Guideline framework for SUPPORTIVE POSITIONING.

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<td>References. BLISS (2005) Handle me with Care. Supporting your premature baby’s development Bliss-the premature baby charity, London</td>
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<td>Foundation for the study of infant death, London</td>
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<td>Foundation for the study of infant deaths. <a href="http://www.fsid.org.uk">www.fsid.org.uk</a></td>
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1.0 Aim of Guideline Framework

- To ensure preterm and sick neonates receive individualised supportive positioning that optimises their musculo-skeletal development, supports their neuro-development and minimises complications.

2.0 Scope of Guideline Framework

The guideline applies to all neonatal units and maternity units covered by South Central Neonatal Networks. This includes the following hospitals:

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Implications of race, equality & other diversity duties for this document

This guideline must be implemented fairly and without prejudice whether on the grounds of race, gender, sexual orientation or religion.
3.0 Guideline Framework

3.1 Background Information

It has been identified that active muscle tone begins to develop at around 36 week’s gestation, when babies achieve a postural state known as physiological flexion. At this stage the baby is curled up in a confined space, in the womb, developing stronger muscles by pushing up against the walls during movement. If the baby were to be born at this time, they would be able to keep their bodies in a midline position, with flexed arms and legs. They would be able to use this position of stability to observe the world and begin to learn to move and explore. Therefore these final weeks in the womb, moving towards physiological flexion are essential to each baby’s future development.

Premature babies have low muscle tone (have not achieved physiological flexion) as they have missed out on some or all of the essential stages of muscle tone development in the womb. They have to work against gravity in order to move their limbs and research has shown that it is often difficult for them to maintain the positions that best provide and support rest, sleep and self comfort. Without appropriate intervention these babies can develop head flattening and cranial molding, which makes the babies appear less attractive to their parents, and may cause bonding problems. In extreme cases, the baby may develop an arched palate or myopia due to facial distortion, or may also experience difficulty turning and moving their heads due to the lengthened occiput. Babies who are near to term (34-37 weeks gestation) have not achieved ‘complete’ physiological flexion, so if cared for on the neonatal nursery they too will benefit from supportive positioning practices and follow up.

Without support, gravity tends to cause preterm babies shoulders and hips to flatten onto the bed, often called ‘frog leg position’ and ‘W arm position’. This excessive abduction and rotation of the hip and shoulder joints can result in poor or delayed development and mobility problems in the future, including the ability to crawl, stand, walk and fine motor skills such as hand-mouth co-ordination. Babies usually feel more secure and are more physiologically stable if they have boundaries (nesting) placed around them, as they are used to an enclosed womb. In addition they gain comfort from being able to grasp their hands together, suck their fingers or hold onto bedding. Often babies need assistance to find a position in which they are able to do these things.

It is recommended that a flexed, midline position is maintained without overextending the baby’s head and neck. Positioning aids should be used to provide gentle resistance for bracing but that do not restrict the baby’s movement altogether. Further information on how to carry out supportive positioning is included in the practice guidelines below.

There are advantages and disadvantages for each of the different positions a baby may be nursed in, so each baby should be individually assessed and positioned according to their individual condition, preferences and behavioural cues.
It is accepted practice to nurse babies in the neonatal unit so that the mattress surface is angled at 30 degrees and the baby’s head is elevated. Whether the baby is prone, supine or lateral this angle has been found to benefit pulmonary, cardiovascular and intestinal function. The physiological reasons for these advantages are not fully understood but it is presumed that elevating a baby’s head will reduce the pressure of the abdominal organs on the lungs, and lowering a baby’s stomach in relation to its oesophagus will harness the benefits of gravity to reduce reflux and increase gastric emptying.

3.2 Advantages and disadvantages of particular positions.

3.21 Prone position.

Advantages

✓ Particularly beneficial for babies with respiratory compromise as it improves oxygenation, ventilation (higher tidal volumes) and lung compliance. Believed to be due in part, from the mattress surface bracing the chest wall and compensating for weak muscles. Also the prone position inhibits other body movements that might disrupt breathing.

✓ Gastro-oesophageal reflux is reduced and gastric emptying is optimized. These may lead to an improved sleep state as the baby is more comfortable and consequently a decrease in energy expenditure.

✓ Heat loss is minimized and metabolic rate is reduced, babies tend to sleep more often and have lower levels of apnoea of prematurity.

✓ Hand to mouth behaviors’ are encouraged.

✓ Has been found in one study to reduce the distress levels of babies withdrawing from narcotics when compared to the supine position. Felt to be a prone quieting response.

