



Medical Coverage Policy

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Orthotic Devices and Shoes

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Related Coverage Resources

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- [Foot Care Services](#)
- [Lumbar Fusion for Spinal Instability and Degenerative Disc Conditions, including Sacroiliac Fusion](#)
- [Minimally Invasive Spine Surgery Procedures and Trigger Point Injections](#)
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INSTRUCTIONS FOR USE

The following Coverage Policy applies to health benefit plans administered by Cigna Companies. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make coverage determinations. References to standard benefit plan language and coverage determinations do not apply to those clients. Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Each coverage request should be reviewed on its own merits. Medical directors are expected to exercise clinical judgment and have discretion in making individual coverage determinations. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

Overview

This Coverage Policy addresses orthotic devices. Orthotic devices are defined as orthopedic appliances used to support, align, prevent or correct deformities. Static orthoses are rigid and are used to support weakened or paralyzed body parts in a particular position. Dynamic orthoses are used to facilitate body motion to allow optimal function. Myoelectric orthotic devices use neurologic sensors, microprocessor units, and electric motors to provide self-initiated movement.

The policy statements below provide medical necessity criteria for the following:

- [General Criteria for an Orthotic Device](#)

- [Non Foot Orthosis](#)
 - [Cranial Orthotic Devices for Positional or Deformational Plagiocephaly](#)
 - [Upper Limb](#)
 - [Lower Limb](#)
 - [Knee Braces](#)
 - [Shoes](#)
 - [Spinal Orthotic Devices](#)
- [Custom Foot Orthosis](#)
- [Not Medically Necessary Orthoses](#)
- [Experimental, Investigational, or Unproven Orthoses](#)
- [Orthosis Repair and Replacement](#)

Coverage Policy

Coverage for orthotic devices varies across benefit plans. Please refer to the customers' benefit plan document to determine benefit availability and the terms and conditions of coverage.

In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

For the intent of this policy, microprocessor-controlled/computer-controlled devices are considered a type of power enhanced/controlled device.

GENERAL CRITERIA FOR AN ORTHOTIC DEVICE

An orthotic device is considered medically necessary when BOTH of the following criteria are met:

- The orthosis is prescribed to support, align, prevent or correct a deformity
- Evidence of a physical examination within the prior six months, for a condition that supports the use of the item prescribed, is documented in the individual's medical record.

When the above medical necessity criteria have been met, and coverage is available for the specific orthotic device, the following orthoses are considered eligible for coverage when the applicable medical necessity criteria listed below have been met:

- Non Foot Orthosis
 - Cranial Orthotic Devices for Positional or Deformational Plagiocephaly
 - Upper Limb
 - Lower Limb
 - Knee Braces
 - Shoes
 - Spinal Orthotic Devices
- Custom Foot Orthosis

An addition or component to an orthotic device is considered medically necessary when it is required for the effective use of the orthosis.

The following orthotic devices are considered clinically equivalent but not superior to a conventional orthosis, are significantly more expensive than a conventional device, and are therefore considered not medically necessary under many benefit plans:

- mechanical (movement activated) stance control orthotic (HCPCS L2005)
- a custom-foot orthosis for the treatment of plantar fasciitis

NON FOOT ORTHOSIS

I. [Cranial Orthosis](#)

[Coding for Cranial Orthoses](#)

- A custom molded/fitted cranial orthotic device (HCPCS code S1040) is considered medically necessary for the treatment of synostotic plagiocephaly (i.e., craniosynostosis) following surgical correction when the benefit plan includes coverage for this indication.
- A custom molded/fitted cranial orthotic device (HCPCS code S1040) is considered medically necessary for the treatment of moderate to severe nonsynostotic positional plagiocephaly when the benefit plan includes coverage for this indication and ALL of the following conditions are met:
 - Child is **EITHER ONE** of the following:
 - between three and five months of age and has failed to respond to a two-month trial of repositioning therapy
 - age six months to 18 months
 - Cranial asymmetry as evidenced by **EITHER** of the following:
 - cephalic index \pm at least two standard deviations from the mean for the appropriate gender/age (see Table 1)
 - asymmetry of 12 mm or more in **ONE** of the following measures:
 - cranial vault
 - skull base
 - orbitotragial depth (see Table 2)
 - A subsequent custom molded/fitted cranial orthotic device to accommodate growth changes is considered medically necessary when significant cranial asymmetry persists and further meaningful improvement in the asymmetry is expected with continued use of a cranial orthotic device.

Please note: A protective helmet (HCPCS code A8000–A8004) is not a cranial remolding device. A protective helmet (HCPCS code A8000-A8004) is considered a safety device worn to prevent injury to the head rather than a device needed for active treatment. See “Not Medically Necessary” section below.

II. [Upper Limb Orthosis](#)

[Coding for Upper Limb Orthoses](#)

- An upper extremity orthotic device (HCPCS codes L3650-L3999) (i.e., non-myoelectric, non-power enhanced, non custom fitted or custom fabricated hand) is considered medically necessary for an individual requiring stabilization or support to the upper limb and who is expected to have improved function with the use of the device:
 - to substitute for weak muscles (e.g., following cervical spine injury, brachial plexus injury, peripheral nerve injury [e.g., median, ulnar or radial nerves], sprain, strain)
 - to support or immobilize a structure (e.g., rheumatoid arthritis, osteoarthritis, overuse syndromes [e.g., lateral epicondylitis, cubital tunnel syndrome, carpal tunnel syndrome, de Quervain tenosynovitis, trigger finger], trauma, following surgical repairs, fractures [e.g, acromioclavicular dislocation, clavicle fracture])
 - prevent contracture or deformity from neurological injury (e.g., brain injury, stroke [i.e., spasticity], spinal cord injury, brachial plexus injury, peripheral nerve injury)
 - correct joint contractures resulting from disease or immobilization (e.g., post fracture, burns)
 - when necessary to carry out ADLs (e.g., spinal cord injured individuals)

- **A custom fitted (HCPCS codes L3807, L3915, L3917, L3923, L3929, L3931) or custom fabricated (L3763-L3766, L3806, L3808, L3891, L3900, L3901, L3905, L3906, L3913, L3919, L3921, L3933, L3935, L3956, L4205) hand orthotic is medically necessary when the patient's clinical findings are severe and dysfunctional such that an off-the-shelf orthotic is insufficient for the patient's needs when the above medical necessity criteria has been met for an upper limb orthotic and BOTH of the following criteria are met :**
 - One or more of the following additional criteria are met:
 - post-surgical intervention
 - orthotic requires unique components (e.g., pulleys, rubber bands)
 - neurologic co-morbidities (e.g., sensory deficit, spasticity)
 - swelling/lymphedema comorbidity
 - multiple-joint involvement
 - plan of care for serial splinting
 - orthotic will need frequent modification
 - skin impairment co-morbidity
 - The clinical documentation supports the medical necessity of a custom fitted or custom fabricated orthotic beyond what is necessary for an off-the-self orthotic.

III. Lower Limb Orthosis

Coding for Lower Limb Orthoses

- **An ankle orthosis is considered medically necessary for treatment of ankle fracture, sprain, or injury requiring immobilization and/or stabilization.**
- **A nonambulatory ankle-foot orthosis (AFO)/night splint (HCPCS L4396, L4397, L4398) is considered medically necessary for the following indications:**
 - Achilles tendonitis
 - plantar fasciitis
 - plantar flexion contracture of the ankle with dorsiflexion on passive range of motion testing of at least 10 degrees (i.e., a non-fixed contracture) when ALL of the following criteria are met:
 - reasonable expectation of the ability to correct the contracture
 - contracture interferes is expected to interfere significantly with the person's functional abilities
 - ankle contracture splint is used as a component of a therapy program that includes active stretching of the involved muscles and/or tendons
- **A nonambulatory AFO/night splint (HCPCS L4396, L4397, L4398) for ANY other indication, including the following, is considered not medically necessary:**
 - the plantar flexion contracture is fixed
 - foot drop in the absence of ankle flexion contracture
 - for the prevention or treatment of heel pressure ulcer
- **The following prefabricated ankle-foot (AFO) or knee-ankle-foot orthoses (KAFO) are each considered medically necessary:**
 - an AFO for an AMBULATORY individual with a weakness or deformity of the foot and ankle requiring stabilization who is expected to have improved function with the use of the device; HCPCS codes used to represent an ankle-foot device include: L1902, L1906, L1910, L1930, L1932, L1951, L1971, L2112-L2116, L2132, L2134, L2136, L4350, L4360, L4361, L4386, and L4387.

- a KAFO for an AMBULATORY individual who meets criteria for an ankle-foot orthosis and who requires additional knee stability; HCPCS codes used to represent a knee-ankle-foot device include: L2035, L2132-L2136, L2000–L2034, L2036-L2038, L2126, L2128 and L4370.
- **A custom-fabricated AFO or KAFO (HCPCS code L1900, L1904, L1907, L1920, L1940–L1950, L1960–L1970, L1980–L2034, L2036–L2108 and L2126–L2128, L4631) in an AMBULATORY who meets the above medical necessity criteria for an AFO or KAFO is considered medically necessary when ANY of the following criteria applies:**
 - The individual cannot be fitted with a prefabricated (off-the-shelf) AFO or has a documented neurological, circulatory or orthopedic status that necessitates custom fabrication to prevent tissue injury.
 - The condition necessitating the orthosis is expected to be permanent or of long-standing duration (> 6 months).
 - There is a need to control movement about the knee, ankle or foot in more than one plane.
 - The individual has a healing fracture that lacks normal anatomical integrity or anthropometric proportions.

