

**PEDIATRIC SEATING:
IT'S MORE THAN JUST SMALLER EQUIPMENT**

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Pediatric Seating

Importance of Positioning

Pediatric Seating Considerations

How do I know if a child is positioned adequately in their mobility base?

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The Importance of Positioning

- We tend to position ourselves to fit the task at hand
 - Functional vs. resting
- Optimal postural support provides:
 - Stability
 - Alignment
 - Biomechanical advantage
 - Function
 - Improved sitting tolerance

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Pediatric Considerations

- What is difference in Pediatric vs. Adult seating?



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Pediatric Considerations

- Seating is dependent upon the mobility base



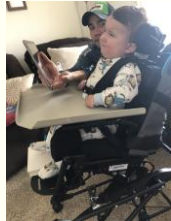
Jay ConfigureFit

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Pediatric Considerations

- Size
 - Very small through adult size
 - Children out of the NICU
 - Thru...
 - Teens who are as tall and heavy as the average adult




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Pediatric Considerations

- Available growth
 - In seating system
 - Before replacement is required
 - Typically 1-3 years
 - In mobility base
 - Before frame is grown
 - Before replacement is required
 - Typically 3-7 years




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Pediatric Considerations

- Flexibility to accommodate changes in medical condition
 - Progressive conditions
 - Most common: spinal muscular atrophy
 - Seating support needs and shape can change
 - Metabolic conditions can worsen, as well




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Pediatric Considerations

- Flexibility to accommodate changes in medical condition
 - Surgeries
 - Orthopedic:
 - Tendon releases - affects ROM
 - VDROs or other hip surgeries
 - Spinal fusion - change in shape and height
 - G-tubes
 - Sudden weight gain and, often, growth




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Pediatric Considerations

- Flexibility to accommodate changes in medical condition
 - Tone management
 - Oral medications
 - Baclofen pump
 - Dorsal Rhizotomy
 - Can change tone, ROM, strength and support required




Baclofen Pump

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Pediatric Considerations

- Flexibility to accommodate changes in medical condition
 - Orthopedic changes
 - spinal curvature development due to:
 - Sudden growth spurts
 - Muscle imbalance
 - Muscle weakness
 - Lack of weightbearing and muscle imbalances can lead to hip subluxation, dislocation



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Pediatric Considerations

- Flexibility to accommodate changes in environment
 - Home based use
 - Day care and Preschool
 - Elementary and beyond
 - Community needs

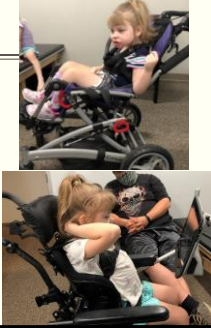


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Seating Varies With The Mobility Base

- Dependent mobility
 - Dependent mobility base (aka adaptive strollers)
 - Manual wheelchair
- Independent mobility
 - Manual wheelchair
 - Power wheelchair



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Pediatric Considerations Summary

- Pediatric Seating has unique challenges, primarily change:
 - Physical growth
 - Developmental changes
 - Medical changes
 - Environmental need
- Pediatric seating is very dependent upon the mobility base, as well

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Questions?

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How do I know if a child is positioned adequately in their current seating?



We will systematically review key points to check



This is a screening tool to determine if formal seating evaluation is required



If evaluation is required, refer to a qualified team if you do not perform these evaluations

Provide information from your screening

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Formal Evaluation

Formal Evaluation typically includes:

- A mat assessment in supine and sitting on the edge of a mat table
- Seating simulation
- Product trials
- Documentation



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Referrals

- First, someone must identify the need for seating evaluation and refer!
- Otherwise, a client will continue to use suboptimal positioning

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Poor Positioning

- Poor positioning impacts:
 - Range of motion
 - Orthopedic symmetry
 - Function
 - Including Access to Assistive Technology
 - Breathing
 - Swallow
 - Vision

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An Example

- Poor Positioning
 - Think how this impacts function, vision, breathing, and swallowing



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An Example

- Optimal positioning
 - Think of the change to function, vision, breathing, and swallow



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Checklist

- See your handout

How do I know if the student is positioned adequately in their mobility base?

