

# Maximising Function: Pelvic Positioning Belts

## A review of evidence and best practice

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### Introduction:

The position and stability of the pelvis strongly influences the functional ability of the trunk, upper limbs and head. Pelvic belts work in conjunction with seat support surfaces to stabilise the body and maximise function. However, belts are also the one support element that are opened, closed and adjusted by non-clinical staff on a daily basis and error in set-up can quickly cause undesirable effects.

### Method:

110 wheelchair and seating systems were reviewed in the UK & Ireland during 2017-2019. Common practice on pelvic positioning was observed and clinical decision-making was discussed with prescribers. Clinical literature in positioning was reviewed and best practice guidelines determined.

### Key Findings:

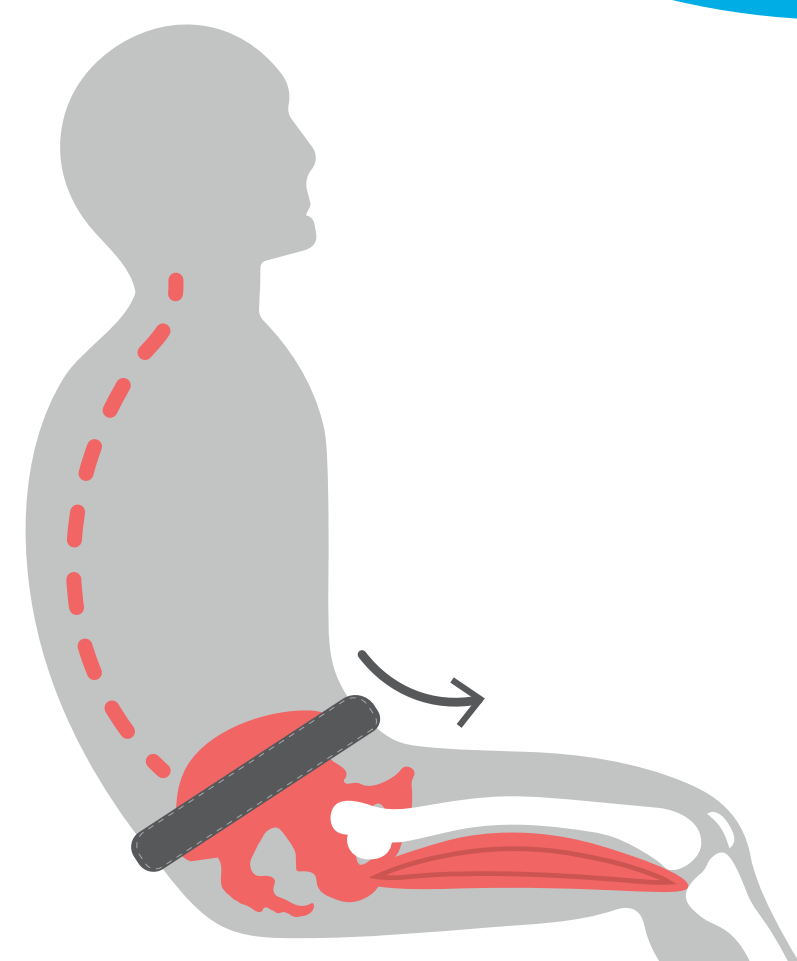
- Limited guidelines and relevant literature for best practice is available
- Prescription typically based on habitual experience
- 20-100% differences in cost (2-point v 4-point)
- 2-point belt capable to offer matched or superior function for specific presentations
- Limited emphasis during assessment placed in type, role and position of belt

