Seat Lifts

DME.SW.109.A
v1.0.2025

Introduction

Seat lift mechanisms are addressed by this guideline.

Criteria

A seat lift mechanism (HCPCS E0627 or E0629) is medically necessary when **all** of the following apply:

- The individual has a condition that affects their strength or mobility (e.g., severe arthritis of the hip or knee, neuromuscular disease).
- The individual is unable to stand up from any chair in the home.
- The individual is able to ambulate or transfer independently once standing.
- The individual has tried and failed other standard treatments to improve standing from a chair (e.g., medications, physical therapy).
- The individual is able to safely use the device.

Not Covered

The following lifts are non-covered and considered convenience items or home modifications:

- Toilet seat lift mechanisms (HCPCS code E0172).
- Stair lifts/stairway chairs.
- Van lifts.
- Bed lifts (bed elevators).

Definitions

A seat lift mechanism refers to a modified seating surface that can exert sufficient force to assist an individual from a seated to standing position in a controlled manner. A seat lift mechanism can be used with individual-owned furniture or incorporated into a combination lift-chair mechanism. The lift mechanism may be either electric or hydraulic and may be either built directly into a chair or used as a separate portable device.

Electric seat lift mechanisms (HCPCS code E0627) are motorized seat lifts that enable the individual to change from a seated to a standing position.

Nonelectric seat lift mechanism (HCPCS code E0629) are battery powered seat lifts that enable the individual to change from a seated to a standing position.

A toilet seat lift mechanism (HCPCS code E0172) is a device with a seat that can be raised with or without a forward tilt while the individual is seated, allowing the individual to ambulate once they are in a more upright position. It may be manually operated or electric. It is attached to the toilet.

Evidence Discussion

Medical background

The United States Food and Drug Administration (FDA) considers seat lift mechanisms to be Class II devices. As such, they are considered to be of moderate to high risk, and they are required to complete the 510(k) clearance process. The 510(k) clearance process requires manufacturers to notify the FDA of the safety and effectiveness of a device prior to marketing it. Seat lift mechanisms available in the United States include various models from Carex® (Compass Health®, Middleburg Heights, OH).

Literature review

- Glickman et al. (2010) conducted a systematic review to evaluate the effectiveness of supported standing devices for individuals with a neuromuscular diagnosis. The review included 39 studies that explored supported standers for improving bone mineral density (BMD), cardiopulmonary function, muscle strength, and range of motion (ROM). The authors reported strong evidence for the use of supported standing for increasing BMD, decreasing hypertonicity (including spasticity), and improving ROM with the use supported standers for children and adults with neuromuscular disorders. Moreover, survey data from physical therapists and participant users attributed numerous improved outcomes to supported standing: ROM, bowel/bladder, psychological, hypertonicity and pressure relief.
- Nordström et al. (2013) conducted a qualitative study to understand the impact of the use of standing devices on quality of life (QOL). The study included data from 319 questionnaires returned from individuals with a prescription for a standing device (aged 2 to 86 years old). The authors reported that standing time decreased with age. Moreover, respondents who were dependent for mobilization or who had received their standing device more than five years earlier used their device most frequently. The most common reasons given for standing were to improve circulation, reduce stiffness, and enhance quality of life.

