

Wheelchair Cushions and Seating

DME.WC.102.A

v1.0.2026

Introduction

Seating and cushions for manual and power wheelchairs 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

Seating and/or a cushion for a wheelchair is indicated when **both** of the following apply:

- The individual meets medical necessity criteria for a manual or power wheelchair.
- The seating is required for the individual to function successfully in the home to take care of their daily needs for any of the following:
 - A **skin protection wheelchair seat cushion** (HCPCS E2603, E2604, E2622, E2623) is indicated for an individual with any of the following:
 - Current pressure ulcer or history of pressure ulcer in the area of contact with the seating surface.
 - Absent or impaired sensation in the area of contact with the seating surface.
 - Inability to perform a functional weight shift.
 - A **positioning wheelchair seat or back cushion** (HCPCS E2605, E2606, E2613, E2614, E2615, E2616, E2620, E2621) is indicated for an individual with a change in anatomy of the trunk or pelvis due to a medical or neuromuscular condition
 - A **combination skin protection and positioning wheelchair seat cushion** (HCPCS E2607, E2608, E2624, E2625) is indicated for an individual who meets

criteria for both a skin protection wheelchair seat cushion and a positioning wheelchair cushion.

- A **custom fabricated back or seat cushion** (HCPCS E2609, E2617) is indicated if all of the following criteria are met:
 - The individual must meet all of the medical necessity criteria for a prefabricated positioning back or seat cushion.
 - The individual must have a wheelchair evaluation performed by a medical professional with specific training and expertise in wheelchair assessments.
 - The documentation provided clearly explains why a prefabricated seating system does not meet the individual's seating and positioning needs.

Additional Information

A complete manual wheelchair base may include:

- A sling seat, seat pan which can accommodate a wheelchair seat cushion, or a seat frame structured in such a way as to be capable of accepting a seating system.
- A sling back, other seat back support which can accommodate a wheelchair back cushion, or a back frame structured in such a way as to be capable of accepting a back system.

A power wheelchair basic equipment package may include:

- Any seat width and depth.
- Any back width.
- Note: There are exceptions for some Group 3 and Group 4 power wheelchairs with a sling/solid seat/back.

A general use seat cushion and/or back cushion (HCPCS E2601, E2602, E2611, E2612) is indicated for an individual who has a manual wheelchair or a power wheelchair with a sling/solid seat/back.

A solid seat support base for a seat cushion with mounting hardware (HCPCS E2231) is indicated when the item is used with a manual wheelchair. HCPCS E2231 is included in the allowance for a power wheelchair.

Not Covered

- A commode seat for a wheelchair (HCPCS E0968) used for comfort, convenience, or hygiene purposes is considered not medically necessary as it is not primarily medical in nature.
- A seat or back cushion is considered a comfort item and not medically necessary if it is provided for use with a transport chair or the individual has a power wheelchair with a captain's seat.

- A powered seat cushion (HPCPS E2610) is considered experimental and investigational, or unproven. There is insufficient evidence published in the medical literature addressing the clinical utility of this item.

Definitions

A **skin protection and/or positioning cushion** may have materials (e.g., air, gel, foam) or features that may be modified to help distribute pressure, address musculoskeletal deformities, and/or correct postural asymmetries.

Custom-fabricated seating is created from an impression or digital image of an individual using created-for or molded-to-patient techniques.

Pressure injuries occur most commonly near the sacrum or ischial tuberosities and may occur in other areas including but not limited to the knees, heels, or other bony prominences. Risk factors for skin breakdown and pressure ulcers may included but are not limited to spinal cord injury, increased pressure over bony prominences, asymmetric posture, and extended duration of sitting.

The **National Pressure Injury Advisory Panel (NPIAP)** provides a method for **classification of pressure injuries**. The system is supported by the Wound Ostomy Continence Nurses (WOCN) Society:

- **Stage 1 pressure injury:** Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. No purple or maroon discoloration, as these may indicate deep tissue pressure injury.
- **Stage 2 pressure injury:** Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may present as an intact or ruptured serum-filled blister. Adipose (fat) and deeper tissue are not visible. Granulation tissue, slough, and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage including incontinence associated dermatitis, intertriginous dermatitis, medical adhesive related skin injury, or traumatic wounds (e.g., skin tears, burns, abrasions).
- **Stage 3 pressure injury:** Full-thickness skin loss, in which adipose (fat) tissue is visible in the ulcer, and granulation tissue and rolled wound edges are often present. Slough or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage, and bone are not exposed.
- **Stage 4 pressure injury:** Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage, or bone. Slough or eschar may

be visible. Rolled wound edges, undermining, or tunneling often occur. Depth varies by anatomical location.

