

AT 101:

HOW DO I KNOW IF THE STUDENT IS POSITIONED ADEQUATELY IN THEIR MOBILITY BASE?

Michelle L. Lange, OTR/L, ABDA, ATP/SMS



Positioning Series

- **AT 101: How do I know if the student is positioned adequately in their mobility base?**
- AT 102: How do I provide alternative positioning in the classroom?
- AT 103: How do I address poor head control in the seating system?

What we will be covering today:

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

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



Referrals

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

Poor Positioning

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

An Example

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



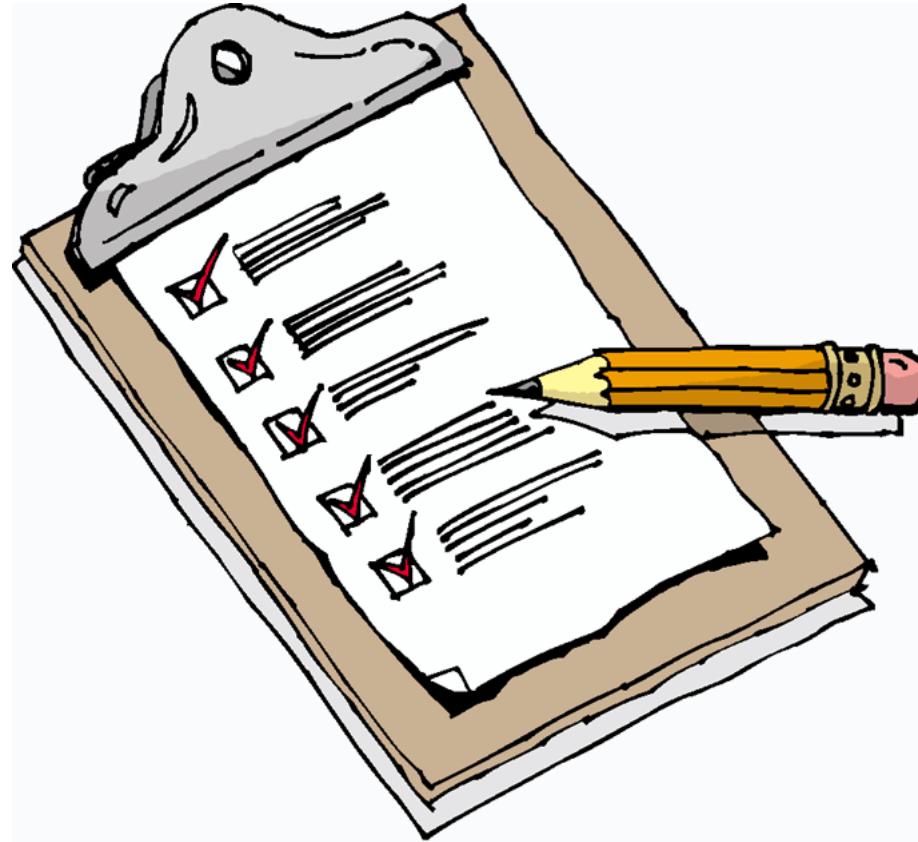
An Example

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



Checklist

- See your handout



Let's start!

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

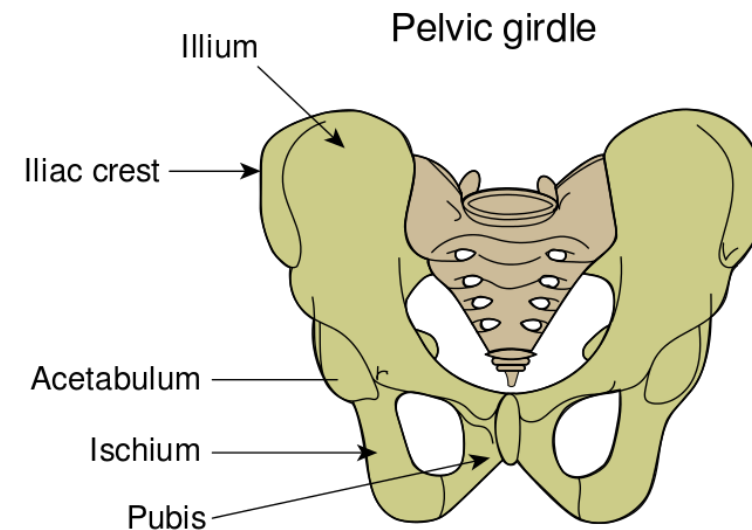


The Pelvis

- 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



Fixed vs. Flexible

- If an asymmetry is flexible, we reduce this to a neutral position
- If an asymmetry is fixed, 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