Disadvantages

○ Gravity has the greatest effect as it pushes the limbs to the sides, shoulders become elevated (W arm position.)

○ The head is always to one side so bilateral head flattening and facial moulding are encouraged.

○ The hips are forced into abduction and rotation (frog leg position) as lower limb flexion and elevation under the pelvis cannot be well maintained.

○ The baby’s chest cannot be seen, so there is increased risk of delay in recognizing upper airway obstruction.
Not safe if umbilical lines are in situ as the insertion site cannot be closely monitored for oozing or bleeding or dislodgement of the lines. **It is possible for a baby to die from excessive blood loss caused by bleeding around umbilical lines or from umbilical vessels.**

The baby cannot be positioned midline (head, spine and neck in alignment), which is necessary for developing physiological flexion.

Without appropriate support the baby’s head and neck will be over rotated, causing marked discomfort and muscle imbalance.

### 3.22 Supine position.

#### Advantages

- It is easy to observe the baby and provide nursing care.
- If the baby is maintained in a supine, midline position then gravitational pressure is more evenly distributed, leading to a more rounded head shape.
- This position is recommended to reduce the risk if sudden infant death syndrome.

#### Disadvantages

- Increased energy expenditure and less effective ventilation lead to higher oxygen requirements.
- Head flattening will occur if the head is always to one side.
- If not supported correctly limbs will ‘flay’ out and this can result in poor muscle tone.
- Gastric emptying is delayed.
- Infants have the least control of their movements, having to fight gravity for all movements.

### 3.23 Lateral position.

#### Advantages:

- Minimizes hip and shoulder abduction and rotation and allows the baby to lie in a flexed position, closest to the foetal position maintained in the womb.
- Gravity tends to draw the arms and legs towards the midline.
- Beneficial for self comfort and fine motor skill development as the baby can easily hold its own hands and explore its face, body and surroundings.
✓ Baby's more frequently feel secure and able to self-regulate, meaning they are most likely to reach an awake-alert state, and then be able to interact with their carer/bond with parent.

✓ Right lateral position increases gastric emptying, as the stomach empties to the right and is aided by gravity.

✓ Left lateral position reduces gastric reflux, because the oesophagus attaches to the top of the stomach at an angle. Gravity will mean the stomach contents have to flow upwards, making reflux more difficult.

✓ There is evidence that preterm infants nursed laterally and with boundaries have lower mean pain scores.

Disadvantages
  o Head flattening is exacerbated as weight is always placed on the side of the face.
  o If the baby is muscle relaxed or unable to move independently their lower arm and leg could feel ‘squashed’ and/or receive pressure injuries if left in the same position for a prolonged period.

3.3 Practice Guidelines.
  • Aim to give the baby a balance of positions over the 24 hour period-alternating between prone, supine and lateral (left/right side.)

  • If the baby does not tolerate certain positions well, such as supine, then try to give them a short period (ie half an hour or as tolerated) in these positions, to give relief to joints and limbs, and try to acclimatize a baby to a new position.

  • Record the baby’s position, with the observations, on the baby’s chart. As well as stating the baby’s position include which side of the face is touching the mattress i.e. right, left (or midline) so that the next staff member can see how they have been positioned over the last 24 hours and position the baby accordingly.

  • If the baby’s bed is elevated then provide support to prevent them from sliding down the bed, this is especially important if the baby is receiving ventilation or CPAP, as moving down the bed will cause pulling on or dislodgement of the ET tube or CPAP prongs. To prevent this, a rolled up blanket (or similar) can be positioned in a U shape under the cot sheet. Do not put rolled up bedding between the baby's legs like a sling- or tuck one leg in and one leg out of a roll. This position is very unbalanced and unnatural for a baby, is likely to be uncomfortable and may cause muscular imbalance.
• Even the best fitting nappy can be too wide between the baby’s legs, stopping their legs lying parallel. Try squashing the section that lies between the baby’s legs to reduce its volume before putting the nappy on. Also, try the next sized nappy down which may fit better. This should be more comfortable for the baby and will help to prevent frog position of legs.

• Ensure the baby is not laying on any lines, wiring or tubing that will be uncomfortable and may cause pressure sores or indentations/ bruising on the baby’s skin. Be especially aware of gastric feeding tubes, that may press on a baby’s ear or transcutaneous monitoring attachment discs, that can be left on the baby skin and the baby accidentally laid onto them.

• Check babies pressure areas on repositioning to note any changes in skin integrity.
  o Any areas of marked or broken skin should be documented.
  o Action taken or planned to treat or prevent the damage should be recorded.
  o Note the time in one position that allowed damage to occur to the baby’s skin and ensure from now on that the baby is repositioned more frequently than this length of time.
  o See skin integrity guideline for further guidance.

