Evidence-Based Response
to Insurance Denials of Standing Devices

Medical Benefits, Evidence, and Coverage Guidelines

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Clinician Task Force

www.cliniciantaskforce.us

National Coalition For Assistive & Rehab Technology

www.ncart.us

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A.) Introduction

This document was developed by the Clinician Task Force (www.cliniciantaskforce.us) and the National Coalition for Assistive and Rehab Technology (www.ncart.us) to provide helpful guidance regarding the proper coverage and funding of standing devices for children and adults. For questions or additional information contact Cara Masselink, PhD, OTRL, ATP, Executive Director, Clinician Task Force, at cara.masselink@wmich.edu, or Don Clayback, Executive Director, NCART, at dclayback@ncart.us.

Standing devices are classified within the broad category of Durable Medical Equipment (DME) and are included in a sub-category of products called Complex Rehab Technology (CRT). CRT products consist of specialized equipment that is individually configured to meet the medical and functional needs of children and adults with mobility related limitations and disabilities. Adequate access to CRT plays a critical role in keeping health care costs down and increasing function and independence. Standing devices have a long history of prescription and use to provide important medical benefits and other positive outcomes.

When properly prescribed and utilized, standing devices play an important role in reducing medical complications, clinical interventions, and hospitalizations for certain children and adults with disabilities. The benefits of standing are not specific to a certain primary diagnosis; individuals with a mobility impairment can be appropriate to stand. Therefore a lack of access to these devices harms individuals who require this technology and will result in increased health care complications and costs.

The process for obtaining a standing device begins with clearance from a health care provider that the client can safely stand. Following medical clearance, an evaluation by a physical or occupational therapist is completed and along with a physician prescription. A letter of medical necessity describes the specific benefits expected by that client and the consequences of not providing the device.

Federal, state, and commercial health insurance programs must maintain appropriate coverage and funding policies to allow adequate access to this specialized equipment. This compilation of medical benefits, evidence, and coverage guidelines was developed to provide a basis for those policies.

B.) Medical Benefits of Standing

A person with a disability can spend much of their life sitting or recumbent. Indisputably, sitting, for 8 or more hours per day, has a deleterious effect on health. The same is true for recumbent positions. It follows that such clients benefit from standing devices to allow for change in body position and weight-bearing.

For clients who are unable to stand independently, standing devices safely support them and allow access to the health benefits of standing as well as access to elements in the environment that are out-of-reach from the seated position. People with disabilities have a right to access the world in the same ways that their able-bodied peers do. The following outlines the medical and functional benefits of standing devices.

Body Structure and Function:

- Prolonged sitting is associated with significant co-morbidities of multiple body systems.
- Standing devices enable weight-bearing for non-ambulatory individuals, which has important evidence-based effects on bone and muscle.
- Weight-bearing is essential for bone development, density, and health; and reduces pathological fractures.
- Weight-bearing reduces spasticity.
- Standing provides pressure relief in populations prone to pressure injury.
- Standing leads to improvements in range of motion of the hips and lower extremities.
- Standing reduces and prevents contractures.
- A standing program supports improvements in bowel function.
- Standing increases cardiovascular and pulmonary demand and can lead to improved organ function.
- Standing can have a beneficial effect on postural adaptations that occur from prolonged bed rest or extended periods of sitting.
- Standing may reduce risk of repetitive strain injuries.

Activity:

- Physical Activity: Standing can be considered exercise for many populations.
- Self-Care: Standing with support and use of a work surface (tray or counter) can enable tasks such as teeth brushing, putting on makeup, and hair styling (grooming) with greater freedom and effectiveness than when attempted from a sitting position.
- Hygiene: Standing can increase independence and ease when using a catheter and/or urinal.
- Eating: Standing can develop improved head, neck, and trunk control essential for safe eating and swallowing.

