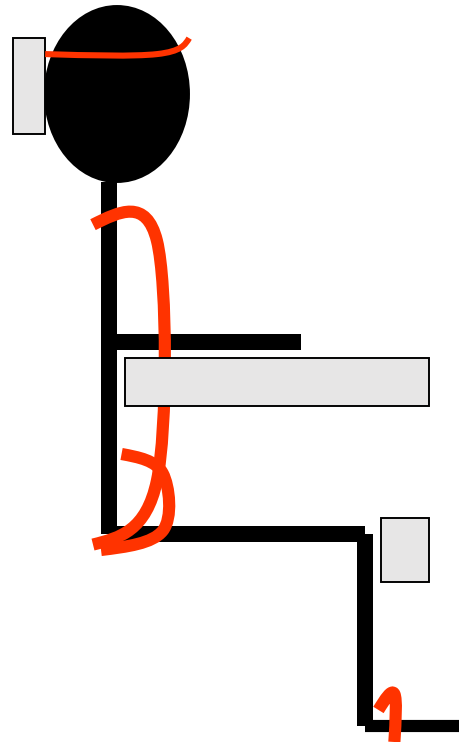


Basic Seating

Ideal Anatomical Seated Position

Pelvis	Neutral (slight anterior tilt)
Hips	Flexed 90°, slightly abducted
Legs	Knees & Ankles at 90°
Trunk	Straight
Head	Facing Forward
Shoulders	Level
Arms	Slightly flexed, abducted and internally rotated, forearm pronated, hand open

90-90-90 vs. HoSoP



Head

over

Shoulders

over

Pelvis

**Provide support at appropriate angles to enable stability, comfort and function
but plan to change the location, angle or strength with progression.**

