

Power Wheelchair Features and Accessories

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Fact Sheet

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A power wheelchair is required for clients with spinal cord injury who are unable to propel with their upper extremities, require power seating functions to accomplish effective pressure relief and positioning or have co-morbidities such as shoulder pain or limited endurance that reduce the ability to propel a manual wheelchair. The primary components of a power wheelchair include the power wheelchair base and seating system. The wheelchair base consists of the propulsion system (motors, batteries, electronics) and wheels, while the seating system is comprised of the backrest, seat cushion, arm, and leg support system.¹

Power Wheelchair Propulsion System

Power wheelchairs are classified as front-, mid-, or rear-wheel drive according to the base's center of gravity and drive wheel location. The wheelchair base should be selected based on the client's home and community environment/terrain, safety in selected wheelchair base, transportation of chair, and the client's preference. There are pros and cons to each of these types of drive options.

Front-Wheel Drive: Propulsion wheels located in front of the wheelchair base with casters in the rear.

- Pros: Stable, tight turning radius especially with 90-degree turns, and efficient in outdoor terrain and over uneven surfaces.
- Cons: When travelling fast, the chair may fishtail.^{1,3}

Mid-Wheel Drive: Propulsion wheels located in the middle of the wheelchair base with a set of casters in the front and a set of casters in the rear.

- Pros: Tight turning radius in a circle creating good indoor mobility.
- Cons: May not be as effective negotiating uneven outdoor terrain.^{1,3}

Rear-Wheel Drive: Propulsion wheels located in the rear with casters in the front of base.

- Pros: Stable, high outdoor speeds.
- Cons: Larger turning radius making it difficult to negotiate indoors.^{1,3}

Basic Power Wheelchair Electronics

A power wheelchair with three or more power seating functions or with the use of an alternative drive input device requires an expandable control box, harness, and multi-function controller. These electronics allow the user to operate the multiple power functions through the joystick. Clients in power wheelchairs can utilize either a standard proportional drive control (i.e., standard joystick), or a non-proportional drive control (i.e., sip-n-puff drive).³ See Power Wheelchair Alternative Drive Controls fact sheet for further details (to be released in 2019).

Basic Power Seating Functions:

Power seating functions include: power tilt, recline, elevating leg rests, and seat elevation:

- Tilt-in-space allows the client to maintain a seat to back angle while changing the orientation in space.
- Recline allows for a change in the seat to back angle.
- Elevating leg rests allow for change in position from flexion to an extension of the knees and often elevates with articulation to maintain appropriate positioning.²

These changes in position provide the client with the ability to: perform pressure relief, increase tissue perfusion, manage medical complications including orthostatic hypotension or autonomic dysreflexia, aid in positioning, trunk control and balance, and manage edema. Power functions can also assist in essential ADLs including positioning for bowel, bladder, and clothing management. Sitting tolerance can also be improved via change in position with power functions to reduce pain, fatigue, and spasticity which may otherwise limit the client's ability to stay in wheelchair.²

Power seat elevation: Seat elevation can provide a client with independence during transfers by creating downhill angle as well as reduce risk of injury to shoulder by optimizing transfer height to improve shoulder mechanics. With use of seat elevation, the client may gain access to many home and community features including light switches and door handles that may otherwise be out of reach. Seat elevation allows other safety benefits including visibility to motorists when crossing streets. The elevation feature may also provide psychological benefits by allowing the client to interact with other individuals eye to eye.⁴

Power Chair Seating Support System:

The seating support system is comprised of the back, seat (including cushion), head, arm, lower leg and foot support. Many different supports can be added at the trunk, pelvis, upper and lower extremities to maintain optimal alignment and posture where paralysis is present. These supports can often be flip up/down, removable, or swing away for ease of transfers. Common postural support devices for clients with spinal cord injury often include lateral trunk supports, lateral pelvic supports, lateral thigh supports, lateral knee supports, trunk or pelvic positioning belt, arm support, posterior upper arm supports or arm troughs, and ankle straps.³

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