

Manual Wheelchair Accessories

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Introduction

Manual wheelchair accessories are addressed by this guideline.

Health Equity Consideration

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

Criteria

A standard wheelchair is indicated when **all** of the following apply:

- The individual needs to use a wheelchair in the home to take care of their daily needs.
- The individual has tried walkers and other less restrictive assistive devices, but they are not supportive enough to enable them to take care of their daily needs.
- The individual or a caregiver can manage the wheelchair effectively.

When medical necessity for a manual wheelchair (as above) is met, wheelchair accessories are indicated when required for the individual to function successfully in the home or to take care of their daily needs.

Adjustable Height Arm Rests

An adjustable height arm rest (HCPCS E0973, K0017, K0018, K0020) is indicated when the individual has documentation of a medical condition that necessitates an adjustable arm rest.

Arm Trough With or Without Hand Support

An arm trough (HCPCS E2209) is indicated when there is documentation of **any** of the following:

- The individual has severe muscle weakness or paralysis.
- The individual requires support for their upper extremity.

Elevating Leg Rests

An elevating leg rest (HCPCS E0990, K0046, K0047, K0053, K0195) is indicated when there is documentation of **any** of the following:

- The individual has swelling in their legs.
- The individual cannot bend their knee(s) all the way.
- The individual is post-amputation and needs support of a residual limb(s).
- The individual is using a reclining wheelchair.

Nonstandard Seat Frame

A nonstandard seat frame (HCPCS E2201, E2202, E2203, E2204) is indicated when there is documentation the individual is unable to use a standard wheelchair seat frame.

Nonstandard Seat Height for a High Strength, Lightweight, or Ultra Lightweight Wheelchair

A nonstandard seat height for a high strength, lightweight, or ultra lightweight wheelchair (HCPCS K0056) is indicated for **both** of the following:

- The individual has a covered lightweight or ultralight weight manual wheelchair.
- The individual is unable to use a standard wheelchair seat height.

Manual Fully or Semi-Reclining Back

A manual fully or semi-reclining back (HCPCS E1225, E1226) is indicated when the individual needs to recline due to **any** of the following:

- The individual has a medical condition that puts them at high risk to develop a pressure sore where their body touches the seat.
- The individual needs to perform intermittent catheterization while in the wheelchair.
- The individual has increased muscle tone.
- The individual has a medical condition that limits their ability to move in the wheelchair.

Positioning Accessories

A positioning device (HCPCS E0953, E0956, E0957, E0960, E0978, E0980) is indicated when the individual needs to keep their spine or pelvis stable due to **any** of the following:

- The individual has weak trunk muscles.
- The individual has asymmetry in their sitting position.
- The individual has increased muscle tone.

Headrest

A headrest (HCPCS E0955, E0966) is indicated when there is documentation of **any** of the following:

- The individual has a covered reclining back or a tilt in space manual wheelchair.
- The individual needs head and/or neck support.

Heel Loop/Holder and/or Toe Loop/Holder

Heel loop/holder and/or toe loop/holder(s) (HCPCS E0951, E0952) is indicated when there is documentation the individual requires lower extremity support for of **any** of the following:

- The individual has weak lower extremity muscles.
- The individual has a nerve, muscle, or bone disease.

Hand Rims

Hand rims (HCPCS E0967) are indicated when there is documentation of **both** of the following:

- The individual has a nerve, muscle, or bone disease.
- The individual is unable to propel the wheelchair without special hand rims.

Push-Rim Activated Power Assist Device

A push-rim activated power assist device (HCPCS E0986) for a manual wheelchair is indicated when there is documentation of **all** of the following:

- The individual must use a wheelchair full time to take care of their daily needs.
- The individual has been independent using a manual wheelchair for at least one year.
- The individual is unable to self propel the manual wheelchair over long distances due to weakness, shoulder overuse, or injury.
- The individual must have a wheelchair evaluation performed by a medical professional with specific training and expertise in wheelchair assessments.

- The individual has had a trial of the device and can use it safely.

Lever-Activated Wheel Drive

A lever drive device (HCPCS E0988) is indicated when there is documentation of **all** of the following:

- The individual has a nerve, muscle, or bone disease.
- The individual had a trial of the device and can use it safely.
- The individual is unable to propel the wheelchair without the lever-activated wheel drive.

Wheelchair Tray (Standard or Ventilator)

A wheelchair tray (HCPCS E0950, E1029, E1030) is indicated when there is documentation an individual requires a wheelchair tray (standard or ventilator) due to their medical condition.

Anti-Rollback Device

An anti-rollback device (HCPCS E0974, E0971) is indicated when there is documentation of **all** of the following:

- The individual uses a manual wheelchair independently.
- The individual has arm weakness or an upper extremity joint injury.
- The individual needs the anti rollback device for safety on ramps.

Crutch or Cane Holder

A crutch or cane holder (HCPCS E2207) is indicated for individuals who use a crutch or cane to ambulate for short distances.

Wheel Lock Brake Extension (Handle)

A wheel lock brake extension (handle) (HCPCS E0961) is indicated when there is documentation the individual has limited upper extremity range of motion or upper extremity weakness on the ipsilateral side.

Manual Wheelchair Accessory, Seat Lift Mechanism

A manual wheelchair accessory, seat lift mechanism (HCPCS E0985) is indicated for an individual when there is documentation of **all** of the following:

- The individual is unable to independently stand up from a manual wheelchair seated position.
- The individual can walk short distances once standing.

Dynamic Positioning Hardware for Back

Dynamic seating frame/hardware (HCPCS E2398) is indicated when there is documentation of **both** of the following:

- The individual needs dynamic movement of the wheelchair seating due to a medical condition.
- The individual is not using a tilt-in-space or reclining back wheelchair accessory.