Sequence of Postural Evaluation

Pelvis

Lower Extremities

Trunk

Head and Neck

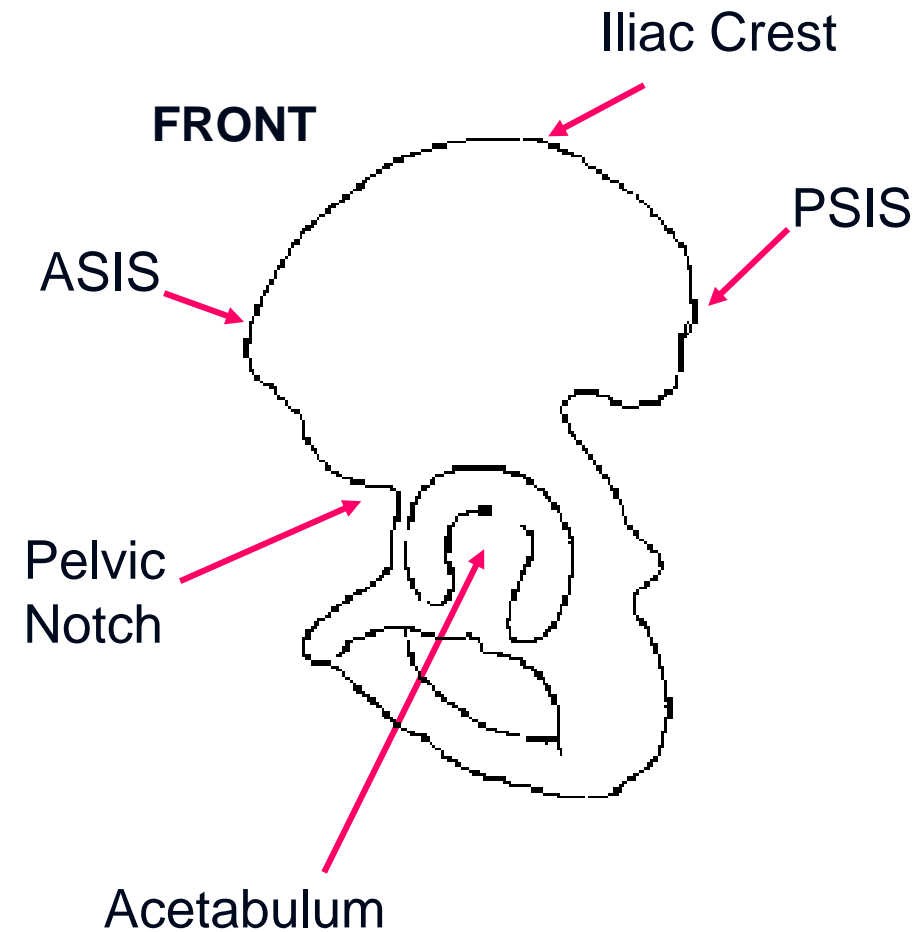
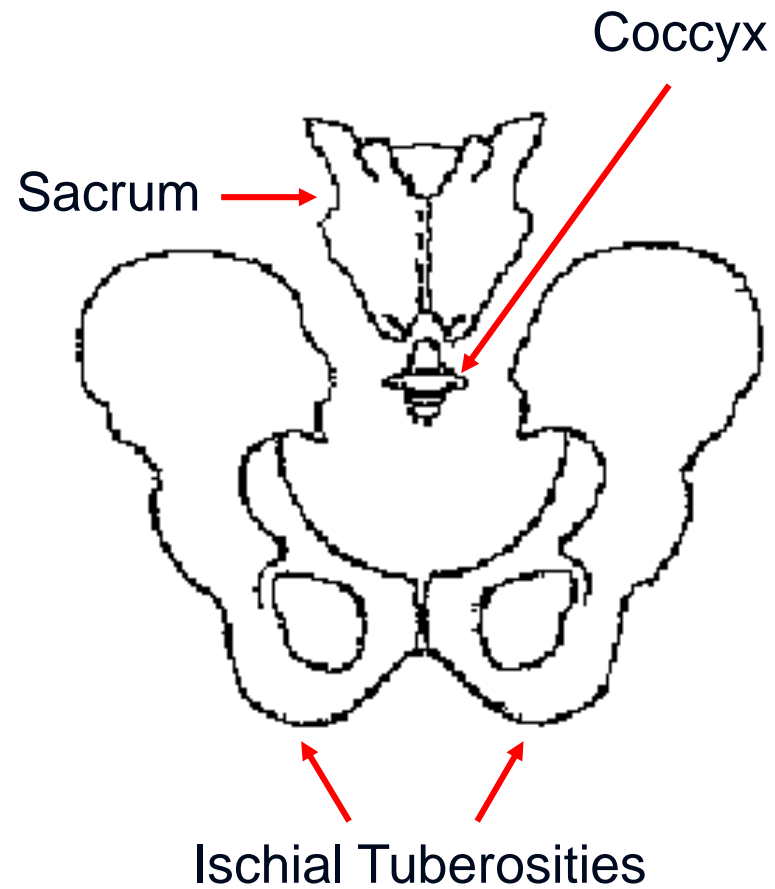
Upper Extremities

What are we looking for?