## Positioning pelvic belts to maximise function

### Common Errors:

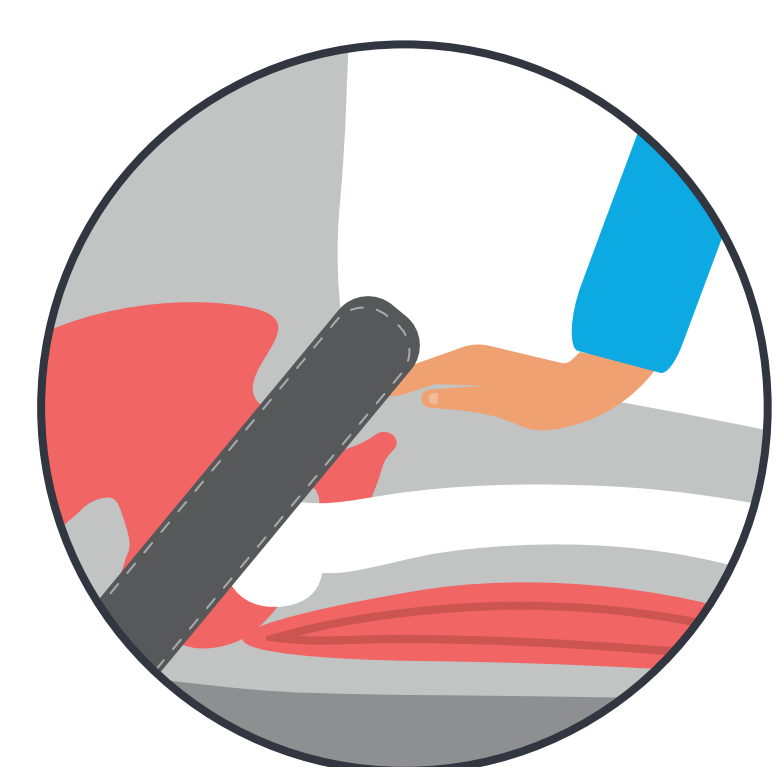
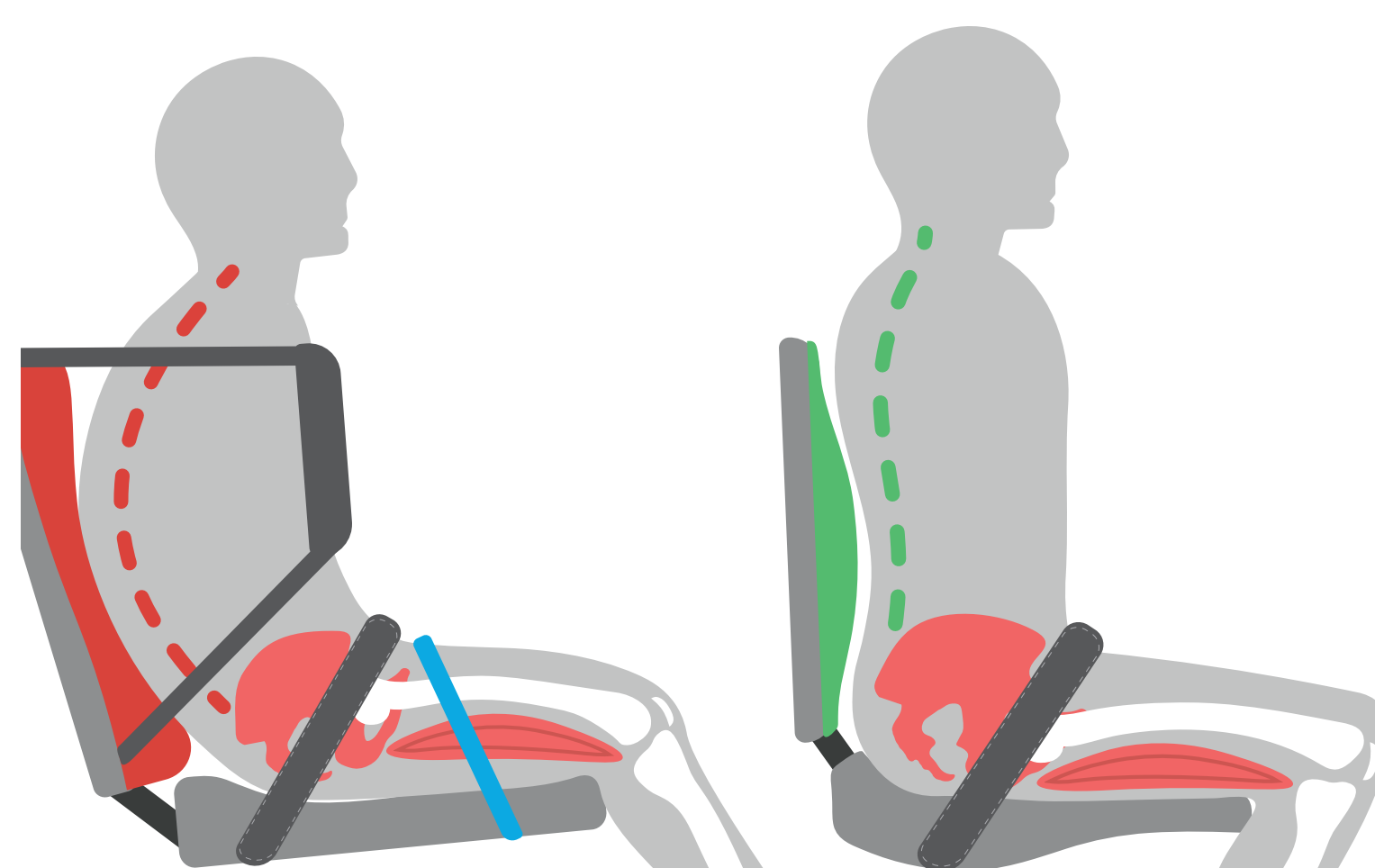
#### 1. Primary belt set too high

