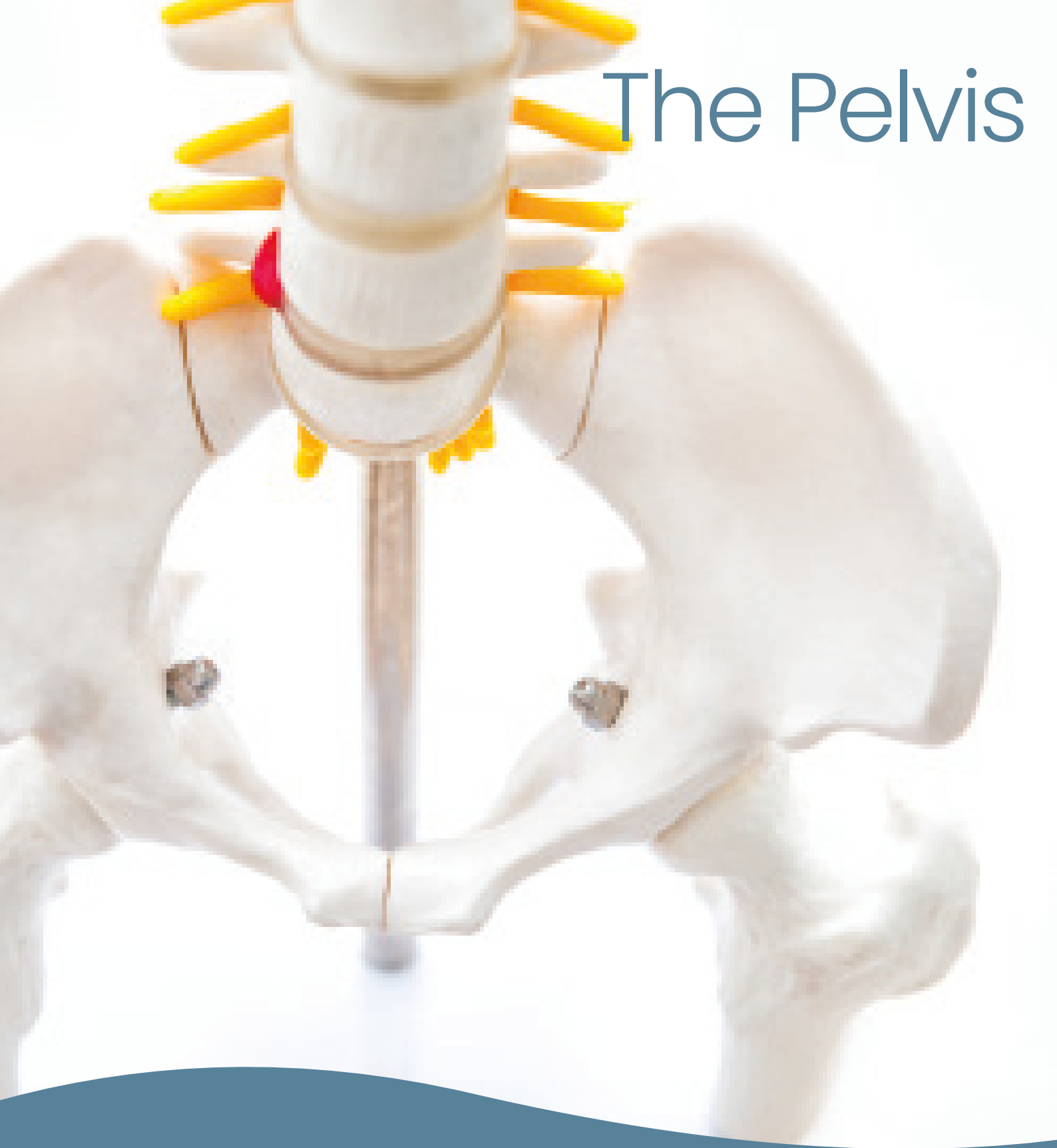
The Pelvis



CareFlex

THE SEATING CHALLENGES SERIES

SEATING CHALLENGES OF THE PELVIS

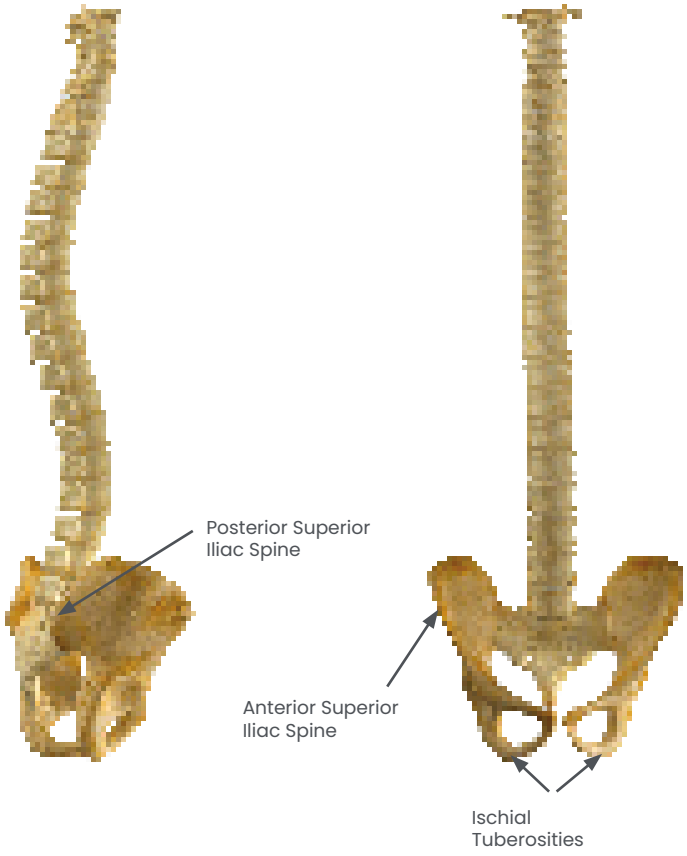
The pelvis is the foundation for a good sitting posture as it dictates what happens to the body segments above and below. Positioned at a person's core, it acts as a support system for the entire body.

Pelvic stability is essential for function and independence; freedom of movement in the upper limbs is achieved through the effective stabilisation of the pelvis and trunk.[1] Pelvic stability can also help manage abnormal muscle tone and encourage normal movement.

An unstable pelvis can:

- Result in the upper limbs becoming restricted to their load bearing role.
- Increase muscle tone and exacerbate abnormal reflexes.
- Increase pain levels.
- Affect a person's compliance with a seating system.

An understanding of what the pelvis is doing, and what it is able to do, is essential in specialist seating. The assessment of an individual's pelvic posture is vital as it will determine the seating prescription and their subsequent care plan.



POSTERIOR PELVIC TILT

A posterior pelvic tilt is when an individual presents with sacral sitting, with the anterior superior iliac spines higher than the posterior superior iliac spines.



This postural challenge can be associated with an increased thoracic kyphosis, cervical spine hyperextension by trying to maintain a functional visual field, a tendency to slide forward in the seat, and an increased risk of pressure injuries over the sacrum and the apex of a kyphotic spine.

What can cause a posterior pelvic tilt?

- Incorrect seat dimensions
- Pelvic instability
- Fatigue
- Limited hip flexion
- Tight hamstring muscles
- Weak abdominals/ back extensors
- Abnormal muscle tone
- Lack of adequate foot support

Are there any seating solutions that can help?

Management will depend on whether the posterior pelvic tilt is correctable or if it is fixed, which can be identified during a comprehensive assessment. The aim is to support the pelvis in all planes of movement. Seating solutions can include:

- Ensuring correct seat depth and seat height.
- A ramped base or tilt-in-space, if appropriate, to encourage pelvic stability and energy management. A pelvic belt, following a risk assessment, can also be considered.
