Throughout the day, we move about—standing, sitting and shifting position frequently. However, many people who require specialized seating remain in the same position for several hours at a time. As rehab professionals, we must consider how alternative positioning can contribute to our clients’ health and well-being.

This article will focus on the benefits and precautions of prone lying, supine lying, sidelying and standing for children of all ages, in both home and school settings. Many of these concepts can easily be applied to the adult population as well. The use of alternative positioning is not specific to any diagnosis; therapists should choose the most beneficial position based on the client’s reflex patterns, muscle tone and orthopedic status.

Providing alternative positioning on a regular basis can benefit a child in many ways, including:

- Improved coordination and posture. By preventing “abnormal” postures and movements from becoming repeated patterns, positioning changes can help minimize or prevent the development of skeletal deformities and poor motor control.
- Good skin condition. Providing a variety of therapeutic positions helps avoid immobility with prolonged pressure over bony prominences.
- Enhanced comfort and decreased fatigue. Therapeutic alternative positioning can increase tolerance for school participation.
- Health maintenance. Therapeutic positions other than sitting can help prevent problems with breathing, swallowing and digestion as well as provide relief from compression of internal organs as is common with severe scoliosis.
- Enhanced self-perception through a variety of experiences.
- Improved overall function.

Prone Lying

Prone position plays an important role in normal development as a precursor to rolling. In this position, the child learns to prop up on his or her elbows or weight bear through the hands while developing good head control. This may be done with or without a wedge. Although head control can also be strengthened in sitting, it tends to be easier in prone lying because fewer demands are placed on trunk control, allowing the child to concentrate more on the head.

This position promotes midline positioning of the upper extremities and elongation of the flexor muscles of the shoulders, trunk, hips (especially tight hip flexors), knees and spine. Balance, weight shift, reciprocal movements and shoulder mobility develop as the child reaches for toys. These principles apply to people with tight musculature and reduced motor control.

Therapists must be aware that this position may apply too much stress on the neck musculature; they should limit the child’s time in this position to avoid excessive fatiguing. In addition, children who have low muscle tone, increased flexor tone and extreme kyphosis or lordosis may find this position too difficult to maintain.

If the child is unable to demonstrate active extension, he or she...
may be pulled further into flexion and will not benefit from the prone position. Those with poor head control will be unable to see and may compensate by throwing their heads back between their shoulders, immobilizing their heads. This in turn will interfere with upper extremity weight bearing.

Inadequate co-contracture between deep back extensors and shoulder protractors will create similar results. A full extensor pattern throughout the spine and lower extremities should be avoided as this will interfere with coordinating body movements and play. Instead, the therapist should attempt to encourage extension through the cervical and thoracic spine. To encourage symmetry, he or she should be sure that the arms and legs are not bent or trapped under the body and that the legs are not crossed.

Also, respiration should always be monitored. Some children may have difficulty turning or lifting their head to clear the supporting surface or may find the position puts too much pressure on their chests.

When prescribing a wedge, consider the following measurements:

1. The wedge height. This will determine whether the weight bearing will be through the forearms or extended elbows or if weight bearing will occur at all.
2. The angle between the humerus and the trunk. Maximum weight bearing will occur when the front surface of the wedge is perpendicular to the floor. However, children with increased tone will have difficulty in separation of the humerus and scapula and may lever their trunks forward over the edge. In this case, the therapist may choose to use a smaller wedge or place straps over the shoulders to maintain trunk position.
3. The wedge length. This depends on the amount of support that is needed under the chest. If the wedge ends at or above the waist, passive extension will be encouraged. A child with lordotic posturing should have a wedge that extends below the hip at least to the knees.
4. The wedge placement. This will depend on the amount of head and shoulder control the child has. As the child’s control increases, the wedge can be brought further away from the axilla.

Supine Lying
This position promotes symmetry, is easily attained and is relatively safe. Muscle coordination of the pectoral, abdominal and hip flexor muscles can be developed as the child learns to work against gravity. In addition, balance is improved when the child moves from side to side.