- Belts unnecessarily covering/superior to the ASIS can pull the pelvis down into posterior tilt, resulting in thoracic kyphosis, neck hyperextension and chin poke
- Flexion at the trunk for forward reach then becomes reduced as the pelvis cannot naturally tilt anteriorly or laterally



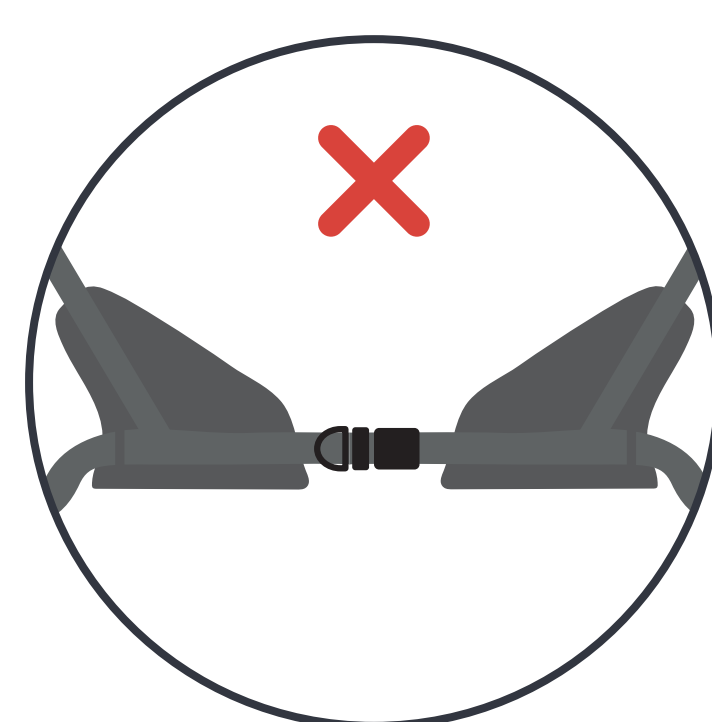
#### 2. Confusing primary and secondary supports

- Belts and trunk harnesses are there to complement the positioning supports of the chair
- Look to correctly configure the primary supports (backrest & seat base) before you set-up secondary supports (belts & harnesses)
- Prescribing secondary supports unnecessarily can impede upper limb, trunk and head control