- **Unstageable full-thickness pressure injury:** Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a stage 3 or stage 4 pressure injury will be revealed. Stable eschar (e.g., dry, adherent, intact without erythema or fluctuance) on the heel or ischemic limb should not be softened or removed.
- **Deep tissue pressure injury (DTPI):** Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, or purple discoloration, or epidermal separation revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle, or other underlying structures are visible, this indicates a full-thickness pressure injury (i.e., unstageable, stage 3, or stage 4). DTPI is not used to describe vascular, traumatic, neuropathic, or dermatologic conditions.

Evidence Discussion

Medical Background

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

Literature Review

- Brienza et al. (2010) performed a randomized controlled trial to determine the efficacy of skin protection wheelchair seat cushions in preventing pressure ulcers in the elderly. The study included 180 individuals who were provided with a properly fitted wheelchair and randomized into skin protection cushion (SPC) or segmented foam cushion (SFC) groups. The SPC group received an air, viscous fluid/foam, or gel/foam cushion. The SFC group received a 7.6 cm crosscut foam cushion. The main outcome measure was pressure ulcer incidence over six months for wounds near the ischial tuberosities (IT ulcers). The secondary outcome measure was combined IT and sacral/coccyx ulcers. There were eight (6.7%) IT ulcers in the SFC group and one (0.9%) in the SPC group. There were 21 (17.6%) combined IT and sacral ulcers in the SFC group and 12 (10.6%) in the SPC group. This clinical trial demonstrated

significant differences in pressure ulcers occurring over the ischial tuberosities between SFC and SPC groups. Thus, the authors concluded that skin protection cushions used with fitted wheelchairs lowered pressure ulcer incidence for elderly nursing home residents and should be used to help prevent pressure ulcers.

- Arias et al. (2014) evaluated the effects of interface pressure (IP) on the ischial tuberosities (IT) in an alternating pressure air-cell cushion. The alternating cushion used in the study consisted of 12 air cells that were inflated and deflated strategically in order to redistribute and release pressure on the ischial regions. Six healthy volunteers sat on the air cell cushion, in static and alternating modes, as well as on a typical foam cushion for 12 minutes. Interface pressure values, user contact area, and pressure distribution were analyzed on the IT. Results demonstrated that IP on IT tended to increase in both foam and static cushions, while in an alternating cushion IP on IT tended to decrease. In addition, contact area was significantly larger in an alternating cushion than in static or foam cushions. Moreover, there was better pressure re-distribution with an alternating cushion than with foam cushion. Thus, the authors opined that the alternating sequence cushion demonstrated an improvement in pressure distribution, and as a result, this proposed cushion may assist with pressure ulcer prevention in wheelchair users.
- A systematic review (Liampas et al., 2021) aimed to evaluate the prevalence, risk factors, and management of musculoskeletal pain in wheelchair users. The authors identified 40 studies that met the inclusion criteria. The authors noted that the thickness of the wheelchair seat cushion had been proposed as a modifiable risk factor for the development of neck pain. Furthermore, the angle of the wheelchair seat may be adjusted to prevent shoulder pain or injury in wheelchair users. Thus, the authors concluded that optimal adjustment of wheelchair seating may prevent musculoskeletal pain in wheelchair users.
- Kim et al. (2022) reported on a randomized controlled trial that investigated the temporal characteristics of interface pressure (IP) on the buttocks to understand weight-releasing tendencies in left hemiplegia (LH), right hemiplegia (RH), and able-bodied individuals. The trial included 35 male participants (13 with LH, 12 with RH, and 10 able-bodied individuals). Data on buttock IPs were collected from an IP sensor on a fabric wheelchair seat for 30 minutes. The results of the study demonstrated a significant right-sided asymmetry for all groups examined. The authors attributed this finding to a natural characteristic of human posture based on previous anatomical research. Moreover, the peak IPs of RH and LH were significantly higher than those of able-bodied individuals. Furthermore, the RH exhibited affected-side weight bearing based on the mean IP. In contrast, the LH relieved the mean IP on the affected-side buttock. In summary, the investigators concluded that due to the right-sided asymmetric mean and high peak IP, wheelchair users with hemiplegia required different rehabilitation strategies to reduce the peak IP and prevalence of pressure ulcers in this population.

- Damiao and Gentry (2022) conducted a systematic review to analyze the evidence on the optimal materials and designs of wheelchair pressure relieving cushions. Seventeen peer-reviewed articles met the inclusion criteria. Of the 17 included studies, two consisted of randomized control trials and 12 consisted of cohort studies in which study participants trialed more than one style of cushion. The included studies reviewed methods and outcomes that addressed measures of pressure relief, such as pressure injury occurrence, pressure mapping, magnetic resonance imaging (MRI) or a combination of these measures. Based on the available evidence, the authors concluded that air-cell cushions provided optimal pressure relief and shear reduction. Moreover, cohort studies suggested off-loading cushions provide superior pressure relief beyond that of air-celled cushions in individuals with orthopedic deformities or postural abnormalities.