730 Cool Springs Blvd, Franklin, TN 37067 (800) 918-8924 www.EviCore.com

- Turcot et al. (2012) conducted a comparative study to examine the body mechanisms utilized during a sit-to-stand (STS) maneuver in individuals with knee osteoarthritis (OA). The study compared data from 25 participants with advanced knee osteoarthritis (OA) and 20 healthy elderly adults. Participants stood from a chair four times without the use of their arms. The following parameters were evaluated: the time to STS; the force ratio between both limbs; and the knee, hip, and trunk kinematics. The pain and functional capacity were obtained from the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). The results showed that participants with knee OA placed approximately 10% additional weight on the contralateral side when compared to a symmetrical weight bearing of the control group. Moreover, participants with knee OA demonstrated a significantly lower knee flexion moment, a higher maximal trunk flexion, and a higher lateral trunk lean on the contralateral side when compared with the control group. In summary, the authors opined that individuals with knee osteoarthritis had a slower rate of transfer of their center of gravity during STS; and moreover, the implementation of strategies to improve this functional component may reduce the risk of falls.
- In 2022, Waiteman and colleagues conducted a systematic review to compare trunk biomechanics between individuals with knee disorders and injury-free controls. The review included 81 observational studies that evaluated six different knee disorders: knee osteoarthritis (OA), total knee arthroplasty, patellofemoral pain, patellar tendinopathy, anterior cruciate ligament deficiency, and anterior cruciate ligament reconstruction. The included studies compared trunk kinematics during weight-bearing tasks (e.g., sit-to-stand (STS), stair negotiation, walking). Of note, high certainty evidence from four studies (402 participants) showed greater trunk flexion in individuals with knee OA compared to controls during STS (P = 0.001). Moreover, high-certainty evidence with large effect from two studies (227 participants) showed greater contralateral trunk lean in individuals with knee OA compared to controls during STS (P = 0.001). Thus, the authors concluded that in individuals with knee OA, greater trunk flexion and contralateral trunk lean was observed during STS. The authors acknowledged that STS requires high knee extensor moments and knee loading, and thus, the authors opined that the observed increase in trunk flexion may represent a compensatory strategy to reduce knee loading and reduce knee pain. However, the authors noted that the persistent use of increased trunk flexion in individuals with knee OA during squatting (STS) tasks may lead to chronic disuse of knee extensors and subsequent muscle weakness and worsened overall function.
- Alencar et al. (2007) reported a cohort study that compared functional outcomes among elderly participants with knee osteoarthritis (OA) with and without a history of falls. The study included 15 participants (aged 74.20 ± 4.46) with a history of falls and 15 participants (aged 71.73 ± 4.73) without a history of falls. The sit-to-stand (STS) task was performed using the Balance Master System to determine functional mobility. STS variables included: time of transfers (seconds), index of elevation (percentage of body weight), and sway speed. Of the variables studied, the center

of gravity time of transfer was significantly longer in the group with a history of falls (0.55 ± 0.32 seconds) compared to the group without a history of falls (0.35 ± 0.16 seconds) ($P = 0.049$). The authors acknowledged that the speed of the STS may have been impacted by pain due to knee OA that led individuals to transfer to a standing position in a more cautious manner. In summary, the authors concluded elderly individuals with knee OA associated with a history of fall required a longer period of time to transfer during the STS task, and thus, proper strategies should be implemented to promote improved balance and function in order to reduce the risk of falls.

- Dolecka et al. (2015) conducted a comparative study to investigate the sit-to-stand (STS) task performed from a standard chair with armrests in community dwelling older adults. The study included 20 individuals 65 years or older (10 with Alzheimer's disease or mixed dementia and 10 without dementia). Each participant performed six STS trials from a standard chair with armrests, including three trials with a table in front and three trials without a table in front. The study examined the most common starting position and the STS strategies utilized by the participants. Trials were digitally recorded and rated by a blinded assessor. The results of the study demonstrated that the most common strategy was leaning forward (119 out of 120 trials). Moreover, individuals with dementia used significantly more strategies ($P = 0.037$), pushed through the armrests more than older adults without dementia ($P = 0.038$), and moved feet backwards more frequently in trials without the table in front ($P = 0.010$). In addition, the presence of the table had no significant effect on STS performance of older adults ($P > 0.317$). In summary, the authors concluded that during an STS task, community dwelling older adults adopted a starting position with the trunk and hips positioned against the backrest, hands mostly resting on knees, and at least one ankle behind the knee line. Regardless of the presence of dementia, the most commonly used strategy was leaning forward, followed by pushing through the armrests or the knees, and moving the feet backwards. Individuals with dementia had a similar starting position but used more strategies to stand up, pushing through their arms more than older adults without dementia and moved their feet backwards more often when no table was in front. Thus, the authors opined that to enable an effective STS task, individuals living with dementia should utilize chairs with armrests and space to move their feet backwards.
- Cheng et al. (1998) conducted a retrospective study to examine the differences in the kinetic data from sit-to-stand (STS) activities among individuals with a history of stroke. The study included 33 individuals with stroke (18 fallers,15 non-fallers). Participants sat in an adjustable chair with their feet on two force plates and performed the STS movement. The results of the study demonstrated that the rate of rise in force was significantly lower in stroke fallers than in stroke non-fallers and healthy subjects ($P < 0.005$). The center of pressure sway during the STS activity was much greater in stroke fallers than in stroke non-fallers or healthy subjects ($P < 0.05$). Moreover, body weight distribution was asymmetric in the individuals with a history of

