CONTROLLING THE PELVIS – A PRACTICAL GUIDE

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It is generally accepted that the pelvis is the building block of posture. All the movements at the pelvis influence all other parts of the body, both proximally and distally. Our ability to stabilize the pelvis greatly affects the sitting posture, comfort and function of the client. In order to stabilize the pelvis we need to look at the surface that the client is sitting on, how it is contoured, what material(s) are used in the cushion and how other seating components such as lateral and medial pelvic/thigh supports, back contours, sacral blocks, and lumbar pads affect the position of the pelvis. These external forces greatly influence the position of the pelvis and how it moves or does not move. We need to determine the forces on the pelvis from all angles – superior, inferior, posterior and anterior. This workshop will focus mainly on the forces that we can apply from an anterior aspect to help stabilize the pelvis.

Limited research has been done to establish the effectiveness of pelvic stabilizers. The majority of the studies/reviews look at the use of physical restraints and lap belts with elderly wheelchair users. Chaves et al (2007) did a literature review of the use of physical restraints and lap belts and made recommendations regarding minimizing risk of injury and seatbelt placement. They concluded that restraints and lap belts can be helpful when used correctly but when used improperly can lead to injury or death. They emphasized the need for education regarding correct positioning and placement of straps on an individual basis.  

Lacoste et al (2009) looked at “Stability of children with cerebral palsy in their wheelchair seating”. They used a questionnaire that parents and therapists completed. The questionnaire addressed postural stability, instability versus activities of daily living, and how and when the seating system was used. Results showed a high percentage (80%) of instability was reported less than half an hour after the child was placed in their wheelchair. Sliding and posterior pelvic tilt, pelvic obliquity and pelvic rotation were identified as being the main problems of instability.  

Rigby et al (2001) and Ryan et al (2005) examined the effects of a rigid pelvic stabilization device. Results showed that with the device the child required less re-positioning and that their volitional arm and hand function improved.  

McDonald et al (2003) assessed the relationship between pelvic and trunk alignment and force measured through a knee block in children with C.P. Results showed that an increase in force leads to a decrease in pelvic tilt and that pelvic tilt was shown to positively correlate with trunk lateral shift and trunk inclination. An improvement in pelvic position has a secondary improvement in trunk alignment.  

Avellis, M, et al (2011) did a kinematic comparison using an optoelectronic system with markers of 2 point and 4 point seat belts in children with Cerebral Palsy. They looked at movement of the pelvis and knee. They found that the 4-point belt was more stable than the 2 point belt and that the 4 point belt prevented sliding under the belt. These studies all have limitations but they all demonstrate that the pelvis does affect sitting posture, function and comfort. This further indicates the necessity to strongly focus on the pelvis when providing a seating system and ensure that adequate support is provided.

Our client’s pelvis must be controlled in all planes. Any one omission could allow the pelvis to slide or be thrust out of our optimal choice. The Inferior, posterior, lateral, medial, distal, and anterior surfaces are equally important. The spatial orientation of the seating is another dimension to be considered.

The posterior surface (back of the seating system) and the inferior surface (seat cushion) are keys to positioning. What the supports are made of can affect how the pelvis is ultimately controlled. The type of foam, the shape, the contours as well as the covering material affect the control we seek.

Foam that is too soft allows the pelvis to sink into it asymmetrically. Too firm a surface is uncomfortable and allows no immersion. The use of anti-thrust blocks, seat wells, leg wedges under the foam, air or gel in a cushion can enhance our seating. Shaped or contoured seats and backs can accommodate body shapes and help build the stable base needed for the pelvis.
Lateral thigh and leg supports are important to maintaining position. They prevent the sideways slide of the pelvis. When combined with medial / distal supports such as pommel abductors, thigh straps, or knee blocks along with good foot support, the legs will not “pull” the pelvis out of position.

Spatial orientation can help minimize the aggressiveness of the hip controls in the case of tilt and can complicate positioning when recline is needed.

Anterior pelvic supports are often the first to be looked at, usually at our peril. “The hips are sliding… so tighten the belts”. These belts, bars, and other positioners are only going to be effective if the other parts of seating have been addressed. Support of the pelvis in all planes allows the most effective anterior control to be applied.

Anterior hip supports are available in many varieties. These range from simple belts with a myriad of buckle styles to customized hardware mounted to the positioning system.

Our approach is from flexible pelvic control to the more rigid control.

**Straight** hip belts are flexible webbing with flexible mounting. They are anchored to the seat with usually with a 45 degree pull on the pelvis or to pull down on the thighs.

**Bifurcate or “Y”** belts are flexible webbing with two flexible mounting points. They are anchored to the back and seat to usually net a 45 degree pull or to pull down on the thighs.

**Groin** straps are two flexible straps mounted in the center of the seat that attach across the upper thighs to a flexible point behind the hips.

**Diaper style** (for babies) is like the groin strap but the client sits on the fabric of the strap and it pulls and attaches like a diaper.

**Semi-rigid belts** are flexible belts with contoured or firm inserts with flexible attachment points.

**Ratchet / Snowboard** belts are semi-rigid belts with a padded, contoured surface with firm attachment points.
ARCUfit by AEL is a flexible belt with fixed pelvic lateral support with solid attachment points.

Hip Grip by Beneficail Designs consists of contoured pads that “grip” around the pelvis mounted with metal attachment hardware.

Rigid bars are a solid, padded, contoured shapes with metal attachment hardware.

Semi-rigid bars are solid, contoured shapes with more “give” in the padding with metal attachment hardware.

It is extremely important to assess each client individually and determine, not only their physical needs, but also what type of pelvic support works for their environment. Some of the more complex pelvic controls require the client to be positioned the same way each and every time. The caregiver needs to be educated on the proper positioning of the client and how the device works for positive results. Compromise is sometimes needed to ensure the device chosen matches all the needs of the client and caregiver.

(This workshop will incorporate case studies to demonstrate some principles. Methods of construction and design for some of the more complex solutions will be demonstrated)
References


