CARE OF NORMAL NEWBORN

This protocol should be extended to a normal neonate only, and not the high risk neonates. Normal neonate for the purpose of this protocol has been defined as follows:

- Birth weight greater than 2500 g and gestation of 37 weeks or more
- Birth weight between 10th to 90th percentiles as per intrauterine growth charts
- Absence of maternal illness or intra-partum event that may put a neonate at risk of illness (e.g. gestational diabetes, antepartum hemorrhage etc)
- Normal Apgar scores with no need for resuscitation at birth
- No postnatal illness such as respiratory distress, sepsis, dyselectrolemia, hypoglycemia or polycythemia

Care at birth

**Personnel and Equipment to be present at delivery**\(^1\,2\): One health provider (physician or nurse) trained in neonatal resuscitation must be physically available at time of birth of all infant irrespective of its 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, 2 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. For multiple births, there should be separate teams.

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). One may refer the ‘Neonatal Resuscitation Programme’ for details of resuscitation\(^3\)
Table 1. Checklist for “Resuscitation Preparedness”

<table>
<thead>
<tr>
<th>For Providing Warmth</th>
<th>Preheat the warmer by turning on manual mode for at least 20 minutes Make available at least 3 towels and blanket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermoregulation in small babies</td>
<td>Plastic Bag or plastic wrap.</td>
</tr>
<tr>
<td>For positioning</td>
<td>The shoulder rolls should be prepared and kept ready</td>
</tr>
<tr>
<td>For clearing airway</td>
<td>10 to 12F suction catheter attached to wall suction set at 80-100 mmHg Meconium aspirator</td>
</tr>
<tr>
<td>For ventilation</td>
<td>Check for the availability and the functioning of the self inflating bags Check for availability of all sizes of the masks 00, 0, and 1 8F feeding tube and 20 mL syringe</td>
</tr>
<tr>
<td>For oxygen delivery</td>
<td>Oxygen tubing or T piece resuscitator that can deliver the free flow oxygen Pulse oximeter Option for providing varying concentration of oxygen (blender, air, oxygen)</td>
</tr>
<tr>
<td>For intubation</td>
<td>Laryngoscope with blades of sizes 0 and 1 Endotracheal tubes, sizes- 2.5, 3.0, 3.5, 4.0</td>
</tr>
<tr>
<td>For medication</td>
<td>Access to 1:10,000 epinephrine and normal saline Supplies for administrating medications and placing emergency umbilical venous catheter Neonatal case record sheet for documentation</td>
</tr>
<tr>
<td>For Transportation</td>
<td>The transport incubator should be stationed in the birthing place for the transportation in all high risk deliveries</td>
</tr>
</tbody>
</table>

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. The evidence based guidelines originally published in October 2010 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.

Time of Birth: The attending physician/nurse should note 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 all the universal/standard precautions in all cases. All fluid products from the baby/mother should be treated as potentially infectious. Gloves, masks and gowns should be worn when resuscitating the newborn. The protective eyewear 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:

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 cord: 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) **Do not apply anything to the cord.**

**Prevention and management of hypothermia:** Immediately after birth the newborn is at maximum risk of hypothermia. This early hypothermia may have a detrimental effect on the health of the infant. Special care should be taken to prevent and manage hypothermia. It should be ensured that the delivery room is 25°C and free from draft of air. The pediatrician should receive the baby directly (no middle person should be allowed) in a pre-warmed sterile linen sheet.

The infant should be dried thoroughly including the head and face areas. Any wet linen should not be allowed to remain in contact with the infant. The infant may be placed on the mother's abdomen immediately after the birth to ensure early skin-to-skin (STS) contact with the mother. This will not only maintain the newborn's temperature, but also promote early breastfeeding and decreases the pain and bleeding in the mother. The baby should be observed for the transition period and made wear the caps and socks.

**Delayed clamping of umbilical cord:** Umbilical cord clamping must be delayed for nearly 2 minutes in order to allow transfer of additional amount of blood from placenta to the infant. This delayed cord clamping in term babies is associated with improved hematologic status, iron status and clinical anemia at 2 to 6 months. Even though, there was an increase in polycythemia among infants in whom late clamping was done, this appeared to be benign.

---

**A meta-analysis including 15 trials (1912 neonates)** 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)**
- **Iron status measured by ferritin concentration**
- **Clinical anemia (RR; 0.53; 95% CI, 0.40 – 0.70).**

---

**A review by Puieg J et al (2007)** 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.
**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 (white greasy material on the skin). The vernix, protects skin of the infant and helps maintain temperature. This gets absorbed on its own after sometime. Currently there is no evidence of advantage of cleaning the baby with paraffin or any other emollient at birth and the same is not recommended.