stroke. In conclusion, the investigators found a lower rate of rise of force and greater postural asymmetry while rising from siting to standing in individuals with a history of stroke.

- A study performed by Dehail and colleagues in 2007 aimed to describe kinematic and electromyographic (EMG) characteristics of rising from a chair during a Sit-to-Walk (STW) task. The study included 24 healthy elderly participants (mean age of 73.8 years). The task consisted of standing up and taking a step. Data were obtained using a 3D motion analysis software. Surface EMG of eight lower limb muscles was recorded. Isokinetic strength of ankle plantar flexor and knee flexors and extensors was evaluated. Compared to the sit-to-stand (STS) kinematic data, the STW transition combined trunk flexion and knee extension in order to enable gait initiation. Moreover, in the majority of cases the tibialis anterior and peroneus longus were the first muscles activated during the STW movement. In addition, the authors noted that the importance of knee extensor strength in the STS task has been demonstrated in the literature. In this study, the higher the strength of the knee extensors, the less the participants flexed their trunk during STW. In summary, the authors acknowledged that the STW is an important functional task in elderly individuals; and moreover, strengthening of key muscles implicated in this task, particularly the knee extensors, may aid rehabilitation strategies and prevent falls in this population.
- Rutherford et al. (2016) conducted a study to evaluate lower extremity mechanics and muscle activation associated with the sit-to-stand (STS) transfer using a portable lifting-seat device and to compare these data to an unassisted transfer in healthy young and older adults. The study included 10 younger (mean age of 25 years) and 10 older (mean age of 69 years) adults during five trials of transfers with and without a portable power lifting-seat device (Power Seat, Uplift Technologies Inc., Dartmouth, NS, Canada). Bilateral lower extremity and low back musculature electromyography (EMG), three-dimensional leg and trunk motion, and ground reaction forces were recorded. Peak sagittal plane joint angles, moments, and muscle activity profiles were calculated. The results of the study demonstrated that trunk, hip, and knee angles were significantly reduced and dorsiflexion was increased with assisted transfer ($P < 0.05$). Moreover, peak hip and ankle joint moments were reduced ($P < 0.05$), and peak muscle activity was lower during the assisted transfer ($P < 0.05$). In addition, older adults used higher relative muscle activation. In summary, knee, hip, and trunk joint flexion angles; hip flexion; and ankle plantar flexion moments; and all muscle activities were reduced with the assisted STS and the effects were similar between healthy younger and older adults.
- In 2021, Lou and colleagues performed a study to investigate the sit-to-stand (STS) and back-to-sit (BTS) movements to investigate the effects of the different seat conditions on the joint angles, joint moments, and movement duration times. The study included 28 healthy elderly individuals during the performance of the STS task under three seat conditions (non-assisted, self-designed lifting seat, and the

730 Cool Springs Blvd, Franklin, TN 37067 (800) 918-8924
www.EviCore.com

UPLIFT® seat). The self-designed lifting seat had two 10 cm springs that were fixed vertically beneath the seat with the help of two support rods. The tests were also performed using a commercial lift chair fitted with a hydro-pneumatic lift actuator (Uplift Technologies, Inc., Dartmouth, Nova Scotia, Canada). No significant difference was observed in the STS duration among the three test conditions. However, the BTS duration was significantly increased in the UPLIFT® seat condition. Moreover, the peak flexion angle of the hip during STS motion was also significantly higher in the UPLIFT® condition. For both motions (STS and BTS), the lifting seats significantly decreased the knee and hip joint moments, but significantly increased the ankle joint moment. Moreover, compared to the non-assistive seat, both assistive lifting seats required a greater ankle joint strength to complete the STS and BTS motions. In conclusion, the results of the study demonstrated that the self-designed lifting system and UPLIFT® seats both significantly reduced the knee and hip moments compared to the unassisted condition.