- Setting the back angle according to hip range of movement.
- A contoured back to support the shape of the spine.
- Ensuring appropriately positioned foot support.
- Ensuring appropriate use of elevating leg rest according to hamstring muscles length.
- Addressing any originating or resulting increased thoracic kyphosis.

ANTERIOR PELVIC TILT

An anterior pelvic tilt is when an individual presents with their pelvis tilted forwards, with the anterior superior iliac spines lower than the posterior superior iliac spines.



This postural challenge can be associated with an increased lumbar lordosis and reduced functional reach.

What can cause an anterior pelvic tilt?

- Inappropriate back support
- Excessive lumbar contouring
- Anterior slope on seat causing instability
- Extensor patterns of activity
- Increased lumbar lordosis
- Tight hip flexor muscles
- Tight paraspinal muscles
- Obesity

Are there any seating solutions that can help?

Management will depend on whether it is correctable or if it is fixed, and the aim is to support the pelvis in all planes of movement. There is also a need to manage any physical or health concerns, such as extensor patterns of activity and obesity, with a holistic management plan that may require signposting to other professionals. Seating solutions can include:

- An appropriate contoured back to support the shape of the spine, especially at posterior superior iliac spines level, to encourage neutral spinal and pelvic orientation.
- Tilt-in-space, if appropriate, to encourage pelvic stability. A pelvic belt, following a risk assessment, can also be considered.
- An anterior trunk support, such as a tray.
- Opening up the back angle; be mindful of causing the individual to slide forward in the seat – a ramped base may also be indicated.
- Addressing any originating or resulting increased lumbar lordosis.
- Any changes are best done in small increments to allow the individual to physiologically adapt.

PELVIC OBLIQUITY

A pelvic obliquity is when an individual presents with an asymmetrical pelvis and falling to one side, with one anterior superior iliac spine higher than the other.



This postural challenge can be associated with a scoliosis, an asymmetrical trunk posture, pelvic rotation and an increased risk of pressure injury over the ischial tuberosity on lower side of the pelvis.

What can cause a pelvic obliquity?

