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Wheelchair Positioning: Postural Care

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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.

2

What we are covering:

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

3

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.

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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!

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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

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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.

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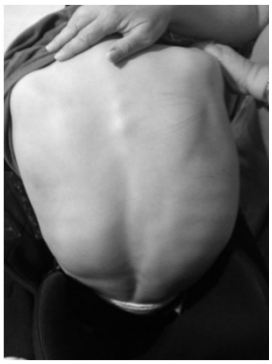
A 24 Hour Approach

- 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



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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

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Case Study

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

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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)

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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

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Case Study (Look again…)

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Case Study

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

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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.

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Case Study

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

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Case Study

- 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

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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

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CONTINUED

Quality and Duration of Sleep

- 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

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CONTINUED

Quality and Duration of Sleep

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

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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

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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

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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

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Orthopedic Losses

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

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Orthopedic Losses

- Common orthopedic issues linked to sleep positioning
  - Abduction
    - Supine, legs fall to either side

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CONTINUED

Orthopedic Losses

- 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

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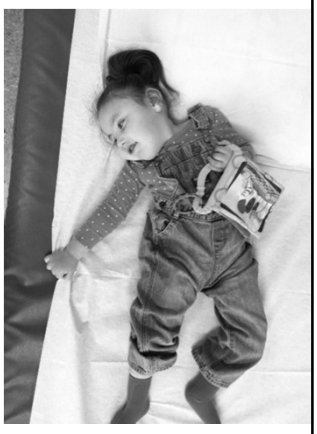
CONTINUED

Orthopedic Losses

- 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



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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

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Questions?

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Interventions

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

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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

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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

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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

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CONTINUED

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

Dreama

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CONTINUED

Interventions

- 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

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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

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Questions?

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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

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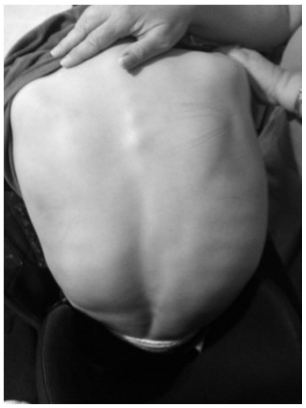
Case Study

- 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



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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

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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

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Case Study

- Joshua with first sleep system version

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Case Study

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Case Study

- Initial sleep system from the side

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Case Study

- 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

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CONTINUED

Questions?

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CONTINUED

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

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CONTINUED

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

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CONTINUED

What Does the Research Say?

- 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!

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CONTINUED

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

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CONTINUED

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

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CONTINUED

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

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Resources

- Posture 24/7
  - https://posture24-7.org/
  - Tamara Kittelson-Aldred, OTR
- Agustsson & Jonsdottir, Posture Management 24/7, In Seating and Wheeled Mobility – a clinical resource guide. Slack, 2018.

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Thank You!

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