Codes addressed in this guideline

The inclusion of any code in this table does not imply that the code is under management or requires prior authorization. Refer to the applicable health plan for management details. Prior authorization of a code listed in this table is not a guarantee of payment. The Certificate of Coverage or Evidence of Coverage policy outlines the terms and conditions of the member's health insurance policy.

HCPCS code	Description
E0172	Seat lift mechanism placed over or on top of toilet, any type
E0627	Seat lift mechanism, electric, any type
E0629	Seat lift mechanism, non-electric, any type

References

1. Medicare Local Coverage Determination (LCD): Seat Lift Mechanisms (L33801) / LCA (A52518) **https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?LCDId=33801**
2. Glickman LB, Geigle PR, Paleg GS. A systematic review of supported standing programs. J Pediatr Rehabil Med. 2010;3(3):197-213. doi: 10.3233/PRM-2010-0129
3. Nordström B, Näslund A, Eriksson M, Nyberg L, Ekenberg L. The impact of supported standing on well-being and quality of life. Physiother Can. 2013;65(4):344-352. doi: 10.3138/ptc.2012-27
4. Turcot K, Armand S, Fritschy D, Hoffmeyer P, Suvà D. Sit-to-stand alterations in advanced knee osteoarthritis. Gait Posture. 2012;36(1):68-72. doi: 10.1016/j.gaitpost.2012.01.005
5. Waiteman MC, Chia L, Ducatti MHM, et al. Trunk biomechanics in individuals with knee disorders: a systematic review with evidence gap map and meta-analysis. Sports Med Open. 2022;8(1):145. doi: 10.1186/s40798-022-00536-6

730 Cool Springs Blvd, Franklin, TN 37067 (800) 918-8924
www.EviCore.com

6. Alencar MA, Arantes PM, Dias JM, Kirkwood RN, Pereira LS, Dias RC. Muscular function and functional mobility of faller and non-faller elderly women with osteoarthritis of the knee. Braz J Med Biol Res. 2007;40(2):277-283. doi: 10.1590/s0100-879x2007000200016
7. Dolecka UE, Ownsworth T, Kuys SS. Comparison of sit-to-stand strategies used by older adults and people living with dementia. Arch Gerontol Geriatr. 2015;60(3):528-534. doi: 10.1016/j.archger.2014.12.007
8. Cheng PT, Liaw MY, Wong MK, Tang FT, Lee MY, Lin PS. The sit-to-stand movement in stroke patients and its correlation with falling. Arch Phys Med Rehabil. 1998;79(9):1043-1046. doi: 10.1016/s0003-9993(98)90168-x
9. Dehail P, Bestaven E, Muller F, et al. Kinematic and electromyographic analysis of rising from a chair during a "Sit-to-Walk" task in elderly subjects: role of strength. Clin Biomech (Bristol, Avon). 2007;22(10):1096-1103. doi: 10.1016/j.clinbiomech.2007.07.015
10. Rutherford DJ, Hurley ST, Hubley-Kozey C. Sit-to-stand transfer mechanics in healthy older adults: a comprehensive investigation of a portable lifting-seat device. Disabil Rehabil Assist Technol. 2016;11(2):158-165. doi: 10.3109/17483107.2014.921843
11. Lou SZ, You JY, Tsai YC, Chen YC. Effects of different assistive seats on ability of elderly in sit-to-stand and back-to-sit movements. Healthcare (Basel). 2021;9(4):485. doi: 10.3390/healthcare9040485
12. Center for Devices and Radiological. (2019, February 8). Regulatory Controls. FDA. https://www.fda.gov/medical-devices/overview-device-regulation/regulatory-controls#gen
13. 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