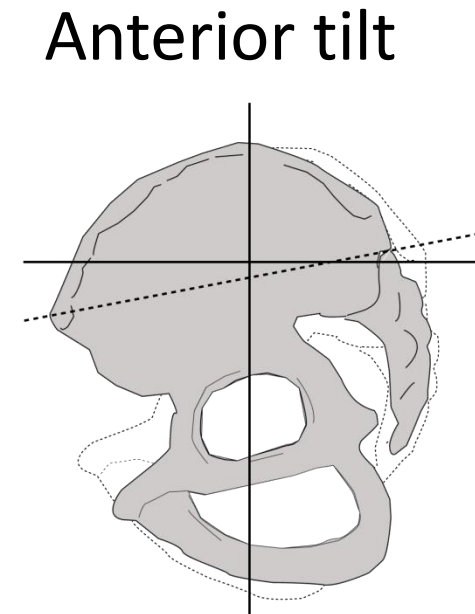
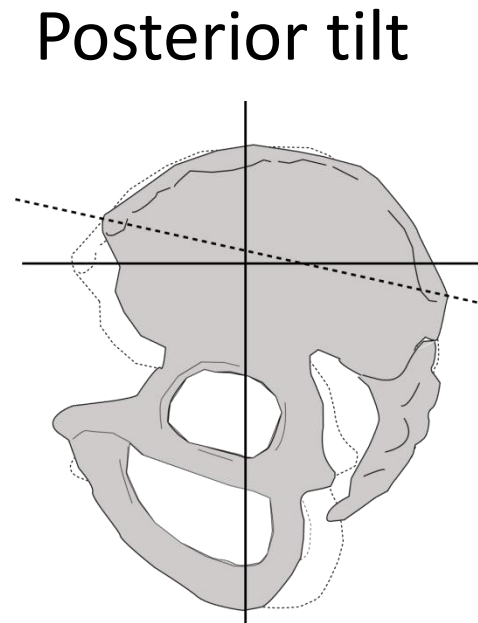
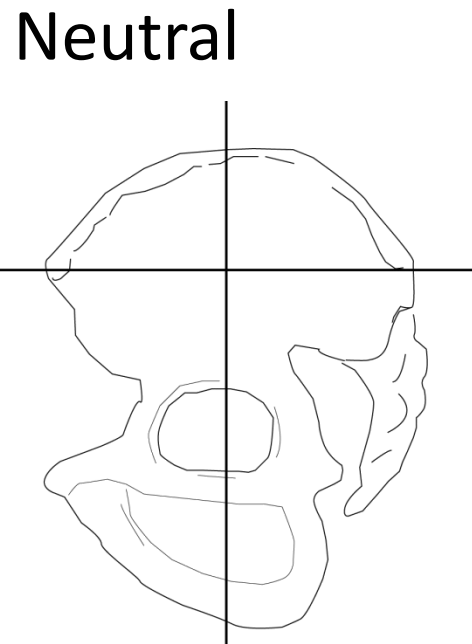


Reducible and
Non-Reducible

Anatomical Bony Landmarks of the Pelvis



Pelvic Positions-Sagittal View



Posterior Pelvic Tilt

Understand the Cause:

- overactive hip extensor muscles
- **tight hamstring muscles**
- seat / back angle greater than 90° - 95°
- seat depth too long
- Decreased lumbar lordosis



Posterior Pelvic Tilt

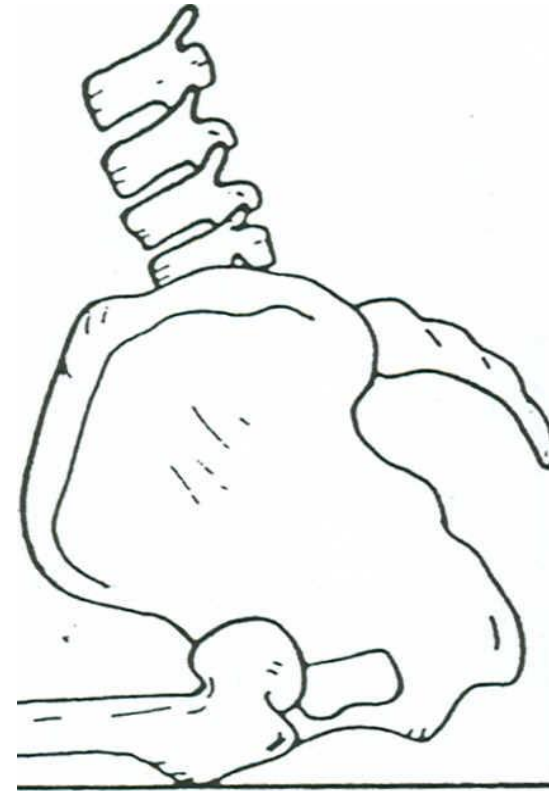
- Posterior Pelvic Tilt can cause:
 - Abduction of the hips
 - External rotation of the hips
 - Pressure ulcer formation on the sacrum
 - Kyphosis of the spine
 - Extension of the neck for vision.
 - Protracted shoulders which impede reach and upper extremity function