Seating System
The checklist is designed to cover the student as determined by a 30-minute sitting evaluation in response. Please refer to the manual for complete directions on using handout or your own.

1. Pelvis is the pelvis in a neutral position within the seating system?
The student is seated at the pelvis in a neutral position within the seating system?
2. Pelvis is the pelvis in a neutral position within the seating system?
The student is seated at the pelvis in a neutral position within the seating system?
3. Head is the head upright and centered, balanced over the trunk, without head hyperextension?
Without subluxation, abduction, or rotation?
4. Lower extremities are the lower extremities aligned with the pelvis?
Without subluxation, abduction, or rotation?
5. Feet length with the feet in a neutral orientation, is the feet in the correct height?
The student who requires foot support or who use anterior trunk supports, this is in a just above the shoulder.
6. Seat depth with the pelvis in a neutral orientation, is there approximately one inch between the heel of the heel and the back of the seat?
If there is more than one inch, the seat depth is too short.
If the heel of the heel is touching the back of the seat or not touching the pelvis to be placed in a neutral tilt, the seat depth is too long.
7. Lower leg length with the pelvis in a neutral orientation, is the distance between the top of the foot and the knee correct?
If the knee height is inappropriate, the distance may be too short.
If the knee height is inappropriate, the distance may be too long.


If you marked "No" for any of these items, further assessment is indicated.

Webb's, Lange, 2011, 2012, 2013, 2017. www.stlouis.com. WebbsLange@stlouis.com

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Let's start!

- Look at the client how they typically sit in their seating system on the mobility base



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The Pelvis

- We start with the pelvis as the rest of the body's posture depends on the position of the pelvis

1. Is the pelvis in a neutral position within the seating system?
 - Neutral tilt
 - Neutral obliquity
 - Neutral rotation
 - Find those ASISs

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Fixed vs. Flexible

- If an asymmetry is flexible (reducible), we reduce this to a neutral position
- If an asymmetry is fixed (non-reducible), we reduce this as much as possible and accommodate the residual asymmetry
- Screening goal:
 - Ensure that what is flexible is reduced as much as possible
 - Without excessive pressures or discomfort
 - Clients with fixed orthopedic asymmetries should have routine formal seating evaluations



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Pelvic Tilt

- Posterior Pelvic Tilt
 - Leads to trunk kyphosis
- Anterior Pelvic Tilt
 - Leads to trunk lordosis



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Tip Time!

- Determining Pelvic Posterior Tilt
- Lean the client forward in their seat.
 - See daylight?
 - Pull the client back to correct



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Pelvic Obliquity

- One side of the pelvis is higher than the other
- Often seen in conjunction with a lateral scoliosis

Here, seen with posterior pelvic tilt



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Pelvic Rotation

- One ASIS is forward of the other
- May look like a leg length discrepancy



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Pelvis

2. If the pelvis is not in a neutral position, can you correct the pelvis and is the corrected position maintained over time in the current seating system?

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Pelvis



Neck hyperextended
Kyphosis
Posterior Pelvic tilt
Knees too far forward

Improved posture, but this was not sustained
Persistent, though reduced posterior pelvic tilt and kyphosis



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Trunk

3. Is the trunk upright and midline?

- In multiple planes:
 - Sagittal plane – is the client leaning laterally to the side?
 - Frontal plane – is the client demonstrating kyphosis or lordosis?
 - Transverse plane – is the spine rotated?
- An upright trunk is critical for head balance



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Trunk

- Lateral asymmetry
 - One shoulder is often higher than the other
 - Check the pelvis for obliquity



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Trunk

- Kyphosis or trunk flexion
 - Often seen in conjunction with posterior pelvic tilt
 - Vertebrae may be prominent
 - Clients who were never ambulatory may not have a natural lumbar curve



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Trunk

- Lordosis or trunk extension
 - Often seen in conjunction with anterior pelvic tilt
 - Typically, hyperextension at the lumbar area
 - Can be seen with a kyphosis, as well



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Seat to Back angle


- This is a critical measurement and can impact the position of the pelvis and the trunk
- This is typically determined at the Mat Assessment during a seating evaluation



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Head

- An upright head is critical for vision, breathing, and swallowing
- Head position is very dependent upon the position of the pelvis and trunk
 - Lordosis leads to a hyperextended neck
 - Kyphosis leads to a forward head position




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Head

4. Is the head upright and midline, balanced over the trunk, without neck hyperextension?

- Sagittal plane – is there lateral flexion?
- Frontal plane – is the head forward or the neck hyperextended?
- Transverse plane – is the neck rotated?