Custom Wheelchair (some codes may include accessories listed above)

A custom wheelchair (HCPCS K0008, K0009, E1220–E1224, E1240-E1295) is indicated when **all** of the following apply:

- The individual needs to use a wheelchair in the home to take care of their daily needs.
- The individual has tried walkers and other less restrictive assistive devices, but they are not supportive enough to enable them to take care of their daily needs.
- The individual can manage the wheelchair effectively.
- Due to specific custom fit needs, the individual is not able to use a different manual wheelchair in the home.
- The individual must have a wheelchair evaluation performed by a medical professional with specific training and expertise in wheelchair assessments.

Not Covered:

Wheelchair options/accessories considered not medically necessary, not primarily medical in nature, and/or convenience items, may include, but are not limited to, **any** of the following:

- Baskets/bags/backpacks/pouches used to transport personal belongings.
- Cup or phone holders.
- Support frames for cellular phones.
- Items for transport of the wheelchair (e.g., transit options, tie-downs, mobility assistive device rack for automobiles).
- Home/property modifications or fixtures to real property including, but not limited to, ramps, accessible showers, elevators, lowered bath or kitchen counters and sinks, and grab bars.
- Options/accessories used as backups or future anticipated needs for current options/accessories.
- Options/accessories used to perform leisure or recreational activities.
- Wheelchair-mounted assistive robotic arm(s) (e.g., Jaco® Assistive Robotic Arm).
- A manual standing system for a manual wheelchair (HCPCS E2230).

Additional Information

Only one power mobility feature is indicated at a time. Additional power mobility features (including power operated vehicles, power wheelchairs, or push-rim activated power assist devices) are considered not medically necessary.

Replacement accessories/options [e.g., swingaway, detachable footrests (HCPCS K0052)] should be billed separately only when they are replacements. The most specific HCPCS code must be used when available.

Table 1: Codes included in the allowance for the primary device when provided at the same time

Included in the primary code	Used only as a replacement
Rollabout Chair (E1031)	All options and accessories
Transport Chair (E1037, E1038, E1039)	All options and accessories except E0990, K0195
Manual Wheelchair Base (E1161, E1229, E1231, E1232, E1233, E1234, E1235, E1236, E1237, E1238, K0001, K0002, K0003, K0004, K0005, K0006, K0007, K0009)	E0967, E0981, E0982, E0995, E2205, E2206, E2210, E2220, E2221, E2222, E2224, E2225, E2226, K0015, K0017, K0018, K0019, K0042, K0043, K0044, K0045, K0046, K0047, K0050, K0052, K0069, K0070, K0071, K0072, K0077
E0973	K0017, K0018, K0019
E0950	E1028
E0990	E0995, K0042, K0043, K0044, K0045, K0046, K0047
K0195	E0995, K0042, K0043, K0044, K0045, K0046, K0047

Definitions

Mobility refers to the ability to move about in one's environment.

Mobility-related activities of daily living (MRADLs, daily needs) are activities required for personal care including toileting, feeding, dressing, grooming, and bathing in customary locations within the home.

A **manual wheelchair** is a wheeled chair with a seat width and back height available in a range of sizes. The typical seat width and seat depth of an adult manual wheelchair

is 15 to 19 inches. A standard wheelchair has a seat height greater than or equal to 19 inches.

An **adult nonstandard manual wheelchair seat frame** (HCPCS E2201, E2202, E2203, E2204) has a width and/or depth of 20 inches or more. An adult standard manual wheelchair seat frame has a seat width and/or depth of 15-19 inches.

A **Nonstandard Seat Height for a High Strength, Lightweight, or Ultra Lightweight Wheelchair** (HCPCS K0056) may be required to maximize function and prevent injury. An adult standard manual wheelchair seat frame has a seat height of 17-21 inches. The front seat height of the wheelchair affects transfers and access to tables or desks. The wheelchair user's legs need to be supported and the footplates should be at least two inches off the ground for safe propulsion. The rear sitting height also affects the vertical position of the rear wheel. The ideal rear seat height relative to the hand-rim is positioned with the elbow in 100-120 degrees of flexion.

A **Push-Rim Activated Power Assist Device (PAPAW)** (HCPCS E0986) is a system that measures the force an individual exerts on the push-rim and then amplifies this force through the application of an electromechanical system. A PAPAW includes all components, e.g., drive wheels, batteries, chargers, controls, mounting hardware, etc.

A **Lever-Activated Wheel Drive** (HCPCS E0988) is an alternative drive mechanism for propulsion of a manual wheelchair. It includes a manual lever-arm mechanism attached to the wheel(s). The lever activates adjustable gears and has the capability to shift between forward, reverse, and braking.

A **Manual Wheelchair Accessory, Seat Lift Mechanism** (HCPCS E0985) is a type of wheelchair accessory used to lift the body from a sitting position to a standing position. Seat lifts are generally recommended only for individuals who are able to ambulate once they are standing.

A **Manual Wheelchair Accessory, Manual Standing System** (HCPCS E2230) is a standing feature on a manual wheelchair that brings an individual to an upright standing position. The wheelchair standing feature allows individuals to independently stand frequently, as part of their daily routine, without transferring into a separate device.

Dynamic Positioning Hardware for Back (HCPCS E2398) describes a wheelchair component that allows for movement of the wheelchair seat back. This type of system responds to a force or movement and assists an individual with musculoskeletal tone or spasticity to an upright position.

RESNA (Rehabilitation Engineering and Assistive Technology Society of North America) is a multidisciplinary professional organization "dedicated to promoting the health and well-being of people with disabilities through increasing access to technology solutions." RESNA offers certification, continuing education, and professional development.

Evidence Discussion

Purpose of technology/description of device

Medical Background

The United States Food and Drug Administration (FDA) considers wheelchair accessories to be Class I devices (FDA, 2024). As such, they are considered to be low to moderate risk, and manufacturers are not required to complete premarket notifications prior to marketing the devices.

