karma A Better Wheelchair, A Better Fit

Flexx Clinical Justification

Foot-Propel

By adjusting the seat height, depth, and rear axle position, the system optimizes foot propulsion efficiency, ensures proper lower limb alignment, and eliminates environmental interference by removing the leg rest. It also focuses on preventing sacral pressure and skin shear forces, while balancing propulsion and rearward stability.

Seat Height: The Key to Propulsion Efficiency — For foot-propel users, the goal is for the user to have feet flat on the ground while seated securely, with approximately 100°–110° of knee extension range for effective force application.

Preventing shear injury: If the seat is too high, the user will shift the pelvis forward to reach the ground, causing sacral pressure and shear forces.

Seat Depth: Ensuring adequate popliteal space — Recommend seat depth one to two inch less than actual thigh length measurement (e.g., measured 17 inches, set to 15 or 16 inches). This additional space not only protects the popliteal fossa but also provides greater movement range during ground push-off and leg recovery.

Legrest Removal and Net Bag — Clearing interference: Although legrests can swing outward, removing them entirely in tight indoor spaces (e.g., home bathrooms) significantly prevents interference with the environment and the user's feet. Net Bag: The net bag is not merely for storage but to improve assistive device compliance. Without an under-seat net, families often refuse to remove legrests because there is nowhere to put them.

Rear Wheel Center of Gravity: Balancing propulsion force and anti-tipping — When the center of gravity (axle) is positioned rearward, more weight is distributed to the front casters. While this increases stability, foot-propel becomes slightly more difficult on carpet or uneven surfaces.

Rearward center of gravity safety: For foot propel users, the center of gravity frequently shifts forward and backward with ground push-off, a rearward axle position provides sense of security and, combined with anti-tippers, prevents tipping during forceful push-off.

Accessory / Feature	Clinical Application for Amputation
Adjustable Seat Depth	Proper seat depth helps the user sit securely and comfortably by minimizing movement on the seat, which reduces pressure and shear forces. Fine-tuning using extension tubes can be performed to maintain approximately 2-3 finger-widths of clearance behind the popliteal fossa. This ensures the user's back remains in full contact with the backrest, avoids compression of the sensitive neurovascular structures in the popliteal region, keeps neutral pelvic alignment, and reduces the risk of the pelvis sliding forward.
Adjustable Seat-to-Floor Height	Lowering the seat height to approximately 390 mm allows the user's feet to rest flat on the ground, providing sufficient friction to pull the wheelchair forward and increasing independent mobility.
Adjustable Seat Angle (Seat Dump)	Depending on the user's trunk control ability, reducing the between front and rear seat height improves transfer convenience and upper-limb wheelchair propulsion efficiency.

Adjustable Rear Wheel Axle	Repositioning the rear wheel axle posteriorly increases the wheelchair's base of support, significantly enhancing stability.
Flip-Back Armrest	With the armrests flipped back, the wheelchair seat surface aligns seamlessly with the bed surface or transfer board. This eliminates barriers to lateral transfer, significantly reducing energy expenditure and fall risk during transfers.
Quick-Release Swing In/Out Legrest	The entire support structure can be swung outward and detached. Swinging the legrests away allows the wheelchair to be positioned closer to the target surface (e.g., toilet or hospital bed), shortening the physical transfer distance and reducing risk for both the caregiver and the user both during transfer and foot-propel.
Net Bag	Removing legrests and storing them in the net ensures a clear path for foot propulsion, preventing secondary injury due to interfering.

The clinical recommendations provided in this document are for professional therapists' reference only and should not replace individualized clinical assessment. The actual prescription should be determined by healthcare professionals based on the user's physical functions, home environment, and individual needs. Karma Medical reserves the right to change product specifications.

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