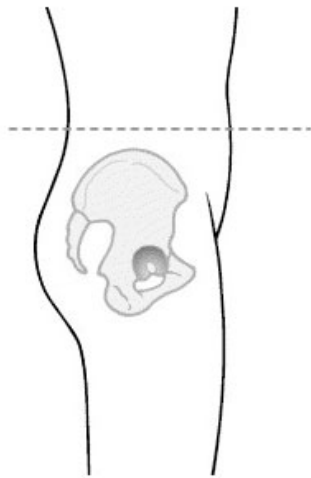


Pelvic Tilt

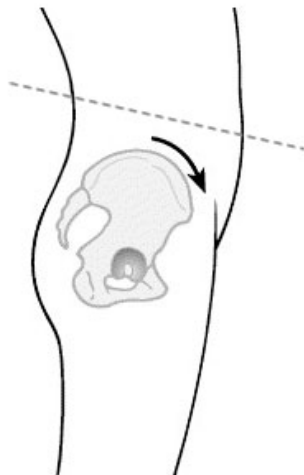
- Posterior Pelvic Tilt
 - Leads to trunk kyphosis
- Anterior Pelvic Tilt
 - Leads to trunk lordosis



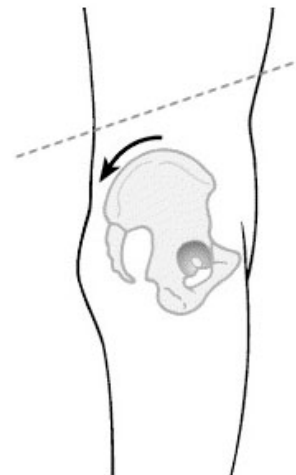
Neutral Pelvis



Anterior Pelvic Tilt



Posterior Pelvic Tilt



Tip Time!

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



Pelvic Obliquity

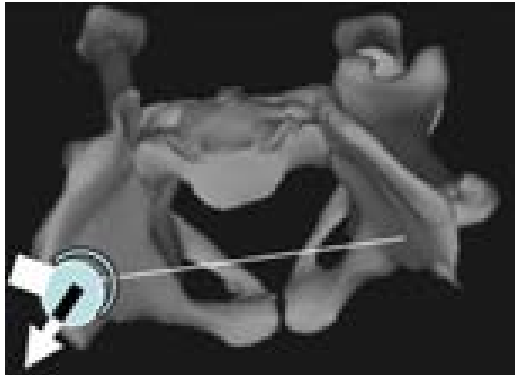
- One side of the pelvis is higher than the other
- Often seen in conjunction with a lateral scoliosis

Here, seen with
posterior pelvic tilt



Pelvic Rotation

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



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?

Neck
hyperextended

Kyphosis

Posterior Pelvic
tilt

Knees too far
forward



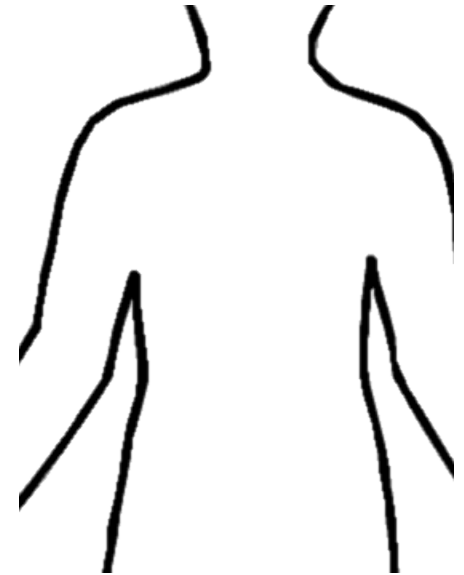
Improved
posture, but
this was not
sustained

Persistent,
though
reduced
posterior
pelvic tilt
and
kyphosis

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



Trunk

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



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



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



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



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



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?