Anterior Pelvic Tilt

Understand the cause:

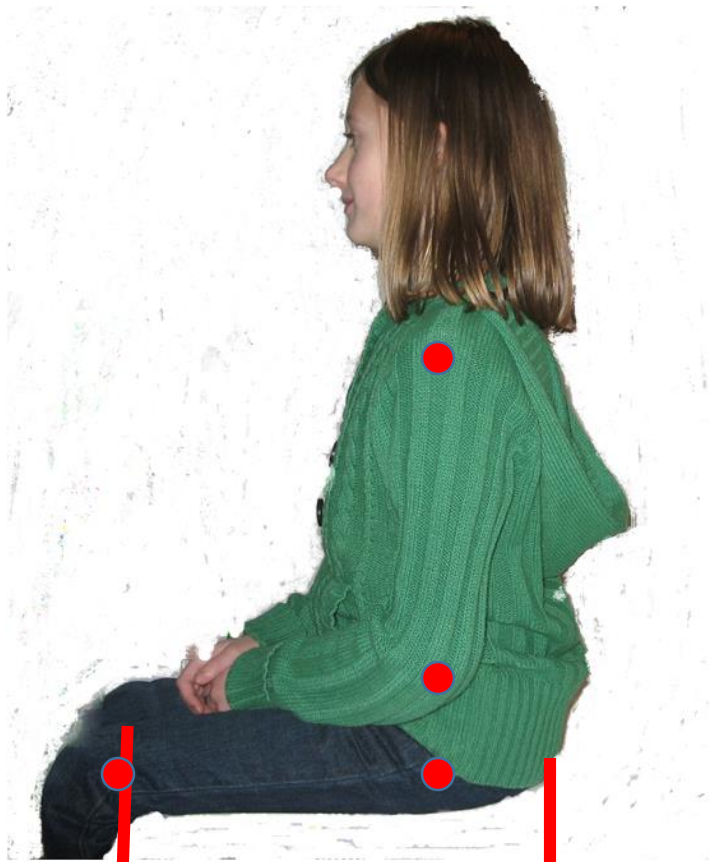
- Tight hip flexors, Quadriceps
- Tight spinal extensors
- Weak abdominals