#### 3. Belt fit too loose

- The belt should allow enough 'give' for the flat of the hand to be placed under the belt. Loose belts can lead to a loss of position and pose a safety risk

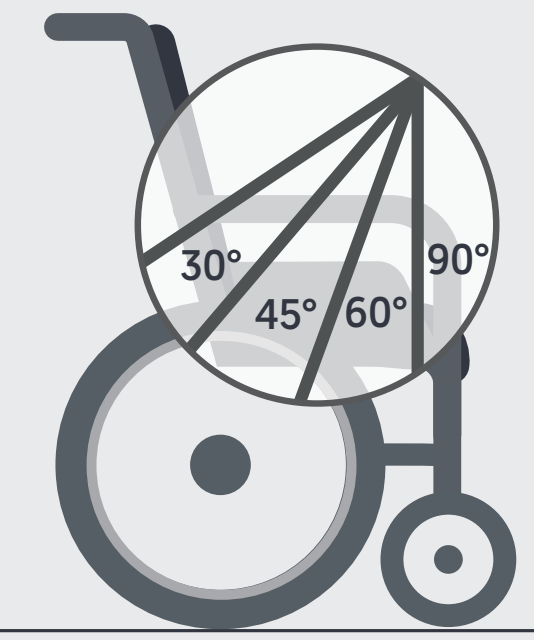


#### 4. Upside down 4-point belts

- Shaped or contoured style belts can be deceiving. If reversed they are unable to provide their intended support which can quickly result in ineffective support