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Head

- Lateral Flexion
 - May be seen in conjunction with lateral trunk lean




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Head

- Head forward
 - Often seen with trunk kyphosis




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Head

- Neck hyperextension




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Head

- Neck rotation
 - May be seen in conjunction with spinal rotation



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Lower Extremities

5. Are the Lower Extremities aligned with the pelvis?

- No adduction
- No abduction
- No internal rotation
- No external rotation

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Lower Extremities

▪ Adduction

- Adduction and internal rotation are often seen as components of extension




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Lower Extremities

▪ Abduction




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Lower Extremities

- Internal rotation



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Lower Extremities

- External rotation




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Lower Extremities

- Windswept tendency
 - One leg adducted and internally rotated
 - One leg abducted and externally rotated
 - If this is 'corrected', the pelvis will be pulled into rotation



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Seating Dimensions

- The dimensions of the seating system may not fit your client correctly, impacting their posture. The client may have outgrown the seat. How do you know?
- Key measurements include:
 - Back height
 - Seat depth
 - Lower leg length

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Seating Dimensions

6. Back Height: with the pelvis in a neutral orientation, is the back at the correct height?



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Back Height

- If the client is in a posterior pelvic tilt, they have slid down and forward and the back height may appear too high
- Back height is determined during the seating evaluation and is based on the amount of support required
- Self-propulsion: usually placed under the scapulae



Jay backs
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Back Height

- If the client uses anterior trunk supports, the height of the back should be at or just above the level of the shoulders
 - Otherwise, the support pulls down the shoulders



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Seating Dimensions

7. Seat depth: with the pelvis in a neutral orientation, is there approximately 1" between the end of the cushion and the back of the knee?



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Seat Depth

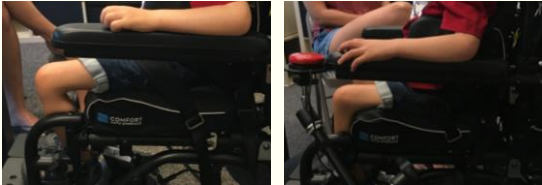
- If there is more than 1", the seat depth is too short
- If the back of the knee or calf is contacting the front of the seat, the seat depth is too long
- If you are trying to pull the client into a neutral tilt and the front of the seat is blocking you, the seat depth is too long

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Seat Depth

- Seat depth looks too long, but the client was in posterior pelvic tilt



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Seating Dimensions

8. Lower leg length: with the pelvis in a neutral orientation, is the distance between the top of the seat and the footplate correct?



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Lower Leg length

- If the distal thighs are unweighted, the distance may be too short.
 - Too much pressure is now under the pelvis
 - The footplates need to be lowered



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Lower Leg length

- If the feet are not making full contact with the footplates, the distance may be too long, and the footplates may need to be raised



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Lower Leg Angle

- Another important seating angle is upper to lower leg
- This is determined at the seating evaluation
- This is often determined by hamstring length
- Tighter angles may result in front caster interference with the footplates



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Summary

- It is critical to determine if a client is positioned adequately or requires intervention
- Optimal position is key to limiting loss of range and orthopedic changes, facilitating function and access to Assistive Technology, and optimizes vision, breathing, and swallowing
- Someone needs to identify the need ... YOU!

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Next Steps:

- Take a look at the clients you work with
- Ask caregivers to bring the seating system and mobility base to your setting so you can check it out
- Use the checklist to determine if a formal seating evaluation is required
- Find out who performs these evaluations in your area
- Collaborate!

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Thanks!

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