Beware that this position encourages arching and asymmetry in children with increased extensor tone; however, a wedge may offer some relief. Children who have difficulty swallowing may not be able to control their saliva and are at risk for aspiration. Also, pure supine lying does not always offer the optimum position for functional play or visual stimulation, and again, a wedge may be helpful.

Sidelying
Sidelying promotes elongation of the weight-bearing side and shortening of the nonweight-bearing side. Muscle balance between extensor and flexor groups can be developed as the child shifts forward and back when reaching for a toy. This position is also helpful in decreasing tone in children with extensor hypertonicity by holding them in or her head against gravity. When positioning, the goal is to maintain the child’s head flexion or midline position, shoulder protraction and hands within his or her visual field.

In positioning, both hips and knees can be bent; however, it is more therapeutic to have the top hip and knee bent and the bottom hip and knee straight to encourage dissociation. This is important in developing pelvic mobility and normal spinal positioning.

It is recommended that the child spend equal time weight bearing on each side so that asymmetries are not encouraged and pressure on the weight-bearing hip and shoulder are evenly distributed. Pillows are generally adequate to position a child sidelying; however, for those with extreme extensor tone a firmer surface may be necessary.

Standing
The benefits of standing are numerous and somewhat controversial. They include improvements in cardiovascular performance and bowel and bladder function, and reduction of pressure sores and muscle contracture development.

It has been suggested that passive standing and weight bearing result in substantial decrease in bone loss, which helps prevent osteoporosis. However, a 1989 study found that children with cerebral palsy may lean into the straps and supports to compensate for muscle weakness, which decreases the amount of weight borne by the feet. All the children in this study rarely bore 100 percent of their body weight in any stander, and weight bearing in the supine stander did not differ statistically from prone and upright standing.

The psychological benefits of standing can be enormous. When standing, a child is better able to see other children face-to-face and interact with them and adults. In addition, the child has greater access to countertops, shelves, sinks and leisure activities. Mobile standers can offer independent mobility in a different position than a wheelchair. This increased social interaction and independence often improves the child’s self-image and self-esteem.

There are three types of standers: prone, supine and upright. In the prone standing position, a child is inclined forward with anterior support. This position is suitable for children who have good head control.
Consider the Alternatives

When prescribing a wedge, consider the following: (a) the height and (b) the length of the wedge, (c) the angle between the humerus and the trunk, and the placement of the wedge. Drawing reprinted with permission from Positioning for Function: Wheelchairs and Other Assistive Technologies, by Adrienne Falk Bergen, P.T., Jessica Presperin, O.T.R., and Travis Tallman, C.C.C.-S.L.P. Valhalla Rehabilitation Publications Ltd.

and need stimulation of the extensor muscles. It is a functional position for play or work, especially when used in conjunction with a tray. However, prone standers are often cumbersome and more difficult to transfer into due to the orientation of the frame.

In the supine standing position, the child is inclined backward with posterior support. These standers are often easier to use if the stander can be first put in the supine lying position, then elevated into standing.

Supine standing tends to be better for those with decreased head control.

In an upright stander, the child stands erect with minimal inclination forward or backward. Good, solid head and trunk control is an asset. Some rehab professionals believe that maximum weight bearing is achieved in this position.

Whichever type of stander is used, certain precautions must be made. Adequate foot positioning is imperative and may involve the use of orthotics. Improper alignment of the lower extremities will affect the trunk and head and may result in the development of compensatory posturing; however, limited range of motion often affects the ability to achieve proper alignment.

Initially, the therapist should limit the child’s time in the stander to allow him or her to become accustomed to weight bearing. The therapist should also monitor the child’s respiration and any cardiovascular effects caused by the increased demands on these systems.

When positioning children in standers, avoid having them lock their knees, stand on their toes or scissor their legs. Changes in leg length and tolerance for the device must also be assessed and accommodated for. For children who are unable to weight bear through their feet, the stander may be adapted into a kneeler.

FOOTNOTE

Mia Chin, B.Sc., O.T.(C), is a member of the Positioning Assessment Unit at Sunny Hill Health Centre for Children. This article was based on a presentation from the 1993 International Seating Symposium in Memphis, Tenn.