### Guidelines for positioning the pelvis for common presentations:

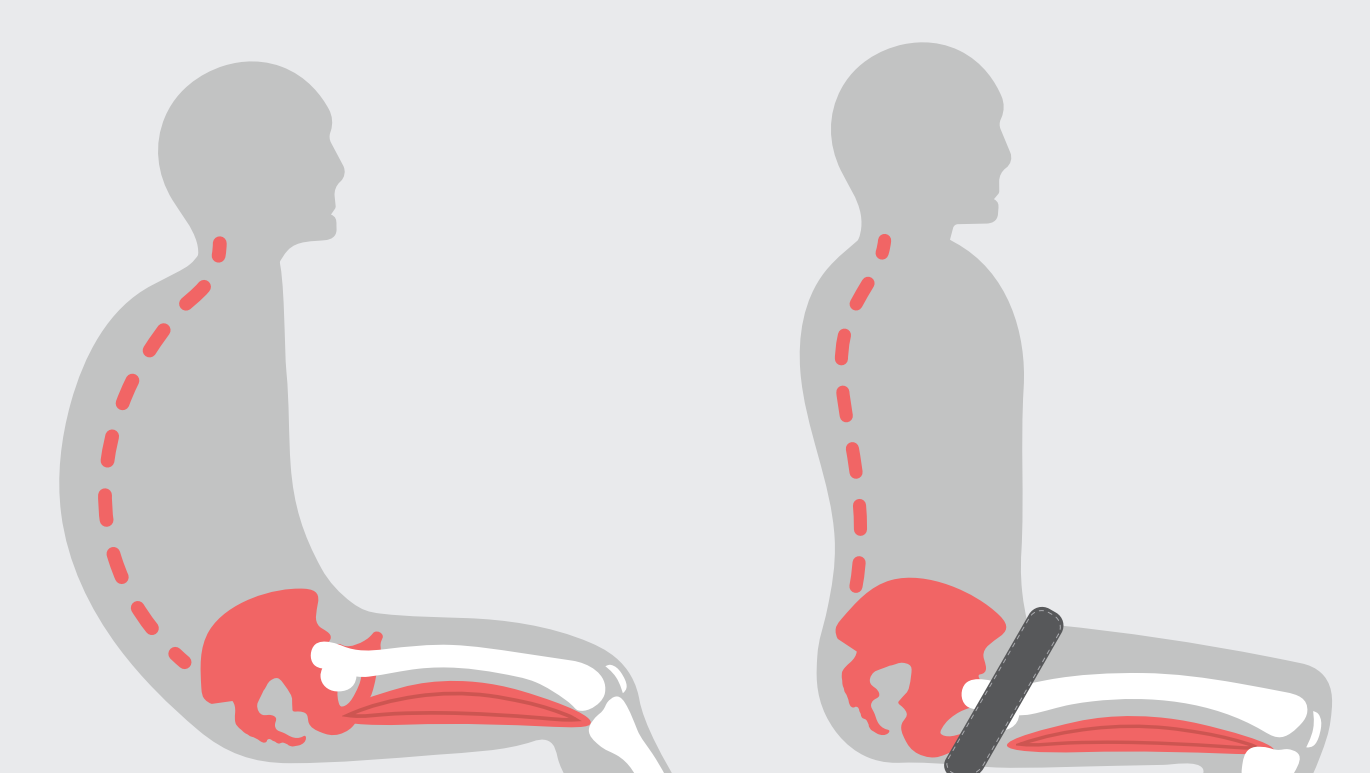


#### Posterior Pelvic Tilt

- Use a 2-point belt
- Position the belt 60–80° anterior and inferior to ASIS
- Facilitates anterior tilt at pelvis to improve forward reach
- Consider a 4-point belt for children with high tone/uncontrolled movement patterns

