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ActiveHeight™

Clinical Resources

by Permobil Academy



ActiveHeight

ActiveHeight is the Permobil power seat function for vertical elevation of the seat. Common terminology of this seat function includes:

- power seat elevation
- power elevating seat
- power adjustable seat height
- high low

Waugh & Crane (2013) describe the seat function as an electromechanical lift that provides adjustable levels of vertical seat to floor height. The seat angles do not change with seat elevate. Whilst elevate is most often seen as a vertical raise from a standard seated height, it also includes the function of lowering the user towards the ground (Arva et al, 2004) as seen in the Permobil K450.



Permobil Academy produces clinical tools to assist Clinicians in practice. If you have a suggestion for a new tool, please let our education team know:

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Clinical Benefits

ActiveHeight for function

Wheelchair users are typically seated at a height that is functional for transfers or for optimal stability of the wheelchair base, however this height is often low relative to a person in standing. Being seated at a height that is relatively low can be challenging when a person is living or working in an environment that is not designed for a wheelchair user, as work surfaces or cupboards are positioned for a person to access in standing.

ActiveHeight allows a person to raise their seat height, potentially bringing them to a height that allows them to access unmodified environments with increased ease, this may allow a person to participate in activities such as:

- Meal preparation – increased height allows improved vision and safer reach for cooking
- Household activity of daily living tasks, such as managing laundry or cleaning tasks
- Reaching into overhead cupboards in a kitchen or office
- Accessing office equipment – such as photocopiers, un-modified work stations



ActiveHeight for transfers

Some wheelchair users find transferring out of a wheelchair seat challenging, this may be due to lower limb weakness limiting their ability to successfully complete a sit to stand, or due to challenges in managing a slide board transfer.

ActiveHeight can assist with wheelchair transfers by:

- Allowing a person to raise their seat to floor height to reduce the strength demands needed to perform a sit to stand
- Optimise the influence of gravity during slide board transfers (or similar), by allowing the wheelchair seat to be slightly raised relative to the surface they are transferring to, this can be useful when a person is living or working in an unmodified environment

ActiveHeight for social interaction

For wheelchair users that spend a significant amount of time with people who are in standing, being seated at a lower height can make social interaction more challenging. Being seated at a lower height means that a wheelchair user needs to look upwards to make eye contact and/or communicate with a person in standing, this can result in a person sitting in increased cervical extension for prolonged period of time. For some users who have a significant thoracic kyphosis, achieving this upwards gaze may not be possible. ActiveHeight allows a person to increase the height of their seat to allow a level gaze for eye contact and to communicate with their standing peers.



Funding

ActiveHeight is a power seat function that requires clinical rationale to be funded. This rationale can be supported through the use of person centred goals relevant to the funding source.

Options to consider:

Transfers

What issues does the person have transferring out of their chair? How does the ability to raise the seat height assist with improving this transfer? Consider all potential transfers – bed, alternative chair, commode, etc.

Activities of daily living (ADLs)

How is the person currently completing their activity of daily living tasks? Is this consistent in different environments – e.g., work, home, family members homes, etc. How does the ability to raise the seat height assist with these tasks?

Environment

What vertical access tasks could be completed independently or with less assistance with the provision of ActiveHeight? For example, would ActiveHeight allow a person to access high cupboards, clothes racks, wall mounted dryers independently? Consider work, home and community environments.

Roles and responsibilities

Does the person have particular roles and responsibilities that require them to be seated at a particular height? For example, does the person have a role that requires them to make eye contact when greeting colleagues or peers as part of successfully completing their role? Are they presenting to community groups and need to be able to scan a room or be easily seen by an audience? Or are they taking care of children or other dependents and need to be able to access wardrobes and raised cupboards as part of assisting with their care?



Permobil Specific

ActiveHeight is unique in that while elevating, the seating system repositions back over the base 3.5" to maintain optimal forward stability, allowing the user to get closer to objects.

Full suspension remains available when the seat is fully elevated, so the user can keep pace with a smooth ride at a top speed of 5 kmph in full elevation.

ActiveHeight enables a seat elevate options of 12" or 14" (up to 35.5cm) from the seated height.

Supporting Literature

Arva, J., Schmeler, M.R., Lange, M.L., Lipka, D.D., & Rosen, L.E. (2009). RESNA Position on the Application of Seat-Elevating Devices for Wheelchair Users. *Assistive Technology*, 21(2), 69-72.