IV. Knee Brace

Coding for Knee Brace

- **A fracture knee brace or a rehabilitative knee brace is considered medically necessary when applied at the time of initial stabilization (e.g., post-surgery, post-injury, post- fracture).**
- **A patellofemoral knee brace is considered medically necessary for the treatment of patellofemoral dislocations or chronic patellar symptomatic subluxation for EITHER of the following indications:**
 - following reduction for an acute (initial) patellar dislocation
 - recurrent dislocation/subluxation of the patella following failure of a three-month exercise and strengthening
- **A prefabricated (i.e., off-the-shelf, custom-fitted) functional knee brace is considered medically necessary when there is documented knee instability and the individual is not considered a surgical candidate for ligament reconstruction.**
- **A custom-fabricated functional knee brace is considered medically necessary when the criteria for a prefabricated functional knee brace have been met and the individual is unable to be fitted with a prefabricated device as a result of ANY of the following (this list may not be all-inclusive):**
 - abnormal limb contour (e.g., disproportionate size/shape)
 - knee deformity (e.g., valgus, varus deformity)
 - minimal muscle mass upon which to suspend the orthosis
- **A prefabricated unloading/offloading knee brace is considered medically necessary for the treatment of moderate to severe osteoarthritis of the knee when ALL of the following criteria are met:**
 - unicompartmental disease that requires load reduction to an affected compartment
 - documented failure of prior medical treatment modalities (e.g., nonsteroidal anti-inflammatory medications, steroid injections, viscoelastic supplementation)
 - radiographic documentation of single-compartment osteoarthritis with or without varus/valgus deformity
 - persistent knee pain limiting activities of daily living

- **A custom-fabricated unloading/offloading knee brace is considered medically necessary when criteria for a prefabricated unloading/offloading brace have been met and the individual is unable to be fitted with a prefabricated device as a result of ANY of the following (this list may not be all-inclusive):**
 - abnormal limb contour (e.g., disproportionate size/shape)
 - knee deformity (e.g., valgus, varus deformity)
 - minimal muscle mass upon which to suspend the orthosis
 - **Accessories to a Knee Brace: a heavy duty knee joint (HCPCS L2385, L2395) is considered medically necessary when medical necessity criteria for the knee brace has been met and the individual weighs greater than 300 pounds.**
 - **Accessories to a Knee Brace: high-strength, lightweight material (HCPCS code L2755) is considered medically necessary for an individual who meets medical necessity criteria for a custom-fabricated knee brace with EITHER of the following indications:**
 - daily activity level (e.g., employment) requires a brace designed for high-impact/high-stress activities
 - weight greater than 250 lbs
-

V. [Shoes](#)

[Coding for Shoes](#)

- **Depth shoes (including inlays provided with the shoe) are considered medically necessary (HCPCS A5500) for an individual with ANY of the following systemic conditions, that are significant enough to result in severe circulatory insufficiency and/or areas of decreased peripheral sensation in the lower extremity:**
 - diabetes mellitus
 - peripheral vascular disease
 - peripheral neuropathy
 - **Custom molded shoes (including inlays provided with the shoe) are considered medically necessary (HCPCS A5501) when criteria have been met for a depth shoe, and the type and/or severity of foot deformity results in failure, contraindication or intolerance to a depth shoe.**
 - **The following modifications to depth or custom-molded shoes may be considered medically necessary:**
 - rigid rocker bottoms (HCPCS A5503)
 - roller bottoms (HCPCS A5503)
 - wedges (HCPCS A5504)
 - metatarsal bars (HCPCS A5505)
 - offset heels (HCPCS A5506)
-

VI. [Spinal Orthosis](#)

[Coding for Spinal Orthoses](#)

- **A spinal orthosis (e.g., cervical orthosis, cervical-thoracic orthosis, thoracic orthosis, thoracic-lumbar-sacral orthosis, lumbar-sacral orthosis, lumbar orthosis) is considered medically necessary for ANY of the following indications:**
 - when mobility restriction is necessary to alleviate pain of spinal origin
 - postoperatively or post-injury to facilitate healing of the spine or related soft tissues

- as support for weak spinal musculature or a spinal deformity that significantly impacts the ability to perform activities of daily living
- scoliosis bracing for children or adolescents (e.g., Milwaukee, Charleston, Boston or Wilmington Brace)

CUSTOM FOOT ORTHOSIS

Coding for Custom Foot Orthoses

- **A custom-fabricated foot orthosis (HCPCS L3000-L3031) is considered medically necessary when there is failure, contraindication, or intolerance to a prefabricated foot orthosis for ANY of the following conditions:**
 - impaired peripheral sensation and/or altered peripheral circulation (e.g., diabetic neuropathy and peripheral vascular disease)
 - the foot orthosis is an integral part of a leg brace and is necessary for the proper functioning of the brace
 - the foot orthosis is used to compensate for a missing portion of the foot (e.g., amputation) and is necessary for the alleviation or correction of illness, injury or congenital defect
 - neurologic or neuromuscular condition (e.g., cerebral palsy, hemiplegia, spina bifida) producing spasticity, malalignment or pathological positioning of the foot where there is reasonable expectation of improvement
 - acquired or congenital foot deformity when ALL of the following criteria are met:
 - The deformity is the result of ONE of the following:
 - symptomatic rigid flatfoot
 - posterior tibial tendon dysfunction
 - mid- or hind-foot arthritis
 - The deformity is associated with significant pain that interferes with activities of daily living and there is impaired gait, balance or mobility as a result of the condition.
 - Conservative medical management has failed.
 - There is a reasonable expectation that the condition will improve through the use of the orthotic device.

NOT MEDICALLY NECESSARY

The following orthoses are each considered not medically necessary:

- custom molded/fitted cranial orthotic device for indications other than those specifically listed above
- protective helmet (HCPCS code A8000-A8004)
- upper limb orthosis (non-powered) for indications other than those specifically listed above
- foot drop splints used as recumbent positioning devices (HCPCS L4394, L4398)
- any orthosis used to treat edema
- any orthosis used to treat pressure ulcers (HCPCS A9283)
- any orthosis used primarily for improved athletic performance or sports participation
- any orthosis used on uninjured body parts or to prevent injury
- prophylactic knee braces
- functional knee braces after successful reconstructive ligament surgery
- patellofemoral knee braces/sleeves for the treatment of postoperative knee effusion or patellofemoral syndrome without subluxation or dislocation
- prefabricated knee brace with inflatable air bladder (HCPCS L1847, L1848)
- a spinal orthosis for indications other than listed above, including as a preoperative diagnostic tool prior to lumbar fusion surgery
- prefabricated foot orthoses
- custom-fabricated foot orthoses for any condition, other than those specifically listed above
- deluxe features for therapeutic shoes (e.g., special colors, type of leather, style) (HCPCS A5508)

- separate orthotic devices for an additional pair of shoes
- inlays/inserts that are direct-formed, compression molded to the individual's foot without the use of an external heat source (HCPCS A5510)
- socks and brace sleeves used in conjunction with an orthotic device
- an additional removable or nonremovable interface (HCPCS L2820, L2830, K0672) dispensed with the initial device
- any of the following items that are considered convenience items and do not treat an underlying physical condition:
 - prophylactic elastic lumbar supports (e.g., tool belts, lumbar belt)
 - inflatable lumbar support pillows/cushions
 - back rest supports

EXPERIMENTAL, INVESTIGATIONAL OR UNPROVEN (EIU)

- **The following orthoses are each considered experimental, investigational or unproven:**
 - myoelectric and/or power enhanced upper extremity orthotic device (e.g., MyoPro® 2)
 - custom-fabricated foot orthosis for the treatment of hallux valgus or hallux rigidus foot deformity
 - foot adductus positioning device (e.g., UNFO foot brace) for the treatment of metatarsus adductus
 - AposTherapy® biomechanical device (Apos US Management Inc., New York, NY)
 - magnetic insole (i.e., orthosis with magnetic foil)
 - electronic/electromagnetic activated stance control KAFO devices (e.g., E-Mag Active, Sensor Walk™, C-Brace®)
 - powered exoskeleton orthosis (e.g., ReWalk Personal System)
 - Copes spinal scoliosis brace
 - SpineCor® spinal orthosis

REPAIR / REPLACEMENT

Repair and/or replacement of an orthotic device is considered medically necessary under the following circumstances:

- when anatomical change or reasonable wear and tear renders the item nonfunctional and the repair will make the equipment usable
- when anatomical change or reasonable wear and tear renders the item nonfunctional and nonrepairable

Repair or replacement is considered not medically necessary when an orthosis becomes unusable or non-functioning because of misuse, abuse or neglect.

General Background

Orthotic Device

An orthotic device is a rigid or semi-rigid device used to support, align, prevent or correct a deformity. Orthotics may also redirect, eliminate or restrict motion of an impaired body part.

Medical necessity for any orthotic device must be documented in the individual's medical record. Supportive documentation includes a prescription for the specific device, recent physical examination for the condition being treated, (i.e., < six months) with assessment of functional capabilities/limitations and any other comorbidities.

Orthoses may be prefabricated or custom fabricated. A prefabricated orthosis is any orthoses that is manufactured in quantity without a specific patient in mind. A prefabricated orthosis can be modified (e.g., trimmed, bent or molded) for use by a specific patient and is then considered a custom-fitted orthosis. An

orthosis that is made from prefabricated components is considered a prefabricated orthosis. Any orthosis that does not meet the standard definition of custom-fabricated is considered to be a prefabricated device.

A custom-fabricated orthosis is one that is specifically made for an individual patient starting with the most basic materials that may include plastic, metals, leather or various cloths. The construction of these devices requires substantial labor such as cutting, bending, molding and sewing, and may even involve the use of some prefabricated components. A molded-to-patient model orthosis is a type of custom-fabricated device for which an impression of the specific body part is made (e.g., by means of a plaster cast, or computer-aided design/computer-aided manufacturing [CAD-CAM] technology). The impression is then used to make a specific patient model. The actual orthosis is molded from the patient-specific model. CAD-Cam and other technologies, such as those that determine alignment of the device, are considered integral to the fitting and manufacturing of the base device.

An unmodified, prefabricated orthosis is generally used in treating a condition prior to a custom-fitted orthosis (prefabricated orthosis that is modified by bending or molding for a specific patient). A custom-fitted orthosis is generally attempted prior to the use of a custom-fabricated orthosis (individually constructed from materials). Custom fabricated devices are considered medically necessary only when the established medical necessity criteria is met for the device and the individual cannot be fitted with a prefabricated (off-the-shelf) device or one is not available. Examples of conditions precluding the use of a prefabricated device typically include abnormal limb contour (e.g., disproportionate size/shape) or deformity (e.g., valgus, varus deformity) or when there is minimal muscle mass upon which to suspend the orthosis.

Orthoses and accessories that are used for participation in sports, to improve athletic performance, that are used to prevent injury in an otherwise uninjured body part, and that are used in conjunction with the device (e.g., socks) are considered not medically necessary.

Identical, spare orthoses used only for the patient's convenience are considered not medically necessary. Additionally, one orthotic per foot is considered appropriate; separate orthotic devices for additional pairs of shoes are not considered medically necessary.

U.S. Food and Drug Administration

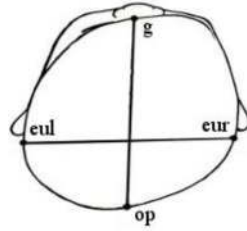
A majority of orthotic devices are regulated by the FDA as Class 1 devices, including the MyoPro® (Myomo) upper limb myoelectric device. Class I devices are subject to the least regulatory control. Cranial orthoses are regulated by the FDA as Class II medical devices and require 510(k) approval. According to the FDA, cranial orthoses are intended for medical purposes to apply pressure to prominent regions of an infant's cranium in order to improve cranial symmetry and/or shape in infants from 3 to 18 months of age, with moderate to severe nonsynostotic positional plagiocephaly.