- Functional Mobility and Transfers: Standing can have a beneficial effect on a client's ability to transfer within the home, for example, from wheelchair to toilet, wheelchair to recliner, wheelchair to bed, and wheelchair to transfer tub bench for bathing.

Participation:

- Instrumental activities of daily living: Cooking, folding laundry, cleaning, etc. are commonly done in standing; most homes are designed with this in mind making participation more readily available to a person in the standing position.
- Group participation: Engagement in social and religious activities improves quality of life and mental health.
- Recreation and leisure: Virtual reality and electronic gaming, painting, drawing, and crafts to be done in standing.
- Improve person-to-person interaction: One aspect of participation is the ability to be physically in the same space as another person; standing allows a person with a disability and able-bodied family members to be physically side by side at home, in school, and at work.
- Mental health functions: Standing supports self-esteem and confidence in pediatric clients, and improves sense of self and feelings of self-efficacy in adults.

C.) <u>Evidence and Clinical Practice Guidelines</u>

The following Clinical Practice Guidelines and references illustrate the broad spectrum of client populations that benefit from standing devices. Clinical practice guidelines are an evidence-based framework that helps clinicians and clients make decisions that align with current best practice recommendations. Peer reviewed, published research articles are also utilized for developing and following best practice standards of medical care. Diagnoses not included in this list are still recommended to be assessed for benefits from standing device usage.

Clinical Practice Guidelines	
1	Dicianno, B. E., Morgan, A., Lieberman, J., & Rosen, L. (2016). Rehabilitation Engineering & Assistive Technology Society (RESNA) position on the application of wheelchair standing devices: 2013 current state of the literature. *Assistive Technology*, *28*(1), 57-62. Arva, J., Paleg, G., Lange, M., Lieberman, J., Schmeler, M., Dicianno, B., Babinec, M., & Rosen, L. (2009). RESNA position on the application of wheelchair standing devices. *Assistive Technology*, *21*(3), 161-168. RESNA (Rehabilitation Engineering and Assistive Technology Society of North America) contributes to the public welfare through scientific, literary, professional and educational activities by supporting the development, dissemination, and utilization of knowledge and practice of rehabilitation and assistive technology in order to achieve the highest quality of life for all citizens. Recommendations: Standing devices are medically necessary as they enable certain individuals to: improve functional reach and access to enable participation in ADLs; improve mobility and lower limb

	function in those with some preservation of lower limb strength; improve range of motion (ROM) and reduce risk of contractures; promote vital organ capacity including pulmonary, bowel and bladder function ; promote bone health; improve circulation; reduce abnormal muscle tone and spasticity; reduce the occurrence of pressure ulcers and skeletal deformities and provide numerous psychosocial and quality of life benefits.
2	*American Academy of Cerebral Palsy and Developmental Medicine Care Pathways.* https://www.aacpdm.org/publications/care-pathways Paleg, G., Livingstone, R., Rodby-Bousquet, E., Story, M., & Maitre, N. L. (2021, March 29). *Care Pathway for Therapeutic Interventions for Central Hypotonia (ages 0-6 years)* [Care Pathway]. American Academy of Cerebral Palsy and Developmental Medicine. https://www.aacpdm.org/publications/care-pathways/central-hypotonia Fehlings, D., Switzer, L., Stevenson, R., Gaebler-Spira, D., Dalziel, B., & Ozel, S. (2019, November 8). *Osteoporosis in Cerebral Palsy* [Care Pathway]. American Academy of Cerebral Palsy and Developmental Medicine. https://www.aacpdm.org/publications/care-pathways/osteoporosis Recommendations: Central Hypotonia: A therapeutic recommendation, adaptive equipment use may increase activity and participation: e.g. adaptive seating; compression garments, walker/gait trainer; stander; and power mobility devices. Additionally, postural management programs facilitate age-appropriate activity and participation in natural routines (i.e. activities in lying, supported sitting, standing). Osteoporosis: One of three prevention strategies recommended, bearing weight increases bone mineral density. Recommend organizing a physiotherapy consult to develop a weight-bearing program (e.g. use of a standing frame).
3	Mercuri, E., Finkel, R. S., Muntoni, F. (2018). Diagnosis and management of spinal muscular atrophy: Part 1: Recommendations for diagnosis, rehabilitation, orthopedic and nutritional care. *Neuromuscular Disorders*, *28*(2), 103-115. doi: 10.1016/j.nmd.2017.11.005 Recommendations: For those with SMA the main objective for rehabilitation in those using wheelchairs/sitters are to prevent contractures, scoliosis and maintain, restore function and mobility. This includes the use of orthoses and splints, active-assistive and passive techniques, supported supine/standing/standing frames and serial casting. Supported standing should be up to 60 minutes and minimal frequency is 3-5 times/week, optimal 5-7 times/week.
4	National Institute for Health Care and Excellence (2017, January 25). *Cerebral Palsy in under 25s: Assessment and Management Cerebral Palsy in under 25s* [NICE guideline NG62]. http://www.nice.org.uk/guidance/ng62/ Recommendations: Standing devices could be considered cost effective for purposes other than solely to increase Bone Mineral Density (BMD).
5	Spinal Cord Injury Centre Physiotherapy Lead Clinicians United Kingdom and Ireland (2013, April). *Clinical Guideline for Standing Adults Following Spinal Cord Injury* [Clinical Practice