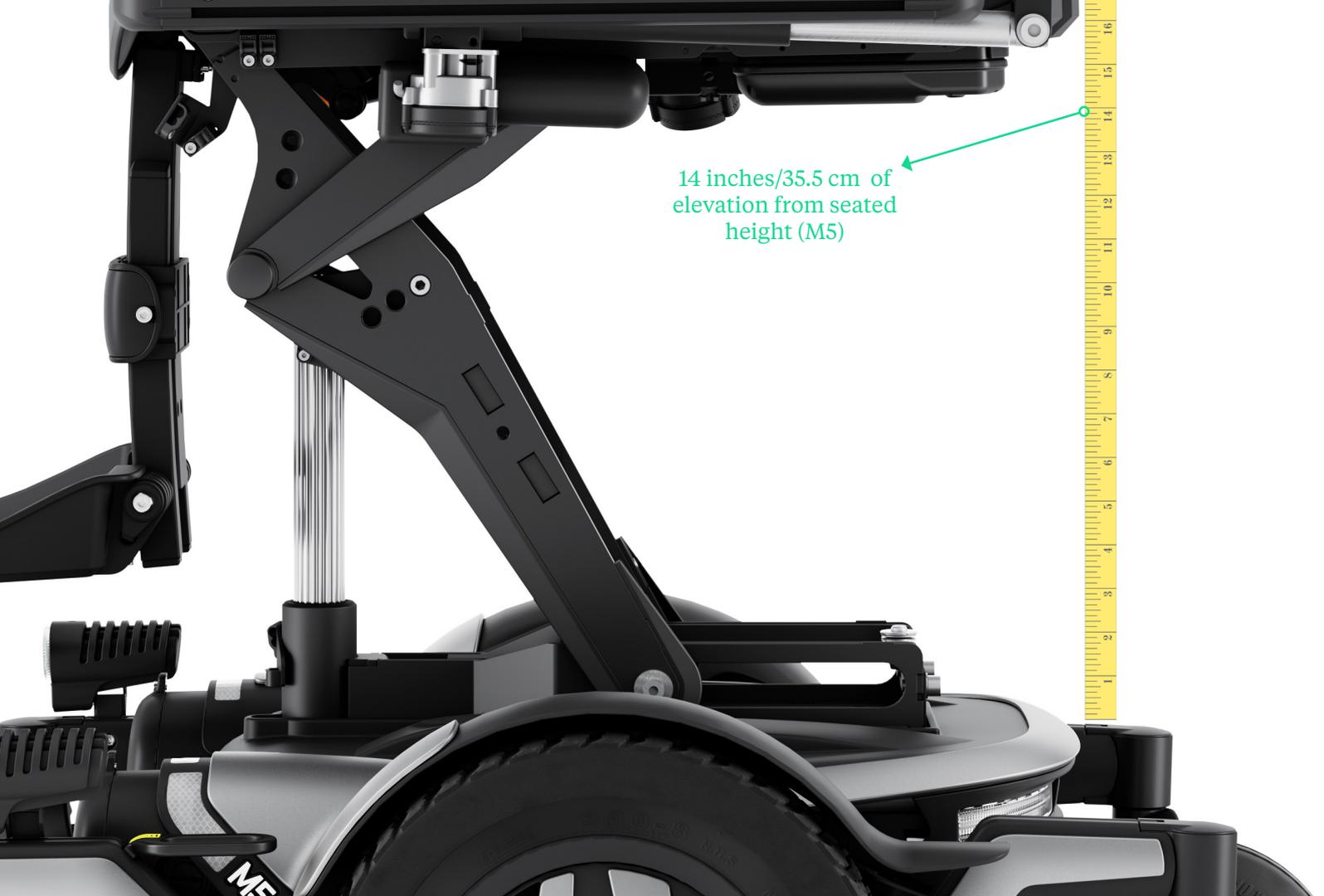
Diebo, B., Challier, V., Henry, J., Oren, J., Spiegel, M., Vira, S., Lafage, V. (2016). Predicting Cervical Alignment Required to Maintain Horizontal Gaze Based on Global Spinal Alignment. *Spine*, 41(23), 1795-1800.

Janssen, W., Bussmann, H., & Stam, H. (2002). Determinants of the Sit-to-Stand Movement: A Review, *Physical Therapy*, 82(9) 866-879.

Paralyzed Veterans of America Consortium for Spinal Cord Medicine (2005). Preservation of upper limb function following spinal cord injury: a clinical practice guideline for healthcare professionals. *The journal of spinal cord medicine*, 28(5), 434-70.

Requejo, P.S., Mulroy, S.J., Haubert, L.L., Newsom, C.J., Gronley, J.K., & Perry, J. (2008). Evidence-Based Strategies to Preserve Shoulder Function in Manual Wheelchair Users with Spinal Cord Injury. *Topics in Spinal Cord Injury Rehabilitation*, 13(4), 86-119.

Sabari, J., Shea, M., Chen, L., Laurenceau, A., & Leung, E. (2016). Impact of Wheelchair Seat Height on Neck and Shoulder Range of Motion During Functional Task Performance. *Assistive Technology*, 28(3), 183-189.



14 inches/35.5 cm of elevation from seated height (M5)



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