Literature Review

- Ganesh et al. (2007) performed a cohort study at a Veterans Affairs teaching hospital to describe the characteristics of manual wheelchair users. The study included 99 individuals with a mean age of 66 and 10 comorbid medical conditions. The authors found that falls and arthritis were present in greater than 50% of patients and highly impacted the need for a wheelchair. Notably, at one month, greater than 30% of individuals had wheelchairs that did not meet common criteria for wheelchair fit; 36% of individuals reported difficulty transferring; and 61% of individuals reported difficulty propelling the wheelchair. The wheelchairs were used for bathroom mobility by 38% of the individuals. In conclusion, the authors reported a high prevalence of perception of difficulty with wheelchair use in the population studied; and thus, the authors opined that wheelchair design for older individuals with multiple co-morbidities should be prioritized.
- Heinrichs et al. (2022) reported on a randomized controlled trial to test the hypotheses that, during manual wheelchair foot propulsion forward on smooth level surfaces, lowering the seat height decreases perceived difficulty, and increases speed, push frequency, and push effectiveness. Fifty able-bodied participants used the Wheelchair Skills Test (WST) capacity scores and the Wheelchair Propulsion Test (WPT) to calculate speed (meters per second), push frequency (cycles per second), push effectiveness (meters per cycle), and the participants' perceived difficulty. Participants used one foot to propel a manual wheelchair five meters backward on a soft surface at five seat heights. The authors concluded that during manual wheelchair foot propulsion backward on a soft surface, lowering the seat height increased speed and push effectiveness, and decreased perceived difficulty. Thus, the authors opined that backward wheelchair foot propulsion on soft surfaces was affected by seat height.
- In 2023, Tefertiller et al. reported on a randomized crossover study which evaluated independence and exertion in individuals with brain injury when using lightweight wheelchairs in comparison with ultra-lightweight wheelchairs. Eighteen individuals with brain injury resulting in hemiplegia were randomly assigned to complete skills and endurance testing in three different wheelchair configurations over a three-

week period: lightweight wheelchairs, ultra-lightweight folding wheelchairs, and ultra-lightweight rigid wheelchairs. The primary outcome was the percentage capacity score from the modified Wheelchair Skills Test 4.1. Secondary outcomes included the Wheelchair Propulsion Test, 100-meter Push Test, heart rate, and rate of perceived exertion. When compared with the lightweight wheelchairs, significant differences were found favoring the ultra-lightweight wheelchairs in the Wheelchair Skills Test and time to complete the 100-meter push test. Moreover, heart rate change and perceived exertion were significantly lower for the ultra-lightweight rigid group in comparison with the lightweight group. However, significant differences were not seen with the Wheelchair Propulsion Test measures across any of the wheelchair frames. Thus, the investigators concluded that using an ultra-light weight wheelchair may lead to improved ability to complete wheelchair skills needed for successful mobility; moreover, a rigid frame may also enable faster mobility in comparison to a folding frame when hemi-propelling.

- Michael et al. (2007) performed a systematic review to determine the effects of tilt-in-space seating on outcomes for non-ambulatory individuals with neurological or neuromuscular impairment. Nineteen studies were included in the analysis. All studies looked at populations with neurological impairment, and most included children with cerebral palsy (n=8) or adults with spinal cord injury (n=8). Studies included in the meta-analysis were randomized and non-randomized trials, and participants acted as their own controls. The authors noted that six studies reported that tilting the seat back reduced the pressure under the ischial tuberosities in a range of conditions. In summary, the authors concluded that there is some evidence to suggest a posterior seat tilt reduces pressures under the pelvis for people with neurological impairment.
- Pradon et al. (2022) conducted a randomized crossover study which compared biomechanical upper limb propulsion variables and physiological exercise-related variables during the use of a wheelchair with a rear drive power assist device (RD-PAD) and a standard manual wheelchair. Twenty-two adults with spinal cord injury were recruited. The RD-PAD (SmartDrive® system) was fitted to their own manual wheelchair. The main variables measured were: handrim forces, gas exchange, and heart rate. The results of the study demonstrated that distance covered was significantly greater with the RD-PAD and peak mechanical effort during the propulsion phase was significantly lower with the RD-PAD. Heart rate, metabolic equivalent of task (MET), tidal volume, minute volume, oxygen consumption, and peak oxygen consumption were all significantly lower with the RD-PAD. Thus, the authors concluded that use of RD-PAD increased the distance covered by manual wheelchair users and reduced the energy costs of propulsion. Moreover, the authors opined that given the results of the study, use of RD-PAD might reduce the risk of musculoskeletal disorders in individuals with spinal cord injury.
- A clinical trial performed by de Groot et al. (2013) evaluated the effect of wheelchair mass, solid versus pneumatic tires, and tire pressure on physical strain and

wheelchair propulsion technique. Eleven able-bodied participants performed 14 submaximal exercise blocks in the same standardized wheelchair on a treadmill with a fixed speed (1.11 meters per second) within three weeks. Outcome measures were power output, physical strain, heart rate, oxygen uptake, gross mechanical efficiency, and propulsion technique. At 25% tire pressure, power output and oxygen uptake were higher compared to 100% tire pressure. Furthermore, a higher tire pressure led to a longer cycle time and contact angle and a lower push frequency. Extra mass did not lead to an increase in power output, physical strain or propulsion technique. Solid tires led to a higher power output and physical strain, which was amplified by increased mass. In conclusion, the authors reported that tire pressure and tire type had an effect on the physical strain of wheelchair propulsion. Notably, solid tires led to a higher power output and physical strain; moreover, increased mass had a greater effect on solid tires versus fully inflated pneumatic tires. Thus, the authors opined that it was important to optimize tire pressure and tire type.