• Ensure rolls/nests are appropriate size for baby. The baby should be positioned in a nest so that their feet are inside the nest, where they can use the nest walls as a boundary that gives them security. Avoid placing a baby so that the nest or positioning rolls are at bottom level, as their legs may then be flailing unsupported in the air.

• Consider clustering activities together to reduce the handling that a baby receives. However, some babies will not cope with a number of activities being performed close together, and will need time to recover between each event. Individualized assessment should take place, of the baby’s needs and preferences (see behavioural cues guideline for further advice.)

• All members of the multi-disciplinary team should remember to reposition a baby once they have completed the task, ie blood test, examination or nursing care. If a staff member is uncertain how to do this, they should inform the baby’s allocated nurse on that shift, who will do it for them and/or educate and support them to learn to do it themselves.

• Position changes should be slow and steady, so the baby is not distressed and also so that invasive and monitoring equipment is not dislodged. Whenever possible, a baby should be touched gently before changing their position, giving them warning that handling is about to occur.
- A baby should never be rapidly ‘flipped over’ 180 degrees – known in the literature as the ‘premie flip’.

- When turning a baby is necessary, try to use a palmer grip as opposed to fingertip pressure, reducing the risk of pressure damage to the fragile skin.

- Staff should ensure they are aware of how to use the variety of available positioning aids safely. As some items may cause harm if used incorrectly. Always refer to the manufacturers instructions, and do not use if any doubt exists. Some important principles include:

  - Gel pillows or mattress should be pre warmed before use so the baby does not get chilled. This can be done by placing the pillow in the baby’s incubator to warm before use or by holding the pillow under warm running water and massing gel to distribute heat throughout the pillow. Dry pillow outside before use.

  - Due to the risk (low but possible) of a baby obstructing their airway when laid on a gel pillow/ mattress- these babies should be nursed on a Pulse oximeter or apnoea monitor.

  - When a baby is receiving High Frequency Oscillatory Ventilation (HFOV) the effectiveness of the ventilation may be reduced if a baby is nursed on either a gel pillow/ mattress or a positioning bean bag. As the energy of the ‘wobble’ intended to ventilate the baby can instead be transmitted into the gel or beans. If the baby is not ventilating effectively on HFOV staff should consider removing these positioning aids.

  - The full weight of a positioning bean bag should NEVER be put onto the baby, as the weight may restrict the baby’s ventilation, especially in the extreme preterm infants.

- Staff should be aware of the varied surfaces babies are nursed on (incubator mattress, pressure relieving gel mattress, synthetic sheepskin, positioning supports) in particular the varying levels of firmness of these surfaces. Whilst no evidence based guidance currently exists for the ‘ideal’ surface to nurse a neonate on it is clear that surface firmness will have an effect on cranial moulding and tissues compromise.

- It seems wise to consider nursing the most vulnerable neonate on the softest more gently supportive surfaces available. For example babies less than 28 weeks gestation, babies with reduced mobility (critically ill, muscular conditions, muscles relaxed,) babies with skin integrity problems or with known surface : skin pressure ‘hot spots’, ie hydrocephalus/ abnormal limbs/ joints.
• It is considered best practice to refer babies to the physiotherapist who were born at less than 32 weeks gestation, because they are at significant risk of having motor delay or motor problems relating to prematurity. Also these problems can usually be treated with simply if caught early or even prevented. However, units without a dedicated physiotherapist will probably find that the physiotherapy service is unable to support routine referral and review of such babies.

• Babies with actual or potential postural problems should always be referred to the physiotherapist. For example babies with conditions known to affect movement, talipes or neuromuscular associated problems, tone problems or any mobility concerns, hydrocephalus causing an increase in head size.

• Babies who are being discharged home must be acclimatized to sleeping only in the supine position without positioning aids and with the head of the bed in the flat position. Support can be removed gradually, but **babies should ideally have one week before discharge sleeping as they will at home.** This helps to educate their parents and gives babies time to adapt whilst still in hospital to the safest way of sleeping at home.

• Actively involve parents in supportive positioning and explain the reasons for the importance of it. Offer written information on positioning to parents- for example a copy of the Bliss ‘Handle me with Care’ booklet.