	Guideline]. https://www.mascip.co.uk/wp-content/uploads/2015/05/Clinical-Guidelines-for-Standing-Adults-Following-Spinal-Cord-Injury.pdf Recommendations: Individuals should be assessed for standing as soon as physiologically stable and it is practically possible following SCI. Standing should take place three or more times a week and should take place for thirty to sixty minutes each time.
6	Consortium for Spinal Cord Medicine (2014). *Pressure Ulcer Prevention and Treatment Following Injury: A clinical practice guideline for health-care providers* (2nd ed.) [Clinical Practice Guideline]. https://www.mascip.co.uk/wp-content/uploads/2015/05/CPG_Pressure-Ulcer.pdf Consortium for Spinal Cord Medicine (2001). *Pressure Ulcer Prevention and Treatment Following Spinal Cord Injury: A Clinical Practice Guideline for Health-Care Professionals* [Clinical Practice Guideline]. *Journal of Spinal Cord Medicine, 24*(Suppl. 1), S40-101. doi: 10.1080/10790268.2001.11753592 Recommendations: Use a seating system that redistributes pressure, minimizes shear, provides comfort and stability, reduces heat and moisture, and enhances functional activity does not only apply to wheelchairs. The concept should apply to any prescribed orthosis, exoskeletal device, or standing device. Wheelchairs and seating systems should allow that individual to redistribute pressure sufficiently to prevent the development of pressure ulcers. Specifically: Use standing wheelchairs to remobilize individuals with existing pelvic pressure ulcers.
7	(n.d.). *Report of the Recommendations: Motor Disorders Assessment And Intervention For Young Children (Age 0-3 Years)* [Clinical Practice Guideline]. Sponsored by the New York State Department of Health, Division of Family Health, Bureau of Early Intervention. https://www.health.ny.gov/community/infants_children/early_intervention/docs/guidelines_motor_disorders_assessment_and_intervention.pdf Recommendations: Adaptive positioning devices, including adaptive seating and adaptive standing devices be considered for children who lack postural stability or have atypical muscle tone affecting postural control and alignment. Examples of devices that may be beneficial for children who have a motor disorder include the following: Adapted positioning and specialized seats (such as adapted strollers, seat inserts, or prone standers) for a child who lacks postural stability and has atypical muscle tone affecting the acquisition of developmentally appropriate motor skills.
8	National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance (2014). *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Australia; 2014. https://www.epuap.org/wp-content/uploads/2016/10/quick-reference-guide-digital-npuap-epuap-pppia-jan2016.pdf Recommendations: Reposition all individuals at risk of, or with existing pressure ulcers, unless contra-indicated. Utilize early mobilization and increased activity as rapidly as tolerated in both the prevention and treatment of pressure ulcers.

