

**Pelvic & Spinal Postures**

**POTENTIAL CLINICAL CAUSES**

**POTENTIAL TECHNICAL (EQUIPMENT) CAUSES**

**PELVIS & LOWER EXTREMITIES**

**PELVIS & SPINE**



**+ SAGITTAL PELVIC ANGLE (Posterior Pelvic Tilt)**



**- SAGITTAL PELVIC ANGLE (Anterior Pelvic Tilt)**



**FRONTAL PELVIC ANGLE (Obliquity)**



**TRANSVERSE PELVIC ANGLE (Rotation)**



**SAGITTAL STERNAL ANGLE (Upper Kyphosis)**



**SAGITTAL TRUNK ANGLE (Kyphosis)**



**SAGITTAL ABDOMINAL ANGLE (Lordosis)**



**SCOLIOSIS**

<p>Low or absent tone in the trunk muscles/low tone/muscle control in pelvis or trunk                  Abnormal (high, low, or fluctuating) tone in trunk and/or lower extremities                  Pathological reflexes in lower extremities or trunk/abnormal reflexes in trunk/lower extremities                  Limited hip flexion                  Decreased lordosis                  Decreased pelvic/lumbar spine range of motion                  Decreased hamstring ROM</p>	<p>Seat depth too long                  Footplate position relative to knee does not accommodate tight hamstring                  Front end angle/hanger angle doesn't accommodate hamstring range                  Footplates too high (thighs not loaded sufficiently)                  Footplates too low (feet not loaded sufficiently)                  Lack of posterior pelvis/sacral support                  Back support too upright                  Seat-to-floor height too high for foot propulsion                  Armrests too low</p>
<p>Increased lumbar lordosis                  Tightened paraspinals                  Weakened abdominals                  Tight quadriceps                  Tight hip flexors                  Obesity</p>	<p>Anterior femoral angle (knees lower than hips)                  Excessive lumbar contour                  Trunk not supported                  Back support too upright</p>
<p>Scoliosis                  Abnormal reflexes in trunk or lower limbs                  Asymmetrical muscle tone (trunk and/or lower extremities)                  Asymmetrical trunk muscle strength                  Asymmetrical soft tissue or muscle mass                  Asymmetrical pelvic/femur bone structure                  Asymmetrical hip flexion range of motion                  Limited hip abduction and/or adduction                  Limited hip internal or external rotation</p>	<p>Poor base of support - i.e. sling upholstery                  Footplates, position and/or seat-to-back angle or front end angle may not match client's available range of motion                  Seat shape does not support trochanters                  Wheelchair too wide                  Seat and/or back does not provide enough lateral pelvic support                  Joystick and/or wheel location inappropriate                  Armrests too low (upper extremities not supported)</p>
<p>Scoliosis or roto scoliosis                  Asymmetrical hip flexion                  Asymmetrical muscle tone (trunk and/or lower leg length discrepancy)                  Posterior dislocated or subluxed hip                  Limited hip abduction and/or adduction range of motion                  Asymmetrical muscle mass in the posterior pelvis                  Unilateral foot propeller (extremities)</p>	<p>Trunk not fully supported                  Lack of posterior pelvis/sacral support                  Seat and or/ backrest contours too narrow                  Seat-to-floor height too high for foot propulsion                  Wheel set up incorrect for hand propulsion</p>
<p>Low/absent muscle tone in the trunk muscles                  Compensation for posterior pelvic tilt                  Diminished head control                  Postural deterioration over time                  Extreme hyper mobility                  Hyper extended cervical spine                  Diminished disc space in upper thoracic spine</p>	<p>Seat-to-back angle too closed                  Back support too low                  Arm support too low                  Back does not match shape of posterior trunk                  Head support mounted too far forward or too low                  Wheel set up incorrect for hand propulsion</p>
<p>Low tone/poor muscle control in pelvis or trunk                  Compensation for posterior pelvic tilt                  Structural spinal deformity                  Diminished head control                  Compensation for visual impairment</p>	<p>Back does not match shape of posterior trunk                  Seat-to-back angle too open or closed                  Lack of adequate posterior pelvis/sacral support/back does not support posterior pelvis                  Back support too vertical                  Back support too low                  Head support mounted too far forward or too low                  Arm supports too low</p>
<p>Low or absent muscle tone in the trunk muscles                  Tightened paraspinals                  Hypermobility of lumbar spine                  Compensation for anterior tilted pelvis                  Compensation for lumbar instability                  Obesity                  Fixed structural deformity</p>	<p>Anterior femoral angle (knees lower than hips)                  Back too vertical                  Excessive lumbar contour                  Back does not match shape of posterior trunk                  Posterior pelvic support too high                  Back support too low                  Orientation in space not optimal (system too upright)</p>
<p>Compensation for pelvic obliquity and/or pelvic rotation                  Asymmetrical muscle tone or strength in the trunk muscles                  Decreased trunk balance                  Structural spinal deformity                  Asymmetrical upper extremity strength during manual wheelchair propulsion                  Inability to hold the head in midline</p>	<p>Back does not match shape of posterior trunk                  Back does not support posterior pelvis                  Back does not provide enough lateral support                  Wheelchair does not provide solid base (sling upholstery)                  Seat cushion does not provide pelvic stability                  Upper extremity support is too low, too high, or too wide                  Joystick or wheel location inappropriate</p>

**Clinical Assessment Goals:**

- ✓ Identify posture/orthopedic asymmetries at each body segment.
- ✓ Is asymmetry reducible or non-reducible?
- ✓ Measure angles in frontal, sagittal, and transverse plane.
- ✓ Absolute angles measure angles between a line connecting 2 points of reference on the body and a neutral/plumb line.
- ✓ Angles which have moved clockwise from neutral axis are (-).
- ✓ Angles which have moved counter-clockwise from neutral axis are (+).

**REFERENCES:**

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