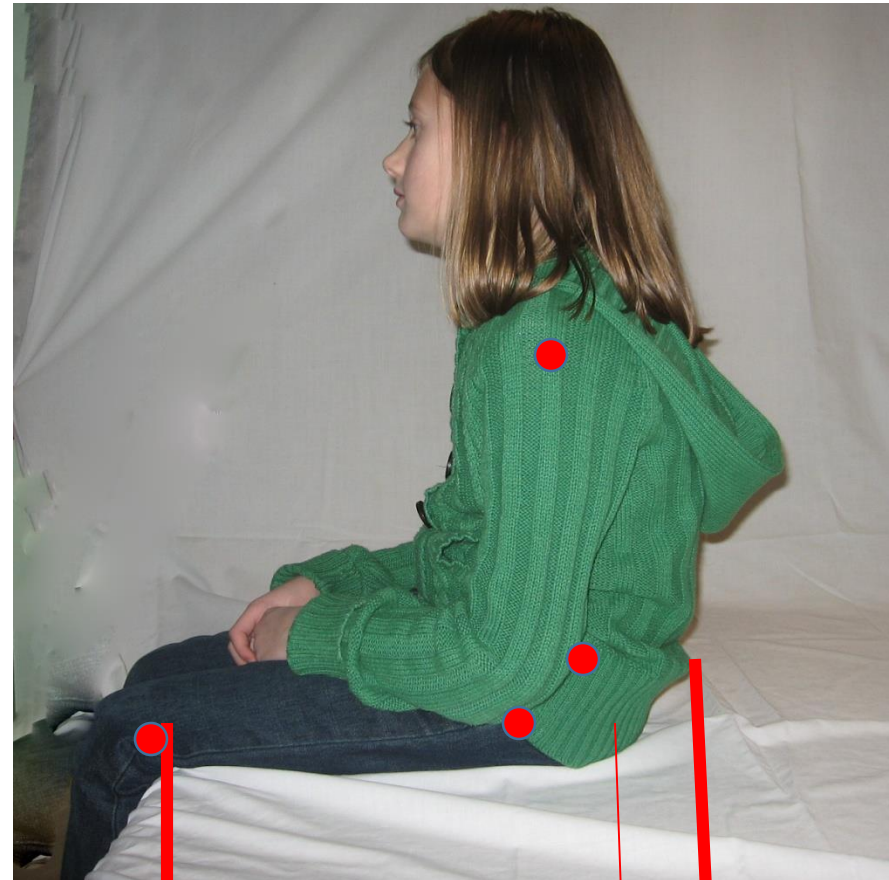
Anterior Pelvic Tilt

Anterior Pelvic Tilt can cause:

- Adduction or internal rotation of the hips
- Instability of the trunk or the potential to fall forward in the seating system.
- Can cause back pain over time.
- Typically causes retraction of the shoulders which can also impede functional reach