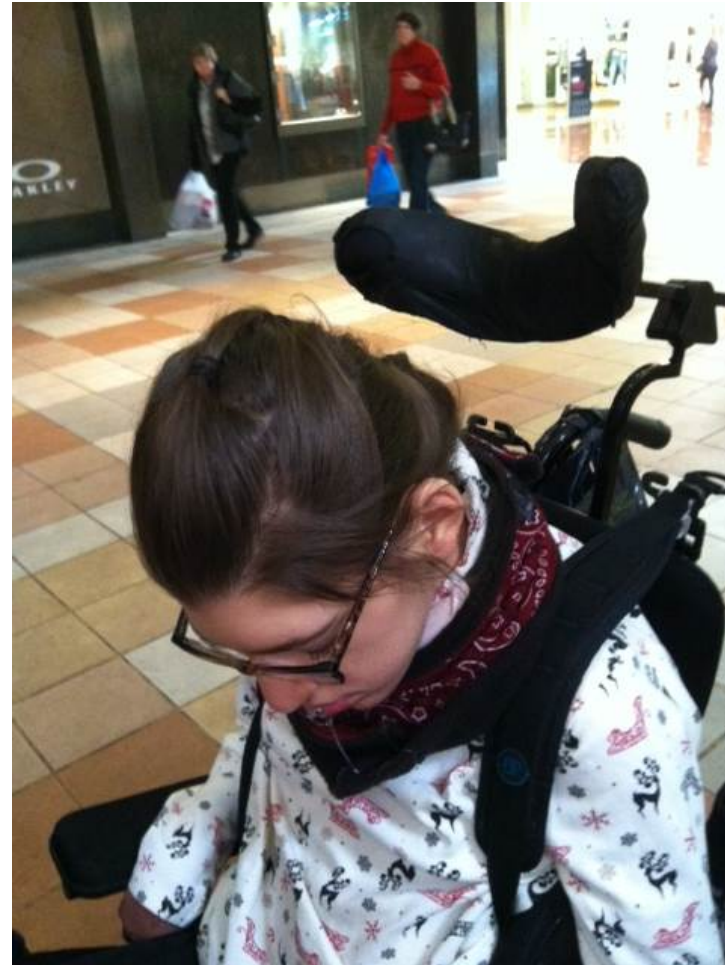
Head

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



Head

- Head forward
 - Often seen with trunk kyphosis



Head

- Neck hyperextension



Head

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

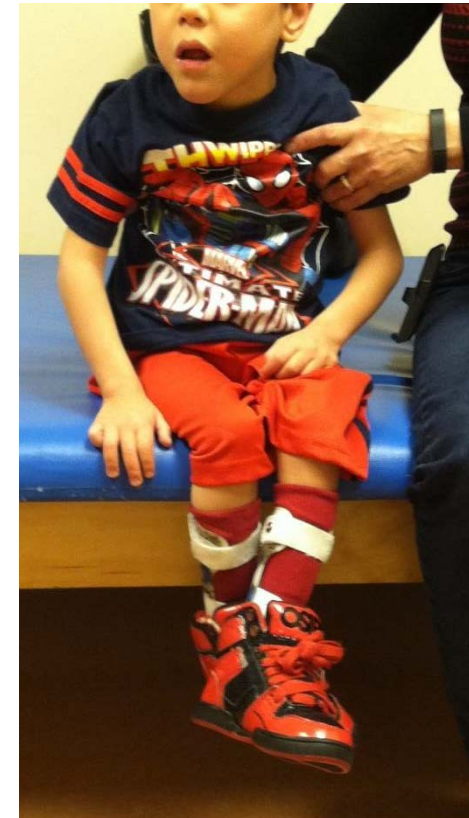


Lower Extremities

- Are the Lower Extremities aligned with the pelvis?
 - No adduction
 - No abduction
 - No internal rotation
 - No external rotation

