

Focus on Function

Implement Adaptive Seating
for Active Sitting

Presenter: Zach Huleatt, PT



Adaptive Seating for Function



Enabling active sitting posture



Development of trunk sitting balance



Allowing ADL and function – hands are available once trunk supported



Support symmetry in sitting

Passive Sitting

Restful; encourages a safe, symmetrical position

- Knees are higher than hips
- Trunk is reclined
- May have a posterior pelvis
- Feet are on raised footplates



Active Sitting

Encourages independent, active control

- Anterior or neutral pelvic tilt
- Feet placement for potential weight bearing
- Slight forward lean of the trunk
- Option of forearms placed on a tray or support surface



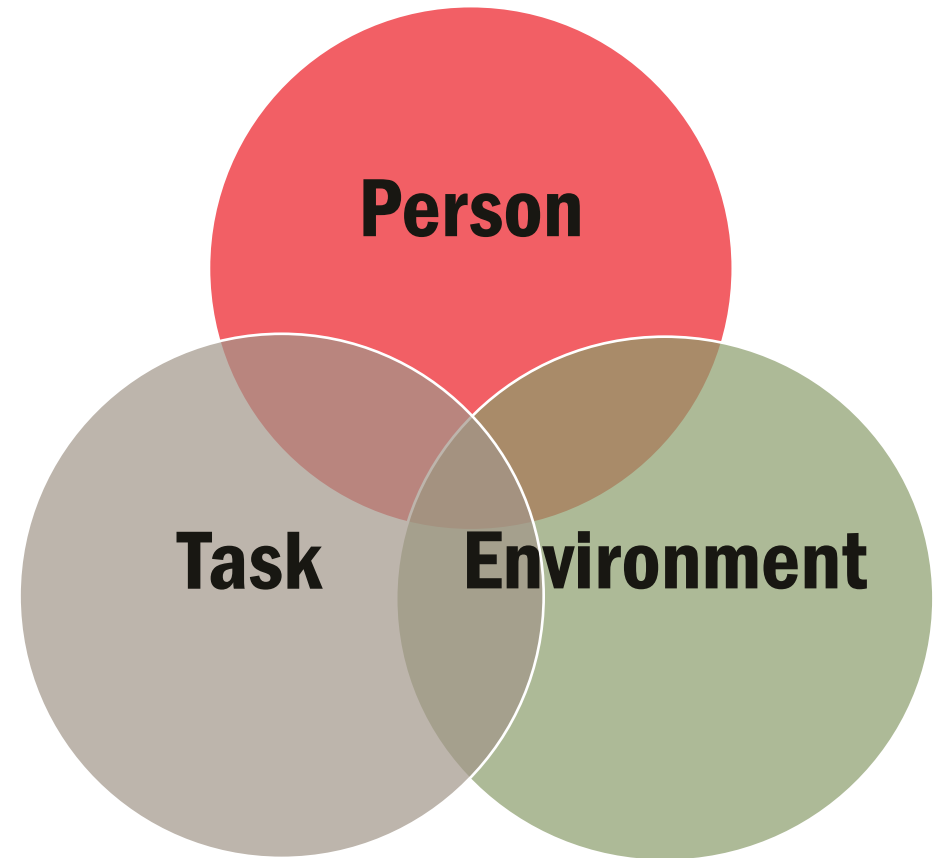
Postural Control

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The ability to control our bodies above our base of support; to hold and adjust a specific position to accomplish a task.

Saavedra, 2020

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Functional Sitting



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A seated position in which children with cerebral palsy gain head, trunk, and foot control with the maximum degree of independent function while performing arm and hand movements during tasks.

Dighe, 2019

”

Functional Seating

- Weight bearing surfaces – base of support
- Position of pelvis – stability/mobility
- Alignment

Costigan, 2011



Weight-bearing Surfaces

Base of support

- Horizontal or forward-sloped seat, clearance at back of knees
- Contact between seat back and lower back
- Consistent foot support

Costigan, 2011



Anterior Tilt

This study suggests that sitting in an anterior sitting posture... facilitate(s) increased trunk extension.