Professional organizations/societies

- A specialty clinical practice guideline for the prescription of a seated wheelchair or mobility scooter (EnableNSW and Lifetime Care & Support Authority, 2011) provided recommendations for individuals with spinal cord injury and brain injury 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 the mobility-related activities of daily living (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, and 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 dynamic component may use mechanical (i.e., springs or hydraulic/pneumatic features) or non-mechanical (i.e., air cushion) methods to absorb forces. 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.

- A 2014 National Institute for Health and Care Excellence (NICE) clinical guideline on the prevention and management of pressure ulcers in primary and secondary care issued guidance related to the management of pressure ulcers. The authors identified various types of devices used for redistribution of pressure to prevent pressure ulcers. Wheelchair cushions included either conforming cushions that reduce contact pressure by increasing surface area, or mechanical cushions which alternate pressure. The authors recommended pressure-reducing cushions for adults who use a wheelchair or who sit for prolonged periods. The authors noted that a gel filled pad and a pressure-reducing cushion are designed to improve tissue tolerance in sitting by providing more surface area and reducing peak pressure. These pressure-reducing surfaces were clinically beneficial compared to foam cushions for reducing the incidence of pressure ulcers in people who use a wheelchair. Moreover, a skin protection cushion was clinically beneficial compared to a segmented foam cushion for reducing the incidence of pressure ulcers. In addition, the authors noted that the evidence suggested a benefit of high specification foam cushions in the prevention of pressure ulcers.
- A 2014 clinical practice guideline by the Consortium for Spinal Cord Medicine Member Organizations provided recommendations on wheelchair seating systems in individuals with spinal cord injury. The authors reported strong evidence that wheelchairs and seating systems should be individualized to redistribute pressure and prevent the development of pressure ulcers. In a full-time wheelchair user with an existing pressure ulcer on a sitting surface, a gel or air surface was recommended to provide pressure redistribution. In summary, this practice guideline noted that individuals with spinal cord injury should be prescribed wheelchair seating systems that are individualized to provide optimal ergonomics and maximal function. Moreover, these specialized wheelchair seating systems should be replaced when no longer effective.

Codes included

HCPSC Code	Description
E0968	Commode seat, wheelchair
E2231	Manual wheelchair accessory, solid seat support base (replaces sling seat), includes any type mounting hardware
E2601	General use wheelchair seat cushion, width less than 22 inches, any depth
E2602	General use wheelchair seat cushion, width 22 inches or greater, any depth
E2603	Skin protection wheelchair seat cushion, width less than 22 inches, any depth
E2604	Skin protection wheelchair seat cushion, width 22 inches or greater, any depth
E2605	Positioning wheelchair seat cushion, width less than 22 inches, any depth
E2606	Positioning wheelchair seat cushion, width 22 inches or greater, any depth
E2607	Skin protection and positioning wheelchair seat cushion, width less than 22 inches, any depth
E2608	Skin protection and positioning wheelchair seat cushion, width 22 inches or greater, any depth
E2609	Custom fabricated wheelchair seat cushion, any size
E2610	Wheelchair seat cushion, powered
E2611	General use wheelchair back cushion, width less than 22 inches, any height, including any type mounting hardware
E2612	General use wheelchair back cushion, width 22 inches or greater, any height, including any type mounting hardware
E2613	Positioning wheelchair back cushion, posterior, width less than 22 inches, any height, including any type mounting hardware
E2614	Positioning wheelchair back cushion, posterior, width 22 inches or greater, any height, including any type mounting hardware

HCPSC Code	Description
E2615	Positioning wheelchair back cushion, posterior-lateral, width less than 22 inches, any height, including any type mounting hardware
E2616	Positioning wheelchair back cushion, posterior-lateral, width 22 inches or greater, any height, including any type mounting hardware
E2617	Custom fabricated wheelchair back cushion, any size, including any type mounting hardware
E2620	Positioning wheelchair back cushion, planar back with lateral supports, width less than 22 inches, any height, including any type mounting hardware
E2621	Positioning wheelchair back cushion, planar back with lateral supports, width 22 inches or greater, any height, including any type mounting hardware
E2622	Skin protection wheelchair seat cushion, adjustable, width less than 22 inches, any depth
E2623	Skin protection wheelchair seat cushion, adjustable, width 22 inches or greater, any depth
E2624	Skin protection and positioning wheelchair seat cushion, adjustable, width less than 22 inches, any depth
E2625	Skin protection and positioning wheelchair seat cushion, adjustable, width 22 inches or greater, any depth
E1297	Special wheelchair seat depth, by upholstery
E2619	Manual wheelchair accessory, foam caster tire, any size, each
E2291	Back, planar, for pediatric size wheelchair including fixed attaching hardware
E2292	Seat, planar, for pediatric size wheelchair including fixed attaching hardware
E2293	Back, contoured, for pediatric size wheelchair including fixed attaching hardware
E2294	Seat, contoured, for pediatric size wheelchair including fixed attaching hardware
K0108	Wheelchair Component or Accessory, Not Otherwise Specified

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