D.) Types of Standing Devices and Clinical Considerations

There are a variety of types of standing devices and they are billed under certain Health Care Product Coding System (HCPCS) codes. The following identifies those HCPCS codes and the respective clinical considerations.

HCPCS Code E0637- Sit-to-Stand System, w/ Seat Lift- Combination Sit-to-Stand system, any size including pediatric, with seat lift feature, with or without wheels. Seats may be stationary or swiveling, solid or sling style. The lift is typically a manual hydraulic or gas cylinder, and may have a power lift option. A standing frame coded under E0637 begins with the user in a seated position, which may allow for independent transfers into the device. Sit to stand devices allow the user to transition between sitting and standing without having to be lifted or transferred out of the device. This enables the user to stand in frequent small bursts throughout the day, which is important for bone mineral density, and skin integrity (pressure relief). E0637 devices provide a safe and supportive transition to standing by providing a slow transition to standing to stretch tight muscles. It is designed to accommodate joint contractures by allowing clients to stand at any degree of knee or hip flexion. It has additional components for corrective or therapeutic positioning.

Clinical considerations for E0637- transitions the client between sitting and standing, potentially allowing more frequent use; may allow independent transfer into the device; also, may allow for independent operation of the device.

HCPCS Code E0638- Standing Frame System- Standing Frame/Table system, one position (e.g. upright, supine, or prone stander), any size including pediatric, with or without wheels. A standing frame system coded under E0638 is usually a non-powered, single-position (Prone, or Supine, or Upright) standing device. It may be a table style support or an upright podium or frame. The primary purpose is to reorient an individual to an upright position or sustain a weight bearing position. E0638 devices are simple pieces of equipment and designed only to help support the person securely in a standing posture. It utilizes only one position and may have difficulty being adapted or adjusted for an individual with significant joint contractures. It has additional components available for corrective or therapeutic positioning. It typically does not have a lift mechanism that the user can access independently to assist with transitioning to standing.

Clinical considerations for E0638-

1.) Prone (E0638)- standing while positioned in prone (on stomach/anterior surface of body); facilitates extension; may help work on head control.
2.) Supine (E0638)- standing in a supine position (on back/posterior surface of the body); provides a flat surface to transfer onto; may be ideal for clients with poor head control.
3.) Upright (E0638)- provides support to maintain upright position when placed in this position by some other means; usually used when a client has good trunk and head control requiring minimal support.

HCPCS Code E0641- Standing Frame System, Multi-position- Standing Frame/Table system, multi-position (e.g. three-way stander), any size including pediatric, with or without wheels. A multi

position standing frame, E0641, is a standing device that may have the capability to add or remove parts to allow the user to be positioned in either a prone position or a supine position. The primary purpose of the E0641 is to transition a user to a vertical, weight-bearing position over time as well as giving options for either prone or supine standing for clients whose needs are expected to change (degenerative conditions, fluctuating conditions, etc.). It has additional components available for corrective or therapeutic positioning. It typically does not have a lift mechanism that the user can access independently to assist with transitioning to standing.

Clinical considerations for EO641- having the capability to be utilized in any one of these three positions: prone, supine, or upright; used with clients whose needs are expected to change; may allow for independent operation of the device.

HCPCS Code E0642- Standing Frame System, Mobile**-** Standing Frame/Table system, mobile (dynamic stander), any size including pediatric. A Mobile or Dynamic Standing system**,** E0642 is a standing device that allows the user to be positioned in upright, sit to stand, slightly prone, or slightly supine position depending on device, then independently move the standing device. Independent manual propulsion is accomplished by means of large wheels or drive wheels. Standing mobility provides greater independence, functional performance and opportunity for exploration and interaction with peers. It has additional components available for corrective or therapeutic positioning.