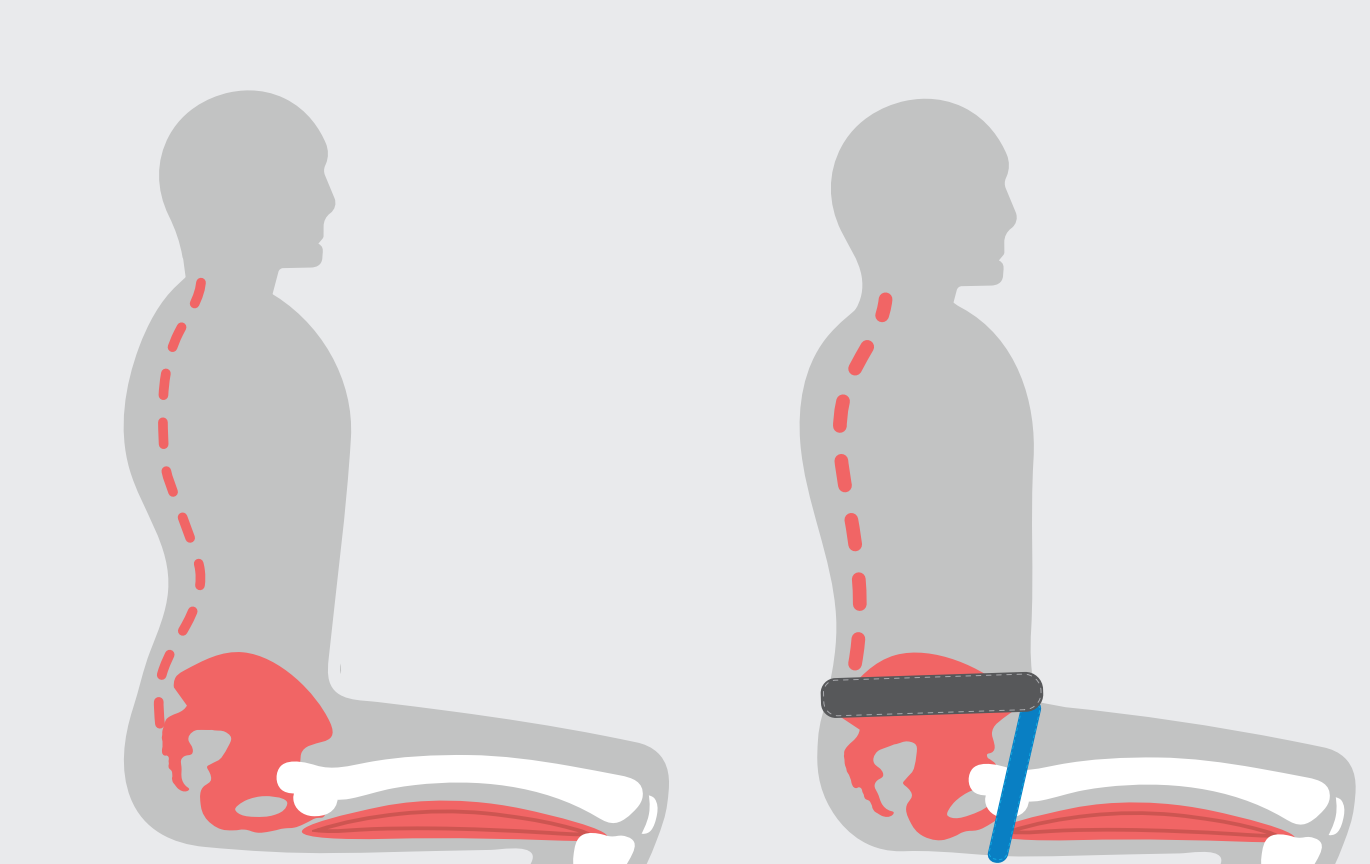
#### Presentation

#### Belt Position



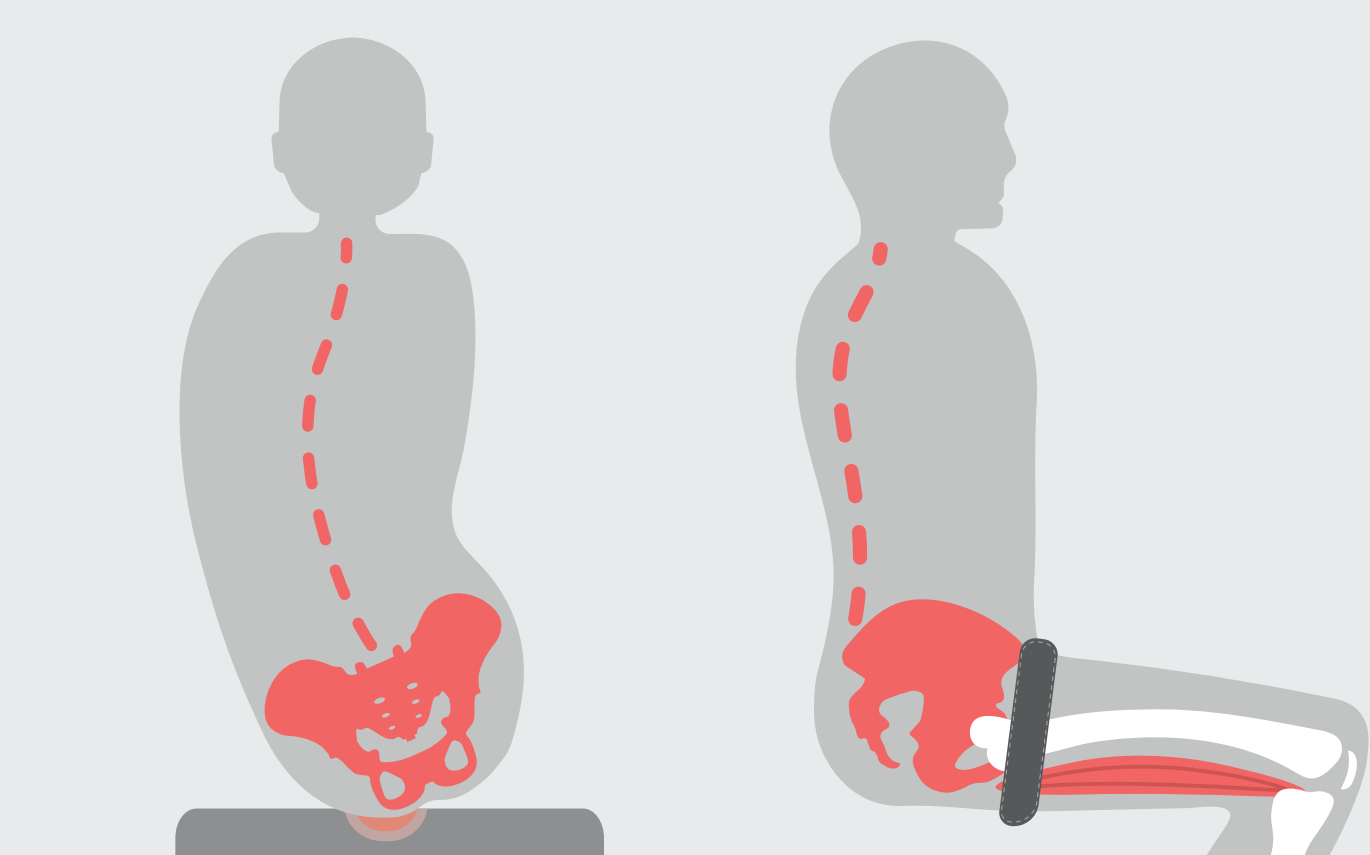
#### Anterior Pelvic Tilt

- Use a 4-point belt
- Position the primary strap 0–30° anterior to ASIS and the secondary straps between 70–90°
- Use bilateral pull to discourage any pelvic rotation