Cranial Orthotic Devices for Positional or Deformational Plagiocephaly

Cranial orthotic devices, also referred to as cranial remolding helmets, are used for treating cranial asymmetry, a condition caused by mechanical factors in-utero or after birth that lead to misshaping of the skull. Cranial orthotic devices are indicated to promote corrective shaping as a treatment of synostotic (i.e., resulting from premature closure of an infant's sutures) or nonsynostotic plagiocephaly (e.g., positional or deformational plagiocephaly), as well as to prevent recurrence of the deformity.

Evaluation of Plagiocephaly

Cephalic Index: Evaluation of cranial asymmetry may be based on the cephalic index, a ratio between the width (side to side) and length (front to back) of the head. Head width is calculated by subtracting the distance from the euryon on the right side of the head (eur) to the euryon on the left side of head (eul) and multiplying by 100. Head length is generally calculated by measuring the distance from the glabella midpoint (g) (midpoint of the flat area of bone just above the nose between the eyebrows) to the opisthocranium point (op), the most projecting point at the back of the head (posterior most point in the midsagittal plane of the occiput) (Figure A).



(Cranial Technologies, 2014)

Figure A

The cephalic index is then calculated as:

$$\frac{\text{Head width (eu - eu)} \times 100}{\text{Head length (g - op)}}$$

The cephalic index is considered abnormal if it is two standard deviations (SD) above or below the mean measurements (American Academy of Orthotists and Prosthetists [AAOP], 2004; Farkas and Munro, 1987). The indices for infants up to 12 months may be found on the following table:

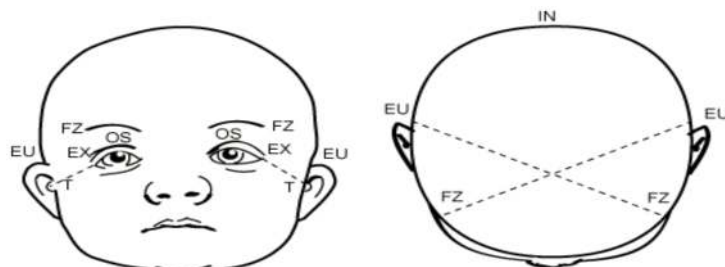
Table 1
Cephalic Index

Gender	Age	- 2 SD	- 1SD	Mean	+ 1SD	+ 2SD
Male	16 days–6 months	63.7	68.7	73.7	78.7	83.7
	6–12 months	64.8	71.4	78.0	84.6	91.2
Female	16 days–6 months	63.9	68.6	73.3	78.0	82.7
	6–12 months	69.5	74.0	78.5	83.0	87.5

Anthropometric Measurements: The evaluation of cranial asymmetry may also be made based on one or more of three anthropometric measures: cranial vault, skull base or orbitotragial depth measurements (AAOP, 2004; Littlefield, et al., 1998). A physician or technician skilled in anthropometry should perform all anthropometric measurements. Cranial orthoses have been indicated for moderate to severe plagiocephaly defined as asymmetry of 12 mm or more (Moss, 1997). Table 2 below defines how these measurements are taken and Figure 1 below illustrates some of the anthropometric landmarks.

Table 2
Specifications for Taking Anthropometric Measurements

Anthropometric Measure	Measurement
Cranial Vault	[left frontozygomatic point (fz) to right euryon (eu)] minus [right frontozygomatic point (fz) to left euryon (eu)]
Skull Base	[subnasal point (sn) to left tragus (t)] minus [subnasal point (sn) to right tragus (t)]
Orbitotragial Depth	[left exocanthion point (ex) to left tragus (t)] minus [right exocanthion point (ex) to right tragus (t)]



Key: EU, euryon; EX, exocanthion; IN, inion; OS, orbitale superius; FZ, frontozygomatic; T, tragus.

Figure 1. Anthropomorphic Landmarks

(Hayes, Inc. 2014)

Upper Limb Orthotic Devices

Upper Limb (Non Powered): Non powered upper limb orthotic devices are most commonly employed to treat injuries and disorders of the finger, hand, wrist, elbow and infrequently, the shoulder. The devices may be classified according to the anatomic region (e.g., wrist, hand), by purpose (e.g., correction, restricting motion) or by function (e.g., compensating for deformity, weakness). Various types of upper limb orthotic devices are available including but not limited to shoulder orthoses, elbow orthoses, finger orthoses, and elbow-wrist-hand orthoses, to name a few. These devices can also be classified as either static (e.g., used to prevent deformity, reduce tone, provide stretch), dynamic (e.g., allow restricted motion) or adaptive/functional (e.g., used to compensate for absent function). Static devices do not allow motion, provide rigid support and are typically used to treat fractures, inflammatory conditions, or nerve injuries. Dynamic devices do allow motion and are most often used to treat weakened muscles and joint contractures. Adaptive/functional devices are used to assist with restoring function, such as for performance of activities of daily living.

Published evidence indicates a number of devices are available for a variety of uses and generally supports upper extremity orthoses are clinically effective for the following indications:

- to substitute for weak or absent muscles (e.g., following cervical spine injury, brachial plexus injury, peripheral nerve injury [e.g., median, ulnar or radial nerves], sprain, strain,
- protect damaged or diseased muscles/joints by limiting motion (e.g., rheumatoid arthritis, osteoarthritis, overuse syndromes [e.g., lateral epicondylitis, cubital tunnel syndrome, carpal tunnel syndrome, de Quervain tenosynovitis, trigger finger], trauma, following surgical repairs, fractures [e.g, acromioclavicular dislocation, clavicle fracture])
- prevent risk of contracture or deformity from neurological injury (e.g., brain injury, stroke [i.e., spasticity], spinal cord injury, brachial plexus injury, peripheral nerve injury)
- correct joint contractures resulting from disease or immobilization (e.g., post fracture, burns)
- when necessary to carry out ADLs (e.g., spinal cord injured individuals)

Upper Limb Myoelectric: Myoelectric powered upper-extremity orthotic devices use neurologic sensors, microprocessor units, and electric motors to provide self-initiated movement of the affected upper extremity. One device, the MyoPro® (Myomo, Inc., Boston, MA), is a myoelectric arm orthosis designed to support a weak or deformed arm. It is purported the MyoPro can enable individuals to self-initiate and control movements of a partially paralyzed or weakened arm using their own muscle signals. The device may be used as exercise equipment during rehabilitation or as a personal assistive device. Individuals with traumatic brain injury, spinal cord injury, brachial plexus injury, amyotrophic lateral sclerosis, stroke, multiple sclerosis and other upper limb neuromuscular deficits may be considered candidates for use of the device. According to the manufacture there are three MyoPro 2 models available, all models are myoelectrically controlled by the wearer's own muscle signal. The Motion E features a powered elbow with static rigid wrist support; Motion W has a powered elbow and a multi-articulating wrist, with flexion/extension and supination/pronation; and Motion G offers a powered elbow, a multi-articulating wrist and a powered elbow.

According to the United States Food and Drug Administration (FDA), Myomo Inc. received 510(k) approval for the Myomo e100 in 2007 as a Class 2 device, described further as exercise equipment, powered, EMG-

triggered. The device is indicated for use by stroke patients undergoing rehabilitation to facilitate stroke rehabilitation by muscle re-education, and/or maintaining or increasing range of motion.

Evidence in the peer-reviewed published scientific literature evaluating consists of review articles, observational studies, and few randomized controlled trials with small patient populations, reporting short term outcome. Much of the evidence evaluates use of robotic movement training in a rehabilitation setting as an adjunct to conventional therapies or for exercise training, with limited evidence evaluating use of the myoelectric device in the home setting. Hayes published a Search and Summary report (Hayes, 2018) evaluating use of the MyoPro or similar devices, in general. According to Hayes a search of the literature located a scant number of studies consisting of two prospective comparative trials, one prospective uncontrolled study, two case reports and five review articles. The authors concluded there is insufficient evidence to assess safety and/or impact on health outcomes or patient management associated with use of the device for paralysis/paresis following stroke. Although myoelectric powered upper extremity orthotic devices are an evolving technology, more recently including those manufactured using 3D technology, additional well-designed, large-scale clinical studies evaluating benefits and harms of this technology after stroke and other neurological injuries are needed to firmly establish safety and clinical efficacy.

Lower Limb Orthotic Devices

Lower limb orthoses are classified by anatomic location (e.g., ankle orthoses, ankle-foot orthoses [AFO], knee-ankle-foot orthoses [KAFO]). Ankle orthoses are supportive devices used to provide immobilization to the ankle. AFOs have a shoe insert component as well as an ankle component. KAFOs contain a knee component, ankle component and shoe insert.

Ankle Orthoses: An ankle orthosis is a type of orthotic device used to treat acute ankle injuries such as a sprain, for rehabilitation after the initial injury and to prevent re-injury of the ankle. They are also used to treat chronically unstable ankles. Ankle orthotic device options include lightweight sports plastics/Velcro models, hinged devices, lace-up devices, neoprene sleeves, ankle wraps and taping, braces, various types of casts, stabilizing shoes and air stirrups.

Ankle-Foot Orthoses (AFO): An AFO extends well above the ankle to the top of the calf. It requires fastening at the lower leg, just above the ankle. This device may be considered medically necessary for ambulatory patients with weakness or deformity of the foot and ankle, which also require stabilization for medical reasons and when the patient has the potential to benefit functionally from use of the device. Commonly, AFOs are used to treat disorders including but not limited to ankle dorsiflexion (upward motion), plantar flexion (downward motion), inversion and eversion (turning inward or outward), spastic diplegia due to cerebral palsy, lower motor neuron weakness due to poliomyelitis and spastic hemiplegia associated with cerebral infarction.

Knee-Ankle-Foot Orthoses (KAFO): A KAFO is an AFO with metal uprights, a mechanical knee joint and two thigh bands. KAFOs may be medically necessary for ambulatory patients who meet criteria for an ankle-foot orthosis, and who also require additional support to the knee for stability. HCPCS codes representing KAFOs are L2000–L2038, L2126–L2136, and L4370.

AFOs and KAFOs may be used by individuals for the treatment of edema and/or for the prevention or treatment of pressure ulcers. When the individual is ambulatory these devices are considered not medically necessary because when used for prevention/treatment of edema or pressure ulcers the devices are not being used to treat a weakness or deformity that requires stabilization and do not meet the definition of a brace. Similarly, walking boots (L4360 and L4386) are AFOs that may be used to relieve pressure on the sole of the foot or that may be used for patients with foot ulcers, when used for these indications these devices are also considered not medically necessary. A walking boot may be considered medically necessary when it is used to provide stabilization for treatment of orthopedic conditions or when used postoperatively for orthopedic surgery.

Additions to AFO/KAFO Devices: Additions to AFOs or KAFOs (L2180–L2550, L2750–L2830) are considered not medically necessary if either the base orthosis is not medically necessary or the specific addition is not medically necessary.

