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Wheelchair Positioning: Postural Care
Michelle L. Lange, OTR/L, ABDA, ATP/SMS

Learning Outcomes:

- The participant will be able to list 3 goals of postural care.
- The participant will be able to list 3 clinical indicators for positioning during sleep.
- The participant will be able to list 3 strategies to position a client during sleep.
What we are covering:

- The importance of positioning outside of the wheelchair seating system
- Goals of sleep positioning
- Sleep positioning interventions

The Importance of Positioning

- Many clients cannot change their body position independently.
  - Muscle weakness, abnormal tone, paralysis, poor coordination or balance.
- The client may sit in static, habitual, destructive postures.
- The wheelchair seating system provides support to maintain an optimal position and provides stability for function.
A 24 Hour Approach

- Clients, do not and should not, spend 24 hours a day in their wheelchair seating system.
- A Positioning Evaluation needs to explore all positions the client is in:
  - Alternative seating systems
  - Standers
  - Sidelyers
  - And Bed!

A 24 Hour Approach

- Many clients spend a great deal of their 24 hours in bed:
  - Sleeping at night
  - Napping during the day
  - Resting during the day
  - Cares – dressing, diaper changes, even feeding
A 24 Hour Approach

- An example:
  - A child with cerebral palsy receives a custom wheelchair seating system to maintain an optimal seated posture.
  - The child may only spend 6 hours a day in this configuration.
  - The other 18 hours a day are spent in other positions and in bed.

A 24 Hour Approach

- An example:
  - That same child may continue to demonstrate negative orthopedic changes.
  - As a result, the seating system may be deemed inadequate.
  - Those other 18 hours may be the actual problem…
    - If those hours are in destructive postures
Terminology

- 24 hour positioning explores all positions a client is in, day and night
- Sleep positioning or nighttime positioning looks at positioning in bed
- Postural care is another word used to describe either of the terms above, but is usually referring to sleep positioning

Case Study

- Brady
- Age 15
- Cerebral Palsy
- Custom molded seating system
- Tilt in space manual wheelchair
Case Study

- During a seating follow-up, we noted that Brady was developing a windswept tendency
  - One leg adducted and internally rotated
  - One leg abducted and externally rotated
- A common cause of windswept tendencies is sleep positioning
- So we put him to bed!

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Case Study

- Brady’s sleep position
- Many clients sleep on their back
- Sitting in a wheelchair for long periods of time leads to a loss of full hip and knee extension
- As a result, the legs either fall to one side (windswept) or to both sides (abducted posture)
Case Study

- Brady required support of his legs in hip and knee flexion to maintain a more aligned posture
- We used a VersaForm pillow for a temporary solution

Case Study (Look again…)
Case Study

- We needed to keep his heels off of the mattress.

Case Study

- The “troughs” for his legs needed to be narrow and deep to maintain neutral rotation.
- A more permanent foam version was eventually fabricated.
- VersaForm tends to lose shape and is very firm.
Case Study

- Changes were also required in the wheelchair
- Lateral and medial knee blocks to maintain neutral alignment

Continued

We were able to catch these changes early and intervene
- After several months, Brady had regained lost range in adduction/abduction and rotation and could easily be positioned in neutral
- He continues to use sleep positioning to maintain a neutral position and to accommodate remaining hip and knee flexion contractures
Questions?

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Goals of Sleep Positioning

- To improve the quality and duration of sleep
- To promote health and maintain safety during sleep
- To minimize, prevent or even reverse orthopedic changes
Many people with disabilities have difficulties with sleep:
- Inability to change position
- Abnormal muscle tone and movement
- Discomfort or pain
- Difficulties with breathing or swallowing
- Leading to sleep deprivation for the client and caregivers
  - Newborn example

Restorative sleep is essential for everyone:

For clients with physical disabilities, restorative sleep helps:
- Repair soft tissue trauma that occurs during the day
- Optimize immune system functioning
- Promote normal growth in children
- Maximize cognitive and physical performance during the day
Health and Safety

Many clients with motor impairments also have significant health issues:
• May require frequent attention at night to keep them safe

Breathing and swallowing are impacted by body position:
• Reflux and aspiration risk

Safety:
• Entanglement
• Entrapment

Orthopedic Losses

Many clients with neuromuscular issues are at risk of developing pressure injuries, losing range of motion and developing orthopedic issues:

These issues can be very costly:

Many of these issues can be addressed by positioning the client during sleep.
Orthopedic Losses

- Common orthopedic issues linked to sleep positioning
  - Scoliosis
    - Supine, spine curves to side

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Orthopedic Losses

- Common orthopedic issues linked to sleep positioning
  - Hip dislocation
    - Top leg during sidelying
Orthopedic Losses

- Common orthopedic issues linked to sleep positioning
  - Windswept tendency
    - Supine, legs fall to the side

Orthopedic Losses

- Common orthopedic issues linked to sleep positioning
  - Abduction
    - Supine, legs fall to either side
A research study showed that typical children make about 55 positional changes a night during sleep.
- And you know what their bed looks like in the morning!
- However, children with cerebral palsy made, on average, only 3 positional changes a night.
- And these changes were minor.