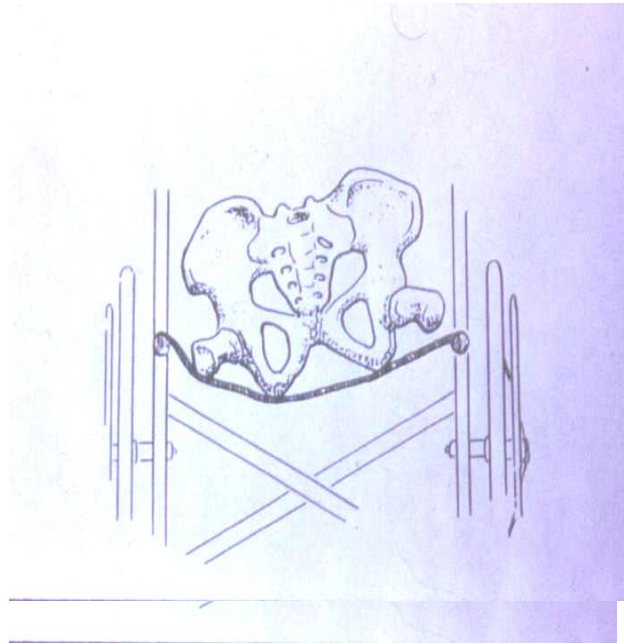


Neutral Pelvic Tilt



Posterior Pelvic Tilt

Pelvic Obliquity and Rotation

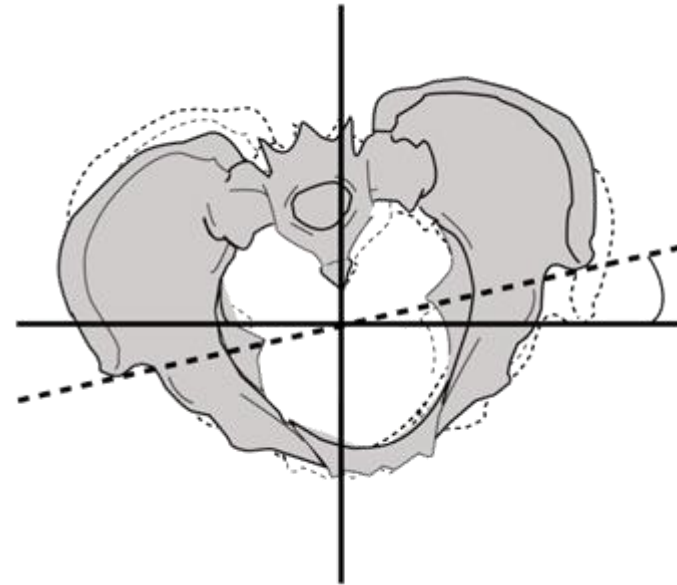


Pelvic Obliquity

- Named for the “low” side
- Above is a “right” obliquity

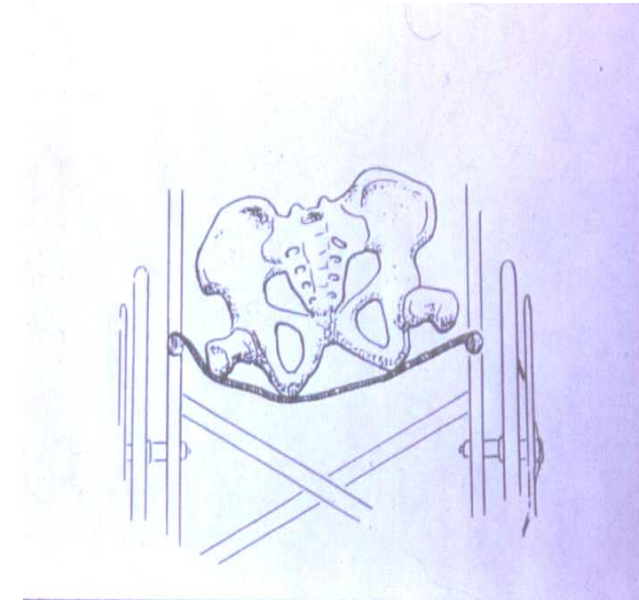
Pelvic Rotation

- Named for the “backward” side
- Below is a pelvic rotation



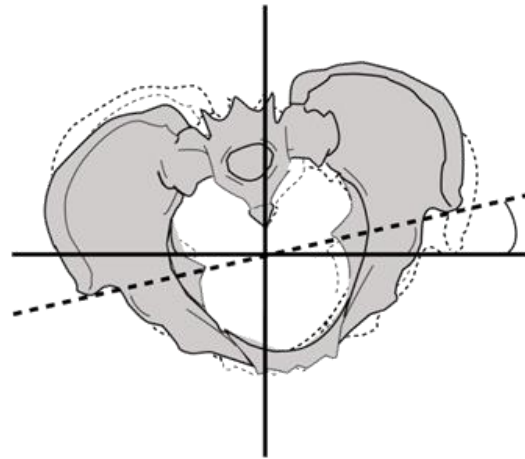
Pelvic Obliquity

- Is when one side of the pelvis is lower than the other.
- Named for the low side
 - If not reduced will cause scoliosis
 - If not reduced can cause pressure ulcer development on low side.
 - Can eventually cause person to develop back pain



Pelvic Rotation

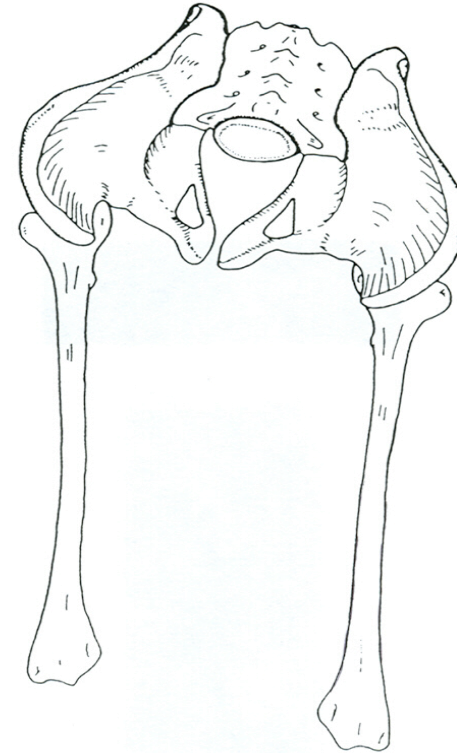
- Pelvic rotation is when one side of the pelvis rotates forward of the other.
- A pelvic rotation is named for the side that is backward.