Nonambulatory AFO/Splints: A splint is defined as an appliance for preventing movement of joints or for the fixation of a displaced or movable body part. Nonambulatory AFO devices, often referred to as splints, include the ankle contracture splint, a night splint and/or a foot drop splint/recumbent positioning device.

A static or dynamic positioning AFO (HCPCS L4396, L4397), also referred to as an ankle contracture splint, is a prefabricated AFO that has all of the following characteristics:

- designed to accommodate an ankle with a plantar flexion contracture of up to 45°
- applies dorsiflexion force to the ankle
- for use by a patient who is minimally ambulatory or nonambulatory
- has a soft interface

These devices may be used to treat plantar flexion contracture of the ankle, Achilles tendonitis, and plantar fasciitis. Ankle flexion contracture is a condition where the muscles and/or tendons that plantarflex the ankle are shortened, resulting in an inability to bring the ankle to 0° by passive range of motion. At 0° flexion, the ankle is perpendicular to the lower leg. Plantar fasciitis is an inflammation of the heel of the foot. Achilles tendonitis is a condition where there is painful inflammation of the Achilles tendon, most often the result of overuse. Conservative treatment for these conditions includes physical therapy, NSAIDs, non-weight-bearing, and strengthening and stretching of the tendons. Nonambulatory AFO/splint devices maintain elongation/stretching of the tendons and reduce tension when worn, typically at bedtime.

When used to treat a fixed contracture and/or in patients who demonstrate foot drop without an ankle-flexion contracture these devices are considered not medically necessary. Furthermore when used to correct positioning of the knee or hip, the effectiveness of these splints is not well-established in the peer-reviewed literature.

A foot drop splint/recumbent positioning device (HCPCS L4398) is a prefabricated AFO and has all of the following characteristics:

- designed to maintain the foot at a fixed position of 0° (i.e., perpendicular to the lower leg)
- not designed to accommodate an ankle with a plantar flexion contracture
- for use by a patient who is nonambulatory
- has a soft interface

Foot drop is a condition where there is a weakness and/or lack of use of the muscles that dorsiflex the ankle, but the ability to bring the ankle to 0° by passive range of motion remains. A foot drop splint/recumbent positioning device is not considered medically necessary for the treatment of foot drop when the individual is non-ambulatory because there are other more appropriate treatment modalities.

Stance Control Orthoses: A stance control orthosis is an orthotic knee joint or custom-fabricated KAFO that allows swing-phase knee flexion. The knee joint locks when weight-bearing to provide stance phase stability and, when not weighted, it unlocks to allow a swinging motion of the knee. It is proposed that the stance control components allow the patient to swing their impaired limb with sufficient ground clearance to provide a more normal gait. While there are no specific patient criteria, it is intended for use in patients with lower extremity weakness and who demonstrate some control of hip muscles. Candidates who may benefit from this type of device typically have conditions such as polio, post-polio syndrome, spinal cord injuries, multiple sclerosis, stroke or trauma.

These devices can be activated by a mechanical mechanism controlled by activated movement (e.g., ankle range of motion, limb inclination), or mechanical and controlled electronically (e.g., microprocessor-controlled, electromagnetic). Classifications of the devices include the ankle driven device that requires ankle motion to lock and unlock the knee joint; a gait driven device which requires the individual have the ability to reach full hip extension in stance and full knee extension in swing phase in order to unlock and lock the knee joint; or weight driven which locks the knee joint when weight is transferred onto foot plates. Electronic activated devices generally add resistance to knee flexion when the limb is loaded in less than a fully extended position, potentially improving function when the individual is ascending stairs or walking on uneven surfaces.

Evidence in the published, peer-reviewed scientific literature evaluating stance control orthotic devices is limited. Most of the evidence that support some improvement of gait pattern are in the form of literature reviews (Rafiaei, et al. 2015), small case reports (Kim, et al., 2016; Yakamovich et al., 2006; Herbert and Liggins, 2005) and small case series (Probsting, et al., 2015; Bernhardt, et al., 2011; Irby, et al., 2007; Irby, et al., 2005) and lack high statistical power. The types of devices in these trials vary making comparisons across studies difficult. Furthermore much of the information available for these devices is from the manufacturers. As a result, drawing strong conclusions that support improved clinical outcomes with the use of these devices is difficult. Stance control devices have not been clearly established as superior to conventional devices and there is limited evidence to suggest it is considered equivalent. Published scientific evidence evaluating enhanced features such as electronic controls (i.e., microprocessor, electromagnetic activation) is inadequate to support clinical utility.

University of California Berkeley Laboratory (UCBL) Orthosis (HCPCS L3000): This orthosis is a variant of the traditional prefabricated arch support and was originally designed to maintain a flexible, paralytic valgus foot deformity in the corrected position. This orthosis is cast in a semi-weight-bearing position. Some authors recommend the device to treat flatfoot, plantar fasciitis, calcaneal spurs, posterior tibial tendon dysfunction and rheumatoid arthritis.

Powered Exoskeleton: Powered lower extremity orthoses are orthotic devices (e.g., trunk-hip-knee-ankle-foot device) undergoing research and development with the intent of assisting individuals with spinal cord injuries and other lower-limb impairments to ambulate. These devices are also referred to as exoskeletons and employ the use of computer-controlled, motorized leg-braces that assist with restoring ambulation. Individual patient selection criteria is very specific and use of the device requires coordinated and structured rehabilitation prior to and during home use. The FDA describes/categorizes a powered exoskeleton as a prescription device composed of an external, powered, motorized orthosis used for medical purposes that is placed over a person's paralyzed or weakened limbs for the purpose of providing ambulation. With a wrist-pad controller the user can activate the robotics system to stand, sit, or start walking, and with a torso tilt sensor, the user can trigger step to step transition during walking. In theory, the devices restore mobility, increase function, and improve health status and quality of life. In addition to medical necessity criteria established by the manufacturer and FDA approval trials, use of the device requires a lengthy training period with a skilled physical therapist licensed for training with the device, a dedicated caregiver to assist with the device, access to a facility that offers a rehabilitation program for the device, and complex rehabilitation provided over several weeks to months.

Several FDA approved robotic lower body exoskeleton devices have been approved by the FDA, including the ReWalk exoskeleton, Ekso, Ekso GT, and the Indego. Some devices are approved only for use in the rehabilitation setting (e.g., Ekso™ and Ekso GT™[(Ekso Bionics® Inc); HAL for Medical Use [(Lower Limb Type) [CYBERDYNE Inc.]. The FDA-approved indications for these devices include use by individuals with hemi- and paraplegia due to spinal cord injuries or stroke when accompanied by a specially trained caregiver. None of these types of devices are intended for sports or climbing stairs; the individuals must retain upper-limb strength and mobility to manage stabilizing crutches when using these devices. More recently, the Restore™ Exo Suit (ReWalk Robotics, Ltd) received U.S. Food and Drug Administration ("FDA") approval, intended for use in the treatment of stroke survivors with mobility challenge in the clinical setting. According to the manufacturer the Restore Suite provides coordinated plantarflexion and dorsiflexion assistance to the individual's impaired foot and ankle; power is transmitted from waist belt-mounted motors through cables to attachment points on the calf and an insole which is placed in a shoe. Sensors clipped to the shoes detect motion and communicate timing of the assistance. Using a handheld smartphone controller, a trained therapist is able to monitor key metrics, adjust assistance level, change/ select modes and record standard gait training assessments." The device is not approved for use in the home setting. In addition, upper limb exoskeletons are under investigation although there is a paucity of evidence in the medical literature evaluating these devices.

There is limited evidence in the published peer-reviewed medical literature to demonstrate the safety and efficacy of these devices. Publications to date consist primarily of review articles, small observational trials, and systematic reviews/meta-analysis, long term outcome data is lacking as well as RCTs. In addition, outcomes vary across trials, making comparison difficult (Molteni et al., 2021; Rodriguez-Fernandez, et al., 2021; Duddy, et al., 2021; Guanziroli, et al., 2018; Juszczak, et al., 2018; ; Wu, et al., 2018; Tefertiller, et al., 2017; Gorgey, et al., 2017 ; Platz, et al., 2016; Miller, et al., 2016; Kozlowski, et al., 2015; Hartigan, et al., 2015; Yang, et al., 2015 ;

Asselin, et al., 2015; Fineberg, et al., 2013; Esquenazi, et al., 2012; Zeilig, et al., 2012). There are insufficient studies comparing motorized or robotic wearable walking assistive devices versus alternative devices therefore no conclusions can be made regarding efficacy and improved health outcomes. One RCT recently published by Molteni and colleagues (2021) compared a powered exoskeleton device to conventional gait training for subacute stroke patients in a rehab setting, the authors concluded that the device allows unable walking patients to conduct an early and intensive overground gait experience in the rehab setting. This is consistent with other studies where outcomes are measured in a rehabilitation setting with an attempt to mirror outdoor conditions. The published evidence tends to support some individuals demonstrate improved bowel regulation and improved spasticity, a majority of individuals are able to walk with the device (with no to minimal assistance) for short distances (e.g., 50-100 meters) and some individuals have reported positive outcomes on quality of life during training sessions. Serious adverse outcomes have not been reported in the literature. The authors of a systematic review concluded after reviewing a total 87 clinical studies evaluating powered lower limb exoskeletons that “despite some reports of positive impact to physical exercise, ability to carry out ADLs and reduction of secondary health conditions related to sedentariness, the technology is limited by heavy and bulky devices that require supervision and walking aids”. Furthermore the evidence supporting a benefit is limited to short intervention trials with few subjects and diversity among the clinical protocols. As such, the authors concluded these devices are still in the early stages of development and RCTs are needed to demonstrate clinical efficacy (Rodriguez-Fernandez, et al., 2021). Trials evaluating everyday use and the functional and psychological effects of the exoskeleton are currently recruiting and/or ongoing, further illustrating long-term outcomes evaluating use of the device after the trial period, and overall quality of life and functional improvement following use in the home or community setting have not yet been firmly established. .

In 2019 the Canadian Agency for Drugs and Technologies in Health (CADTH) published an updated report evaluating motorized walking devices titled “Wearable Motorized and Robotic Walking Assistive Devices for Patient with Compromised Mobility: A Review of Clinical effectiveness, Cost-Effectiveness and Guidelines”. (Marchand, MacDougall, 2019). The author’s sought to determine the following:

- What is the clinical effectiveness of motorized or robotic wearable walking assistive devices for adults with compromised mobility?
- What is the cost-effectiveness of motorized or robotic wearable walking assistive devices for adults with compromised mobility?
- What are the evidence-based guidelines regarding motorized or robotic wearable walking assistive devices for adults with compromised mobility?