An example:
- Maria has cerebral palsy
- She has a fixed lateral spinal curve of 20 degrees
- She is well supported in her wheelchair seating system, but her curve keeps getting worse
- When first placed in bed, her curve is 20 degrees
- When her tone kicks in, her curve is pulled into 45 degrees!
  - And she remains in that position the rest of the night.
Orthopedic Losses

- Supporting a client in their wheelchair seating system can be challenging:
  - Gravity
  - The client is awake and active, impacting their posture

- Supporting a client during sleep can be much easier:
  - Less or no gravitational impact
  - Body is typically relaxed, less impact from tone and movement patterns

Questions?
Interventions

Many Sleep Positioning systems are made out of the country
Why?
  - Funding!

Interventions

Clinical Considerations:
- Symmetry – but significant force is not required or desired
- Comfort – after all, we are promoting sleep
- Stability – many clients are used to huge stability in their seat and then have none in bed
- SAFETY – avoiding risk of entanglement/entrapment
- Thermal – keep in mind thermal properties so the client is not too hot or too cold
Interventions

- Many families try pillows of all shapes and sizes
- For some clients, this can be a hazard
- Pillows are also not typically adequate to block movement

Interventions

- Sleep Positioning Systems
  - Commercially available, individualized, lying support systems that may contain one or more component parts and are held together by a base layer (Polak, 2009)
  - Using low tech items
Interventions

- Sleep Positioning Systems
  - Care Wave Lying & Positioning System
  - Chailey Lying Support
  - Dreama
  - Moonlite
  - Recumbant Sleep Orthosis (Aspen Seating)
  - Simple Stuff Works
  - Sleepform
  - Snooooooze
  - Symmetrisleep

What position is best?

- Optimal posture is supine with 30 degrees hip abduction and 30 degrees hip flexion (Blake et al., 2015)

- This will vary with the client, however

- Many clients also need the head of the bed elevated due to reflux or poor secretion management
Low Tech Options

- Time to get creative!
- Many specialized sleep positioning pillows out there, designed for the general population
- As you could see on the Sleep Systems, these often use a combination of supports to achieve the desired position

Questions?
Case Study

- Joshua
- Age 16 years
- Cerebral palsy
- He has a rapidly changing scoliosis secondary to hormone injections designed to speed puberty and stop growth

Case Study

- Joshua’s curve had increased from 20 to 40 degrees in 6 months
- He had never slept more than 2 hours at a time since birth
  - Which meant, neither did Mom!
- He would only tolerate sleeping in prone and choked when placed in supine
Case Study

- Joshua in typical sleeping position, no intervention
  - Lateral spinal curve
  - Hips flexed and rotated
  - Left leg flexed and tucked under right leg, externally rotated

Case Study

- Joshua began a sleep positioning program
- He used a custom made pillow under his trunk to raise him enough to give him more room at the shoulders and to turn his head
- Dad made plexiglass brackets to support him laterally
- This was placed on a non-slip base and then covered with a blanket
Case Study

- Joshua with first sleep system version
Case Study

- Initial sleep system from the side

Results
- Joshua now sleeps up to 6 hours at a time!
  - Mom is my new BFF!
- He is much more relaxed in the morning when he wakes up
- His curve has reduced from 40 to 20 degrees!
- He has had improvements in range of motion of the left hip
Questions?

What Does the Research Say?

- 2006 Consensus statement
  - Children in GMFCS Levels IV to V should begin Postural Management in lying as soon as possible after birth, in sitting from age 6 months and in standing from 12 months (Gericke, 2006).
  - These recommendations are based on prevention
  - Reality: when sleep positioning is provided, typically orthopedic losses have already occurred
What Does the Research Say?

- Sleep Positioning has been advocated for a long time (Bower, 2008)
- Much initial work was done by the Goldsmiths in the UK
- This is now common in the UK, much of Europe, and Australia
- This is not common in the USA, probably due to lack of research, education and funding

- Children using postural management experienced fewer hip problems (Pountney, 2009; Hill, 2009; Dawson, 2013)
- Numerous studies indicate that children using postural management had less incidence of hip subluxation, dislocation, and resulting surgeries
- However, this research is not strong and more is needed!
What Does the Research Say?

- Sleep problems in children with developmental disabilities are much more common and severe than in typical children (Keenan, 2007)
- We know that many of the clients we work with have difficulties sleeping
- One goal of sleep positioning is improved quality and duration of sleep

Research – Next Steps

- Further research is needed (Pountney, 2006)
- We need more research
- Research is challenging as this is not a homogeneous group and sleep positioning interventions will vary between individuals
- A good first step are individual case studies, like Joshua
Take Home Message:

- Sleep Positioning can:
  - Increase health and safety during sleep
  - Prevent entanglement or entrapment
  - Maintain joint range of motion
  - Minimize, prevent and even reverse orthopedic distortions
  - Improve comfort
  - Minimize pressure areas during sleep
  - Improve duration and quality of sleep

Resources

- Posture 24/7
  - https://posture24-7.org/
  - Tamara Kittelson-Aldred, OTR

References


References

Thank You!

Contact Information:

- MichelleLange1@outlook.com
- www.atilange.com