Pelvic Rotation

May give appearance of:

- LE leg length discrepancy
- Appearance of “Wind-swept” LE’s
- Often associated with a spinal scoliosis



Lower Extremities

What are we looking for(PROM)?

- Limitations in Hip flexion
- Limitation in hip abduction or adduction
- Limitation in external and internal rotation.

Feel and observe, then think about why it is occurring.

Lower Extremities

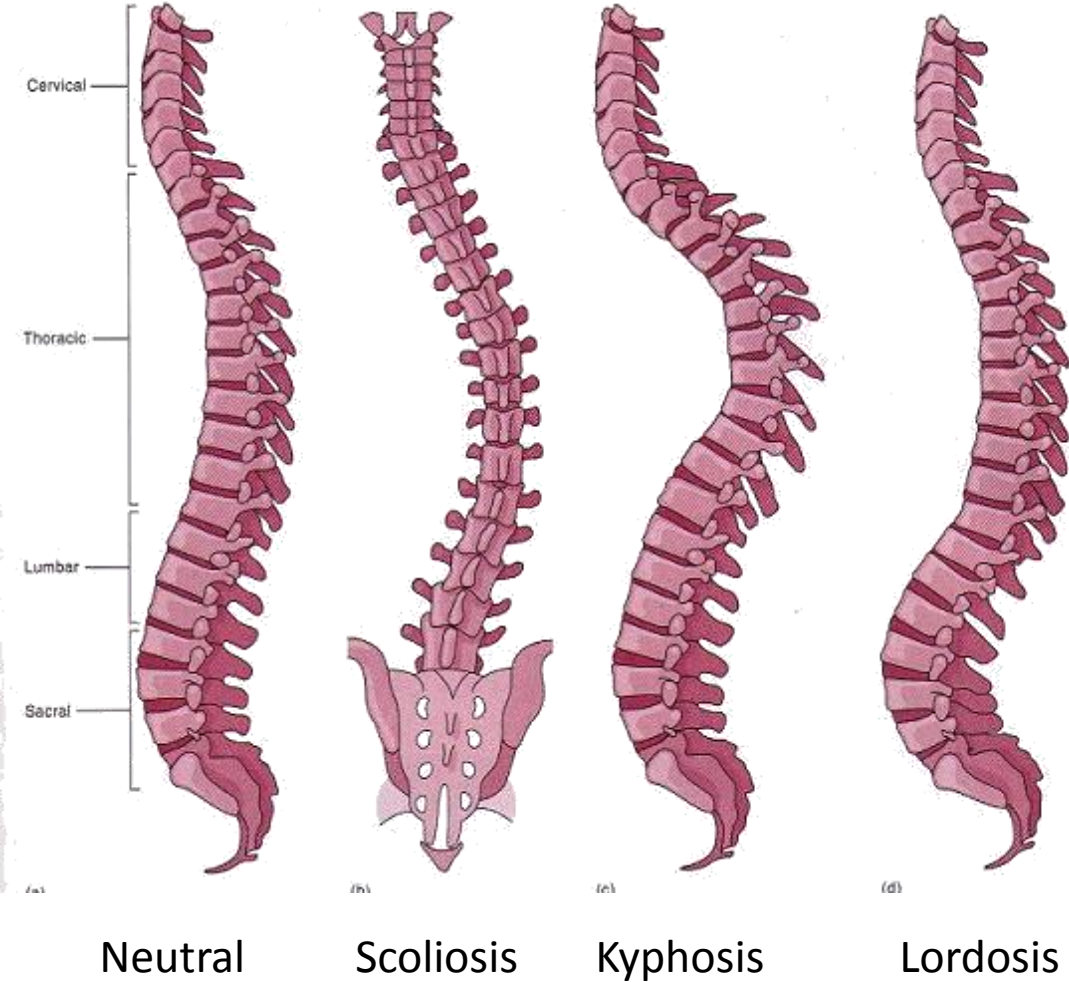
Continue PROM

- What is the PROM limitations of the knee?
- What is the PROM of the ankles?
- Do we stretch our client before we check PROM?