In addition to the three nonrandomized trials included in the initial report, one new systematic review was included in the update and aimed to determine whether powered exoskeletons are effective as assistive and rehabilitation devices in improving locomotion in patients with spinal cord injuries. In summary, the authors noted the review did not contain any relevant literature regarding the clinical effectiveness of motorized or robotic wearable walking assistive devices versus alternate wearable motorized or robotic or manual walking assistive devices for adults with compromised mobility. In addition, no cost-effectiveness studies or evidence-based guidelines were identified. The evidence reviewed was insufficient to draw conclusions.

Knee Braces

A brace is defined as an orthosis or orthopedic appliance that supports or holds in correct position any movable part of the body and that allows for motion of that part. It must be a rigid or semirigid device used for the purpose of supporting a weak or deformed body member or restricting or eliminating motion in a diseased or injured part of the body. It must provide support and counterforce on the limb on which it is being used. For individuals who weigh more than 300 pounds heavy duty knee joints may be medically necessary.

Types of Knee Braces

There are four basic kinds of knee braces referenced in the published literature:

- prophylactic braces, which are designed to prevent or reduce the severity of knee injury

- functional braces, which are designed to (a) provide stability for the anterior-cruciate ligament (ACL) or other ligament deficiency of the knee and (b) provide protection for the ACL or other ligaments after repairs or reconstructions
- rehabilitative braces, which are designed to allow protected motion of injured knees or knees that have been treated operatively
- unloader/offloader braces, which are designed to provide pain relief in arthritic knees

Prophylactic Knee Braces: The objective of using a prophylactic knee brace is to prevent or reduce the severity of injury to a healthy knee. The prophylactic knee brace is generally indicated for protection of the medial-collateral ligament (MCL) against valgus knee stresses and ACL protection from rotational stress in similar situations and are available off-the-shelf. There is insufficient evidence to provide strong conclusions that use of prophylactic knee braces significantly reduces knee injuries (AAOS, 2014; AAOS, 2003; AAP, 2001).

Functional Knee Braces: Functional knee braces, also referred to as derotational braces (e.g., HCPCS code L1840), provide stability to an unstable knee when rotational and anterior-posterior forces are applied to the ligaments. Their main function is to reduce risk of injuries without significantly impairing function (AAP, 2003) and can either be purchased off-the-shelf or are custom fabricated. The brace is designed to be worn during activities and to allow protected motion, as well as to prevent excessive loading. The published, peer-reviewed scientific literature reveals few clinical studies to support improvement in subjective responses with use of the functional brace, such as increased stability, decreased pain, improved performance or increased patient confidence. The literature does not support prophylactic functional knee brace use to prevent reinjury after graft maturation following a successful ACL reconstruction (AAOS, 2014; DeLee, 2003). However, there is some evidence to indicate that functional braces are beneficial when the patient has demonstrated knee instability and is not a candidate for ACL reconstruction.

Rehabilitative Knee Braces: Rehabilitative knee braces (e.g., HCPCS codes L1832, L1844) are intended to control the knee flexion-extension angle during the initial healing period after cruciate ligament or meniscal fracture management or reconstructive surgery. Rehabilitative braces are typically used short term for the early postoperative period to protect the fracture site or surgical repair while range-of-motion, weight-bearing and muscle activity are initiated. There is little published evidence and data supporting the use of rehabilitative braces, although they appear to be well accepted clinically and avoid the risks to the knee associated with cast immobilization.

Unloading/ Offloading Knee Braces: Unloading braces are recommended for the treatment of pain and disability that may result from moderate to severe osteoarthritis of the knee. Osteoarthritis of the knee is associated with an overload of a focal area of cartilage. This focal overload leads to failure of the load-bearing capacity of the affected cartilage and subchondral bone. Grading of osteoarthritis is often determined by the Kellgren-Lawrence scale which describes the severity of articular cartilage changes associated with osteoarthritis; grade 3 or 4 on the grading scale is considered moderate to severe osteoarthritis. In most cases, unicompartmental osteoarthritis and varus and valgus deformities can be treated by unloading braces, although joint disease that is present in both medial and lateral compartments and patellofemoral joint disease has not been successfully treated with braces (Pruitt, 2005). Varus deformities cause overload to the medial compartment, while valgus deformities cause overload to the lateral compartment. Knee braces with varus or valgus adjustments (e.g., HCPCS code L1843, L1844, L1845) may be medically necessary for patients who are ambulatory and require bracing to alleviate pressure on the medial or lateral compartment of the knee. Evidence in the published, peer-reviewed scientific literature evaluating the use of knee bracing for osteoarthritis (Matsuno, et al., 1997; Kirkley, et al., 1999; Richards, et al., 2005; Richmond, et al., 2009; Rannou, et al., 2010; Duivenvoorden, et al., 2015) tends to support some effectiveness and demonstrate reduction in pain, improved functionality, and reduced loading to the damaged compartment.

Fracture brace: Another less commonly utilized knee brace is a fracture brace (e.g., HCPCS code L1832). This type of brace has been employed for the treatment of tibial-femoral fractures and may be custom-made or prefabricated. It is a functional brace that is applied after initial stabilization. It allows protected weightbearing and motion of the joints above and below the fracture. Published literature indicates this brace promotes early joint movement, prevention of contractures, and early weightbearing, which results in earlier healing.

Patellofemoral knee brace: Knee sleeves, also known as patellofemoral knee braces (e.g., HCPCS code L1810), are elastic sleeves used to provide a feeling of support to the knee. These devices are intended to resist lateral displacement of the patella and thereby decrease knee pain. Generally, these devices function as a counterforce brace and have little efficacy for improving pain and function in the treatment of patellar subluxation, dislocation, or patellar hypermobility. The sleeve may be modified to include an opening for the patella, movable straps or a buttress (e.g., felt, inflatable air pocket) and is used to stabilize the patella. Plain knee sleeves may be used to treat postoperative knee effusions and patellofemoral pain syndrome in the absence of subluxation, although clinical efficacy has not been firmly established when used for these conditions (France and Paulos, 1994; Paluska and McKeag, 2000; LaBella, 2004; Lun, et al., 2005; Chew, et al., 2007).

Shoes (Therapeutic)

In contrast to standard shoes (basic shoe), therapeutic shoes have additional depth and may be used to accommodate foot deformities. In general, therapeutic shoes may be considered medically necessary for the treatment of some foot conditions, are accommodative or functional, and are fitted and furnished by a specially trained health professional (e.g., podiatrist, orthotist, prosthetist) or certified pedorthotist. Shoe selection is based primarily on the foot condition or related disease, the shape of the foot, and the individual's daily activities (Janisse and Janisse, 2008). Standard shoes (basic shoes) purchased over-the-counter are not considered therapeutic shoes.

According to the American Diabetic Association (ADA), diabetic Individuals with neuropathy or evidence of plantar pressure may be adequately managed with a well-fitted walking shoe or athletic shoe; those with bony deformities (e.g., hammertoes, prominent metatarsal heads, bunions) may require extra-wide shoes or depth shoes; those with extreme bony deformities (e.g., Charcot foot) who cannot be accommodated with commercial therapeutic footwear may require custom-molded shoes (ADA, 2007). Early management is important for prevention or delay of ulceration and/or amputation.

Shoes Types and Accessories: Therapeutic shoes that may be considered medically necessary for a person with systemic conditions that involve impaired circulation and/or loss of protective sensation, including diabetes mellitus, include a depth shoe (HCPCS code A5500) or a custom-molded shoe (HCPCS code A5501), and may or may not have an internally seamless toe. A depth shoe is defined as follows:

- has a full length, heel-to toe filler that when removed provides a minimum of 3/16" of additional depth used to accommodate custom-molded or customized inserts
- is made from leather or other suitable material of equal quality
- has some form of closure (e.g., velcro, lace or zipper)
- is available in full and half sizes with a minimum of three widths so that the sole is graded to the size and width of the upper portions of the shoe according to the American standard last sizing schedule or its equivalent. (The American last sizing schedule is the numerical shoe sizing system used for shoes in the United States.)

A custom-molded shoe is defined as follows:

- is constructed over a positive model or mold of an individual's foot
- is made of leather or other suitable material of equal quality
- has removable inserts which can be altered or replaced as the individual's condition warrants
- has some form of shoe closure (lace, velcro, zipper).

Therapeutic shoe inserts (HCPCS A5512, A5513, A5514) and/or modifications (HCPCS codes A5503, A5504, A5505, A5506, and A5507) may be considered medically necessary and are often required for correct fitting of the shoe. Inserts are total contact (continuous physical contact with weight-bearing portion of the foot) multiple density removable inlays that are directly molded to the plantar surface of the individual's foot or a model of the foot. Modifications of depth or custom-molded shoes include but are not limited to:

- rigid rocker bottoms

- roller bottoms
- wedges
- metatarsal bars
- offset heels
- flared heels

Deluxe features (HCPCS codes A5508) such as special colors, special leathers, and styles do not contribute to the accommodative or therapeutic function of the shoe and are not considered medically necessary.

Inlays (i.e., inserts) that reflect compression molding to the individual's foot over time through heat and pressure generated by wearing a shoe with the insert present (HCPCS code A5510), without external heat sources, do not offer total contact and are not considered medically necessary.

Soft, open toe post-operative shoes (i.e., Sroufe "toe shoe") do not meet the definition of durable medical equipment, are not considered orthotics, and are considered convenience items.

A foot adductus positioning device (e.g., UNFO foot brace, UNOS Medical Ltd., Holon Israel) is a device intended for the treatment of metatarsus adductus in newborns. Metatarsus adductus is a condition resulting in medial deviation of the forefoot on the hindfoot, also referred to as "in-toeing". Management of metatarsus adductus depends on degree of flexibility, treatment often involves only observation with spontaneous resolution in a majority of cases. In some cases, passive stretching or serial casting may be recommended (i.e., if no improvement by six months of age). Long term functional problems are rare even if in-toeing does not completely resolve (Rosenfeld, et al. 2020).

According to the manufacturer, components of the UNFO foot brace include a rigid plastic insert to support the foot. The insert is covered by a soft thermoplastic material to prevent pressure sores. The medial wall is curved as "anti-adductus shape" to allow more space at the mid-foot for adequate correction. The cushion is molded over the first metatarsus and the big toe for better consistent fixation of the foot in the brace. A circular adjustable strap immobilizes the foot in the brace. Fixed over the medial wall of the brace, a Velcro strap (which features a wide and soft pillow for comfort) can be adjusted by the treating physician as the treatment progresses. The strap has two major functions: to stabilize the heel in the heel cage and the whole foot in the brace, which ensures that the foot remains securely fixed in the brace and to apply corrective pressures on the mid foot for adequate realignment of the foot. According to the FDA approval for this device, it is a Class I device, classified as a corrective orthotic shoe. Evidence in the peer-reviewed scientific literature evaluating the foot adductus positioning device is lacking therefore conclusions regarding safety, efficacy, and improved net health outcomes cannot be made.