**Clamping of the cord:** The umbilical cord should be clamped at 2-3 cm away from the abdomen using a commercially available clamp, a clean and autoclaved thread or a sterile rubber band. The stump should be away from the genitals to avoid contamination. When the commercial clamps are not available, the rubber band could be a better option than a thread, as once cord starts shrinking; 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 any 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. There are no studies that report the advantage of this ritual.

**Care of the Eye:** At birth both the eyes of the neonates should be cleaned with separate swabs. The sterile water or the normal saline may be used for this purpose. The swipe to clean the eyes should be gentle and from the inner canthus area to the outer canthus. Currently, there is insufficient evidence to recommend the routine antibiotic prophylaxis for prevention of opthalmia neonatorum in Indian settings. The cleaning on a daily basis is not recommended as a routine.

**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 record of the Baby:** 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. Weighing of the baby is a complex skill and it requires adequate training of health providers.

**Initiation of breastfeeds:** The breastfeeding should be initiated at the earliest time possible. 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 active proactive support is unlikely to result in high rates of successful breastfeeding. Time of initiation of the breastfeeding should be documented.

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

**First Examination:** The baby should be thoroughly examined by the attending person from head to toe and the findings should be recorded in neonatal record sheet. It is very important to examine midline structures for malformations (e.g. cleft lip, neck masses, chest abnormality, omphalocele, meningocele, cloacal 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 with 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. One should ensure that the family members and the mother get 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. The studies have shown that any separation during these initial hours may have a significant adverse impact on various outcomes including successful breastfeeding in later stage of life.
CARE OF BABY BEYOND FEW HOURS AFTER BIRTH

**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.23,24

**Oil Massage:** The benefits of the oil application have been described for the low birth weight babies in both the developed and the developing countries28,29,30. However, a paucity of data still exists for the oil application and/or massage in the term babies.31 Oil massage is a low cost traditional practice that is well ingrained into the Indian 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 breastfeeds:** A proactive and a systematic approach should be followed to initiate, support and maintain breastfeeds. The various advantages of the breast feeds should be discussed with the mother to motivate her for breastfeeding. 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.32 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.

**Powder application:** Currently there is no evidence to suggest the regular use of any powder and the same should be avoided.

**Position of sleep:** No Indian study has addressed the issue of relation of sleep position to occurrence of SIDS. There is substantial evidence in the literature from the developed countries of an association of prone position and the SIDs independent of the other variables.33,34 However, the converse, viz a reduced incidence of SIDS with supine position has also not been investigated and reported. None of the studies were conducted in the hospital or the facility setting. Considering the above all the healthy term newborns should be preferably is made to sleep on their backs.

**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 strongly discouraged35.

**Timing of discharge in a Normal Newborn:** Whenever possible the baby should undergo an observation period of 48 to 72 hrs in the health facility (for establishment of breastfeeding and observation for any morbidity including jaundice). However, an early discharge within 24 to 48 hrs may be considered for the non-primigravida mothers who have a history of successful breastfeeding.

The following criteria should be met in all the babies prior to discharge planning:

---

*Three large cluster randomized trials from Nepal25, Bangladesh26 and Pakistan27 have shown an encouraging reduction in neonatal mortality rate after application of topical chlorhexadine to the umbilicus in the early days of life. Nepal (RR 0.66; 95% CI 0.46-0.95), Bangladesh (RR 0.80; 95% CI 0.65-0.98) and Pakistan (RR 0.62; 95% CI 0.45-0.85).*
The routine formal examination of the newborn has been performed and 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 a significant jaundice or any other illness requiring close observation by a health provider.

The newborn is breastfeeding adequately. The adequacy of feeds can be determined by:
  - Passage of urine 6 to 8 times every 24 hrs
  - Baby sleeping well for 2-3 hrs 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, particularly born to primigravida mothers should be called for follow up visit at 48 hrs of discharge if discharged before 48 hours. 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. All the advantages of the breast milk, short term and long term should be discussed with the mother to facilitate a success.

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. The danger signs should be documented and mother should be educated to recognize the same and report early when they are recognized:
   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 deg C or below 35.5 deg C

Table 1 provides research priorities in regard to normal newborn care.

The Young infant study published in Lancet 2008; 371;S135-147; evaluated 3177 children aged 0—6 days and 5712 infants aged 7—59 days for clinical signs and symptoms, and determined the specificity and sensitivity of each one in predicting a severe illness. The study reported that (a) history of difficulty feeding; (b), history of convulsions; (c), movement only when stimulated; (d) respiratory rate of 60 breaths per minute or more; (e) severe chest in drawing, temperature of 37.5°C or more or below 35.5°C, had the highest Sensitivity (85%) and specificity (75%) for severe illness.

