

## Sleep Positioning Equipment

Sleep positioning equipment is designed to address patient needs for safe sleep in an appropriate position. This equipment may be used in conjunction with an adaptive bed.

We change our body posture and position frequently throughout the day, depending on our level of comfort or the task we are performing. People with physical disabilities, and specifically those with severe motor impairment, may not be able to change their body posture or position independently. People who use wheelchairs often lack the ability to move in and out of a variety of postures while they sit, because of muscle weakness, muscle spasticity, paralysis, poor coordination or balance. As a result, they may sit in static, habitual, often asymmetrical postures which can negatively impact their health, comfort, and ability to function. Many wheelchair users need special supports in their seating system to help them maintain a more aligned posture and to provide the stability they lack in order to use their arms or head for function.

Proper positioning has long been recognized as an important consideration when evaluating and recommending seating systems for wheelchairs. However, clinicians are beginning to realize the importance of looking at a person's posture throughout their 24-hour day. 24 hour postural management is an approach which looks at all of the different positions and supportive equipment that a person with severe motor impairment assumes and uses throughout their 24 hour day, and tries to optimize postural alignment as much as possible in all environments, including nighttime. A 24-hour positioning evaluation examines how a person is positioned in their wheelchair, in bed and during alternative daytime positioning. A child with cerebral palsy may have a very appropriate seating system in a manual wheelchair which helps to maintain their spine and hip joints in neutral alignment. However, if that same child only spends 6 hours a day in their wheelchair, that leaves 18 more hours in other positions – oftentimes, destructive postures which place them at risk for orthopedic complications.

So, just what is Sleep Positioning? Sleep Positioning is the specific therapeutic positioning of a person's body during sleep. Sleep Positioning has three main goals:

- To improve the quality and duration of sleep
- To promote health and maintain safety during sleep
- To prevent or lessen the development of orthopedic deformities

**To improve the quality and duration of sleep.** Many individuals with physical disabilities have a difficult time sleeping, due to an inability to change their position, abnormal muscle tone and movement, discomfort or pain, or because of difficulties with breathing or swallowing. This leads to poor sleep quality and duration - essentially sleep deprivation - for both the disabled individual and their caregiver. *Restorative sleep is essential for people with physical disabilities* in order to help repair soft tissue trauma that may have occurred during the day (from abnormal postures and spasticity), to optimize immune system functioning, to promote normal growth in children and to maximize cognitive and physical performance during the daytime.

**To improve the quality and duration of sleep.** Some individuals with motor impairment also have significant health problems, and they require frequent attention during the night to keep them safe. For some individuals, basic physiological mechanisms such as breathing and swallowing are influenced by body posture and movement, as well as body position with respect to gravitational forces. Some individuals are even at risk of becoming entangled in bedcovers or pillows because of uncontrolled movement patterns, leading to possible asphyxia.

**To prevent or lessen the development of orthopedic deformities.** Additionally, many individuals with neuromuscular problems are at risk of developing pressure sores, loss of joint range of motion, and orthopedic deformities such as scoliosis and hip dislocation that may lead to costly surgical interventions. Many of these persons spend much of their day and night in destructive, asymmetrical postures which actually facilitate the development of orthopedic deformities and associated health complications.

The concept of therapeutic positioning during the daytime is widely accepted. Many types of wheelchairs, seating systems and other pieces of adaptive equipment are used in order to help individuals with motor impairment maintain symmetrical, stable postures during the day, both to help them function but also to help prevent orthopedic complications. However, these same individuals may be spending 8-12 hours a day in bed, lying in asymmetrical, destructive postures which can negate the benefits of good positioning during the daytime. Therapeutic positioning during sleep can be especially effective because the person is not performing tasks which may increase muscle tone and abnormal movement patterns. *Sleep Positioning can therefore be a vital component in the overall 24-hour postural management and care of individuals with severe motor impairment.*

In summary, the primary goal of Sleep Positioning is usually to help a person *maintain a stable, symmetrical, comfortable sleeping position throughout the night* in order to:

- Increase health and safety during sleep by maintaining positions which prevent aspiration, choking and/or positional apnea, for clients at risk, allowing for safe swallowing and optimal respiration throughout the night.
- Increase safety during sleep by preventing persons from becoming entangled in bed covers or pillows, for those at risk
- Help maintain joint range of motion and reduce the risk of developing orthopedic deformities by increasing the number of hours the person spends in symmetrical, therapeutic postures
- Decrease joint stiffness and pain which results from sleeping in asymmetrical postures
- Minimize pressure areas on the body during sleep in order to improve comfort and sleep duration, as well as to decrease the risk of pressure sores for persons at risk.
- Improve the duration and quality of sleep, in order to promote optimum body system functioning and health, and improved physical and cognitive performance during the day.

If young children who are at high risk for orthopedic deformities receive 24 hour postural management, long term orthopedic losses will be reduced over those of young children who only receive seating intervention in a wheelchair base.



Fig 1: This is how Ashley is positioned at night with pillows to fall asleep.



Fig 2: This is the destructive sleep posture she ends up in for most of the night, promoting a Right Convex C-curve scoliosis and windswept hip deformity

Fig 3 (opposite): Excellent alignment achieved using a sleep positioning system. Sleeping in this posture 9-10 hours/night may help prevent scoliosis and hip deformity

Ashley is now sleeping well in her new sleep positioning system, maintaining neutral joint alignment while also staying comfortable all night long.