Clinical considerations for E0642-

1.) Prone (E0642)- standing while positioned in prone (on stomach/anterior surface of body); facilitates extension; may help develop head control. Some medical procedures (e.g. feeding tube, internal pump) may preclude prone positioning.
2.) Supine (E0642)- standing in a supine position (on back/posterior surface of the body); provides a flat surface to transfer onto; may be ideal for clients with poor head control. May be preferred my clients with tracheostomies and other medical items (like implanted pumps)
3.) Upright (E0642)- provides support to maintain upright position when placed in this position by some other means; usually used when a client has good trunk and head control requiring minimal support. May be very difficult for transfers.
4.) Sit-To-Stand (E0642)- transitions the client between sitting and standing, potentially allowing more frequent use; may allow independent transfer into the device; also, may allow for independent operation of the device. May not allow for full hip/knee straightening if one joint is contracted.
5.) Multi-position (E0642)- having the capability to be utilized in any one of these three positions: prone, supine, or upright; used with clients whose needs are expected to change; may allow for independent operation of the device.

HCPCS Code E2230- Manual Wheelchair Accessory, Manual Standing System- A standing feature, which is part of a manual wheelchair base (accessory), that brings the user to an upright weight-bearing angle to their tolerance. The standing position is typically achieved through a sit to stand sequence. The wheelchair standing feature allows individuals to independently stand frequently, as part of their daily routine, without transferring into a separate device. This is important for bone

mineral density, skin integrity (pressure relief), and energy conservation. Standing integrated into the manual wheelchair base may also allow the user to be more independent with functional activities of daily living.

Clinical consideration for E2230- transitions the client between sitting and standing, potentially allowing more frequent use; may allow independent transfer into the device; also, may allow for independent operation of the device.

HCPCS Code E2301- Power Wheelchair Accessory, Power Standing System- A standing feature, which is part of a power wheelchair base (accessory), that brings the user to an upright weight-bearing angle to their tolerance. The standing position can be achieved through various options including sit to stand, supine standing, a customized sequence, or a combination of sequences. The wheelchair standing feature allows individuals to independently stand frequently, as part of their daily routine, without transferring into a separate device, especially if assistance is needed for transfers and that assistance is not readily available. This is important for bone mineral density, skin integrity (pressure relief) and energy conservation. Standing integrated into the power wheelchair base may also allow users to be more independent with functional activities of daily living in a variety of environments because the standing feature is always with them.

Clinical considerations for E2301- transitions the client between sitting and standing, potentially allowing more frequent use; may allow independent transfer into the device; also, may allow for independent operation of the device.

HCPCS Code E1399- Durable Medical Equipment, Miscellaneous- This code is used for all standing device accessories/components needed for support, alignment, and safety which are not included in the base configuration of the system.

E.) Reductions in Health Care Costs from Standing Devices

The cost of a complex fully supportive standing frame can range from $5,000 to $9,500. Despite the expense, it is an economical and preventative intervention when considering the benefits it provides as an alternative to more costly interventions. The following reviews the types of medical interventions and treatments that can be avoided or minimized through the use of standing devices.

In-person therapy- After prescription and training by an appropriately trained rehab professional, a standing frame is able to be used in the home to provide intervention that would otherwise cost upwards of $80 per hour for physical or occupational therapy. Typically, a standing frame is expected to be used between 3 to 10 hours per week. Therapeutic intervention for just 3 hours a week would cost $240, which over 50 weeks equates to $12,000 in the first year alone. Because of growth built into the equipment, children can often use the same standing device for as long as 5 years. Adults who do not have a change of medical condition can often use theirs for 7 or more years. Over 7 years, that would equate to over $84,000 worth of intervention.

