Supported positioning for the premature infant is a clinical concern of many therapists, nurses, and developmental pediatricians involved in the care of infants in the newborn special care unit (NBSCU). The global hypotonia normally observed in the infant born prematurely at 28 to 30 weeks' gestation enables gravity to have profound effects. Without the liquid milieu of the uterus, motility, which would be typical in utero, is difficult to achieve (Saint Anne Dargassies, 1979). Enhancing normal movement is a challenge to occupational and physical therapists who are experienced in the art of positioning as a treatment technique. Understanding tonal influences on posture and development is extremely helpful in enabling the therapist to assist the premature infant in experiencing flexion as would a full-term infant.

Positional disorders of postnatal origin are discussed by Desmond (1980). Prolonged immobilization on a firm surface, along with the continuing influence of gravity, results in a flattening of the body against that surface. The following nursery-acquired positional disorders may result:

1. A "frog-leg" position of the lower extremities, which includes wide hip abduction, external rotation, and ankle eversion. This position is disadvantageous for later weight bearing.

2. Shoulders that tend to retract and abduct with the upper extremities in lateral flexion (a "W" position). Persistence of this position reduces the ability to rotate the shoulders forward, allowing the hands to approach each other at midline. This movement precedes "hand regard" and "reaching to grasp."

3. Progressive head flattening, which is due to the weight of the large head resting laterally on the surface because of poor neck muscle tone. The significance of a misshapen head is more than cosmetic. The normal rotation of an elliptical head in the supine position is difficult as the infant matures and neck muscle tone improves.

4. Increased neck hyperextension and shoulder elevation (Anderson & Auster-Leibhaber, 1984), which may develop in infants with severe respiratory distress syndrome (RDS) who have experienced prolonged supine positioning on ventilators.

These malpositions may be reduced by frequently changing and supporting the resting infant in prone, supine, and sidelying positions. Providing the infant with the opportunity to feel movement in a variety of positions is optimal. Premature infants often demonstrate difficulty tolerating certain positions. The therapist then uses joint approximation, movement, and stabilization techniques to prepare the child to handle the position. The ability of the infant to rest in neutral flexion is desired in prone, supine,
and sidelying positions. The goals of positioning the premature infant are as follows:

- to stimulate active flexion of the trunk and limbs,
- to achieve more rounded heads and active head rotation,
- to encourage more balance between flexion and extension,
- to allow for more symmetrical postures,
- to enhance midline orientation which contributes to eye/hand/mouth control, and
- to facilitate smooth antigravity limb movement.

Along with achieving these goals, a frequent outcome of good positioning is enhanced comfort and reduced stress. “Ex-utero, the fetus is compelled to fight and adapt” (Saint Anne Dargassies, 1979, p. 45). Placement on soft surfaces in a neutral flexed position has been effective in quieting and comforting premature infants in the NBSCU at Good Samaritan Hospital. The use of positional aids has also been effective in achieving the positioning goals. The aids that have been used are lambskin, supine support pillows, Premie Comfort Pads, and water beds.

Supine Support Pillow

This pillow was designed by the therapists at Good Samaritan Hospital after infants who showed frequent irritability had been observed in extremely poor supine positioning.\(^1\) Two-inch foam hospital bed levelers are used to make these pillows. The foam is cut out in the middle, forming a nest for the infant's trunk and head. The foam is contoured to slope gently under the scapulae to assist the infant in flexing the upper extremities toward midline. The hips are supported in flexion, and the lower extremities channelled in slight abduction. The horseshoe-shaped head support allows for head rotation (see Figure 1). Infants demonstrate a dramatic difference in their movement patterns as they are assisted in confronting gravity when positioned on the pillow. The infant photographed (see Figure 2) demonstrates the classic difficulty of the premature infant in trying to achieve and sustain symmetrical flexion in a supine position. With support, the infant can move and relax into flexion (see Figure 3).

Vinyl material was used to cover the foam in the pillows. Disinfectant spray is used to clean the pillows. The pillows are encased in quilted slip covers while in use.

Lambskin

Flexion in prone and sidelying positions can be achieved on natural lambskin.\(^2\) The tactile stimulation

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\(^1\) For more information on these pillows, interested readers may contact the Ohio Medical Instruments Co., 315 W Liberty Street, Cincinnati, Ohio 45214

\(^2\) Such lambskin can be purchased from Babycare Lambskins, Baby Lamb Products, Inc., 31 Drakewood Lane, Novato, California 94947.
from the lambskin facilitates flexion, especially in the prone position. Placing water pillows made from sealed plastic bags under the lambskin helps to reduce the effects of gravity (see Figure 4).

In a sidelying position, support across the pelvis with a folded diaper can provide the key stabilization that helps the infant sustain flexion. A folded diaper between the infant's legs allows for neutral lower extremity positioning. The infant can easily achieve a hand-to-mouth pattern in this position. Additional proprioceptive input along the back, buttocks, head, or abdomen can be comforting and can quiet the infant. This can be achieved by positioning the infant against blankets or lambskin rolls next to the isolette walls or corners.

At times the infant may prefer the touch of lambskin over that of the supine pillow and he or she may be more content in a supine position on the lambskin. Rolled blankets can be used to support these infants in neutral flexion on the lambskin.

Premie Comfort Pads

These are pillows filled with polystyrene beads; they are like large bean bags. Infants can be positioned in a supine, sidelying, or prone position on this pad. It has a variable surface, however, and skill is required for optimal positioning. Presently, we find these pads most useful in positioning very small premature infants (weighing from 1,000 to 1,500 grams), especially those on ventilators. These very tiny infants must be positioned very carefully to prevent neck hyperflexion.

Laundering and cleaning techniques for all of these positional aids have been approved by the Infectious Disease Control Department of this hospital. The nurses have implemented the use of these aids into their daily routine, and therapists are finding them effective treatment aids. When the positional aids are used, careful attention must be paid to the infant's medical status and feeding schedule. Communication between the therapists and the medical staff is essential for effectively monitoring the infant's responses. Supine positioning primarily occurs approximately ½ hour before feedings. Neutral alignment, comfort, and proper timing appear to reduce the chances of aspiration. Aspiration at this facility has not been associated with supine positioning. Respiratory function is monitored closely when infants who are in the acute stages of RDS are put in the supine position. At times, these infants appear to tolerate prone positioning better than supine or sidelying positioning. Nursing regulates positioning in such cases.

Summary

This paper identifies positional disorders and tonal abnormalities that are associated with immobilization and the effects of gravity on the preterm infant. Intervention methods to reduce these abnormalities focus on assisting the infants in achieving movement into

Figure 3
Infant on Supine Support Pillow

Figure 4
Infant Flexed on Lambskin and Water Pillow

5 The Premie Comfort Pad (patent pending) can be obtained from Patient Comfort Products, 3745 Purdue Street, Dallas, Texas 75225.
neutral flexion in prone, supine, and sidelying positions. Specific positional aids are discussed that help reduce head flattening, enhance movement into flexion, and enhance comfort while the infants are in the NBSCU.

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References