- Incorrect seat dimensions
- Asymmetrical trunk weakness/abnormal muscle tone
- Scoliosis or other structural deformity of the spine
- Spinal surgery
- Limitations of hip range of movement
- Hip trauma, dislocation or subluxation
- Asymmetrical pain or discomfort in the trunk or lower limbs
- Fatigue and the effects of gravity

Are there any seating solutions that can help?

As with any postural challenge at the pelvis, management will depend on whether it is correctable or if it is fixed, and the aim is to support the pelvis in all planes of movement. Seating solutions can include:

- Ensuring correct seat width and arm rest height.
- Building up the base under the lower side of pelvis, if correctable.
- Building up the base under the higher side of the pelvis to encourage equal weight distribution, if fixed.
- Adequate trunk support, either through a contoured back or lateral support.
- Ensuring back angle accommodates hip range of movement.
- Addressing any originating or resulting scoliosis.
- Considering the length of time sitting and adjusting care plan accordingly.

PELVIC ROTATION

A pelvic rotation is when an individual presents with one hip further forward in the seat, with one anterior superior iliac spine more forward than the other.



This postural challenge can be associated with spinal rotation, pelvic obliquity and windsweeping. It is worth noting that an individual with a leg length discrepancy or hip problems may also present with one leg appearing further forward than other.

What can cause a pelvic rotation?

- Incorrect seat dimensions
- Spinal rotation
- Windsweeping
- Asymmetrical hip range of movement
- Hip trauma, dislocation or subluxation
- Abnormal muscle tone
- Unilateral foot propulsion for function and independence
- Standing asymmetrically

Are there any seating solutions that can help?

As aforementioned, management of postural challenge at the pelvis will depend on whether it is correctable or if it is fixed, and the aim is to support the pelvis in all planes of movement. Seating solutions can include:

- Ensuring correct seat width.
- A pelvic belt, following risk assessment, if correctable, to encourage alignment at the hips.
- Contoured back support rotated to accommodate the pelvis, if fixed.
- Ensuring back angle accommodates any hip range of movement limitations.
- A stepped base to ensure equal weight distribution of the thighs.
- Addressing any associated spinal rotation.

HOW CAN CAREFLEX HELP?

A comprehensive seating assessment is critical for appropriate seating prescription. Due to the variability among people, a universal seating position is not practicable or safe; therefore, a thorough assessment is recommended to ensure the chair prescribed is tailored to the individual. CareFlex offer a free no-obligation assessment service; we are a team of highly skilled and extremely knowledgeable professionals and we pride ourselves on our efforts to truly improve quality of life, from initial contact through to after-care.

The HydroCare could be a great solution for correctable pelvic instability, with seat depth adjustment, angle adjustable seat and integrated WaterCell Technology.

The much-loved HydroTilt could offer effective support for moderate postural challenges with seat width adjustment, tilt-in-space, a contoured back and adjustable footplate.

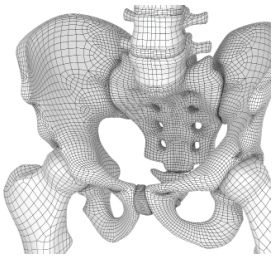
If greater flexibility is required for more complex postures, then the HydroFlex with back angle recline and an articulating back or SmartSeatPro with seat width adjustment and multi-adjustable back components, which can be altered in height, depth, angle, offset and rotation, could be the suitable solution.

In multi-user environments, the MultiAdjust could be the ideal solution for individuals with moderate postural challenges as it offers adaptable seat dimensions, back angle recline, and adjustable foot support.

There is also the option to add a tray for anterior support, a wedge to ramp the base, or a pelvic belt to encourage essential pelvic stability. Building up the base or a stepped base can also be achieved using the Tailored Seating Solutions service.



REFERENCES



References

1. Green EM, Nelham RL (1991) Development of sitting ability, assessment of children with a motor handicap and prescription of appropriate seating systems *Prosthetics and Orthotics International* **15**:203-216



Please check out our further publications in this Seating Challenges Series and don't forget to visit our website for all our available learning resources.

DISCLAIMER

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The information given in this book represents current advice at the time of publication. It is intended as general information and guidance and is not a substitute for professional medical advice which should be sought for specific, individual cases. It is the responsibility of the treating clinician, relying on independent knowledge and skills, to determine the best intervention and method of application for the client.

1. Tilt-in-Space and Back Angle Recline should always be prescribed responsibly, ensuring that they are safe and appropriate for the user following a comprehensive assessment of posture and risk, with advice sought from the multi-disciplinary team where indicated. In some cases these functions will be contra-indicated, and they could also increase shear and friction forces.

2. All belts and harnesses must also be prescribed, implemented and monitored responsibly following a comprehensive risk assessment. Please see the Device safety information alert for further information: www.gov.uk/drug-device-alerts/all-posture-or-safety-belts-fitted-to-supportive-seating-wheelchairs-hoists-and-bathroom-equipment-risk-of-serious-injury-or-death