

# The JCM Moonlite Sleep System: Assisting in the provision of 24-hour postural support

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*Children and adults with mobility problems often suffer with contraction of unused muscles, which can consequently pose a risk to joint stability. Both contraction and joint instability can be extremely painful, leading to among other issues, poor quality of sleep. Although seating provision attempts to maintain appropriate posture during the day, suitable equipment provision must also be considered for the night. Sleep systems aim to provide appropriate support, promote postural symmetry and increase quality of sleep.*

*This article discusses the Moonlite Sleep System, manufactured by JCM. It describes the features and benefits of the system and summarises client feedback to date.*

*Key Words: posture, pressure relief, comfort, sleep system*

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Children and adults who have progressive neurological and neuromuscular disorders pose a challenge for clinicians when providing them with devices on order to maximise postural symmetry and prevent muscular contracture and joint deformity. Twenty-four-hour postural management is now an accepted treatment intervention of allied health professionals working within the field of neurodisability. Postural management is defined as:

**'the use of any technique to minimise postural abnormality and enhance function' (Farley et al, 2003).**

Therapists assess sitting, lying and standing postures to ensure an individual is able to adopt as symmetrical a posture as possible during prolonged periods of immobility while still being comfortable, able to function and maintain pressure redistribution techniques (Muscular Dystrophy Campaign, 2006). Balanced posture is dependent upon a number of factors, such as the ability of muscles to perform in a co-ordinated manner, and intact proprioception. Optimum posture allows us to perform many different activities throughout the day by changing from one balanced position to another. Many of these postures are changed easily, and some unconsciously, but no one posture can be maintained indefinitely, as skeletal muscle becomes fatigued (Collins and Shipperley, 1999).

## MAINTAINING SYMMETRICAL POSTURE – A 24-HOUR REQUIREMENT

### Use of wheelchairs

Until recently, a primary focus for promoting and maintaining optimum posture has been provision of suitable postural management in the wheelchair. Wheelchair seating systems are designed to support the body in a symmetrical postural alignment, discouraging the development of asymmetry. However, these goals are balanced with simultaneously attempting to promote function and independence and provide comfort for the user. However, sitting in a wheelchair for long periods of time can encourage contractures to develop, as it is difficult to maintain an upright sitting posture because of gravitational influences, possible muscle tone imbalance and energy limitations.

### Effects of poor positioning

Whatever the cause of poor positioning in the seated person - whether it be as a result of their physical condition or poor seating - it is important to highlight that if left unaddressed, this poor positioning will cause muscle shortening and soft tissue damage. The implications of this are first of all increased risk of pressure damage, as the client will not be able to change position, and secondly, fixed postural changes, which cannot be changed, other than by

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surgical intervention. Fixed postural changes will compromise internal organs such as the lungs and the digestive system, and also limit the client's functional ability. Another important factor with regard to poor seated posture is the effect on the spine. Wherever the pelvis tends to position itself, the head will move over it. As a consequence the normal curves of the spine will be lost, with resultant long term postural changes occurring, for example, scoliosis. Spasticity (contraction) in the muscles around the hip places abnormal forces on the joint. Over time, this can cause subluxation or dislocation of the hip joint, which can be extremely painful.

### Interventions to prevent postural problems

It is therefore essential that sitting in a wheelchair is interspersed with the provision of other interventions (e.g. passive stretching and exercises, and supported postures when lying) if muscle shortening is to be inhibited. Passive stretching aims to maintain joint range of movement and counteract the development of contracture, and to reduce muscle spasticity which may contribute to the development of contracture. Joints need regular movement to maintain their mobility. When a joint cannot be moved regularly through its full range of motion physiological changes occur in the surrounding muscles and other tissues causing them to shorten, which restricts mobility about the joint. This is a common complication affecting patients who are unable to maintain a full range of joint movement because they have a neurological condition associated with immobilisation, muscle weakness, flaccid or increased (spastic) muscle tone (NHS Quality Improvement Scotland, 2005).

Physiotherapy programmes use specific sets of exercises and activities to work towards two important goals: preventing weakening or deterioration

in the muscles that aren't being used (disuse atrophy), and keeping muscles from becoming fixed in a rigid, abnormal position (contracture). Individuals are encouraged to perform stretches every day at home or in school in order to prevent muscle shortening and contractures and a carer can be taught how to do them safely. However, this intervention has resource and time limitations.

### Positioning in bed

Over one third of any person's time is spent in bed. It is therefore recommended that for those people who are at risk of muscle contractures and joint deformities, a sleep system is used, in order to provide appropriate support during the night. A number of aspects should be considered when selecting a suitable sleep system and these are outlined below. Sleep systems should be used for the following reasons:

- To continue postural management through the night and help prevent any asymmetry in the body shape
- To facilitate appropriate positioning in supine, prone and side-lying positions
- To help position and protect vulnerable joints
- To keep users comfortable, improve sleep patterns and quality of life
- To help prevent pressure-related problems by supporting the body evenly.

It is also essential that any sleep system facilitates positioning change, thereby reducing the risks associated with manual handling and avoiding sleep disruption.

## THE MOONLITE SLEEP SYSTEM

The JCM Moonlight sleep system is equipment that provides postural support for clients in bed (*Figure 1*). The system is flexible, easy to use and offers the opportunity to follow through with postural work completed throughout waking hours; enabling 24-hour postural care to be possible. It has been designed primarily for three groups of people:

- People with a physical disability who cannot change their position during the night
- People who are at risk of becoming asymmetrical as a result of limited mobility
- People who use special seating during the day and sleep in an asymmetrical position.

