Standing Frames

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Introduction

Standing frames are addressed by this guideline.

Criteria

A standing frame is medically necessary when there is documentation of **all** of the following:

- The individual is unable to stand due to weakness, loss of tone, or decreased motor control.
- The individual is unable to walk.
- The individual is under the care of a physician trained to evaluate function, rehabilitation, and the neuromuscular system.
- The device is prescribed by the specialty trained physician for daily use in the home.
- The individual has tried the device and is able to tolerate being upright.
- The individual and/or a caregiver is able to operate the device.

Definitions

A **prone** individual is one who is lying with the front or face downward.

A **supine** individual is one who is lying on the back or having the face upward.

Reciprocal movement refers to the alternating movements of arms and legs as seen in walking and other normal movements.

Orthostatic (postural) hypotension occurs when the blood pressure suddenly drops when standing up after sitting or lying down.

Bone mineral density (BMD) is a term used to describe the amount of calcium present in bone.

Neurological and neuromuscular conditions that impair motor control or cause abnormal muscle tone include but are not limited to: cerebral palsy, stroke, muscular dystrophy, spinal muscular atrophy, multiple sclerosis, brain or spinal cord injury, and spina bifida.

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Duchenne muscular dystrophy (DMD) is a type of muscular dystrophy which results in progressive muscle degeneration and weakness. Onset of symptoms is generally in early childhood, between the ages of three to five.

The **Amended Motor Club Assessment (AMCA)** is a tool used to measure motor function in multiple sclerosis. The tool is comprised of two sections: a functional activity subscore and a lower limb subscore. Scores range from 0 to 76 points, with higher scores denoting better motor function.

Evidence Discussion

Purpose of technology/description of device

A standing frame places an individual in an upright position to reflect a natural standing position. Standing mobility devices are designed to provide greater independence, functional performance, and an opportunity for exploration and interaction with peers. Standing frames facilitate upright head and trunk control and promote functional use of the arms or hands; promote elongation of the trunk and lower extremity musculature; decrease flexor spasticity; increase range of motion; reduce contractures; facilitate bone growth or decrease bone demineralization; improve hip joint development; improve bowel, bladder, gastrointestinal, circulatory, and respiratory function; promote skin integrity by offloading weight; and foster upright interaction with peers and environment and enhance psychosocial functioning.

Standing frames may be manual or sit-to-stand. In a manual stander, the individual is typically placed into the frame in a standing position. This type of upright stander is often used by children, as a caregiver can assist with transferring them into an upright position. Sit-to-stand type standers (e.g., gas spring assisted pump, hydraulic, motorized) incorporate a seat lift feature that raises the individual from a sitting to a standing position. This type of upright stander is more commonly used in an adult population when it may be more difficult to transfer into an upright position.

Standing frames provide a variety of positioning options. A prone standing frame places the person in a forward tilt. This position encourages head control and anti-gravity use of muscles in the upper trunk but requires sufficient head control for safe use. The amount of weight-bearing can be adjusted by changing the angle of tilt of the frame. This is important for people with reduced leg strength or contractures. A supine standing frame requires the person to lie down on the frame before it is moved into a more upright position. The clinical advantage of a supine standing frame is its use with those who lack antigravity strength in their upper trunk, in addition to reducing the amount of lower extremity weight-bearing needed for partially upright standing. Multi-positional standing frames, also known as 3-way standing frames, can accommodate an individual who requires upright, prone, and supine positions. A mobile standing frame is a device that allows the user to move in a standing position.

Medical Background

The United States Food and Drug Administration (FDA) considers non-powered standing frames to be Class I devices. 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. The United States Food and Drug Administration (FDA) considers powered standing frames 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. Manufacturers of standing frame devices available in the United States include EasyStand®, Prime Engineering, R82®, Rifton®, and Zing®.