Cochrane review by Brown S et al[40] looked at 7 studies (n=3435) looked at the early postnatal discharge from hospital for healthy mothers and term infants and the re-admission within 8 weeks. They found that the failure of breastfeeding was an important cause for the readmission. Hence, a review of cases discharged early at 2-3 days after discharge, may have a role in preventing readmission.
References


<table>
<thead>
<tr>
<th>Research question</th>
<th>Subjects</th>
<th>Study design</th>
<th>Intervention</th>
<th>Outcomes to be measured</th>
</tr>
</thead>
</table>
| 1. Effect of delayed cord clamping in term LBW babies (IUGR)                     | Term LBW (weight<10<sup>th</sup> centile) | RCT          | I: Delayed cord clamping (2 to 3 minutes) C: immediate cord clamping                                                 | • Short term: hematocrit, Hb, rates of polycythemia, serum bilirubin levels during neonatal period  
  • Fe status and clinical Anemia at 3 and 6 months  
  • Neurodevelopment at 18 to 24 months                                                                                                  |
| 2. Is footprint of baby a reliable method to ascertain the identity of a neonate  | Term normal neonates                     | Descriptive  | Nil                                                                                                                   | • Proportion of footprints reliable enough to determine the identity of neonate, when presented to experts. |
| 3. Reliability and cost effectiveness of use of the biometric system for the identification of the mother baby dyad | Term Normal neonates                     | RCT          | I: Use of biometric system O: conventional system e.g. footprint                                                    | • The cost involved and identity establishment by a expert by both the methods          |
| 4. What is the safest method for clamping the cord                                | Term normal neonates                     | RCT          | Subjects can be randomized to 3 methods of clamping e.g. (1) Commercial clamp (2) thread (3) rubber band              | • Rates of cord slippage, oozing of blood  
  • Need for re-clamping in the first 24 hrs Parental satisfaction and acceptability  
  • Cost                                                                                                                                  |
<p>| 5. Does providing the cap and socks compared to routine wrapping reduce the risk of hypothermia in a newly born baby? | Term Normal Neonates                     | RCT          | I: Use of Cap and Socks immediately after birth C: Use of the routine wrapping                                       | The incidence of episodes of hypothermia in the first 24 hrs temp monitoring            |
| 6. Epidemiology of vitamin K deficiency bleeding (both clinical and bio-chemical) in | Term normal neonates                     | Case series retrospective | Nil                                                                                                                   | Profile of disease                                                                       |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Term Normal Neonates</th>
<th>Method</th>
<th>Control (C)</th>
<th>Outcome Measures</th>
</tr>
</thead>
</table>
| 7. Evaluation of benefits of Vitamin K1 vs routinely used K3 in the doses used for prophylaxis (0.5 to 1 mg) | Term normal neonates | RCT          | I: Prophylaxis using Vitamin K1  
C: Prophylaxis using Vitamin K3 | Biochemical Levels of PIVKA, Clinical VKDD (Early & Late) |
| 8. Feasibility of the use of oral Vitamin K formulation for VKDD prophylaxis, as most babies are born in rural setting where the IM administration is not possible | Term normal neonates | RCT          | I: Prophylaxis using oral Vitamin K  
C: Prophylaxis using IM Vitamin K | Biochemical Levels of PIVKA, Clinical VKDD (Early & Late) |
| 9. What are reasons (Post discharge Morbidities) for readmission after discharge following birth hospitalization in the first month of life? | Term normal Neonate  | Cohort       | Nil         | Proportion of babies readmitted during the first month  
The disease profile / reasons for the admission of these neonates |
| 10. Postnatal age at readmission after discharge following birth hospitalization in the first month of life? | Term normal neonate | Cohort       | Nil         | The distribution of the admission characteristics of the neonates admitted in the first month of life (maximum admitted at different day of life) |
| 11. What should be optimum hospital stay of normal neonates? | Term neonates delivered by Normal and cesarean (Study both group separately) | RCT          | Different hospital stays such as:  
For normally delivered neonates: 24 hr vs 48 hr vs. 72 hr  
For cesarean babies: 48 hr vs 72 hr vs. 96 hr | • Breastfeeding rates  
• Readmissions rates  
• Hypothermia, jaundice rates  
• Maternal morbidities (need collaboration with ObGyn)  
• Maternal satisfaction |