AposTherapy® is a customized shoe-like device claimed by the manufacturer to be a noninvasive biomechanical treatment for osteoarthritis of the knee and lower back pain (Apos US Management Inc., New York, NY). It is purported adjustable external spacers (i.e., pods) placed in the sole of the custom shoe aim to correct gait patterns. AposTherapy is initiated by a physical therapist using computerized gait analysis software to analyze the walking pattern. The physical therapist then calibrates the pods which provide perturbation on the bottom of the AposTherapy shoes based on the analysis. It is claimed the biomechanical device works to retrain muscles around the knee by adjusting the center of pressure, thereby changing the way one's foot interacts with the ground. In theory, the pod causes an imbalance requiring one to realign the weight placed on joints and correct abnormal walking patterns, thereby correcting back, hip and knee alignment during ambulation. The evidence base to date consists mainly of retrospective, prospective, controlled, non-randomized trials (Elbaz, et al., 2010; Drexler, et al., 2012; Segal, et al., 2013; Bar-Ziv, et al., 2013; Yaari, et al., 2015; Barzilay, et al., 2016; Yaari, et al., 2015; Tenenbaum, et al., 2017; Solomonow-Avnon, et al., 2017; Debbi, et al., 2019; Reichenbach et al., 2020). Some evidence supports significant improvement in short and mid-term outcomes using WOMAC scores and SF-36 questionnaires as well improvement in gait velocity, cadence and stride length. Reichenbach and colleagues (2020) published the results of a randomized controlled trial evaluating the effect of biomechanical footwear therapy (n=111) versus control footwear (n=109) for treatment of pain related to knee osteoarthritis at 24 weeks followup. The experimental group wore two shoes with two convex adjustable rubber pods screwed to the outsole at the heel while the control group wore footwear which had a device that had visible outsole pods that were not adjustable and did not create a convex walking surface. Followup occurred at 24 weeks with

outcomes measured using WOMAC pain subscores standardized to range from 0 (no symptoms) to 10 (extreme symptoms) and secondary outcomes which included WOMAC physical function and stiffness subscores and the WOMAC global score, all ranging from 0 (no symptoms) to 10 (extreme symptoms). A total of 213 subjects completed follow-up. All scores improved in all groups at 24 weeks, the authors reported the experimental group scores demonstrated a larger decrease in scores compared to the control group and that results were statistically significant, but of uncertain clinical importance. In addition to lack of long term outcomes, some limitations of the trial noted by the authors include differences in appearance of the shoes, lack of blinding, longer daily shoe wear in the experimental group, and allowance of supplemental analgesic use.

In March 2020 Hayes, Inc. published a health technology assessment evaluating the Apos Therapy System for treatment of osteoarthritis of the knee. Eligible studies reviewed by Hayes included 1 nonrandomized controlled trial, 1 cohort study, 5 database reviews, and 3 pretest/posttest studies. Treatment duration ranged from 8 weeks to 2 years. The authors concluded there is a very-low-quality body of evidence does not allow for conclusions regarding the efficacy of treatment of osteoarthritis of the knee with the AposTherapy device. A limited evidence base suggests that the AposTherapy System may result in clinical and statistical improvements in pain, function, and QOL and is not associated with any serious complications. Uncertainty exists due to lack of comparative evidence with commonly accepted treatments, lack of follow-up, and potential overlap of patient populations between studies. Additional independent studies are required to further establish the long-term effectiveness of the AposTherapy System, examine long-term need for treatment, and identify optimal patient selection criteria for its use (Hayes, 2020).

The device has been investigated as a treatment for a number of conditions including OA of the knee and hip, pre- and post- total arthroplasty, as well as chronic back pain and other miscellaneous musculoskeletal conditions (e.g., osteonecrosis, ankle instability). However studies have primarily been in the form of case series and cohort studies with small patient populations, short-term follow-up and lack controls and there is a lack of comparative evidence with other commonly accepted treatments. Although the available data suggest that the device may improve pain and function short term for some individuals, larger, well designed studies with long-term follow-up are needed to establish the role of AposTherapy in the management of musculoskeletal conditions. Clinical trials in the form of RCTs evaluating the effectiveness of AposTherapy for knee pain due to OA are in progress. At present, there is insufficient evidence in the published peer-reviewed medical literature to support clinical efficacy of AposTherapy as a treatment for musculoskeletal conditions, including but not limited to knee osteoarthritis and/or chronic low back pain.

Spinal Orthotic Devices

Spinal orthoses include cervical orthoses (CO), cervical-thoracic orthoses, (CTO), thoracic orthoses (TO), thoracic-lumbar-sacral orthoses, (TLSO), lumbar-sacral orthoses (LSO), and lumbar orthoses (LO). These devices are used to relieve pain, reduce progression of disease/injury, and to improve function related to various spine conditions such as spinal stenosis, vertebral fractures, scoliosis, spondylosis, spondylolisthesis, Scheuermann's disease (kyphotic deformity), and sprains. A spinal orthosis can be designed to control gross movement of the trunk and intersegmental motion of the vertebrae in one or more planes of motion. If the device does not provide control of motion in one or more planes, or if it does not provide intracavitary pressure, then the item should not be considered a spinal orthosis.

Studies addressing the use of spinal orthotic devices such as lumbar supports and belts for the prevention of injury report that despite their use, efficacy is debatable (van Poppel, et al., 1998), and individual workers presenting with no prior history of low-back pain are unlikely to benefit from back belt use (Ammendolia, et al., 2005). In general, research has not demonstrated these devices are effective when used for the prevention of injury (Erdil, 2016; Bigos, et al., 2009; van Duijvenbode, et al., 2009; van Poppel, 2004; Lahad, et al., 1994).

Evidence evaluating use of these devices for treatment of various clinical conditions is mixed, although some evidence supports improved clinical outcomes with use of these devices a majority of the evidence suggests there is little to no difference in outcomes (Urquhart, et al., 2017; Takasaki, et al., 2017; Skoch, et al., 2016; Newman, et al., 2016; Negrini, et al., 2016; Agabegi, et al., 2010; van Duijvenbode, et al., 2008; Yee, et al., 2008).

Evidence evaluating spinal orthoses for treatment of Adolescent Idiopathic Scoliosis (AIS) has been published. The goal of treatment for AIS is a curve with a Cobb angle of <40° at skeletal maturity. Natural history studies indicate that curves <40° do not progress after skeletal maturity. In skeletally immature patients with AIS, bracing reduces the risk of curve progression to ≥50° (the usual threshold for surgery) at skeletal maturity. The efficacy of bracing is directly related to the number of hours per day that the brace is worn. Most curves can be managed with an underarm brace (a TLSO, also known as the Boston brace). The TLSO is relatively easy to hide under clothing and fairly well accepted by most patients. Other types of underarm braces include the Charleston brace and the Providence brace, which are designed to be worn only at night. A small percentage of curves require a brace with an under-chin extension (a CTLSO, also known as the Milwaukee brace). The CTLSO is more difficult to hide under clothes and less well-tolerated by patients. Data regarding the efficacy of other brace types such as flexible braces (e.g., SpineCor, Copes) is lacking (Scherl/UpToDate, 2018; Guo, et al., 2014).

The American Board of Internal Medicine’s (ABIM) Foundation Choosing Wisely® Initiative (2017): The Choosing Wisely from the American Chiropractic Association (ACA) (August 15, 2017) does not support prescribing lumbar supports or braces for the long-term treatment or prevention of low-back pain.

Use Outside of the US

A National Institute for Health and Clinical Excellence (NICE) guideline for low back pain and sciatica (NICE, 2016) does not support offering belts or corsets for managing low back pain with or without sciatica.

Custom Foot Orthosis

A foot orthosis is a type of shoe insert that does not extend beyond the ankle and may include items such as heel wedges and/or arch supports. The goal of treating conditions with foot orthoses is to decrease pain and increase function. They may also be indicated to correct foot deformities and provide shock absorption to the foot. Evidence in the published, scientific, peer-reviewed literature and clinical practice guidelines tend to suggest custom-fitted and custom-fabricated foot orthoses are at least as effective as prefabricated orthoses for the treatment of heel-pain syndromes and other conditions; the evidence does not indicate custom fabricated devices are clinically more effective when compared to prefabricated devices.

Conditions for which shoe orthoses may be indicated include the following when there is failure, contraindication, or intolerance to a prefabricated device:

- treatment of impaired peripheral circulation and sensation (i.e., diabetic peripheral neuropathy, altered biomechanics, peripheral vascular disease, skin pathology, ulcers)
- when the orthosis is an integral part of a leg brace and is necessary for the proper functioning of the brace
- treatment of neurologic or neuromuscular conditions (i.e., stroke, neoplasms, hemiplegia, cerebral palsy, myelomeningocele, lower extremity spasticity, hypotonicity of certain muscles, neuromuscular imbalances) and there is reasonable expectation of improvement
- for congenital or acquired foot deformities (i.e., symptomatic rigid flatfoot, posterior tibial tendon dysfunction, mid- or hind-foot arthritis) when there is associated significant pain, impaired gait and prior conservative management has failed

Medicare Coverage Determinations

	Contractor	Policy Name/Number	Revision Effective Date
NCD	National	No NCD.	
LCD	CGS Administrators, LLC	Ankle-foot/Knee-Ankle-Foot Orthosis (L33686)	1/1/2020

	Contractor	Policy Name/Number	Revision Effective Date
LCD	Noridian Healthcare Solutions, LLC	Ankle-foot/Knee-Ankle-Foot Orthosis (L33686)	1/1/2020
LCD	Noridian Healthcare Solutions, LLC	Orthopedic Footwear (L33641)	1/1/2020
LCD	CGS Administrators, LLC	Orthopedic Footwear (L33641)	1/1/2020
LCD	Noridian Healthcare Solutions, LLC	Therapeutic Shoes for Persons with Diabetes (L33369)	1/1/2020
LCD	CGS Administrators, LLC	Therapeutic Shoes for Persons with Diabetes (L33369)	1/1/2020

Note: Please review the current Medicare Policy for the most up-to-date information.

Coding/Billing Information

Note: 1) This list of codes may not be all-inclusive.

2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

3)*Some orthotics devices listed below require a physical examination within the prior 6 months and a prescription for the device.

