



GUIDELINE

SUBJECT: Positioning for the preterm or sick neonate in NICU

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PERSON RESPONSIBLE FOR MONITORING AND REVIEW:

Jennifer Ormsby CNC Newborn Services(Relieving)

COMMITTEE RESPONSIBLE FOR RATIFICATION AND REVIEW:

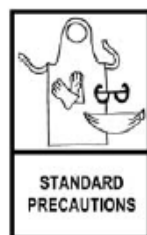
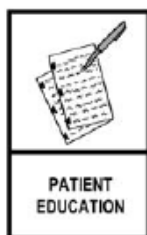
Management Executive Committee NICU

KEYWORDS: nesting, plagiocephaly, positioning, posture, preterm, wrapping

Disclaimer:

It should be noted that this document reflects what is currently regarded as a safe and appropriate approach to care. However, as in any clinical situation there may be factors that cannot be covered by a single set of guidelines, this document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. It does not replace the need for the application of clinical judgment to each individual presentation.

S.W.P.



Aims

The preterm or sick infant requires support to facilitate and maintain postures that enhance motor control and physiological functioning and reduce stress.

The developmental goals of positioning are:

- To provide flexion in the limbs and trunk and the facilitation of midline skills.
- To assist the infant in self-regulation and maximize infant stability.
- To preserve energy and promote growth.
- To promote CNS organization

Considerations for positioning

- Respiratory needs
 - The position should optimise the infant's ability to breathe independently.
 - Infants with increased respiratory demands may be more stable in prone. Evidence suggests prone position provides improved respiration and greater chest wall synchrony and improved gas exchange. The prone position is thought to help by stabilizing the chest wall and may also reduce extra movement which may compromise the respiratory system. The prone position may also reduce apnoeas in more mature infants with a history of regular apnoeic episodes.
 - Some infants may settle better in side lying where their limbs can be more flexed and limbs in a midline position. Being more settled may result in more stable respiratory status.
 - Ensure upper airway is not compromised.
 - Ensure ETT is patent and CPAP works efficiently.
- Posture
 - Preterm infants are hypotonic (floppy) less than 28 weeks then start to develop hypertonia (increased resistance) around 30 weeks. Flexor strength develops first in the lower limb then progressively in the upper limb. Extensor muscles are stronger than flexor muscles until they balance out around term corrected.
 - Muscle imbalance and hypotonia make it difficult for the preterm infant to bring itself into the midline position and self settle into a comfortable position.
 - The loss of a fluid environment and the impact of gravity further limit the preterm infant's movement. In supine it is very challenging for the preterm infant to reposition itself or bring its arms and legs into a flexed posture.
 - The loss of boundaries (uterine wall) to resist and strengthen against also limits the infant's movements. The use of high boundaries in nesting provides the baby containment and facilitates midline movements (e.g. hands to face).
 - The low tone and extra uterine environment can further influence muscle balance and can result in scapula retraction (pushed back) and hyperextension of the trunk and neck and abducted legs (turned out). This can impact on future gross motor development.
 - When positioning in prone and supine ensure the neck is not in extreme rotation.
 - Movements of preterm infants can be jerky and abrupt initially. The infant should be provided with some containment by nesting or wrapping to reduce stress and fatigue and maintain sleep. As preterm infants get closer to term their movements become smoother and more capable of bringing limbs into flexion and the amount of support required may be reduced.