- Kloosterman et al. (2013) conducted a systematic review to determine the advantages and disadvantages of transitioning to a power-assisted wheelchair. Ten studies measuring body function and structure reported reduced strain on the upper extremities and cardiovascular system during power-assisted propulsion compared to hand-rim propulsion. Twelve studies measuring activities and social participation reported that precision tasks were easier to perform with a hand-rim wheelchair. Wheelchair tasks which require more torque were easier with a power-assisted wheelchair. The authors concluded that power-assisted propulsion might be beneficial for individuals with reduced upper extremity strength or low cardiopulmonary reserves. In addition, individuals who have difficulty propelling a wheelchair in a challenging environment (e.g., carpets or steep inclines) may benefit from power-assisted wheelchair use. However, the authors noted that a power-assisted propulsion required additional width and weight in comparison to a hand-rim wheelchair, and thus, the accessibility of the home environment needed to be considered in proper selection of these devices.
- Rice et al. (2015) conducted a randomized controlled trial to examine the efficacy of a multifactorial intervention in non-ambulatory individuals with multiple sclerosis (MS) based on wheelchair optimization, propulsion skill/technique training, and behavioral strategies. Fourteen participants were randomly assigned to two groups: an intervention group that received custom-fit ultra lightweight manual wheelchairs with propulsion/skills training followed by three months of at-home use with the custom ultra lightweight wheelchair and weekly phone calls, and the control group that received no training and used their own wheelchairs at home. Participants were assessed at baseline and three months later for fatigue, upper extremity strength, and propulsion technique. The results of the study demonstrated that the intervention was well tolerated and no adverse events were reported. Moreover, the intervention group demonstrated increased strength, less fatigue, and a reduced application of braking torque during propulsion. Thus, the investigators concluded that a three-month

physical activity intervention based on manual wheelchair propulsion and training was safe and feasible for some wheelchair users living with MS and may produce additional benefits in the areas of strength, fatigue, and propulsion technique.

- Flemmer and Flemmer (2016) conducted a systematic review including 77 articles to examine the effectiveness of push-rim propelled wheelchairs, crank-propelled wheelchairs, lever-propelled wheelchairs, and push-rim activated power assist wheelchairs. The authors concluded that push-rim propelled wheelchairs were lighter, easier to steer, and had good indoor maneuverability but may lead to overuse injuries of the wrist and shoulder. Crank-propelled and lever-propelled wheelchairs caused less strain on the upper body compared to push-rim propelled wheelchairs, but these devices were larger, heavier, and less convenient to use indoors. In conclusion, the authors noted that the majority of manual wheelchairs were push-rim propelled with no gearing or power assistance. Although they were light and easy to maneuver on a flat surface, evidence indicated that push-rim propulsion was inefficient and straining on the upper body. Hence, the long-term repetitive overuse injuries associated with push-rim propulsion may cause shoulder and wrist pain and injury that may force an individual to use powered propulsion.
- Smith et al. (2016) conducted a systematic review to identify factors associated with participation in social and community activities for adult wheelchair users. Thirty-five studies were included in the analysis. Twenty-nine studies were quantitative, including 28 cross-sectional designs, and one single-group pre-post study. The systematic review focused on social and community participation in the following International Classification of Functioning, Disability and Health (ICF) participation domains: community, social and civic life (including community life, political life and citizenship, and recreation and leisure), interpersonal interactions and relationships, and major life areas (including education, and work and employment). The authors found that wheelchair factors, accessibility, skills with wheelchair use, pain, finances, and education were modifiable factors frequently reported to be associated with participation. Thus, the authors opined that multi-modal interventions might be more effective at improving the participation of wheelchair users than a single intervention, which only targets one of these factors. For example, an intervention which focuses on improving wheelchair skills and reducing barriers to accessibility may be more effective than an intervention focusing on one of these factors alone.
- A cross-sectional study performed by Sakakibara et al. (2017) aimed to characterize the life-space mobility and social participation of manual wheelchair users. The study included 49 individuals aged 50 years or older who were using a manual wheelchair on a daily basis for the past six months. Life-space mobility and social participation were measured using the Life-Space Assessment and the Late Life Disability Instrument. The results of the study demonstrated that occupancy time and distance traveled are statistically significant predictors of life-space mobility. The authors opined that the finding that lower occupancy time and greater number of bouts were associated with participation that was more frequent, which raised

accessibility and safety issues for manual wheelchair users. Those individuals who were more active in their social participation also used their wheelchairs to transition more often between their various activities.

- A study performed by Thomas and colleagues in 2018 aimed to characterize how wheelchair configuration changes, user variables, and usage conditions affected dynamic tip probability while rolling down a slope and contacting a small block. Rigid body dynamic models of a manual wheelchair and test dummy were created using multi-body software and validated with 189 experiments. Dynamic stability was assessed for a range of seat angles (0° to 20° below horizontal), backrest angles (0° to 20°), rear axle positions (0 to 20 centimeters from base of backrest), ground slopes (0° to 15°), bump heights (0 to 4 centimeters), wheelchair speeds (0 to 20 kilometers per hour), user masses (50 to 115 kilograms), and user positions. The authors found that the probability of forward tipping, corresponding to the greatest risk of injury, was significantly reduced for decreased speeds, smaller bumps, a reclined backrest, and a lower rear seat height. For wheelchairs with dynamic seating adjustability, when traveling downhill, adjustments to the seat or backrest can increase the likelihood of safely rolling over a bump.
- A cross-sectional study performed by Heung and Ng (2009) investigated the effect of chair seat height and turning direction on the Timed Up and Go (TUG) scores in individuals after stroke. The time taken to complete the TUG test with various chair seat heights (65%, 90%, and 115% of each subject's leg length) and turning directions (toward the affected and unaffected side) were measured for 25 individuals with subacute stroke. The study found significant differences in TUG scores between the three levels of chair seat height. The lowest TUG scores were recorded when the seat height was 115% of the subject's leg length and the highest at a seat height of 65% of the subject's leg length. In addition, turning toward the affected side was found to be significantly quicker than turning toward the unaffected side. In summary, the authors concluded that when chair seat height was optimized based on leg length, TUG scores improved. Of note, TUG times were longer when a lower chair was used, which was attributed to the positioning of the center of mass and the sit-to-stand momentum transfer dynamics. The authors noted that the design of the chair (the height of the armrests, the seat depth, and the angle of the back support) might also influence the TUG scores; thus, further exploration of these features of the chair was warranted.
- Lange, ML. (2023) conducted a case report to evaluate the clinical benefits of dynamic seating interventions over time. The author followed an individual with cerebral palsy through 15 years of wheelchair seating interventions. Throughout the study period, the subject reported multiple issues with positioning including: significantly increased muscle tone, extension patterns, extraneous movement, loss of body position in relation to the seating system, loss of alignment with other assistive technologies, high-energy expenditure, client injury and pain, and equipment damage. Dynamic seating interventions were found to eliminate injury, and improve

pain, fatigue, seating tolerance, and function. Thus, the author concluded that dynamic seating may address numerous positioning challenges in individuals with increased muscle tone in conjunction with an appropriate seating system and mobility base.