I. CRANIAL OROTHOSIS

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
S1040	Cranial remolding orthosis, pediatric, rigid, with soft interface material, custom fabricated, includes fitting and adjustment(s)

Protective Helmet: Considered a safety device and Not Medically Necessary:

HCPCS Codes	Description
A8000	Helmet, protective, soft, prefabricated, includes all components and accessories
A8001	Helmet, protective, hard, prefabricated, includes all components and accessories
A8002	Helmet, protective, soft, custom fabricated, includes all components and accessories
A8003	Helmet, protective, hard, custom fabricated, includes all components and accessories
A8004	Soft interface for helmet, replacement only

II. UPPER LIMB ORTHOSIS

Considered Medically Necessary when criteria in the applicable policy statements listed above are met for non-powered upper limb orthosis:

HCPCS Codes	Description
L3650*	Shoulder orthosis, figure of eight design abduction restrainer, prefabricated, off-the-shelf
L3660*	Shoulder orthosis, figure of eight design abduction restrainer, canvas and webbing, prefabricated, off-the-shelf
L3670*	Shoulder orthosis, acromio/clavicular (canvas and webbing type), prefabricated, off-the-shelf
L3671*	Shoulder orthosis, shoulder joint design, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3674*	Shoulder orthosis, abduction positioning (airplane design), thoracic component and support bar, with or without nontorsion joint/turnbuckle, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3675*	Shoulder orthosis, vest type abduction restrainer, canvas webbing type or equal, prefabricated, off-the-shelf
L3677*	Shoulder orthosis, shoulder joint design, without joints, may include soft interface, straps, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3678*	Shoulder orthosis, shoulder joint design, without joints, may include soft interface, straps, prefabricated, off-the-shelf
L3702*	Elbow orthosis, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3710*	Elbow orthosis, elastic with metal joints, prefabricated, off-the-shelf
L3720*	Elbow orthosis, double upright with forearm/arm cuffs, free motion, custom fabricated
L3730*	Elbow orthosis, double upright with forearm/arm cuffs, extension/ flexion assist, custom fabricated
L3740*	Elbow orthosis, double upright with forearm/arm cuffs, adjustable position lock with active control, custom fabricated
L3760*	Elbow orthosis (EO), with adjustable position locking joint(s), prefabricated, item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3761*	Elbow orthosis (EO), with adjustable position locking joint(s), prefabricated, off-the-shelf
L3762*	Elbow orthosis, rigid, without joints, includes soft interface material, prefabricated, off-the-shelf
L3763*	Elbow wrist hand orthosis, rigid, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3764*	Elbow wrist hand orthosis, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3765*	Elbow wrist hand finger orthosis, rigid, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3766*	Elbow wrist hand finger orthosis, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3806*	Wrist hand finger orthosis, includes one or more nontorsion joint(s), turnbuckles, elastic bands/springs, may include soft interface material, straps, custom fabricated, includes fitting and adjustment
L3807*	Wrist hand finger orthosis, without joint(s), prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3808*	Wrist hand finger orthosis, rigid without joints, may include soft interface material; straps, custom fabricated, includes fitting and adjustment
L3809*	Wrist hand finger orthosis, without joint(s), prefabricated, off-the-shelf, any type
L3891*	Addition to upper extremity joint, wrist or elbow, concentric adjustable torsion style mechanism for custom fabricated orthotics only, each
L3900*	Wrist hand finger orthosis, dynamic flexor hinge, reciprocal wrist extension/ flexion, finger flexion/extension, wrist or finger driven, custom fabricated
L3901*	Wrist hand finger orthosis, dynamic flexor hinge, reciprocal wrist extension/ flexion, finger flexion/extension, cable driven, custom fabricated

HCPCS Codes	Description
L3905*	Wrist hand orthosis, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3906*	Wrist hand orthosis, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3908*	Wrist hand orthosis, wrist extension control cock-up, non-molded, prefabricated, off-the-shelf
L3912*	Hand finger orthosis (HFO), flexion glove with elastic finger control, prefabricated, off-the-shelf
L3913*	Hand finger orthosis, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3915*	Wrist hand orthosis, includes one or more nontorsion joint(s), elastic bands, turnbuckles, may include soft interface, straps, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3916*	Wrist hand orthosis, includes one or more nontorsion joint(s), elastic bands, turnbuckles, may include soft interface, straps, prefabricated, off-the-shelf
L3917*	Hand orthosis, metacarpal fracture orthosis, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3918*	Hand orthosis, metacarpal fracture orthosis, prefabricated, off-the-shelf
L3919*	Hand orthosis, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3921*	Hand finger orthosis, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3923*	Hand finger orthosis, without joints, may include soft interface, straps, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3924*	Hand finger orthosis, without joints, may include soft interface, straps, prefabricated, off-the-shelf
L3925*	Finger orthosis, proximal interphalangeal (PIP)/distal interphalangeal (DIP), non-torsion joint/spring, extension/flexion, may include soft interface material, prefabricated, off-the-shelf
L3927*	Finger orthosis, proximal interphalangeal (PIP)/distal interphalangeal (DIP), without joint/spring, extension/flexion (e.g., static or ring type), may include soft interface material, prefabricated, off-the-shelf
L3929*	Hand finger orthosis, includes one or more nontorsion joint(s), turnbuckles, elastic bands/springs, may include soft interface material, straps, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L3930*	Hand finger orthosis, includes one or more nontorsion joint(s), turnbuckles, elastic bands/springs, may include soft interface material, straps, prefabricated, off-the-shelf
L3931*	Wrist hand finger orthotic, includes one or more nontorsion joint(s), turnbuckles, elastic bands/springs, may include soft interface material, straps, prefabricated, includes fitting and adjustment
L3933*	Finger orthosis, without joints, may include soft interface, custom fabricated, includes fitting and adjustment
L3935*	Finger orthosis, nontorsion joint, may include soft interface, custom fabricated, includes fitting and adjustment
L3956*	Addition of joint to upper extremity orthotic, any material; per joint
L3960*	Shoulder elbow wrist hand orthosis, abduction positioning, airplane design, prefabricated, includes fitting and adjustment
L3961*	Shoulder elbow wrist hand orthosis, shoulder cap design, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3962*	Shoulder elbow wrist hand orthosis, abduction positioning, Erb's palsy design, prefabricated, includes fitting and adjustment

HCPCS Codes	Description
L3967*	Shoulder elbow wrist hand orthosis, abduction positioning (airplane design), thoracic component and support bar, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3971*	Shoulder elbow wrist hand orthosis, shoulder cap design, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3973*	Shoulder elbow wrist hand orthosis, abduction positioning (airplane design), thoracic component and support bar, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3975*	Shoulder elbow wrist hand finger orthosis, shoulder cap design, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3976*	Shoulder elbow wrist hand finger orthosis, abduction positioning (airplane design), thoracic component and support bar, without joints, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3977*	Shoulder elbow wrist hand finger orthosis, shoulder cap design, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3978*	Shoulder elbow wrist hand finger orthosis, abduction positioning (airplane design), thoracic component and support bar, includes one or more nontorsion joints, elastic bands, turnbuckles, may include soft interface, straps, custom fabricated, includes fitting and adjustment
L3980*	Upper extremity fracture orthosis, humeral, prefabricated, includes fitting and adjustment
L3981*	Upper extremity fracture orthosis, humeral, prefabricated, includes shoulder cap design, with or without joints, forearm section, may include soft interface, straps, includes fitting and adjustments
L3982*	Upper extremity fracture orthosis, radius/ulnar, prefabricated, includes fitting and adjustment
L3984*	Upper extremity fracture orthosis, wrist, prefabricated, includes fitting and adjustment

Considered Not Medically Necessary:

HCPCS Codes	Description
L3995*	Addition to upper extremity orthosis, sock, fracture or equal, each

Considered Experimental/Investigational/Unproven when used to report an upper limb electric orthotic or a MyoPro 2 device:

HCPCS Codes	Description
L3904*	Wrist hand finger orthosis, external powered, electric, custom fabricated
L3999*	Upper limb orthosis, not otherwise specified
L8701	Powered upper extremity range of motion assist device, elbow, wrist, hand with single or double upright(s), includes microprocessor, sensors, all components and accessories, custom fabricated
L8702	Powered upper extremity range of motion assist device, elbow, wrist, hand, finger, single or double upright(s), includes microprocessor, sensors, all components and accessories, custom fabricated

III. LOWER LIMB ORTHOSIS

Non Ambulatory Ankle-Foot Orthosis/Night Splint

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L4394*	Replace soft interface material, foot drop splint
L4396*	Static or dynamic ankle-foot orthosis, including soft interface material, adjustable for fit, for positioning, may be used for minimal ambulation, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L4397*	Static or dynamic ankle foot orthosis, including soft interface material, adjustable for fit, for positioning, may be used for minimal ambulation, prefabricated, off-the-shelf
L4398*	Foot drop splint, recumbent positioning device, prefabricated, off-the-shelf

ICD-10-CM Diagnosis Codes	Description
M24.571	Contracture, right ankle
M24.572	Contracture, left ankle
M24.573	Contracture, unspecified ankle
M24.574	Contracture, right foot
M24.575	Contracture, left foot
M24.576	Contracture, unspecified foot
M72.2	Plantar facial fibromatosis
M76.60- M76.62	Achilles tendinitis

Considered Not Medically Necessary:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Basic Ankle, Ankle-Foot Orthosis (AFO): Ambulatory Use

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L1900*	Ankle-foot orthosis, spring wire, dorsiflexion assist calf band, custom fabricated
L1902*	Ankle orthosis, ankle gauntlet or similar, with or without joints, prefabricated, off-the-shelf
L1904*	Ankle orthosis, ankle gauntlet or similar, with or without joints, custom fabricated
L1906*	Ankle foot orthosis, multiligamentous ankle support, prefabricated, off-the-shelf
L1907*	Ankle orthosis, supramalleolar with straps, with or without interface/pads, custom fabricated
L1910*	Ankle orthosis, posterior, single bar, clasp attachment to shoe counter, prefabricated, includes fitting and adjustment
L1920*	Ankle orthosis, single upright with static or adjustable stop (Phelps or Perlstein type), custom fabricated
L1930*	Ankle foot orthosis, plastic or other material, prefabricated, includes fitting and adjustment
L1932*	AFO, rigid anterior tibial section, total carbon fiber or equal material, prefabricated, includes fitting and adjustment
L1940*	Ankle foot orthosis, plastic or other material, custom-fabricated