• Educate parents on the differences in positioning between the neonatal unit and home. In particular after discharge; unless medically directed
  -No nesting or positioning roles to be used.
  -No soft layers between the baby and the mattress- eg sheepskin or fleece.
  -Mattress to be level, head NOT elevated.
  -Baby to be laid supine for sleeping
  -Emphasize cot death prevention guidelines of ‘foot to feet’,

• Staff who need help and support with positioning should:
  -discuss and ask for help from colleagues, the nurse in charge and the Clinical Educator
  -refer to the education folders (with appropriate articles) and resources such as the Bliss booklet on positioning.

• New research, knowledge and understanding of best practice for supportive positioning is always ongoing. Staff should make every effort to update their knowledge and skill base as new ideas and practices arrive. Possible ideas that may soon be reality include a ‘neonatal infant seat’ which supports a low birth weight infant to reduce positioning induced deformities and head flattening (USPatent 4631766). A ‘cocoon’ positioning support that reduces cranial deformities and enhances neurobehavioral development.
- This guideline framework relates to supportive positioning on the neonatal unit which is aimed at supporting musculoskeletal development and optimizing neuro-development. Positioning of the neonate is also important for many other reasons which are not covered in this guideline. For the topics listed below readers must seek full information else where;
  - Positioning during therapeutic cooling
  - Positioning for gastro oesophageal reflux.
  - Cot death guidelines.
  - Use of car seats and baby slings following discharge
  - Tummy time, bouncy chairs- and ongoing positioning needs of post term neonates.
  - Positioning for respiratory physiology.

Ensure that parents are appropriately advised on positioning their babies at home in accordance with the Department of Health’s ‘Back to Sleep’ guidelines. This should include recommendations for the infant to spend time prone when awake and supervised. ‘Back to sleep, Tummy to play.’ (Waitzman 2007)
3.4 Practical guidance on positioning the neonate

**PRONE:**

**Avoid:**
- over rotation of the head and neck
- legs in the frog position

![Figure 1: Babies below 34 weeks gestation lack physiological flexion and will 'flatten' to the bed surface if not appropriately supported.]

**Do:**
- put a roll under the hips
- nest/provide boundaries (rolls) to the feet and arms with rolls/nests
- alternate the head right and left in turn
- consider tucking the baby in with a sheet or blanket for extra security

![Figure 2: The simple insertion of a small soft roll at hip level (NOT below stomach) brings the knees into midline, and flexes the hip joints.]
Figure 3: A ‘surf board’ can also be used to support the baby in a prone position to flex its hips, and bring legs and arms closer to the midline. The ‘surfboard’ is made of a soft flattened roll, its width must not be wider than the baby’s shoulders or they will be forced out of alignment. The roll should start at hip level to support the body, but must not lie between the baby’s legs or the hips will be pushed outward unnaturally.

Figure 4: Once positioned prone the baby can be given boundaries and support in a variety of ways. For example, using rolled up bedding, positioning rolls or nests. Most babies will benefit from ‘tucking in’ with a cover or nest straps, as long as their movement is not restricted or prevented.
**LATERAL:**

**Avoid:**
- putting a roll behind the head as it can overextend the neck
- thick rolls between the legs pushing them apart

![Figure 5: Bedding should not be placed between the baby’s legs as it prevents the knees and hips coming together in midline flexion. If support is needed place a roll around the baby’s feet, and legs, or position the baby inside a nest. If the baby is being nursed on an angled surface and tends to slip down the bed then make the size of the boundary higher, providing a physical barrier for the baby to ‘rest on’.

**Do:**
- provide nests/boundaries for supporting a midline position and promoting fine motor skills
- alternate left and right lateral positions with position changes

![Figure 6: A variety of different methods for supporting a baby in the lateral position.](image)
SUPINE:

Avoid:
- rolls under the neck/head
- no positioning aids/splayed out position

Figure 7: The support provided for the baby is not effective, as the legs and feet have no boundaries for security and are instead left ‘floating’. Consequently the baby cannot develop its muscles by pushing against the bedding and is likely to feel vulnerable and exposed.

Do:
- provide nests/boundaries(rolls), especially for the feet
- support the arms - allowing for the arms/hands to be brought towards the face
- turn the head to left, right or midline alternately

Figure 8: In this picture a positioning roll has been wrapped around the baby and then a sheet placed over the top, with the feet tucked into the sheet to give security.
Figure 9: One technique for creating a nest from bedding. Such a nest may be used for positioning a baby prone, supine or laterally.

Figure 10: Three common mistakes when positioning the neonate. 1) Believing that use of a positioning aid means a baby if effectively positioned. 2) Rigidly restraining a baby into a position, rather than providing flexible boundaries and security. 3) Providing insufficient boundaries so that the baby is not supported to retain its position.