 60/min)
   e. Severe chest in drawing
   f. Temperature of more than $37.5^0$ C or below $35.5^0$ C
   g. Yellow staining of palms and soles

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