- A randomized trial performed by de Klerk et al. (2018) examined early skill acquisition with push-rim activated power-assisted wheelchairs (PAPAWs) and compared it with regular hand-rim wheelchairs (RHWs). Twenty-four able-bodied individuals were randomized to either the RHW group or the PAPAW group. The experiment consisted of five sessions with three blocks of four-minute steady-state practice. Data were collected with a drag-test, breath-by-breath spirometry, and a motion capture system. The last minute of each four-minute block was used for analysis. The results of the study demonstrated that both groups improved their mechanical efficiency, reduced their stroke rate, right-left and forward-backward deviation on the treadmill, and had a lower rate of perceived exertion (RPE) over time. The authors concluded that PAPAW was more efficient than the RHW given the reduced energy requirement of the user from the motor assist; however, the PAPAW was more difficult to control. The authors noted that future studies on PAPAWs should focus on the control needs of the user and their interaction with the power-assist technology.

Professional organizations/societies:

- A 2021 specialty practice review article by Sehgal and colleagues stated that wheelchairs should be considered for patients who do not have the lower limb strength, balance, or endurance needed for ambulation. Moreover, patients must have sufficient upper body strength and coordination to use manual wheelchairs. In summary, the authors provided a consensus recommendation that wheelchairs can provide patients with improved mobility and quality of life, but proper sizing and patient education were required to avoid injury to bony prominences and skin breakdown due to seat pressure.
- A 2023 update to the 2012 position paper published by RESNA (Worobey et al.) provided recommendations on the clinical application of ultralight manual wheelchairs (ULWCs). The review of the literature included 102 studies. The authors noted that ULWCs were customizable, including configuration and adjustability, while minimizing overall weight. Moreover, various seat configurations were available with ULWCs, which also accept external positioning devices such as cushions, back supports, and postural support accessories. When deciding on selection of an ULWC, the most frequent considerations were overall weight, configurability, and compatibility with seating and postural support needs. In addition, the authors noted that much of the original research on ULWCs focused on individuals with spinal cord injury; however, other populations may also benefit from individualized wheelchair configuration, such as pediatric individuals or those with a progressive disease such as multiple sclerosis or Parkinson's disease. In summary, the authors recommended that, for individuals

who relied on manual wheelchairs as a primary means of mobility, ULWCs were recommended due to the customizable nature of these devices.

- A specialty clinical practice guideline for the prescription of a seated wheelchair or mobility scooter provided recommendations for individuals with spinal cord injury and brain injury (EnableNSW, Lifetime Care & Support Authority, 2011) ranging from topics on the goals and evaluation, assessment and review, capacity and performance, upper limb capacity and risk of injury, wheelchair features, through to propulsion, training, transport, and maintenance. The authors noted that the mobility assistive equipment should significantly improve an individual's participation in MRADLs in the home. In addition, a willingness by the individual to use the mobility assistive equipment safely and on a routine basis should exist. The authors noted that existing conditions (e.g., limited cognition, impaired judgment, decreased vision) need to be evaluated when determining the appropriateness of any mobility assistive equipment. When mobility assistive equipment is selected to allow for participation in MRADLs, the respective environment (e.g., floor surfaces, turning radius, physical layout) must be able to accommodate the equipment. An assessment of upper extremity function (e.g., strength, range of motion, endurance, pain, deformity) should be conducted on individuals considering using a manual wheelchair to meet their MRADLs or primary role function. In circumstances where a user is unable to propel a manual wheelchair, but cannot safely and efficiently operate a powered mobility device (e.g., due to cognitive limitations, impaired judgment, decreased vision), a manual wheelchair would be clinically appropriate if a willing and able caregiver can safely maneuver the wheelchair.
- A 2021 RESNA position paper (Lange et al.) aimed to provide a definition for, and clinical applications related to, dynamic seating. The paper defined dynamic seating as "movement which occurs within the seating system and/or wheelchair frame in response to intentional or unintentional force generated by the client." The authors opined that dynamic seating may be used in three primary clinical scenarios. First, dynamic seating may be used to absorb and dissipate force that could otherwise lead to injury, equipment breakage, decreased sitting tolerance, increased agitation, decreased function, or further increases in extension and energy consumption. Second, dynamic seating may be used to allow movement to provide sensory input, increase alertness, and decrease agitation. Third, dynamic seating may be used to improve postural control, stability, active range of motion, and function. In addition, the authors stated that clinical contraindications and precautions, and the weight of the mobility base must also be taken into consideration when prescribing dynamic seating. The authors concluded that although stronger evidence was needed, existing research did support the application of dynamic seating in numerous clinical scenarios.