Trunk

- When checking the trunk, check if the lateral curvature is reducible.
- Do the curves in the trunk move to a neutral alignment?
- Do the shoulders or pelvis move with the trunk?
- Can the client lie flat with both shoulders on the mat?
- If the shoulders and pelvis are moving with the trunk then the trunk is most-likely non-reducible.

Trunk



Shoulders, Neck and Head

- Do the shoulders rest back onto the mat?
- Are the shoulders still protracted or more retracted?
- Does the neck stay neutral or is it still flexed forward, rotated, or laterally flexed?
- Can the head achieve a neutral position?

Upper Extremities

- Is the client able to use their arms in the supine position?
- Can they lift their arms and reach forward?
- If they can move their arms is the movement functional or could it be functional?

Supine then Sitting



Principles of Seating

- Optimize function
- Minimize orthopedic deformities
- Maximize weight distribution to manage pressure
- Maintain vital body functions (Swallowing and breathing)
- Maximize visual, perceptual and cognitive abilities
- Maximize comfort and sitting tolerance (Be Realistic)
- Remember Consumers Goals

Pelvis

The pelvis is the single, most critical element in the seated position. If the pelvis is not in neutral, well-balanced alignment, you will see compensatory positions of the legs, trunk, head and neck, and limited functional use of the upper extremities.

References

- Arledge, S., et al (2011). RESNA Wheelchair Service Provision Guide retrieved on June 1, 2014 from CMS, (2009). 280.3 Mobility Assistive Equipment (MAE), (Effective May 5, 2005), Medicare National Coverage Determinations Manual Chapter 1, Part 4 (Sections 200 – 310.1) Coverage Determinations, Retrieved on June 1, 2014 from http://www.cms.hhs.gov/manuals/downloads/ncd103c1_Part4.pdf
- Fundamentals in Assistive Technology, 4th edition (2010). RESNA Press, Michelle Lange, OTR, ABDA, ATP, Editor Mills, T., Holm, M. B., Trefler, E., Schmeler, M., Fitzgerald, S., & Boninger, M. (2002). Development and consumer validation of the Functional Evaluation in a Wheelchair (FEW) instrument. Disabil Rehabil, 24(1-3), 38–46.
- National Government Services, (2013). LCD for Manual Wheelchair Bases, Effective 11/01/2013
- National Government Services, (2013). Article for Manual Wheelchair Bases - Policy Article - Effective 11/01/2013
- National Government Services, (2013). LCD for Power Mobility Devices, Effective 10/01/13
- National Government Services, (2013). Article for Power Mobility Devices - Policy Article - Effective 10/01/2013 Retrieved on June 1, 2014 from http://www.ngsmedicare.com/ngs/portal/ngsmedicare/!ut/p/a0/04_Sj9CPykssy0xPLMnMz0vMAfGjzOIN_IxdHN1MTQwMgk1NDTxdDYLMfYPNjQwsjPULsh0VAQwMirs!/

References Continued

- Paralyzed Veterans Administration (2005), Preservation of Upper Limb Function Following Spinal cord Injury: A Clinical Practice Guideline for Health-care Professionals, Retrieved on June 1, 2014 from www.pva.org
- Richter WM, et al, (2007), Stroke pattern and handrim biomechanics for level and uphill wheelchair propulsion at self-selected speeds. Arch Phys Med Rehabil 2007; 88(1):81-87
- Waugh, K., et. Al, (2013) A Clinical Application Guide to Standardized Wheelchair Seating Measures of the Body and Seating Support Surfaces, Revised Edition, Retrieved on June 1, 2014 from <http://www.ucdenver.edu/academics/colleges/medicalschoo/programs/atp/Resources/WheelchairGuide/Pages/WheelchairGuideForm.aspx>
- World Health Organization. (2002). Towards a common language for functioning, disability and health: ICF. Retrieved on June 1, 2014 from <http://www.who.int/classifications/icf/training/icfbeginnersguide.pdf>