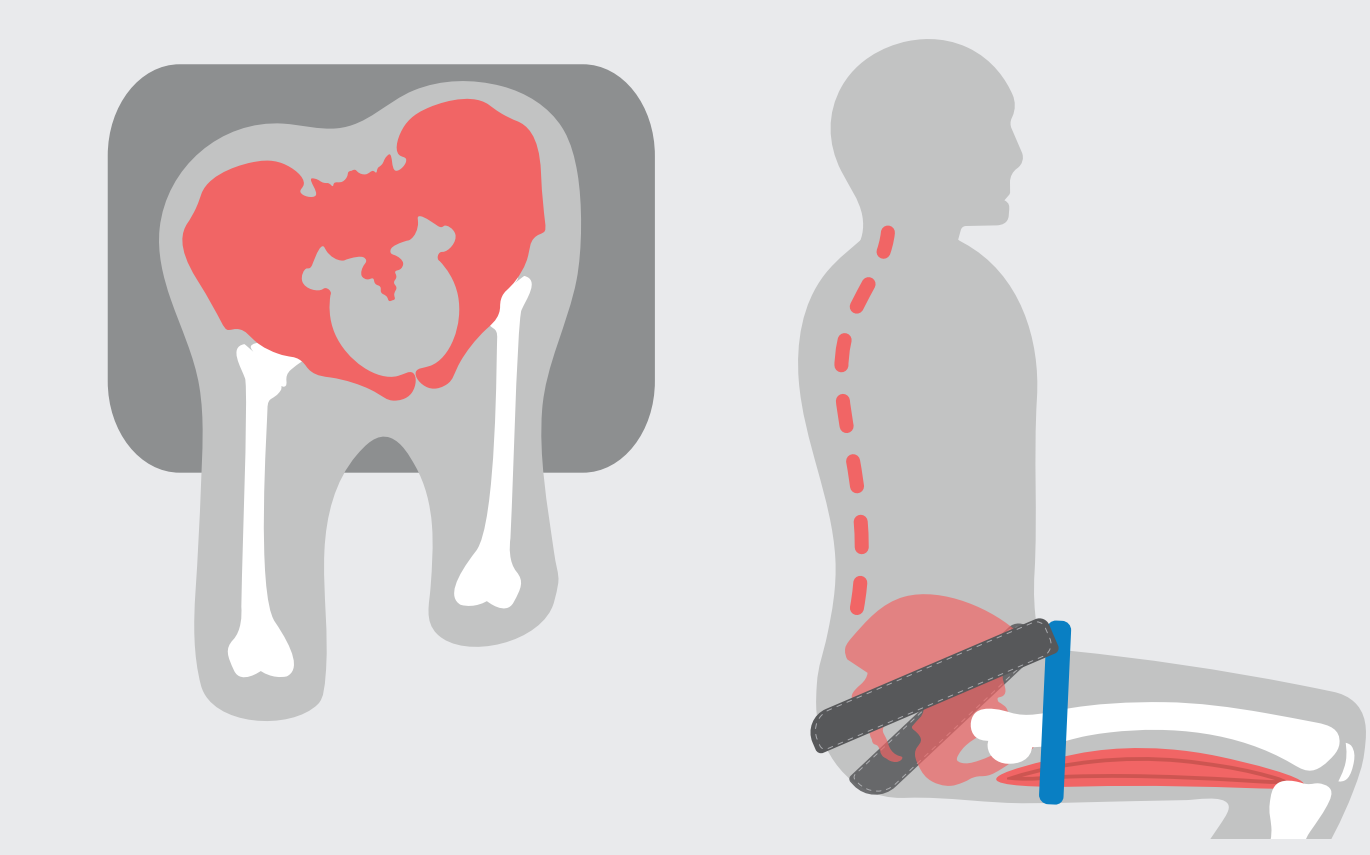
#### Pelvic Obliquity

- Use a 2-point belt
- Position the belt 60–90° anterior to ASIS, over top of thighs
- Unilateral pull of belt combined with thoracic supports may control obliquity
- Consider use of obliquity inserts on seat base if pelvis still oblique
- 4-point belt can provide additional security. Secondary straps positioned near vertical



#### Pelvic Rotation

- Use a 4-point belt
- Position the primary belt at approximately 30° anterior to ASIS
- Primary belt attachment points can be unilaterally fixed i.e. 30° and 45°
- Secondary straps positioned at 45-90°



### Take Home Message:

- Assess in lying and sitting. Use manual assessment to ascertain magnitude and direction of support needed
- Make use of primary supports (seat back & base) first and then secondary (laterals, hip guides, belts & harnesses)
- Incorrect pelvis & belt positioning can result in impeded head, trunk and upper limb function
- Assessment for all supports should be made on an individualised basis

### References

- Cimolin, V. et al., 2013. Comparison of two pelvic positioning belt configurations in a pediatric wheelchair. Assistive technology, 25(4), pp. 240-246. Lange, M., 2008. The Pelvis: using secondary supports in positioning [online]. Mobility Management, 08 July. [Online]. Available from: <https://mobilitymgmt.com/articles/2008/07/01/the-pelvis-usingsecondary-supports-in-positioning.aspx> 2.
- Siekman, A., 2013. The influence of belt use on reach and push function in active wheelchair users [presentation]. International Seating Symposium, 8th March 2013. [Online]. Available from: [http://www.iss.pitt.edu/ISS2013/ISS2013Program/SD2/PS06/PS602/ISS2013\\_Handout\\_PS6\\_2.pdf](http://www.iss.pitt.edu/ISS2013/ISS2013Program/SD2/PS06/PS602/ISS2013_Handout_PS6_2.pdf)
- Stickney, B. and Story, M., 2011. Controlling the pelvis – a practical guide [Lecture]. Canadian Seating & Mobility Conference, 18th February 2011. [Online]. Available from: [http://www.csmc.ca/docs/archives/2011\\_archive/ws/W09%20-%20CONTROLLING%20THE%20PELVIS%20-%20A%20PRACTICAL%20GUIDE.pdf](http://www.csmc.ca/docs/archives/2011_archive/ws/W09%20-%20CONTROLLING%20THE%20PELVIS%20-%20A%20PRACTICAL%20GUIDE.pdf)

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\*Conflict of Interest: James Gilmour is employed as an occupational therapist by Leckey



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