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# Wheelchair Seating: Considerations For The Hands-dependent Sitter

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## Learning Outcomes

The participant will be able to:

1. Define a hands-dependent sitter.
2. List 3 goals when positioning a hands-dependent sitter.
3. List 3 clinical guidelines when positioning a hands-dependent sitter.

## What we will be covering:

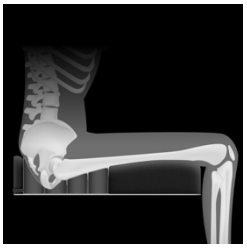
- What is a “hands-dependent sitter”?
- Clinical Guidelines
- Case Study

## SMS Series

- This is part of a series of webinars designed to prepare the participant for the Seating and Mobility Specialist examination
- And… develop more advanced seating and wheeled mobility skills

## Seating and Wheeled Mobility

- Every mobility base includes some form of seating
- Primary supports include seat, back, armrests, and footrests
- Seating interventions vary tremendously depending on the client age, diagnosis, prognosis, postural needs, pressure risks, etc.



## Postural Needs

- One way of looking at wheelchair seating is by postural support needs:
  - Hands-free sitter
  - Hands-dependent sitter
  - Prop sitter

## Hands-free Sitter

- The person is able to lift their hands off of the surface without changing the position of the trunk
  - Can also shift weight to the side and return to a midline position
  - Good trunk control

## Hands-Dependent Sitter

- This person uses one or both hands on a surface to maintain sitting balance
  - If hands are lifted, the trunk will collapse

## Prop Sitter

- This person cannot maintain sitting, even with the support of both arms
  - External support is required

## The Hands-dependent sitter

- Goals
  - Provide adequate proximal support for distal control
  - Optimize function
  - Prevent development of asymmetrical postures
  - Mitigate pressure issues

## The Hands-Dependent Sitter

- With hands lifted, the trunk will collapse.
- The client can typically sit hands-free with support provided posterior and lateral to the pelvis and posterior to the lumbar thoracic area.

## The Hands-dependent Sitter

- Clinical Guidelines – Assessment
  - Observation of seated posture
  - Mat Exam
    - Postural support requirements
    - Range of motion
    - Sitting balance
    - Muscle strength
    - Sensory status

## Assessment

- Observation of seated posture
  - No matter what level of postural support is needed, it is important to observe how the client is positioned in the current seating system
    - Note your findings

## Assessment

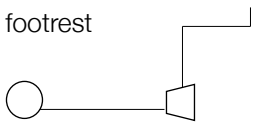
- Mat Examination
  - Sitting on edge of mat table
    - Without support of hands, the trunk will collapse
      - Collapse may be posterior (kyphosis and posterior pelvic tilt)
      - Collapse may be lateral (scoliosis with or without pelvic obliquity)

# Assessment

- Range of Motion
  - In supine on the mat table, it is very important to determine how much available hip flexion the client has.
    - This determines the seat to back angle
    - *See The Mat Assessment course

# Assessment

- Range of Motion
  - In supine on the mat table, it is very important to determine how much available hip flexion the client has.
  - Also, check hamstring range with the hip flexed at approximately 90 degrees.
    - Determines angle of knee / footrest hanger



# Assessment

- Sitting Balance
  - The hands-dependent sitter will lose sitting balance if the hands are not supporting the body
  - However… during the mat exam we determine how much support, where, and at what angles optimizes the trunk and head control / balance the client does have

# Assessment

- Muscle Strength
  - The client may have difficulty balancing muscle groups to maintain upright sitting without help
    - Co-contraction
    - Due to paralysis, weakness, abnormal muscle tone
  - We need to provide enough postural support that the client can maintain their supported posture over time and during functional activities.

## Assessment

- Sensory Status
  - The hands-dependent sitter is less likely to be able to perform an adequate weight shift.
  - Consider appropriate seating materials and weight shift strategies
  - Also, these clients may have atrophy and bony prominences
    - Increases pressure risk

## The Hands-dependent Sitter

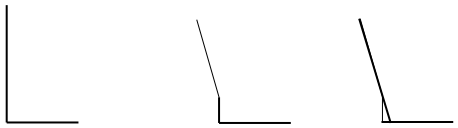
- Clinical Guidelines – Functional Activities
  - Provide adequate postural support for functional activities such as:
    - Self-propelling
    - Eating
    - Reaching

# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - To prevent collapse into a posterior pelvic tilt and kyphosis, significant support is required posterior to the pelvis and often laterally.
    - Cushions with significant posterior pelvic support
      or
    - Strong contact with back at the level of the pelvis

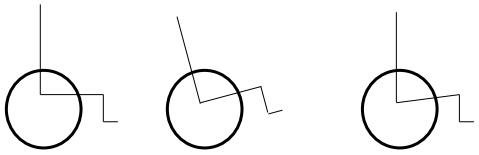
# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Angles are critical
    - Angle of pelvis to lower back
    - Angle of thigh to trunk
      - More open than pelvis to lower back to create and maintain lordotic curve



# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Frame tilt
    - Changing orientation in space or seat slope
    - Decreases negative impact of gravity and fatigue
    - A lower seat height in the rear (i.e. 1" lower) can increase sitting balance and stability
    - Not always necessary



# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Lateral Support
    - Determining the optimal amount of lateral thoracic support to optimize hands-free functioning without getting in the way

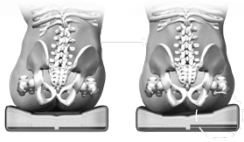
# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Pelvic Obliquity
    - Even with posterior and lateral support, the pelvis can collapse into obliquity
      - Particularly if bony asymmetries exist, i.e. partial ischial removal
        - Pressure issues

# The Hands-dependent Sitter

- Obliquity pad to 'fill in' this space

  or
- Off-loading cushion
  - Weight on trochanters



Spex Seating

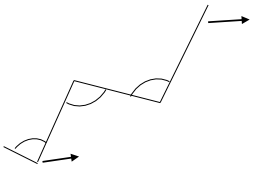
Ride Designs Custom AccuSoft Cushion

# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight hamstrings
    - May pull the pelvis into a posterior tilt

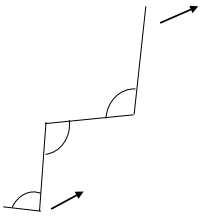
# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight Hamstrings
    - Close knee angle
      - May have to bevel front of seat



# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight Hamstrings
  - Open seat angle
    - Places client's body mass behind the center of gravity
      - Promotes instability and sliding
    - Can combine with slight anterior tilt (approximately 10 degrees) to compensate

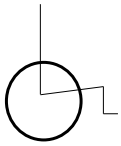


# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight hip flexors
    - Pulling the thighs downward pulls the pelvis into an anterior tilt

# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight hip flexors
  - Options
    - Wedge the forward portion of the seat so that the pelvis is in neutral
      - Watch the pressure on the ITs

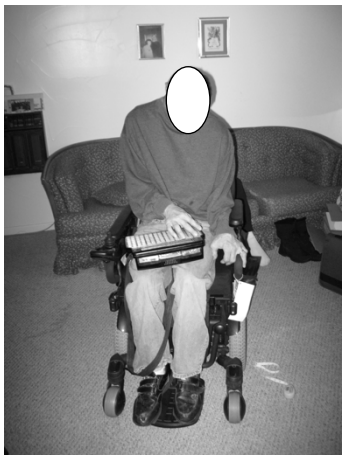


# The Hands-dependent Sitter

- Clinical Guidelines – Interventions
  - Tight hip flexors
  - Options
    - Allow the client to lean forward
      - Off-loads the ITs
      - Can use belly binder

## Seating Impacts Mobility

- Always check to see if changes made to seating for the hands-dependent sitter impact self-propulsion, weight shifts, and transfers
- Frame adjustments may be required, as a result



## Case Study

- Paul
- 6 years old
- Cerebral Palsy
- Twin, born at 28 weeks

## Case Study

- Paul – medical background
  - Overall hypertonia
  - Difficulty regulating body temperature
    - Gets cold easily
  - Continent – bowel and bladder
    - Accidents up to once daily
  - Verbal
  - G-tube
    - Meds and additional fluids

## Case Study

- Paul – surgeries
  - G-tube
  - Dorsal rhizotomy

# Case Study

- Paul – function
  - Gross Motor
    - Stand pivot transfer with assistance
    - W-sits
    - Bunny Hops

Public domain image

# Case Study

- Paul – equipment
  - Car seat
  - MWC – Zippie Zone
    - Can self-propel
  - Standard tandem stroller
  - Stander
  - Gait trainer
  - Bath seat
  - Adaptive seat (at school)
  - AFOs
  - Glasses

# Case Study

- Mat Exam findings
  - Range of motion well within limits required for a seated posture
  - Strong hip adduction and internal rotation
  - Tight hamstrings

# Case Study

- Paul - Posture
  - Mostly dependent upon external supports to maintain a seated posture
  - Can sit on edge of mat table using hands for short periods of time
  - He can let go momentarily without falling over.

# Case Study

- Paul – postural support needs
  - With significant contact at upper pelvis and lower back, he can maintain an upright posture.
    - Otherwise, he collapses into a posterior pelvic tilt.
  - With significant pelvic support, he can move his trunk back and forth without loss of position.
  - With significant pelvic and lower back support, he has:
    - improved trunk and head balance
    - decreased active extension
    - Increased function

# Case Study

- Recommendations:
  - Custom molded seating system
  - 3 year warranty for growth
  - Provided intimate contact at posterior pelvis and lower back where he required
  - Provided trunk support to minimize risk of spinal curvature development
  - Still allowed trunk movement for functional activities, including self-propulsion
    - Lightweight

## Case Study

- Results:
  - Decreased active extension
  - Reduced hip adduction and internal rotation
  - Sufficient posture support and stability for increased function

## References:


- Minkel, J. (2018). Seating and Mobility Evaluations for Persons With Long-Term Disabilities. In Seating and Wheeled Mobility, eds M. Lange & J. Minkel, Slack, Thorofare, NJ.
- Sutherland, S. (2018). Postural Support and Pressure Management Considerations for Hands-Dependent Sitters. In Seating and Wheeled Mobility, eds M. Lange & J. Minkel, Slack, Thorofare, NJ.

## Questions?

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## Thanks!

CONTINUED

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