



**Spinal Seating Professional Development Project
Reference Document RD7.1: Postural Intervention For Posterior Pelvic Tilt And Kyphosis**

Postural Intervention For posterior Pelvic Tilt And Kyphosis

This table is a guide for clinicians to address all aspects of the seating and mobility system in postural interventions. A MAT evaluation and body measurement is required prior to postural interventions.

Common causes of the posterior pelvic tilt and kyphosis in SCI clients:



(Illustrations used with permission from Zollar, Jean Anne, 1996)

Posterior pelvic tilt:

- footplate set up too low causing the pelvis to slide
- seat depth too long pulling pelvis forward
- hip extensor spasm pattern
- restricted hip flexion range of motion
- influence of hamstrings shortening
- fixed thoracic kyphosis limiting head position for vision → tendency to position pelvis forward to gain better head position for vision
- back support angle too reclined
- a flat cushion with no contour and no seat tilt to provide pelvic stability

Kyphosis:

- poor head / neck or trunk control, pulling shoulders forward
- arm support too low, client hunches down to reach arm support
- inadequate or inappropriate posterior support and / or contour of the back support to provide comfort or stability
- posterior pelvic tilt generally flattens the lumbar spine and encourage the shoulders to hunch during sitting

Influences from functional capacity and environment:

- habitual posture for function or comfort
- the client is unable to self-adjust their posture
- poor posture and positioning after transfer
- suboptimal eyesight or visual field – client hunching over to gain vision
- inadequate vehicle height dimension to provide clearance above the head during travel

Indicators for intervention:

- risk of sliding down the wheelchair
- risk of falls
- risk of pressure area on sacrum, ischial tuberosities
- increased kyphosis, neck and head flexion posture
- poor visual field for interaction with the environment
- swallowing and respiratory function
- reduced wheelchair propulsion efficiency and increased risk of upper limb overuse syndrome

Possible seating solutions for posterior pelvic tilt and kyphosis

Cushion:

Assess that the cushion size is appropriate for the client's body size measurement. Check that there is appropriate clearance between cushion and calf, particularly, for the clients with shortened hamstrings or spasms.

For a client who has a flexible posterior pelvic tilt, contouring the cushion anterior to the pelvis assists in maintaining pelvic position

For a client who has a fixed posterior pelvic tilt, support fixed postures through contouring that matches the client's posture.

In posterior pelvic tilt position, the ischial tuberosities (IT) are pointing forward. Check that the IT are not sitting hard against the "crest" / anterior to the well for cushions that have a Ischial well / dish design.

Back support

Back support should be set up to align with the client's "trunk to thigh angle" to seat to "back support angle".

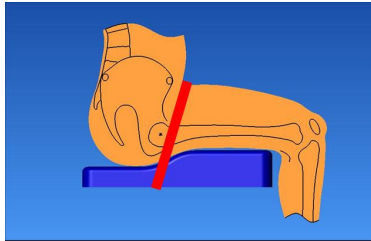
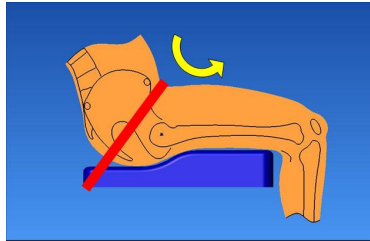


If there is a restricted trunk to thigh and thigh to lower leg angle limitation, the seat back support angle may need to be increased, depending on the available front footplate hanger and foot support configuration. (see Manual wheelchair section)

Match the lumbar space to the shape of the backrest at lumbar thoracic area to support posterior superior iliac spine (PSIS).

When the client has a flexible posterior pelvic tilt, and /or kyphosis, provide posterior support to PSIS, and / or anterior support such as a pelvic belt and a shoulder harness. An effective



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	<p>shoulder harness requires the back support height to be level with the shoulder.</p> <p>For a client who has a fixed posterior pelvic tilt and /or kyphosis, the posture can be accommodated by providing support to PSIS and contouring to spinal curvature.</p> <p>Consider the use of tilt in space or the combination of seat slope and back recline angle to facilitate vision.</p>
Foot support	<p>Ensure footplate is setup: an approximate calculation for seat to foot support distance is the lower leg length + shoes / heel height – estimated cushion height</p> <p>Consider the influence of the hamstring on pelvic tilt and thigh to lower leg angle. A 90° legrest hanger angle relaxes the hamstring while a 60° hanger angle places the feet forward, pulling on the shortened hamstring, resulting in the pelvis tilted posteriorly. Other strategies to accommodate tight hamstrings include extended or “swept- back” footplates, centre- mount footplate hangers to reduce the thigh to lower leg angle</p>
Arm support	Adjust armrest height as arm support may influence trunk position
Headrest	Adjust to head position if applicable.
Manual wheelchair setup	<p>Ensure seat depth is shorter than the “thigh depth” body measurement so that the calf is not right again the seat cushion (approximately 3-4cm less for footplate hanger angle <70°. For thigh to lower leg angle 90° or less, greater clearance is required).</p> <p>When there is an increased back support to seat angle, the wheelchair may become tipplier rearward. Horizontal axle position may require adjustment. (see Module 9)</p>
Power wheelchair configuration	Same as above. The use of seat tilt, back support recline or tilt in space to facilitate balance and vision. (See Module 10)
Secondary support and accessories	<p>Shoulder harness can be used to provide anterior support.</p> <p>Consider the use of a 2 point or 4 point pelvic belt to maintain the pelvic position through the anterior superior iliac spine (ASIS).</p> <p><i>Cautions:</i></p> <p><i>A standard “lap belt” has a possible risk of rising up over the belly to come in contact with insertion sites or obstructing tubing. E.g., supra- pubic catheter, PEG feed tube.</i></p> <p><i>The use of 60° or 70° mounting angle rather than a 45° angle may be a possible solution after careful assessment and trials.</i></p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>70° Pelvic belt mount</p> </div> <div style="text-align: center;">  <p>45° Pelvic belt mount</p> </div> </div> <p><i>(illustration used with permission from Bodypoint®, 2008)</i></p>
Others positioning items	<p>Custom fabrication of the anterior knee support on a power wheelchair has been used to control pelvic tilt position in situations where there are limited options. The femur and the hip joint must be intact if this setup is to be used. Skin around the knee should be protected with soft material or inserts. Skin check should be conducted daily. Using the seat tilt in combination with the knee supports is recommended.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>