Literature Review

- Freeman et al. (2019) reported on a multicenter, randomized controlled trial (Standing Up in Multiple Sclerosis (SUMS)) which examined the effectiveness of a home-based, self-managed, standing frame program for individuals with progressive multiple sclerosis and severe mobility impairment. The study randomly assigned 140 individuals with progressive multiple sclerosis to either a standing frame (intervention) group (n=71) or a usual care group (n=69). The intervention group used the standing frame for at least 30 minutes three times per week for 20 weeks. Motor function, as assessed by the Amended Motor Club Assessment (AMCA), was measured in all participants at baseline, at 20 weeks, and at 36 weeks. The primary clinical outcome was the AMCA score at 36 weeks, and a 9-point AMCA change was considered clinically meaningful. At 36 weeks, the use of the standing frame resulted in a significant increase in AMCA score compared with that for usual care alone. The authors found that the standing frame protocol significantly increased motor function in individuals with severe progressive multiple sclerosis compared to usual care alone; however, the improvement did not reach the predetermined minimal clinically meaningful level of improvement. Moreover, the authors found evidence for improved hip and ankle joint range of motion and quality of life in the standing frame group. In summary, the authors opined that the use of a home-based, self-managed standing frame program could improve motor function in individuals with progressive multiple sclerosis.
- Dennett et al. (2020) conducted a qualitative study imbedded in the Standing Up in Multiple Sclerosis (SUMS) trial to further understand the experiences of individuals with progressive multiple sclerosis and their standing frames. Of the 140 participants in the SUMS trial, 12 participants kept audio diaries of their experiences. In analysis of the qualitative data, four quoted themes were developed: "Feeling like the old me;" "Noticing a difference," "I want to do it right;" and "You have a good day, you have a bad day." Over the six month data collection period, the investigators reported subjective improvements in physical and psychological symptoms, which were associated with an increase in activities of daily living and engagement with previous

activities. The authors noted that the subjective findings of this study complemented the objective findings related to improved motor function reported in the randomized SUMS trial.

- Paleg and Livingstone (2015) performed a systematic review to determine the effectiveness of home-based standing programs for adults with neurological conditions including stroke and spinal cord injury (SCI). Thirty-six studies addressing the impact of a standing intervention on adults with sub-acute or chronic neurological conditions were included in the analysis. The investigators reported strong evidence that the use of home-based standing programs impacted range of motion and activity with SCI and stroke populations. Moreover, low evidence level studies supported improvements in bone mineral density, strength, and spasticity.
- Glickman et al. (2010) performed a systematic review to investigate the available evidence on the clinical use of supported standing in both pediatric and adult individuals with neuromuscular disorders. The analysis reviewed 39 studies (29 with adult and 10 with pediatric participants). The studies included user and therapist survey responses in addition to results of clinical interventions. The investigators identified moderately strong evidence of improvement in bone mineral density (BMD) with use of a standing device, specifically vertebral BMD. In addition, use of a standing device was associated with a reduction of hypertonicity and improvement in range of motion in individuals with neuromuscular disorders.
- Townsend et al. (2020) conducted a cohort study to describe stander use in non-ambulatory children with spinal muscular atrophy (SMA). The study included data from 397 children with SMA types 1 and 2. Approximately 70% of children with type 2 SMA engaged in consistent (defined as a minimum of three to five times per week) stander use. In addition, one out of 10 children with severe type 1 SMA engaged in consistent stander use, despite significant weakness requiring lower extremity bracing and trunk and head support.
- Paleg et al. (2013) conducted a systematic review to evaluate the evidence on effective dosing for pediatric supported standing programs. Thirty studies were included in the analysis. The authors found that pediatric individuals with neuromuscular conditions demonstrated improved bone mineral density, hip biomechanics, and range of motion from standing, as well as reduced spasticity. The authors concluded that standing for five days per week for at least 45 to 60 minutes per day as tolerated was recommended for pediatric supported standing programs.
- Gibson et al. (2009) reported on a randomized controlled trial which assessed whether static weight-bearing in a standing frame affected hamstring length and improved activities of daily living (ADLs) in nonambulatory children with cerebral palsy (CP). Five nonambulatory children ages six to nine years with CP treated with a standing frame were included in the study. Participants stood in a standing frame for one hour, five days per week, for six weeks, followed by six weeks of not using a standing frame; each phase was repeated. The measurement of the popliteal angle and the assessment of ADLs were made at baseline and throughout the study period.