Miedenar, 1990

Data from this study reveal that an approximately 10° anterior seat tilt may be beneficial for children with cerebral palsy, affecting spinal elongation, reducing dynamic curvatures, and improving sitting stability.

Sochanewskyj, 1991

The results suggest that anterior inclination of seat surface may provide a positive effect on respiratory function in children with spastic diplegic CP.

Shin, 2015

Foot Support



Foot-support enhanced the children's capacity to modulate trunk extensor activity, which was associated with improved reaching quality.

Angsupaisal, 2019



- Consider muscle imbalances
- Foot placement can impact position of pelvis



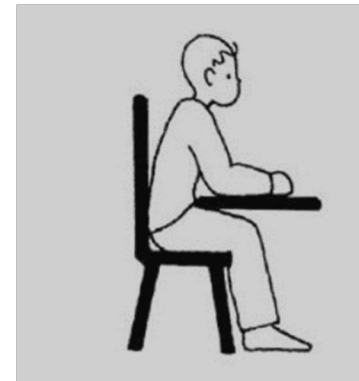
Alignment

- Position lower extremities to support upper body
- Appropriate external supports to upper body
- Align trunk and neck/head

Costigan, 2011



Weight-bearing surfaces & Position of pelvis



Scoliosis

Three points of control

- Two to fix
- One to adjust
- As far apart as possible from each other

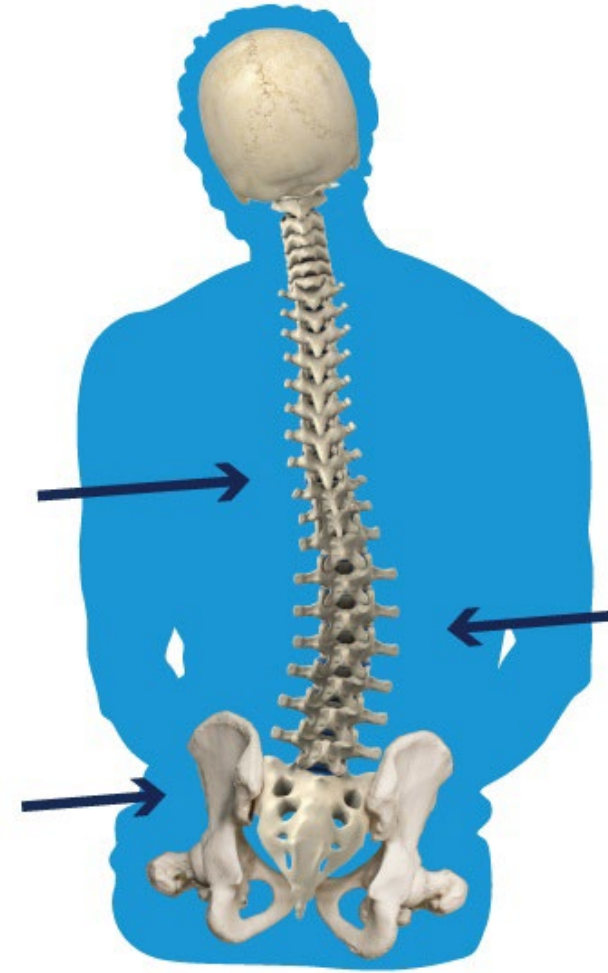
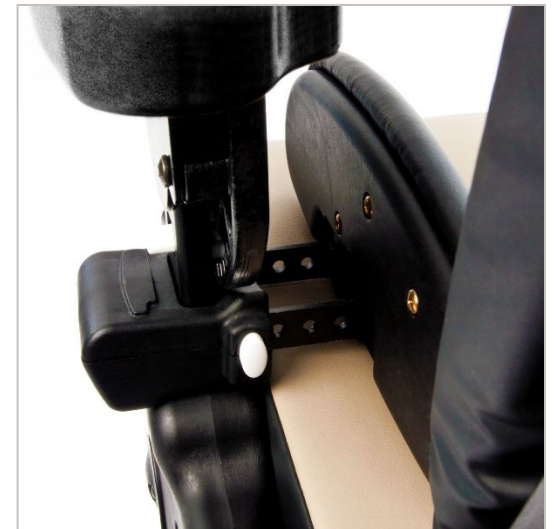
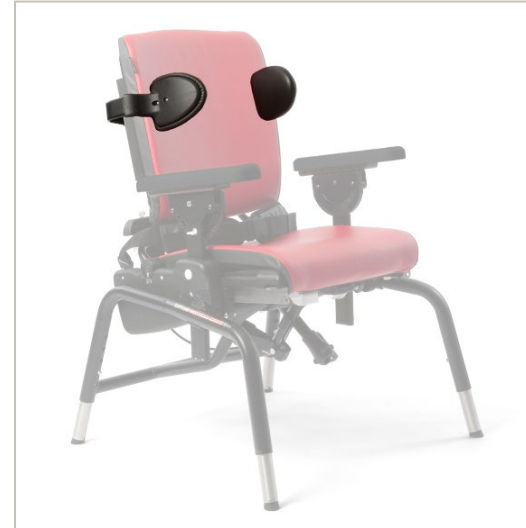