Spinal fusion surgery can be required for clients who have developed body shape complications such as scoliosis caused by asymmetrical positions over time. Standing devices are an important part of a 24-hour plan of care that protects the skeletal integrity of people who cannot achieve symmetrical body positions on their own. Since a single client's spinal fusion surgery can cost $100,000 including post-operative hospital stay, even a modest reduction in the number of such surgeries required represents significant cost savings for the health care system.

Surgical hamstring tendon releases are sometimes required for clients who spend much of their time sitting in order to regain ability to transfer independently, or progress to supported walking. These body structures can be lengthened non-surgically by daily positioning that includes regular significant time spent in standing. Many wheelchair users cannot stand functionally with knees straight without support for the time needed to gain these benefits. Hamstring release surgery can cost upwards of $10,000 (excluding rehabilitation costs) and includes significant disruption and recovery for the client and their family. Again, even a modest reduction in the number of these surgeries required each year brings significant cost savings for the health care system.

Total Hip Arthroplasty surgery can be required to repair poorly formed hips which are causing pain and reduction in function for clients. The formation of the deep stable hip socket desired is a result of sustained standing during development. Bone density is known to be related to weightbearing, so it can be expected that without weightbearing, the hips of adults can become more fragile than their weightbearing peers. Surgery to repair a broken hip, or to complete a Total Hip Arthroplasty (THA) can easily exceed $20,000. If surgery is required by a person with other medical complications, they may need to recover in the ICU at an additional cost of up to $10,000 per day.

Botox injections for the lower extremity muscles have been widely accepted as a safe and effective intervention to control lower limb spasticity in children and adults. It has shown to have a significant effect in tone and spasticity reduction, however the injections must be regularly completed and have a cost of $2,500 to $3,000 for each injection site. If a person were to receive injections every 12 to 15 weeks as commonly recommended the cost would equal or exceed $12,000 per year.

Complex Wheelchair modifications- Clients who experience a loss of range of motion in their hamstrings become less able to achieve a neutral sitting position, where a level pelvis provides a base of support for the head and trunk to be aligned over the pelvis and the lower extremities comfortably flexed at the hip, knees, and ankles. These clients can require expensive custom modifications in order to continue to use their wheelchairs and seating systems. A custom contoured seat or back cushion can easily cost $5,000 or more. Custom foot supports and foot boxes can also be required, and in severe cases, full custom seating systems are needed. This can be a preventable expense for those clients who are medically and functionally able to stand with support.

Considering the above factors, the cost of a standing frame, when compared to other interventions often utilized in combination with each other, can be covered as an economical, preventative, and conservative therapeutic intervention and translate to significant savings to the health care system.

F.) Overview of Coverage Criteria and Guidelines

The following criteria should be included in a written coverage policy for standing devices:

1.) Client has been deemed medically safe for standing- Based on physical assessment, or on a recent history of successful standing program, the client's physician has cleared them for supported standing. Any restrictions or precautions the client may have must be accommodated by the selected equipment.
2.) Client limitations in body functions and structures are accommodated by the selected equipment- The following are examples of clinical considerations that may be present: If the client has existing range of motion limitations, equipment must be selected that matches those limits. If a client is at risk of orthostatic hypotension, equipment should be able to be quickly and easily moved into a supine position. If the client has impaired head/ trunk control, the equipment should provide necessary support. If the client can only transfer within limited parameters, the equipment should be able to accommodate those parameters.
3.) Client and clinician have medical and functional goals that require the use of a supportive standing frame- Client should have a functional plan for where and how the standing frame will be used. Clinical goals, to which the client has agreed, should address the client's impairments of range of motion, spasticity, pain, bowel/bladder function, respiration and/ or circulation. With successful use of supported standing, the client will be able to demonstrate progress toward these goals.

It is suggested that the clinical team consider different types and components of standing devices before achieving a final recommendation on which individually configured device is most appropriate for the client. This process should allow clinician observation of the client using the standing device.