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The study found a high compliance with the standing program (85% of sessions completed). In addition, hamstrings significantly lengthened during standing phases. Moreover, feedback and assessment suggested that transfers and ADLs became easier after phases of standing frame use. Thus, the authors concluded that in nonambulatory children with CP, six weeks of standing frame use led to significant improvements in hamstring length and may have increased the ease of performance of ADLs.

- Nordström et al. (2013) reported on a study that examined the characteristics of individuals who use standing devices. Questionnaires were returned from 319 individuals (ranging in age from 2-86 years old) who were prescribed standing devices. The authors attempted to explore the degree of device use, experiences with and reasons for standing, and perceived impact of the use of standing devices on well-being and quality of life. The authors found that more than half of respondents used their standing device almost daily or more, and the standing time decreased with increased age. In addition, the devices were used most frequently by individuals that received their devices more than five years earlier or who were dependent for mobilization. Moreover, standing devices were used most frequently to improve circulation and well-being, as well as reduce stiffness. This descriptive study included individuals of various ages and diagnoses that used different types of standing devices. The authors recommended that standing should be promoted in individuals with limited mobility to improve health experiences and quality of life.

Professional organizations/societies:

- In an update to the 2010 Duchenne muscular dystrophy (DMD) care considerations guidelines, Birnkrant et al. (2018) provided guidance on advances in the management of DMD. The authors noted that standing devices were supported by clinical consensus for prevention of contracture and deformity. Moreover, the authors recommended standing devices when standing in good alignment becomes difficult, if contractures are not too severe to prevent positioning or tolerance.
- The Rehabilitation Engineering & Assistive Technology Society of North America (RESNA) position statement on the application of wheelchair standing devices (Dicianno B.E., 2013) noted the benefits of upright standing for individuals who are utilizing a wheelchair for mobility. In a review of the literature, the author cited the (Gibson et al., 2009) study of children with cerebral palsy, noting that the use of standing frames resulted in activities of daily living being carried out successfully, compared to no use of a stander. Based on a review of the literature, the author noted that standing has a beneficial effect on range of motion and can be a way some individuals can treat and prevent contractures independently. Moreover, several measures of pulmonary function have been found to improve with standing. The author also cited evidence demonstrating that standing frame programs may delay onset and progression of scoliosis in individuals with myopathies.

- The 2016 National Institute for Health and Care Excellence (NICE) guidelines for spasticity management in children under 19 years of age (primarily those with CP) endorsed the use of standing systems as part of individualized postural management. The guideline also emphasized considerations for safe and appropriate use of equipment, particularly for children with poorly controlled seizures, respiratory compromise, risk of aspiration, and risk for bone fracture due to osteoporosis.
- The 2017 National Insitute for Health and Care Excellence (NICE) guidelines for the assessment and management of cerebral palsy (CP) in individuals under 25 years of age recommended that standing frames not be used solely to prevent low bone mineral density in children and young people with CP. The guideline cited two low- to moderate-quality studies that evaluated the effects of time spent on the standing frame on bone mineral density. However, the authors of the guideline highlighted that standing frames could be considered cost effective for other purposes that were beyond the scope of this review question.
- In an update of the 2007 consensus statement by the International Conference on the Standard of Care for spinal muscular atrophy (SMA), Mercuri et al. (2018) recommended supported standing for up to 60-minute intervals at least three to five times per week, with goals including: lower extremity stretching; maintaining range of motion; promoting bodily functions, bone health, and optimal spine and trunk posture; and enabling upright participation. Moreover, the authors reported increasing evidence that a proactive approach, including regular sessions of physical therapy utilizing stretching including the use of standing frames was recommended as a comprehensive approach to rehabilitation in individuals with SMA.

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 Codes	Description
E0637	Combination sit to stand frame/table system, any size including pediatric, with seat lift feature, with or without wheels
E0638	Standing frame/table system, one position (e.g., upright, supine or prone stander), any size including pediatric, with or without wheels
E0641	Standing frame/table system, multi-position (e.g., three-way stander), any size including pediatric, with or without wheels

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HCPCS Codes	Description
E0642	Standing frame/table system, mobile (dynamic stander), any size including pediatric

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