

Neonatal Transport

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Introduction

Transporting sick neonates is not an easy task. Indeed, in cases of at-risk pregnancy, it is safer to transport the mother prior to delivery than to transfer the sick baby after birth (in-utero transport).

In developing countries the problem of transporting small and sick neonates is compounded by several practical constraints like:

- (i) Facilities are scarce and not easily available
- (ii) Families have poor resources
- (iii) Organized transport services are not available. At times the baby may have to be transported on foot or on bullock cart
- (iv) No health provider is available to accompany the baby
- (v) Facilities are not fully geared up to receive sick neonates
- (vi) Communication systems are non-existent or inefficient

Thus transporting neonates in developing countries is a formidable challenge.

In spite of the best planning, babies will develop serious problems during transport to a higher level of care. Care providers should, therefore, be ready and confident to handle this responsibility.

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Transport to Health Facility

Ideally transport of a newborn should be in an orderly manner i.e. a neonate who is found to be sick by a health worker at home visit should be referred to a PHC. If the facilities or expertise at the PHC are not adequate enough to manage this sick neonate, he should be referred to the FRU and thereafter to the Medical College. Sicker of the neonates require referral to an apex institution or a tertiary care centre. However, most sick babies directly reach the Medical Colleges or even the apex institutions, thus bypassing the PHCs & FRUs. This creates an imbalance, as a

consequence the higher institutions are overburdened and there is poor utilization of resources as well as the manpower at FRUs and district hospitals. It is thus important to promote and practice regionalization of care.

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Prepare well before transport

1. ***Assess***

Make careful assessment of the baby. Make sure that there is a genuine indication for referral.

2. ***Correct hypothermia***

If baby is in hypothermia (temperature $<36^{\circ}\text{C}$), normalize the temperature of the baby, as far as possible, before commencing the transportation. Continuing hypothermia during the period of travel will compromise many body systems.

3. ***Write a note***

Write a precise note for the providers at the referral facility providing details of the baby's condition, need for referral and treatment given to the baby.

4. ***Encourage mother to accompany***

Mother should accompany the baby for breast feeding and for providing supportive care to the baby on the way and in the hospital. In case she cannot accompany the baby immediately, she should be encouraged to reach the facility at the earliest.

5. ***Arrange a provider to accompany***

A doctor/nurse/health worker should accompany the baby, if feasible, to provide care to the baby en route and to facilitate care at the referral facility.

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Communication

Explain the condition, the prognosis and the reasons for referral of the baby to the family. Explain where to go and indicate whom to contact. Inform the referral facility beforehand, if possible. This allays the anxiety of

the parents and the other family members. Prior information to the referral facility helps to build the confidence and removes the fears of unknown, thus positively motivating the family for transport.

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Assess & Stabilize

It is of utmost importance that a neonate is stabilized before the transport is begun, as an unstable neonate is going to deteriorate on the way and may reach the referral facility in a moribund state defeating the very purpose. The neonate should be assessed for temperature maintenance, airway patency, breathing efforts, state of circulation, fluid and hydration status, medications to be administered and feeding that is to be provided. If, on assessment, any of the above parameters is found to be compromised, remedial action should be immediately taken.

- i). **Temperature** : Assess temperature by touch or by using a thermometer. If the baby is found to be in cold stress or hypothermia, the baby should be warmed either under a warmer or by providing KMC.
- ii). **Airway**: Assess the airway for patency by noting the position of the neck, any secretions in mouth/nose and whether chest movements is adequate. If the neonate has secretions or his position is not appropriate, he needs to be suctioned and placed in appropriate position with a shoulder roll.
- iii). **Breathing**: Assess the baby for breathing efforts; if not breathing adequately provide tactile stimulation or if need be provide ventilation using a bag and mask with 100% oxygen. If the neonate has respiratory distress, he may require oxygen supplementation using an oxygen hood.
- iv). **Circulation**: Assess the status of circulation by pulse volume and capillary refilling time. If the circulation is compromised i.e. CRT > 3 secs and/or peripheral pulses are poor with normal temperature, then a fluid bolus of 10ml/kg normal saline or Ringer lactate should be provided over 20-30 minutes. The status should be reassessed for need of further boluses.
- v). **Fluids**: If the neonate to be transported is sick and cannot be fed,

then the maintenance fluid based on birth weight, the day of life and presence or absence of abnormal losses needs to be calculated and started. (Refer to care of LBW for details on fluid requirement). Any neonate on IV therapy must be transported with a health care provider.