Codes

HCPCS Codes	Description
E0950	Wheelchair accessory, tray, each
E0951	Heel loop/holder, any type, with or without ankle strap, each
E0952	Toe loop/holder, any type, each
E0953	Wheelchair accessory, lateral thigh or knee support, any type including fixed mounting hardware, each
E0955	Wheelchair accessory, headrest, cushioned, any type, including fixed mounting hardware, each
E0956	Wheelchair accessory, lateral trunk or hip support, any type, including fixed mounting hardware, each
E0957	Wheelchair accessory, medial thigh support, any type, including fixed mounting hardware, each
E0960	Wheelchair accessory, shoulder harness/straps or chest strap, including any type mounting hardware
E0961	Manual wheelchair accessory, wheel lock brake extension (handle), each
E0966	Manual wheelchair accessory, headrest extension, each
E0967	Manual wheelchair accessory, hand rim with projections, any type, replacement only, each
E0971	Manual wheelchair accessory, anti-tipping device, each
E0973	Wheelchair accessory, adjustable height, detachable armrest, complete assembly, each
E0974	Manual wheelchair accessory, anti-rollback device, each
E0978	Wheelchair accessory, positioning belt/safety belt/pelvic strap, each
E0980	Safety vest, wheelchair
E0981	Wheelchair accessory, seat upholstery, replacement only, each
E0982	Wheelchair accessory, back upholstery, replacement only, each
E0983	Manual wheelchair accessory, power add-on to convert manual wheelchair to motorized wheelchair, joystick control

HCP Codes	Description
E0984	Manual wheelchair accessory, power add-on to convert manual wheelchair to motorized wheelchair, tiller control
E0985	Wheelchair accessory, seat lift mechanism
E0986	Manual wheelchair accessory power assist system
E0988	Manual wheelchair accessory, lever-activated, wheel drive, pair
E0990	Wheelchair accessory, elevating leg rest, complete assembly, each
E0995	Wheelchair accessory, calf rest/pad, replacement only, each
E1017	Heavy duty shock absorber for heavy duty or extra heavy duty manual wheelchair, each
E1018	Heavy duty shock absorber for heavy duty or extra heavy duty power wheelchair, each
E1022	Wheelchair transportation securement system, any type includes all components and accessories
E1023	Wheelchair transit securement system, includes all components and accessories
E1028	Wheelchair accessory, manual swingaway, retractable or removable mounting hardware, other
E1029	Wheelchair accessory, ventilator tray, fixed
E1030	Wheelchair accessory, ventilator tray, gimbaled
E1031	Rollabout chair, any and all types with casters 5" or greater
E1032	Wheelchair accessory, manual swingaway, retractable or removable mounting hardware used with joystick or other drive control interface
E1033	Wheelchair accessory, manual swingaway, retractable or removable mounting hardware for headrest, cushioned, any type (did add to power wheelchair)
E1034	Wheelchair accessory, manual swingaway, retractable or removable mounting hardware for lateral trunk or hip support, any type (did add to power wheelchair)
E1037	Transport chair, pediatric size
E1038	Transport chair, adult size, patient weight capacity up to and including 300 pounds

HCP Codes	Description
E1039	Transport chair, adult size, heavy duty, patient weight capacity greater than 300 pounds
E1161	Manual adult size wheelchair, includes tilt in space
E1200	Amputee wheelchair, fixed full length arms, swing away detachable footrest
E1220	Wheelchair; specially sized or constructed, (indicate brand name, model number, if any) and justification
E1221	Wheelchair with fixed arm, footrests
E1222	Wheelchair with fixed arm, elevating legrests
E1223	Wheelchair with detachable arms, footrests
E1224	Wheelchair with detachable arms, elevating legrests
E1225	Wheelchair accessory, manual semi-reclining back, (recline greater than 15 degrees, but less than 80 degrees), each
E1226	Wheelchair accessory, manual fully reclining back, (recline greater than 80 degrees), each
E1229	Wheelchair, pediatric size, not otherwise specified
E1231	Wheelchair, pediatric size, tilt-in-space, rigid, adjustable, with seating system
E1232	Wheelchair, pediatric size, tilt-in-space, folding, adjustable, with seating system
E1233	Wheelchair, pediatric size, tilt-in-space, rigid, adjustable, without seating system
E1234	Wheelchair, pediatric size, tilt-in-space, folding, adjustable, without seating system
E1235	Wheelchair, pediatric size, rigid, adjustable, with seating system
E1236	Wheelchair, pediatric size, folding, adjustable, with seating system
E1237	Wheelchair, pediatric size, rigid, adjustable, without seating system
E1238	Wheelchair, pediatric size, folding, adjustable, without seating system
E1240	Lightweight wheelchair, detachable arms, (desk or full length) swing away detachable, elevating legrest

HCP Codes	Description
E1250	Lightweight wheelchair, fixed full length arms, swing away detachable footrest
E1260	Lightweight wheelchair, detachable arms (desk or full length) swing away detachable footrest
E1270	Lightweight wheelchair, fixed full length arms, swing away detachable elevating legrests
E1280	Heavy duty wheelchair, detachable arms (desk or full length) elevating legrests
E1285	Heavy duty wheelchair, fixed full length arms, swing away detachable footrest
E1290	Heavy duty wheelchair, detachable arms (desk or full length) swing away detachable footrest
E1295	Heavy duty wheelchair, fixed full length arms, elevating legrest
E1298	Special wheelchair seat depth and/or width, by construction
E2201	Manual wheelchair accessory, nonstandard seat frame, width greater than or equal to 20 inches and less than 24 inches
E2202	Manual wheelchair accessory, nonstandard seat frame width, 24-27 inches
E2203	Manual wheelchair accessory, nonstandard seat frame depth, 20 to less than 22 inches
E2204	Manual wheelchair accessory, nonstandard seat frame depth, 22 to 25 inches
E2205	Manual wheelchair accessory, handrim without projections (includes ergonomic or contoured), any type, replacement only, each
E2206	Manual wheelchair accessory, wheel lock assembly, complete, replacement only, each
E2207	Wheelchair accessory, crutch and cane holder, each
E2208	Wheelchair accessory, cylinder tank carrier, each
E2209	Accessory, arm trough, with or without hand support, each
E2210	Wheelchair accessory, bearings, any type, replacement only, each
E2220	Manual wheelchair accessory, solid (rubber/plastic) propulsion tire, any size, replacement only, each