Illustration Source: <https://hub.permobil.com/blog/justification-for-lateral-trunk-supports>

Scoliosis

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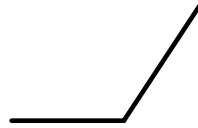


Backrest Angle and Seat Tilt

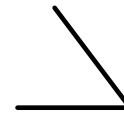
Backrest Recline



90° angle



Open seat
angle



Closed
seat angle

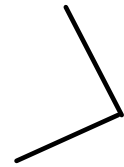
Seat Tilt



Upright



Posterior
Tilt



Anterior
Tilt

Backrest Angle and Seat Tilt

	Backrest Angle Forward	Backrest Angle Reclined
Seat Tilt Anterior	Backrest Forward Seat Tilt Anterior <i>Active sitting, promote forward lean</i>	Backrest Reclined Seat Tilt Anterior <i>Early weight acceptance, posture</i>
Seat Tilt Posterior	Backrest Forward Seat Tilt Posterior <i>Reduce tone, use eye gaze device</i>	Backrest Reclined Seat Tilt Posterior <i>Pressure relief, digestion</i>



Trunk Control and Motor Function

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The evaluation of trunk control can provide valuable information for functional abilities of children with spastic CP.

Kallem, 2009

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Study suggests a strong association between segmental trunk postural control and gross motor function and mobility with significant clinical implications for the treatment of children with CP.

Curtis, 2015

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MOVE:

Mobility Opportunities Via Education/Experience



Sit-to-Stand



Sit-to-Stand (STS)

“ Impairments in postural control during the STS movement are related to functional performance. Pavão, 2014 ”

“ The ability to transfer from sitting to standing and from standing to sitting predicted independent walking in young children with CP.”

Begnoche, 2016 ”

“ The ability to sit-to-stand independently may be an important precursor skill for independence in upright mobility and self-care for children with moderate to severe mobility limitations.

Chaovalit, 2022 ”

Dynamic Seating

- Dissipate client forces to reduce active extension
- Protect a client from injury by reducing intermittent and sustained forces
- Protect wheelchair seating, mounting hardware, and the frame from loss of alignment and damage
- Provide movement to decrease agitation and increase alertness



Lange, 2023; Video Credit: Seating Dynamics

Active Sitting with Adaptive Seating

Body Structure & Function	Activity	Participation
✓ Positioning to improve musculoskeletal alignment ✓ Positioning to promote lung clearance and respiratory care	✓ Improved postural control to swallow, speak, see, hear, reach, and engage ✓ Support for feeding, whether self-feeding, assisted oral feeding, or via g-tube ✓ Potential to improve sit-to-stand transitions and stand-pivot transfers	✓ Improved access to varying-height surfaces for activities ✓ Ease of access through doorways/in smaller spaces ✓ Improved arm and hand reach to interact and participate, such as use of AAC (Augmentative and Alternative Communication)

Thank You

