

# Seat Lifts

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## Introduction

Seat lift mechanisms 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 seat lift mechanism is considered 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
- stair lifts/stairway chairs
- van lifts
- bed lifts (bed elevators)

## Evidence Discussion

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.

A 2022 observational study by Löppönen et al. evaluated free-living sit-to-stand transition characteristics as indicators of functional capacity among community-dwelling older adults. The study included 479 individuals aged 75, 80, and 85 years who wore thigh-mounted accelerometers for 3 to 7 consecutive days to capture the frequency and intensity of sit-to-stand movements performed during daily life. Results demonstrated that both the number of sit-to-stand transitions and the angular velocity of these movements declined with advancing age. Higher sit-to-stand frequency and greater angular velocity were significantly associated with better lower-extremity performance, including higher Short Physical Performance Battery scores and greater knee extension strength (all  $p < .001$ ). Conversely, reduced sit-to-stand performance was associated with slower five-times sit-to-stand test completion, increased lower-extremity functional limitations, greater fear of falling, and reported difficulty with other mobility tasks such as stair negotiation. The authors concluded that sit-to-stand transition characteristics reflected the adequacy of lower-limb muscle strength required for independent mobility and served as sensitive indicators of emerging functional decline. Study limitations included the observational design, reliance on accelerometer-derived movement measures rather than direct assessment of task quality, and restriction to relatively high-functioning community-dwelling individuals, which may have limited generalizability. Despite these limitations, the findings highlighted sit-to-stand performance as a foundational movement underpinning functional independence and

supported interventions that assist individuals with controlled transitions from sitting to standing during daily activities in the home.

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 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.

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.

## 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

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