The process for obtaining a standing device begins with an evaluation by a physical or occupational therapist. There are many different formats that a physical or occupational therapist can use for evaluation; however, there are common areas that must be addressed. The evaluation and prescription processes must be documented, so that it is clear to the reviewer the entire process that was followed.

The evaluation process and related documentation should include:

- Date of birth, weight, and height
- Discussion of goals of the client/caregiver for the standing device
- Summary of diagnoses, onset of the diagnoses and relevant co-morbid conditions
- Client impairments: limitations in body function and structure, such as:
    - Lower extremity range of motion and postural deviations that would affect the types of the supports to obtain and maintain a standing position
    - Strength measures, where applicable
    - The presence of spasticity
    - The presence or history of pressure injuries
- Functional skills, such as ability to transfer
- Activity of Daily living status
- Discussion of how and where the stander will be used

The clinician observation and prescription process should include:

- This involves the client/caregiver, therapist, and the CRT Supplier. The manufacturer's representative is involved as needed. Based on the results of the clinician observation(s), a device is selected.
- This can take place at the client's home, at the therapist's office/clinic, at the client's school, or any other physical setting that enables the client to be physically placed in the stander for observation by the therapist.
- The prescription documentation should include:
    - Documentation of other devices considered, and why they were not appropriate for the client.
    - Justification of the model (type, please see below for overview of clinical considerations) of device being recommended. In addition to justification of the type of stander, each component chosen must be justified as well. The therapist relates all of this to the findings of the client's evaluation.
    - Statement that the client/caregiver demonstrated the ability to safely use the device.
    - Outline of the therapist's prescribed standing program recommendations.

This document is then signed by the evaluating therapist as well as the physician.

The following are existing policies from various funding sources that can be used as references:

1.) https://www.mass.gov/files/documents/2019/12/13/mg-standers.pdf
2.) https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=DHS16_141946
3.) https://www.preferredone.com/SharedMP/MedicalPolicyActive/dme.pdf
4.) https://www.forwardhealth.wi.gov/kw/pdf/2018-14.pdf
5.) https://www.colorado.gov/pacific/sites/default/files/Wheelchair.pdf

G.) Systematic Reviews That Address Supportive Standing

The following references are provided as additional evidence describing the benefits of standing devices.

1	Novack, I., Morgan, C., Fahey, M., Finch-Edmonson, M., Galea, C., Hines, A., Langdon, K., Mc Namara, M., Paton, M. C., Popat, H., Shore, B., Khamis, A., Stanton, E., Finemore, O. P., Tricks, A., Te Velde, A., Dark, L., Morton, N., & Badawi, N. (2020). State of the Evidence Traffic Lights 2019: Systematic review of interventions for preventing and treating children with Cerebral Palsy. *Current Neurology and Neuroscience Reports, 20*(2). doi: 10.1007/s11910-020-1022-z
2	Etoom, M., Khraiwesh, Y., Lena, F., Hawamdeh, M., Hawamdeh, Z., Centonze, D., & Foti, C. (2018). Effectiveness of Physiotherapy Interventions on Spasticity in People With Multiple Sclerosis: A Systematic Review and Meta-Analysis. *American Journal of Physical Medicine and Rehabilitation*, *97*(11), 793-807. doi: 10.1097/PHM.0000000000000970
3	Meyling, C. G., Ketelaar, M., Kuijper, M. A., Voorman, J., Buizer, A. I. (2018). Effects of Postural Management on Hip Migration in Children With Cerebral Palsy: A systematic review. *Pediatric Physical Therapy, 30*(2), 82-91. doi: 10.1097/PEP.0000000000000488.

