

## CLINICAL RATIONALE/JUSTIFICATION FOR SMARTDRIVE POWER ASSIST

This information is only a guide. Permobil recommends that a clinician experienced in seating and mobility be consulted to determine if these features are appropriate for the user's particular needs. Permobil provides this information to assist prescribing therapists. Each client should be considered as an individual with specific clinical needs based upon individual assessment.

### **Client medical needs/presentation:**

Client presents with limited strength/weakness of the upper extremities

Client presents with pain in upper extremities

Client presents with limitations to range of motion of the upper extremity joints

Client presents with decreased endurance/fatigue

Client presents with fluctuations in muscle tone/spasticity

Client presents with risk of skin and tissue breakdown or history of skin/tissue breakdown (might be a result of shear/friction related to strained propulsion or poor positioning during propulsion)

Client presents with high risk of upper extremity overuse injury

Client has a history of repetitive strain injury (rotator cuff, carpal tunnel syndrome)

Client has postural deformities/postural instability and these are worsened through strain of propulsion

Client is unable to self propel a manual wheelchair for a full day and perform Activities of Daily Living tasks

Client has difficulties or is unable to cross a street in a safe time

Client is unable to transport items within home and outside of home and propel at the same time

Client is unable to manage inclines, uneven terrain, thresholds within the home or changes in flooring



### **Product requirements:**

Lightweight, Transportable - The SmartDrive is 12.5 pounds and can be lifted easily into a vehicle or on and off the wheelchair by client and/or caregiver.

Removable from wheelchair - SmartDrive is easily removed or installed onto the camber tube (or the quick release attachment on a folding chair).

Full day battery life - The SmartDrive will allow the client to complete daily activities without the worry of the battery running low.

Programmable and modifiable - The Pushtacker device and app allow the clinician and client to program speed and acceleration rate as well as on/off for safety and independence. The settings can be changed easily on either the Pushtacker device and/or the app.

Provides power to manual wheelchair - Using the SmartDrive reduces upper extremity propulsion strokes and increases coast times, therefore lessening upper body movement and strain and providing energy conservation for the client.

The SmartDrive enhances safety during use. For example, the client now has speed to cross at street lights and power to manage inclines and uneven terrain.

Use of the SmartDrive allows for enhanced function while moving in the wheelchair. The client can hold object in one hand while still controlling wheelchair with other hand (for temporary transport of items). The client can carry items more safely as client is in a stable position while moving.

The SmartDrive can be used by a caregiver as appropriate.

**SmartDrive Power Assist assists the client in meeting the above stated needs.**

### **References:**

Consortium for Spinal Cord Medicine, 2005. Preservation of Upper Limb Function Following Spinal Cord Injury: A Clinical Practice Guideline for Healthcare Professionals.

Kentar, Y. et al. 2018. Prevalence of upper extremity pain in a population of people with paraplegia. Spinal Cord 56, 695-703. Published online, <https://doi.org/10.1038/s41393-018-0062-6>

Nash, Mark S., et al., 2008. Power-Assisted Wheels Ease Energy costs and Perceptual Responses to Wheelchair Propulsion in Persons with Shoulder Pain and Spina Cord Injury. Arch Physi Med Rehabil, Vol 89.

Pradon, D, et al. 2017. Effect of the use of electric assistance on the propulsion of the manual wheelchair Smartdrive on the biomechanical parameters of the propulsion in ecological situation. Annals of Physical and Rehabilitation Medicine.

<https://permobil.ca/smartdrive/>