- All positions should reduce the impact of gravity and support the infant with hands to midline and legs flexed. Side lying with nesting is the position that facilitates this best.
- Infant self-regulation
 - The preterm infant's ability to self settle gradually improves but may need to be facilitated. This can be facilitated by boundaries, positioning to minimize the effects of gravity (e.g. side lying), pacing of cares/interventions and containment holds.
 - Boundaries of nest need to be high enough to contain the legs and close enough that the baby can brace his feet against it.
 - Observation of each baby will assist in understanding how much support each baby needs, his own ability to self regulate and which position the baby is most settled in.
- Infant stress
 - Stress should be minimized by positioning the infant to maximize comfort and enable the infant to self soothe e.g. hands to midline, boundaries close enough for the infant to reach with feet.
- Energy conservation and Heat conservation:
 - The position that the baby settles best in will reduce energy consumption.
 - Prone position can also increase time asleep and decrease energy expenditure compared to supine.
 - The surface area is greatest in supine and therefore greater heat loss.
 - Use of nesting with high boundaries can also help reduce heat loss.
 - Nesting and ambient heating can be adjusted to achieve both comfort and warmth.
- Head shape
 - Preterm infants have very soft skulls and time spent too long in one position may result in narrowing of the head or asymmetry of head shape. It is important to vary the head position both when prone, side lying or supine. The use of gel pillows or water pillows may reduce the degree of flattening.
 - Education to parents about alternating the baby's head positioning when sleeping and the importance of regular tummy time (when awake) once home may prevent flattening of the head after discharge.
- Skin integrity
 - The preterm infant requires regular position changes to maintain skin integrity.
- SIDS
 - It is widely accepted that sleeping a baby on its back at home reduces the risk of sudden infant death syndrome.
 - While the infant is monitored and breathing and self-regulation is more important it is safe to sleep the infant on its side or stomach.
 - All infants who are not being monitored should sleep on their back in the nursery unless directed by a neonatologist. Education to parents about the needs of their baby and their progression of positions should be explained.

- Attachments and Lines
 - Care should be taken to ensure attachments and lines are appropriately positioned to ensure function and appropriately visible.

Consideration for different positions

Side lying

- Easy for baby to comfort self e.g. hand to mouth/face.
- Allows hands midline.
- Prevents retraction of shoulders and abduction of legs.
- Reduces heat loss and energy consumption.
- Boundaries to support this position are necessary.

Prone

- Supports breathing.
- Reduces heat loss and energy consumption.
- Need appropriate positioning to prevent postural problems e.g. boundaries to keep the legs tucked up and positioning of the arms forward with the hand near the face.
- Extreme head rotation can occur if not appropriately positioned.
- If an infant requires predominantly prone position to support respiration, repositioning for short periods to side lye may be indicated to allow a change of position.

Supine

- Increased heat loss and energy consumption.
- Difficult for the infant to move against gravity and get into a flexed (tucked up) position.
- More startle behaviours and motor disorganisation.
- Safest position for sleeping for babies who are off monitors and at home.
- Nesting or wrapping should support bringing the arms to the middle/face and minimise hip abduction (frog legged position).

Sitting

- Appropriate seating may be provided for infants close to or past term corrected who are:
 - having awake periods and ready for more stimulation
 - having significant reflux on request by a neonatologist
- Seating should be fitted by the physiotherapist or occupational therapist to ensure midline flexed posture and appropriate toleration.

Considerations for different infants

Positioning for a **monitored** preterm infant in incubator/open care

- Appropriate nesting to facilitate hands midline/to face, shoulders forward and hip and knee flexion. The nest should be within reach of the infant's feet so it may feel the boundary when moving their legs. The use of a "seatbelt" may further facilitate hands to midline or provide further containment to maximise comfort and minimise stress.
- Regular position change at cares.

- Infants who require prone position to optimise respiratory status may benefit from short periods in sidelying if tolerated.
- Alternate the head position to minimise preference and head moulding.

Positioning for **monitored** preterm infant in cot

- Some preterm infants may not be as stable in supine when first transferred from humidicrib to cot. These infants may benefit from positioning in sidelying with nesting and “seatbelt” or wrap to support in flexion and hands to midline.
- Slowly increasing time in supine as the infant tolerates.
- Parents should be educated that while the infant is still monitored it is safe to position in sidelying or prone.
- When in supine the infant should be wrapped with hands midline/near face and hips and knees flexed. The infant should be positioned at the bottom of the cot.
- The head position should be alternated side to side to avoid development of plagiocephaly. Any infant with head moulding or preference to one side should be referred to the NICU physiotherapist.

Positioning for the infant in a cot and **not monitored**.