Lower Extremities

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



Lower Extremities

- Abduction



Lower Extremities

- Internal rotation



Lower Extremities

- External rotation



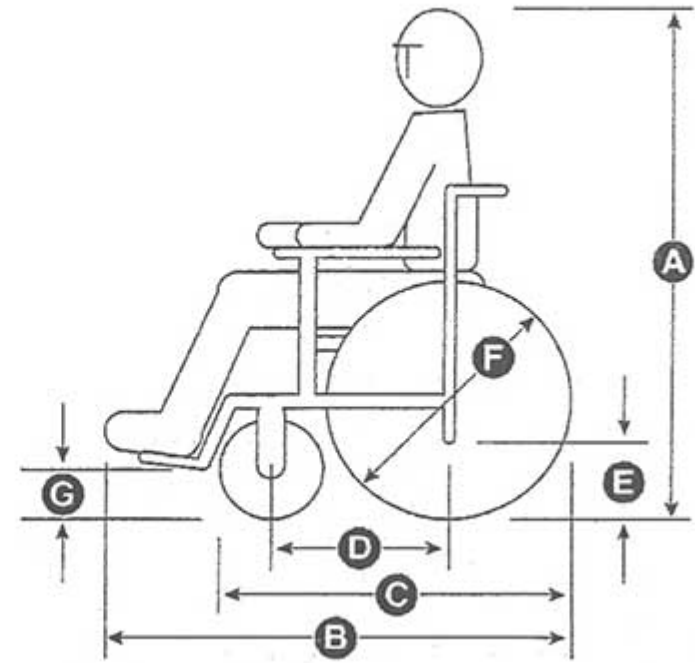
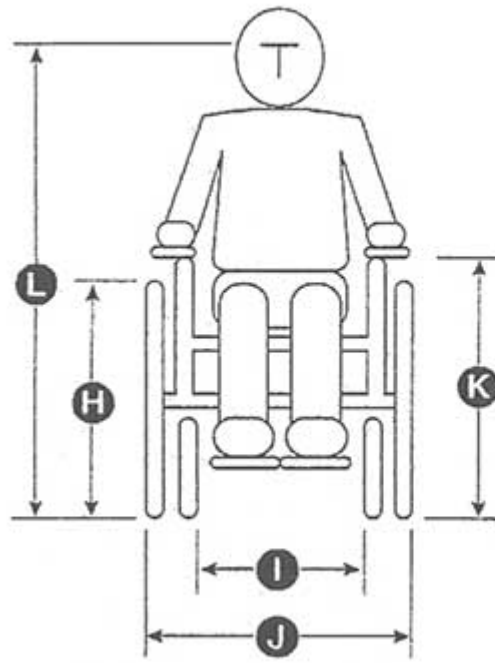
Lower Extremities

- 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



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



Seating Dimensions

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



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
- 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



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



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?



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

Seat Depth

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



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?



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



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



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



Take Home Message:

- 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 AT, and optimizes vision, breathing, and swallowing
- Someone needs to identify the need ... YOU!

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!

Questions?

Thank you!

- AT 102: How do I provide alternative positioning in the classroom?
February 20 at 2:00pm CST
- AT 103: How do I address poor head control in the seating system?
March 13 at 2:00pm CST

Contact Information:

Michelle Lange

MichelleLange1@outlook.com

www.atilange.com

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

Positioning Checklist

This checklist is designed to screen the student to determine if a formal seating evaluation is required.

Please refer the student, as indicated, to a qualified wheelchair seating team in your area.

- ___ 1. Pelvis: is the pelvis in a neutral position within the seating system?
This includes neutral pelvic tilt, obliquity, and rotation.

- ___ 2. Pelvis: if the pelvis is not in a neutral position, can you correct the pelvis and is this corrected position maintained over time in the current seating system?

- ___ 3. Trunk: is the trunk upright and midline?

- ___ 4. Head: is the head upright and midline, balanced over the trunk, without neck hyperextension?

- ___ 5. Lower extremities: are the lower extremities aligned with the pelvis?
Without adduction, abduction, or rotation?

- ___ 6. Back height: with the pelvis in a neutral orientation, is the back at the correct height?
For students who require full support or who use anterior trunk supports, this is at or just above the shoulders.

- ___ 7. Seat depth: with the pelvis in a neutral orientation, is there approximately one inch between the end of the cushion and the back of the knee?
If there is more than one inch, the seat depth is too short.
If the back of the knee is contacting the front of the seat or not allowing the pelvis to be placed in a neutral tilt, the seat depth is too long.

- ___ 8. Lower leg length: with the pelvis in a neutral orientation, is the distance between the top of the seat and the footplate correct?
If the distal thighs are unweighted, the distance may be too short.
If the feet are not making full contact with the footplates, the distance may be too long.

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