HCP Codes	Description
E2221	Manual wheelchair accessory, solid (rubber/plastic) caster tire (removable), any size, replacement only, each
E2222	Manual wheelchair accessory, solid (rubber/plastic) caster tire with integrated wheel, any size, replacement only, each
E2224	Manual wheelchair accessory, propulsion wheel excludes tire, any size, replacement only, each
E2225	Manual wheelchair accessory, caster wheel excludes tire, any size, replacement only, each
E2226	Manual wheelchair accessory, caster fork, any size, replacement only, each
E2227	Manual wheelchair accessory, gear reduction drive wheel, each
E2228	Manual wheelchair accessory, wheel braking system and lock, complete, each
E2230	Manual wheelchair accessory, manual standing system
E2398	Wheelchair accessory, dynamic positioning hardware for back
K0001	Standard wheelchair
K0002	Standard hemi (low seat) wheelchair
K0003	Lightweight wheelchair
K0004	High strength, lightweight wheelchair
K0005	Ultralight weight wheelchair
K0006	Heavy duty wheelchair
K0007	Extra heavy duty wheelchair
K0008	Custom manual wheelchair/base
K0009	Other manual wheelchair/base
K0015	Detachable, non-adjustable height armrest, replacement only, each
K0017	Detachable, adjustable height armrest, base, replacement only, each
K0018	Detachable, adjustable height armrest, upper portion, replacement only, each
K0019	Arm pad, replacement only, each
K0020	Fixed, adjustable height armrest, pair

HCPSC Codes	Description
K0038	Leg strap, each
K0039	Leg strap, h style, each
K0042	Standard size footplate, replacement only, each
K0043	Footrest, lower extension tube, replacement only, each
K0044	Footrest, upper hanger bracket, replacement only, each
K0045	Footrest, complete assembly, replacement only, each
K0046	Elevating legrest, lower extension tube, replacement only, each
K0047	Elevating legrest, upper hanger bracket, replacement only, each
K0050	Ratchet assembly, replacement only
K0052	Swing away, detachable footrests, replacement only, each
K0053	Elevating footrests, articulating (telescoping), each
K0056	Seat height less than 17" or equal to or greater than 21" for a high strength, lightweight, or ultralight weight wheelchair
K0065	Spoke protectors, each
K0069	Rear wheel assembly, complete, with solid tire, spokes or molded, replacement only, each
K0070	Rear wheel assembly, complete, with pneumatic tire, spokes or molded, replacement only, each
K0071	Front caster assembly, complete, with pneumatic tire, replacement only, each
K0072	Front caster assembly, complete, with semi-pneumatic tire, replacement only, each
K0073	Caster pin lock, each
K0077	Front caster assembly, complete, with solid tire, replacement only, each
K0195	Elevating leg rests, pair (for use with capped rental wheelchair base)

HCPSC Code	Description
E1227	Special height arms for wheelchair
E1228	Special back height for wheelchair

HCP Code	Description
E2227	Manual wheelchair accessory, gear reduction drive wheel, each
E2228	Manual wheelchair accessory, wheel braking system and lock, complete, each
E0958	Manual wheelchair accessory, one-arm drive attachment, each
E0959	Manual wheelchair accessory, adapter for amputee, each
E0969	Narrowing device, wheelchair
E0970	No. 2 footplates, except for elevating leg rest
E0992	Manual wheelchair accessory, solid seat insert
E0994	Arm rest, each
E1015	Shock absorber for manual wheelchair, each
E1014	Reclining back, addition to pediatric size wheelchair
E1011	Modification to pediatric size wheelchair, width adjustment package (not to be dispensed with initial chair)
E2211	Manual wheelchair accessory, pneumatic propulsion tire, any size, each
E2212	Manual wheelchair accessory, tube for pneumatic propulsion tire, any size, each
E2213	Manual wheelchair accessory, insert for pneumatic propulsion tire (removable), any type, any size, each
E2214	Manual wheelchair accessory, pneumatic caster tire, any size, each
E2215	Manual wheelchair accessory, tube for pneumatic caster tire, any size, each
E2216	Manual wheelchair accessory, foam filled propulsion tire, any size, each
E2217	Manual wheelchair accessory, foam filled caster tire, any size, each
E2218	Manual wheelchair accessory, foam propulsion tire, any size, each
E2219	Manual wheelchair accessory, foam caster tire, any size, each
E2295	Manual wheelchair accessory, for pediatric size wheelchair, dynamic seating frame, allows coordinated movement of multiple positioning features

HCP Code	Description
E2626	Wheelchair accessory, shoulder elbow, mobile arm support attached to wheelchair, balanced, adjustable
E2627	Wheelchair accessory, shoulder elbow, mobile arm support attached to wheelchair, balanced, adjustable rancho type
E2628	Wheelchair accessory, shoulder elbow, mobile arm support attached to wheelchair, balanced, reclining
E2629	Wheelchair accessory, shoulder elbow, mobile arm support attached to wheelchair, balanced, friction arm support (friction dampening to proximal and distal joints)
E2630	Wheelchair accessory, shoulder elbow, mobile arm support, monosuspension arm and hand support, overhead elbow forearm hand sling support, yoke type suspension support
E2631	Wheelchair accessory, addition to mobile arm support, elevating proximal arm
E2632	Wheelchair accessory, addition to mobile arm support, offset or lateral rocker arm with elastic balance control
E2633	Wheelchair accessory, addition to mobile arm support, supinator
K0105	Iv hanger, each
K0108	Wheelchair component or accessory, not otherwise specified
K0462	Temporary replacement for patient owned equipment being repaired, any type