4	Miller, S. D., Juricic, M., Hesketh, K., Mclean, L., Magnuson, S., Gasior, S., Schaeffer, E., O'donnell, M., & Mulpuri, K. (2017). Prevention of hip displacement in children with cerebral palsy: a systematic review. *Developmental Medicine & Child Neurology, 59*(11):1130-1138
5	Novack, I., Morgan, C., Adde, L., Blackman, J., Boyd, R. N., Brunstrom-Hernandez, J., Cioni, G., Damiano, D., Darrah, J., Eliasson, A. C., de Vries, L. S., Einspieler, C., Fahey, M., Fehlings, D., Ferriero, D. M., Fetters, L., Fiori, S., Forssberg, H., Gordon, A. M., … & Badawi, N. (2017). Early, Accurate Diagnosis and Early Intervention in Cerebral Palsy: Advances in diagnosis and treatment. *JAMA Pediatrics, 171*(9), 897-907. doi: 10.1001/jamapediatrics.2017.1689
6	Pérez-de la Cruz, S. (2017). Childhood cerebral palsy and the use of positioning systems to control body posture: Current practices. *Neurologia, 32*(9), 610-615.
7	Craig, J., Hilderman, C., Wilson, G., & Misovic, R. (2016). Effectiveness of Stretch Interventions for Children With Neuromuscular Disabilities: Evidence-Based Recommendations. *Pediatric Physical Therapy, 28*(3):262-75. doi: 10.1097/PEP.0000000000000269
8	Paleg, G., & Livingstone, R. (2015). Systematic review and clinical recommendations for dosage of supported home-based standing programs for adults with stroke, spinal cord injury and other neurological conditions. *BMC Musculoskeletal Disorders, 16*(358). doi: 10.1186/s12891-015-0813
9	Montero, S. M., Gómez-Conesa, A. (2014). Technical devices in children with motor disabilities: a review. *Disability & Rehabilitation Assistive Technology, 9*(1):3-11. doi: 10.3109/17483107.2013.785034.
10	Paleg, G. S., Smith, B. A., & Glickman, L. B. (2013). Systematic review and evidence-based clinical recommendations for dosing of pediatric supported standing programs. *Pediatric Physical Therapy, 25*(3):232-47.
11	Fehlings, D., Switzer, L., Agarwal, P., Wong, C., Sochett, E., Stevenson, R., Sonnenberg, L., Smile, S., Young, E., Huber, J., Milo-Manson, G., Kuwaik, G. A., & Gaebler, D. (2012). Informing evidence-based clinical practice guidelines for children with cerebral palsy at risk of osteoporosis: a systematic review. *Developmental Medicine & Child Neurology*, *54*(2), 106-16.
12	Newman, M., & Barker, K. (2012). The effect of supported standing in adults with upper motor neuron disorders: a systematic review. *Clinical Rehabilitation, 26*(12), 1059-77.
13	Pin, T. W. (2007). Effectiveness of static weight-bearing exercises in children with cerebral palsy. *Pediatric Physical Therapy, 19*(1), 62-73.

H.) Document Development Team

The Clinician Task Force (CTF) is comprised of more than 80 physical and occupational therapists across the United States who are recognized as leaders in the field of Complex Rehabilitation Technology (CRT). The organization advocates for best practice, evidence-based methods in the service delivery of wheelchairs, seating and accessories, and access to appropriate wheeled mobility and seating for non-ambulatory individuals to promote positive outcomes. The physical and occupational therapy professional codes of ethics guide an approach to wheeled mobility service delivery from dual best-practice and client-centered perspectives. The CTF informs and guides policy and education through research and expert clinical experience. For more information visit www.cliniciantaskforce.us.

The National Coalition for Assistive and Rehab Technology (NCART) is a national non-profit organization of suppliers and manufacturers of Complex Rehab Technology products used by individuals with

disabilities and chronic medical conditions. NCART works to ensure these individuals have adequate access to the specialized CRT products and related supporting services they depend on. In pursuit of that goal, NCART collaborates with consumers, clinicians, and physicians along with federal, state, and private policymakers to establish and protect appropriate coverage, coding, funding, and supplier standards policies. For more information visit www.ncart.us.

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