### Features of the Moonlite Sleep System

The Moonlite can be used for supine, prone and side lying. The adjustability of the system, using lateral pads with a range of different sizes, allows for progressive alterations to be made to the individual's sleeping position, taking into account the changing needs throughout their life. The supports are flexible

*Figure 1. The Moonlight Sleep system demonstrating a position of postural support in bed.*





**Figure 2.** The knee abduction system is used to maintain alignment of the legs in a supine lying position; providing midline symmetry and preventing windsweeping by securely supporting the knees

enough to be moved and folded into a flat position to allow personal care to take place during the night, without having to dismantle the system. However, the flexibility of the supports does not compromise the degree and quality of postural support offered.

The system has three key features: a fold-flat support, a knee abduction system and a side lying leg support. The system is constructed from a light, easy to clean plastic sub frame that can be flexed to profile the shape required, supporting the client from head to toe. This means that the system can function on its own or with any profiling bed. The supports 'slide and lock' onto the frame, providing maximum side support and maintaining mid-line position. These supports are adjustable in angle and can be laid flat to make moving and handling the client in and out of bed easier without having to remove every bracket. On top of the Moonlite frame lies a padded cover, made from pressure relieving foam and gel pads, helping to keep the user's body temperature normal. This is then covered with a two-way stretch top sheet to make the system complete.

### Support in supine lying

In conventional supine lying, the user is at risk of developing tight hamstrings and therefore limited knee extension. The Moonlite knee abduction system is used to maintain alignment of the legs in a supine lying position by providing mid-line symmetry and preventing 'windsweeping' at the hips by securely supporting the knees (*Figure 2*). Hip and lateral supports ensure that the rest of the body remains in a mid-line position. The knee cup size is carefully adjusted in assessment to precisely fit the individual, providing maximum comfort and support. Independent adjustment of the knee cups ensures the correct degree of abduction or adduction as required. The abduction system can either be



**Figure 3.** For side lying there is an adjustable height and angle top leg support which slides into place with minimum effort as well as an extra high back support bracket

used in conjunction with the Moonlite Sleep System or as an accessory on its own.

### Support in side lying

In side lying, the shoulders and pelvis tend to rotate forwards or backwards, twisting the spine. It is also difficult to abduct the legs and maintain a good hip and pelvis position. When side lying in the Moonlite Sleep System, supports can be fitted on both sides of the user, to create a channel supporting the trunk (*Figure 3*). The leg support is designed to position and abduct the legs in side lying and because it is free standing on top of the system, it is easy to remove and replace when users need to be turned during the night. The top leg is fully supported which in turn maintains the position of the pelvis. This, in conjunction with the trunk support brackets, holds the body in a mid-line position and discourages rotation in the hips and trunk (*Figure 4*). The leg support is available in different sizes and adjustable in both height and angle. It therefore solves a complex problem with minimum fuss. For

**Figure 4.** Demonstration of the Moonlite Sleep System in side-lying.



more active users, the top of the support is slotted, so that soft straps can be added to the system to help guide the position of the leg.

### Usability of the Moonlite Sleep System

The Moonlite Sleep System is available in a range of sizes, to suit standard beds and cots. An assessment chart is provided to ensure correct choice of positioning. The bed and the pads themselves are labelled to ensure that carers can repeat the desired support each time the system is set up. This is especially beneficial when tailoring a programme for a child or when the system is used for a group of children. In those circumstances where the sleep system needs to be used in more than one environment, the Moonlite packs away in its own bag and is easy to transport.

### CLIENT FEEDBACK

JCM offer a trial service for the Moonlight Sleep System and has compiled feedback data on over 50 users to date. Common themes extrapolated from this feedback include reports of improved quality of sleep with less waking during the night, less requirement for repositioning during the night, pain reduction both during the night and the following morning, improved pressure relief, particularly over heels and the user. Many carers of people who

tried the system also reported them being more relaxed in the morning than usual.

### CONCLUSION

24 hour postural positioning is an essential aspect to postural management and as such the provision of a suitable sleep system is an important contributor to this. The Moonlite Sleep System is an extremely versatile system which provides optimum postural support and comfort during the night and which meets a variety of user and carer needs. The reported benefits of the system would strongly suggest that the Moonlite Sleep System is considered in all situations where postural management, support, pressure reduction and improved quality of sleep are identified goals. **IJTR**

*Conflict of interest: none*

- Collins F, Shipperley T (1999) Assessing the seated patient for the risk of pressure damage. *Journal of Wound Care* **18** (3): 123–6
- Farley R, Clark J, Davidson C, Evans G, MacLennan K, Michael S, Morrow M, Thorpe S (2003) What is the evidence for the effectiveness of postural management? *International Journal of Therapy and Rehabilitation* Vol. **10**: 449–455
- Wheelchair Provision for Children and Adults with Muscular Dystrophy and Other Neuromuscular Conditions (2006) Muscular Dystrophy Campaign
- Evidence Note 12 (2005) Manual passive stretching for adults unable to move their own joints. NHS Quality Improvement Scotland

### KEY POINTS

- Twenty-four hour postural management is now an accepted treatment intervention of allied health professionals working within the field of neurodisability.
- Development of muscular contractures and joint deformity is common in people with no or limited ability to walk.
- Provision of pressure relief is essential for people who lack the ability to reposition themselves independently.
- The Moonlite Sleep System can be used for supine, prone and side lying.
- The Moonlite Sleep System can be profiled without the requirement of a profiling bed.