- Vi). **Medications:** Assess the need for antibiotics, anticonvulsants vitamin K, theophylline etc. and administer them in appropriate dosage and by the recommended route. Also remember to document the drugs administered to the baby on the referral note to avoid inadvertent repeat dosing and toxicity.
- vii). **Feeding:** Assess if the baby can be fed using paladaya or gavage or directly at the breast. If the neonate can be fed, he should be fed enterally.

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Who to accompany

As far as possible mother should accompany the baby. This serves to keep the baby warm on the way as well as helps in providing expressed breast milk. Ideally, a health provider should accompany the baby to take care of the untoward incidents that can occur on the way; this also helps to boost the confidence of the family.

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Care during transport

The accompanying person should be explained to ensure the following:

1. **Ensure warm feet**

- Whatever method of keeping the baby warm is employed, make sure that the baby's feet are warm to touch. Warm feet means that the baby is neither hypothermic nor in cold stress.
- If the baby passes urine or stool, wipe him promptly. He should not remain wet, otherwise he will lose heat.

2. **Ensure an open airway**

- Keep the neck of the baby in slight extension

- Do not cover the baby's mouth and nose
- Gently wipe the secretions from the nose and the mouth with a cotton or cloth covered finger.

3. Check breathing

Watch baby's breathing. If the baby stops breathing, provide tactile stimulation to the soles to restore it.

4. Provide feeds

- If baby is in a position to suck on the breast, he should be offered breast feeds. If he can take spoon feeding, expressed breast milk can be provided carefully.
- If the distance is long, a nasogastric catheter may be inserted and gavage feeding given. In that case, the amount of each feed should be specified. However, it is not easy to train the accompanying members in this modality and should be resorted to only if absolutely essential.

[NB: Intravenous fluid administration during transport is best avoided]

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Ensure warm transport

Use one of the following approaches to keep the baby warm during transportation:

1. Skin to skin care (Kangaroo Mother Care)

This is probably the most effective, safe and convenient method.

- Baby is naked except for a cap and a napkin
- Baby is placed facing the mother in skin to skin contact between breasts
- Baby's back is the covered by tying the blouse or with a fold of gown/'chunari'

[The skin to skin contact can also be provided by another woman or a man (father)].

2. Cover the baby

Cover the baby fully with clothes (or cotton) including the head and the limbs. Nurse the baby next to the mother or another adult during

transport.

3. *Improvised containers*

Different workers have suggested the use of thermocol box, basket, padded pouch, polythene covering etc. for ensuring temperature stability during transport. If familiar, you may use one of these innovative methods.

4. *Transport incubator*

This is the ideal mode of transport, but is rarely available.

[NB: The use of rubber hot water bottle is fraught with considerable danger due to accidental burns to the baby if the bottle is not wrapped properly or remains in contact with baby's body. It is therefore best avoided. But if no other means of providing warmth is available, this method may be employed, but with utmost caution. The accompanying members of the team should be explained special precautions].

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In the event of a health care provider not accompanying the transported neonate, it is in the best interest of the baby that there are no running intravenous fluids on the way, orogastric and nasogastric feeds are avoided and hot water bags are not used to provide warmth. All these practices may harm the neonate as these need supervision by a health care provider and hence are best avoided.

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Summary & Conclusion

Neonatal transport indeed is a formidable task, in fact a challenge for the family as well as the healthcare provider. A simple, timely, efficient approach without any panic is required. There is a need to educate the providers regarding the ideal neonatal transport. Finally one must not forget that the family plays a major role and must be a part of the decision making process right from the beginning.

Table: Summary of safe transport of neonates

I.	Prepare well before transport
1.	Communicate and write a note
2.	Assess & stabilize
3.	Correct hypothermia
4.	Encourage mother to accompany
5.	Arrange a provider to accompany
II.	Ensure warm transport
	Skin to skin care (Kangaroo mother care)
	or
	Cover the baby
	or
	Use improvised warm containers
	or
	Use transport incubator
III.	Provide other care during transportation
1.	Ensure warm feet
2.	Ensure an open airway
3.	Check breathing
4.	Provide feeds

Take the baby to the nearest referral facility, by the shortest route, safe mode using the fastest possible mode of transport (avoid too fast travel leading to jerks / bumps due to poor road which may harm the sick baby).