References

1. Medicare Local Coverage Determination (LCD): Wheelchair Options/Accessories (L33792) / LCA (A52504) <https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?LCDId=33792>
2. Medicare Local Coverage Determination (LCD): Manual Wheelchair Bases (L33788) / LCA (A52497) <https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?LCDId=33788>
3. Digiovine C, Koontz A, Berner T, et al. Wheelchairs and Seating Systems. In: Cifu D, ed. Braddom's Physical Medicine and Rehabilitation. Sixth ed. Elsevier; 2021:261-290.e2:chap 14.
4. United States Food and Drug Administration (FDA). Code of Federal Regulations - Title 21--Food and Drugs - Chapter I--Food and Drug Administration Department of

Health and Human Services - Subchapter H-Medical Devices - Part 890 Physical Medicine Devices - Sec. 890.3910 Wheelchair Accessory. 2001. Accessed May 31, 2024. <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=890&showFR=1&subpartNode=21:8.0.1.1.32.4>

5. Ganesh S, Hayter A, Kim J, Sanford J, Sprigle S, Hoenig H. Wheelchair use by veterans newly prescribed a manual wheelchair. *Arch Phys Med Rehabil*. 2007;88(4):434-439. doi:10.1016/j.apmr.2006.12.045
6. Heinrichs ND, Kirby RL, Smith C, Russell KFJ, Theriault CJ, Doucette SP. Effect of seat height on manual wheelchair foot propulsion, a repeated-measures crossover study: part 2 - wheeling backward on a soft surface. *Disabil Rehabil Assist Technol*. 2022;17(3):325-330. doi:10.1080/17483107.2020.1782490
7. Tefertiller C, Jones J, Sevigny M, Dahlin M. Manual wheelchair configuration in unilateral upper- and lower-extremity propulsion: a randomized crossover study to assess effects of rear wheel axle position and frame type. *Arch Phys Med Rehabil*. 2023;104(8):1188-1194. doi:10.1016/j.apmr.2023.03.014
8. Michael SM, Porter D, Pountney TE. Tilted seat position for non-ambulant individuals with neurological and neuromuscular impairment: a systematic review. *Clin Rehabil*. 2007;21(12):1063-1074. doi:10.1177/0269215507082338
9. Pradon D, Garrec E, Vaugier I, Weissland T, Hugeron C. Effect of power-assistance on upper limb biomechanical and physiological variables during a 6-minute, manual wheelchair propulsion test: a randomised, cross-over study. *Disabil Rehabil*. 2022;44(22):6783-6787. doi:10.1080/09638288.2021.1973586
10. de Groot S, Vegter RJ, van der Woude LH. Effect of wheelchair mass, tire type and tire pressure on physical strain and wheelchair propulsion technique. *Med Eng Phys*. 2013;35(10):1476-1482. doi:10.1016/j.medengphy.2013.03.019
11. Kloosterman MG, Snoek GJ, van der Woude LH, Buurke JH, Rietman JS. A systematic review on the pros and cons of using a pushrim-activated power-assisted wheelchair. *Clin Rehabil*. 2013;27(4):299-313. doi:10.1177/0269215512456387
12. Rice IM, Rice LA, Motl RW. Promoting Physical Activity Through a Manual Wheelchair Propulsion Intervention in Persons With Multiple Sclerosis. *Arch Phys Med Rehabil*. 2015;96(10):1850-1858. doi:10.1016/j.apmr.2015.06.011
13. Flemmer CL, Flemmer RC. A review of manual wheelchairs. *Disabil Rehabil Assist Technol*. 2016;11(3):177-187. doi:10.3109/17483107.2015.1099747
14. Smith EM, Sakakibara BM, Miller WC. A review of factors influencing participation in social and community activities for wheelchair users. *Disabil Rehabil Assist Technol*. 2016;11(5):361-374. doi:10.3109/17483107.2014.989420
15. Sakakibara BM, Routhier F, Miller WC. Wheeled-mobility correlates of life-space and social participation in adult manual wheelchair users aged 50 and older. *Disabil Rehabil Assist Technol*. 2017;12(6):592-598. doi:10.1080/17483107.2016.1198434

16. Thomas L, Borisoff J, Sparrey CJ. Manual wheelchair downhill stability: an analysis of factors affecting tip probability. *J Neuroeng Rehabil*. 2018;15(1):95. doi:10.1186/s12984-018-0450-3
17. Heung TH, Ng SS. Effect of seat height and turning direction on the timed up and go test scores of people after stroke. *J Rehabil Med*. 2009;41(9):719-722. doi:10.2340/16501977-0411
18. Lange ML. Clinical changes as a result of dynamic seating in a young adult with cerebral palsy. *Disabil Rehabil Assist Technol*. 2023;18(7):1101-1106. doi:10.1080/17483107.2021.1984593
19. de Klerk R, Lutjeboer T, Vegter RJK, van der Woude LHV. Practice-based skill acquisition of pushrim-activated power-assisted wheelchair propulsion versus regular handrim propulsion in novices. *J Neuroeng Rehabil*. 2018;15(1):56. doi:10.1186/s12984-018-0397-4
20. Sehgal M, Jacobs J, Biggs WS. Mobility Assistive Device Use in Older Adults. *Am Fam Physician*. 2021;103(12):737-744.
21. Worobey L, Bernstein J, Ott J, et al. RESNA position on the application of ultralight manual wheelchairs. *Assist Technol*. 2023:1-18. doi:10.1080/10400435.2023.2221148
22. EnableNSW, Lifetime Care & Support Authority. Technical report for the Guidelines for the prescription of a seated wheelchair or mobility scooter for people with a traumatic brain injury or spinal cord injury. 2011.
23. Lange ML, Crane B, Diamond FJ, Eason S, Presperin Pedersen J, Peek G. RESNA position on the application of dynamic seating. *Assist Technol*. doi:10.1080/10400435.2021.1979383
24. Center for Devices and Radiological. (2019, February 8). Regulatory Controls. FDA. <https://www.fda.gov/medical-devices/overview-device-regulation/regulatorycontrols#gen>
25. Center for Devices and Radiological. (2024). Device Approvals and Clearances. FDA. <https://www.fda.gov/medical-devices/products-and-medical-procedures/device-approvals-and-clearances>