- Any infant that is not monitored should be positioned supine, at the bottom of the cot. The infant should be wrapped with hands midline/near face and hips and knees flexed. The wrapping should not be so firm that it completely restricts the infant.
- The head position should be alternated side to side to avoid development of plagiocephaly. Any infant with head moulding or preference to one side should be referred to the NICU physiotherapist.
- Parents should be educated on safe sleeping as per SIDS guidelines.
- Some infants with congenital problems may require positioning in side lying or prone in order to maintain a clear upper airway. This will be recommended by a neonatologist or respiratory consultant.

Documentation

Document on the nursing flow chart what position the infant is in and the position of the head. This will ensure an alteration of head position to minimise head moulding and allow for monitoring of position changes.

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AUTHOR: Rosie Day Paediatric Physiotherapist

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APPENDIX 1: Nesting methods

There are a number of methods to make a nest to support the infant. The key features of a nest are:

- A boundary high enough at the bottom that the feet are contained **within** the nest.
- The boundary should be close enough so the infant can reach the end with his feet so he can brace against it.
- It should facilitate the hands to midline and minimize shoulder retraction.
- The baby should be visible and easily accessed for cares.

There are a few different methods demonstrated below as a guide.

Nesting method 1: Suitable for LBW infants and ELBW infants on CPAP or ventilated or no respiratory support.

1. Take baby blanket



2. Fold in half



3. Fold in 1 corner



4. Fold in other corner



5. Tape along join



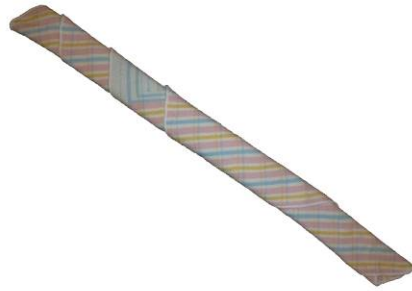
6. Take a second blanket and fold over from one corner



7. Continue folding



8.



9. Place both pieces together



10. Shape to provide height



11. Position infant so bottom of nest supports legs into flexion. Shape at front and back of the infant to provide support.



Nesting method 2: Suitable for infants on CPAP and in sidelying. Use to blankets for stronger, larger nests.

1. Fold blanket from one corner



2.



3. Leave the remaining corner free



4. Stand upright



5. Shape ends to form horseshoe shape



6. Adapt to the size of the infant



7. Position infant with legs flexed against the bottom of the nest and hands midline



8. The height of the nest should contain the infant's leg.



9. Position the infant to support legs into flexion and hands to midline.



Nesting method 3:

1. Fold blanket from one corner



2. Continue folding blanket



3. Continue folding blanket



4. Place folded blanket upright



5. Lay muslin wrap over blanket



6. Place infant in nest



7. Wrap infant with hands to midline



8. Tuck muslin excess under edge of blanket.



9. Alternatively if the infant need to be more visible fold muslin over blanket



Nesting method 4: Suitable for infants of CPAP and larger or term infants

1. Take a blanket



2. Fold in corner of blanket



3. Continue folding on diagonal



4. Continue folding



5. Place folded blanket at end of 2nd blanket



6. Make a couple of folds to join



7. Bring ends up to form a nest



8. Position the infant to support hands to midline and legs flexed



For larger babies

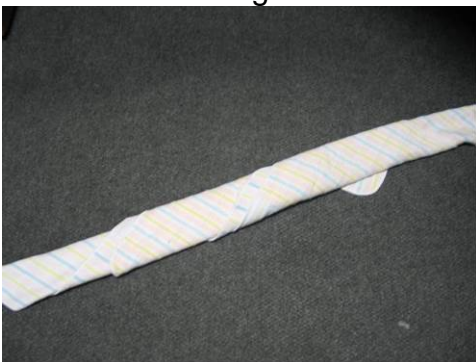
1. Use 2 blanket overlaid



2. Fold on the diagonal



3. Continue folding



4. Place on 2nd blanket



5. Fold over to join together and bring ends around to form nest



6. Position the infant to support hands to midline and legs flexed



APPENDIX 2: Wrapping

1. Fold over top edge of wrap



2. Bring hand to midline and bring wrap over shoulder and secure under opposite hip



3. Repeat for other arm



4. Open at bottom and flex knees and hips



5. Bring wrap up from bottom and fold back to ensure face is clear. Tuck in at sides.