HCPCS Codes	Description
L1945*	Ankle foot orthosis, plastic, rigid anterior tibial section (floor reaction), custom fabricated
L1950*	Ankle foot orthosis, spiral, (Institute of Rehabilitative Medicine type), plastic, custom-fabricated
L1951*	Ankle foot orthosis, spiral, (Institute of Rehabilitative Medicine type), plastic or other material, prefabricated, includes fitting and adjustment
L1960*	Ankle foot orthosis, posterior solid ankle, plastic, custom fabricated
L1970*	Ankle foot orthosis, plastic, with ankle joint, custom fabricated
L1971*	Ankle foot orthosis, plastic or other material with ankle joint, prefabricated, includes fitting and adjustment
L1980*	Ankle foot orthosis, single upright free plantar dorsiflexion, solid stirrup, calf band/cuff (single bar "BK" orthosis), custom fabricated
L1990*	Ankle foot orthosis, double upright free plantar dorsiflexion, solid stirrup, calf band/cuff (double bar "BK" orthosis), custom fabricated
L2106*	Ankle foot orthosis, fracture orthosis, tibial fracture cast orthosis, thermoplastic type casting material, custom fabricated
L2108*	Ankle foot orthosis, fracture orthosis, tibial fracture cast orthosis custom fabricated
L2112*	Ankle foot orthosis, fracture orthosis, tibial fracture orthosis, soft, prefabricated, includes fitting and adjustment
L2114*	Ankle foot orthosis, fracture orthosis, tibial fracture orthosis, semi-rigid, prefabricated, includes fitting and adjustment
L2116*	Ankle foot orthosis, fracture orthosis, tibial fracture orthosis, rigid, prefabricated, includes fitting and adjustment
L4350*	Ankle control orthosis, stirrup style, rigid, includes any type interface (e.g., pneumatic, gel), prefabricated, off-the-shelf
L4360*	Walking boot, pneumatic and/or vacuum, with or without joints, with or without interface material, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L4361*	Walking boot, pneumatic and/or vacuum, with or without joints, with or without interface material, prefabricated, off-the-shelf
L4386*	Walking boot, non-pneumatic, with or without joints, with or without interface material, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L4387*	Walking boot, non-pneumatic, with or without joints, with or without interface material, prefabricated, off-the-shelf
L4631*	Ankle foot orthosis, walking boot type, varus/valgus correction, rocker bottom, anterior tibial shell, soft interface, custom arch support, plastic or other material, includes straps and closures, custom fabricated

Basic Knee-Ankle-Foot Orthosis (KAFO): Ambulatory

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L2000*	Knee-ankle-foot-orthosis, single upright, free knee, free ankle, solid stirrup, thigh and calf bands/cuffs (single bar "AK" orthosis), custom fabricated
L2010*	Knee ankle foot orthosis, single upright, free ankle, solid stirrup, thigh and calf bands/cuffs (single bar "AK" orthosis), without knee joint, custom fabricated
L2020*	Knee ankle foot orthosis, double upright, free ankle, solid stirrup, thigh and calf bands/cuffs (double bar "AK" orthosis), custom fabricated
L2030*	Knee ankle foot orthosis, double upright, free ankle, solid stirrup, thigh and calf bands/cuffs, (double bar "AK" orthosis), without knee joint, custom fabricated

HCPCS Codes	Description
L2034*	Knee ankle foot orthosis, full plastic, single upright, with or without free motion knee, medial lateral rotation control, with or without free motion ankle, custom fabricated
L2035*	Knee ankle foot orthosis, full plastic, static (pediatric size), without free motion ankle, prefabricated, includes fitting and adjustment
L2036*	Knee ankle foot orthosis, full plastic, double upright, with or without free motion knee, with or without free motion ankle, custom fabricated
L2037*	Knee ankle foot orthosis, full plastic, single upright, with or without free motion knee, with or without free motion ankle, custom fabricated
L2038*	Knee ankle foot orthosis, full plastic, with or without free motion knee, multiaxis ankle, custom fabricated
L2126*	Knee ankle foot orthoses, fracture orthosis, femoral fracture cast orthosis, thermoplastic type casting material, custom fabricated
L2128*	Knee ankle foot orthoses, fracture orthosis, femoral fracture cast orthosis, custom fabricated
L2132*	KAFO, fracture orthosis, femoral fracture cast orthosis, soft, prefabricated, includes fitting and adjustment
L2134*	KAFO, fracture orthosis, femoral fracture cast orthosis, semi-rigid, prefabricated, includes fitting and adjustment
L2136*	KAFO, fracture orthosis, femoral fracture cast orthosis, rigid, prefabricated, includes fitting and adjustment
L4370*	Pneumatic full leg splint, prefabricated, off-the-shelf

Additions to Basic Lower Limb Orthosis

Considered Medically Necessary only when medical necessity for a basic lower limb orthotic device has been met:

HCPCS Codes	Description
L2180*	Addition to lower extremity fracture orthosis, plastic shoe insert with ankle joints
L2182*	Addition to lower extremity fracture orthosis, drop lock knee joint
L2184*	Addition to lower extremity fracture orthosis, limited motion knee joint
L2186*	Addition to lower extremity fracture orthosis, adjustable motion knee joint, Lerman type
L2188*	Addition to lower extremity fracture orthosis, quadrilateral brim
L2190*	Addition to lower extremity fracture orthosis, waist belt
L2192*	Addition to lower extremity fracture orthosis, hip joint, pelvic band, thigh flange, and pelvic belt
L2200*	Addition to lower extremity, limited ankle motion, each joint
L2210*	Addition to lower extremity, dorsiflexion assist (plantar flexion resist), each joint
L2220*	Addition to lower extremity, dorsiflexion and plantar flexion assist/resist, each joint
L2230*	Addition to lower extremity, split flat caliper stirrups and plate attachment
L2232*	Addition to lower extremity orthosis, rocker bottom for total contact ankle foot orthosis, for custom fabricated orthosis only
L2240*	Addition to lower extremity, round caliper and plate attachment
L2250*	Addition to lower extremity, foot plate, molded to patient model, stirrup attachment
L2260*	Addition to lower extremity, reinforced solid stirrup (Scott-Craig type)
L2265*	Addition to lower extremity, long tongue stirrup
L2270*	Addition to lower extremity, varus/valgus correction ("T") strap, padded/lined or malleolus pad
L2275*	Addition to lower extremity, varus/valgus correction, plastic modification, padded/lined
L2280*	Addition to lower extremity, molded inner boot
L2300*	Addition to lower extremity, abduction bar (bilateral hip involvement), jointed, adjustable
L2310*	Addition to lower extremity, abduction bar-straight
L2320*	Addition to lower extremity, non-molded lacer, for custom fabricated orthosis only
L2330*	Addition to lower extremity, lacer molded to patient model, for custom fabricated orthosis only

HCPCS Codes	Description
L2335*	Addition to lower extremity, anterior swing band
L2340*	Addition to lower extremity, pre-tibial shell, molded to patient model
L2350*	Addition to lower extremity, prosthetic type, (BK) socket, molded to patient model, (used for "PTB," "AFO" orthoses)
L2360*	Addition to lower extremity, extended steel shank
L2370*	Addition to lower extremity, patten bottom
L2375*	Addition to lower extremity, torsion control, ankle joint and half solid stirrup
L2380*	Addition to lower extremity, torsion control, straight knee joint, each joint
L2387*	Addition to lower extremity, polycentric knee joint, for custom fabricated knee ankle foot orthosis, each joint
L2390*	Addition to lower extremity, offset knee joint, each joint
L2397*	Addition to lower extremity orthosis, suspension sleeve
L2405*	Addition to knee joint, drop lock, each
L2415*	Addition to knee lock with integrated release mechanism (bail, cable, or equal), any material, each joint
L2425*	Addition to knee joint, disc or dial lock for adjustable knee flexion, each joint
L2430*	Addition to knee joint, ratchet lock for active and progressive knee extension, each joint
L2492*	Addition to knee joint, lift loop for drop lock ring
L2500*	Addition to lower extremity, thigh/weight bearing, gluteal/ischial weight bearing, ring
L2510*	Addition to lower extremity, thigh/weight bearing, quadri-lateral brim, molded to patient model
L2520*	Addition to lower extremity, thigh/weight bearing, quadri-lateral brim, custom fitted
L2525*	Addition to lower extremity, thigh/weight bearing, ischial containment/narrow M-L brim molded to patient model
L2526*	Addition to lower extremity, thigh/weight bearing, ischial containment/narrow M-L brim, custom fitting
L2530*	Addition to lower extremity, thigh/weight bearing, lacer, non-molded
L2540*	Addition to lower extremity, thigh/weight bearing, lacer, molded to patient model
L2550*	Addition to lower extremity, thigh/weight bearing, high roll cuff
L2750*	Addition to lower extremity orthosis, plating chrome or nickel, per bar
L2760*	Addition to lower extremity orthosis, extension, per extension, per bar (for lineal adjustment for growth)
L2768*	Orthotic side bar disconnect device, per bar
L2780*	Addition to lower extremity orthosis, non-corrosive finish, per bar
L2785*	Addition to lower extremity orthosis, drop lock retainer, each
L2795*	Addition to lower extremity orthosis, knee control, full kneecap
L2800*	Addition to lower extremity orthosis, knee control, knee cap, medial or lateral pull, for use with custom fabricated orthosis only
L2810*	Addition to lower extremity orthosis, knee control, condylar pad
L2820*	Addition to lower extremity orthosis, soft interface for molded plastic, below knee section
L2830*	Addition to lower extremity orthosis, soft interface for molded plastic, above knee section

Orthosis for Prevention/Treatment of Ulcer/Pressure Reduction

Considered Not Medically Necessary:

HCPCS Codes	Description
A9283*	Foot pressure off-loading/supportive device, any type, each
L2840*	Addition to lower extremity orthosis, tibial length sock, fracture or equal, each
L2850*	Addition to lower extremity orthosis, femoral length sock, fracture or equal, each

ICD-10-CM Diagnosis Codes	Description
	All codes

Stance Control KAFO

Considered Experimental/Investigational/Unproven when used to represent an electronic/electromagnetic activated stance control KAFO device (e.g., E-Mag Active, Sensor Walk, C-brace®):

HCPCS Codes	Description
L2005†	Knee ankle foot orthosis, any material, single or double upright, stance control, automatic lock and swing phase release, any type activation, includes ankle joint, any type, custom fabricated.
L2006	Knee ankle foot device, any material, single or double upright, swing and/or stance phase microprocessor control with adjustability, includes all components (e.g., sensors, batteries, charger), any type activation, with or without ankle joint(s), custom fabricated

†Note: Not Covered as lowest cost alternative when used to represent a mechanical (movement activated) stance control orthotic device and the medical necessity definition allows for non-coverage of a more expensive but equivalent service.

ICD-10-CM Diagnosis Codes	Description
	All codes

Experimental/Investigational/Unproven when used to report powered, exoskeleton orthosis (e.g., ReWalk Indego):

HCPCS Codes	Description
E1399	Durable medical equipment, miscellaneous
K1007	Bilateral hip, knee, ankle, foot device, powered, includes pelvic component, single or double upright(s), knee joints any type, with or without ankle joints any type, includes all components and accessories, motors, microprocessors, sensors

ICD-10-CM Diagnosis Codes	Description
	All codes

Casting/Strapping

Considered Medically Necessary and when used to report bilateral casting or strapping for a medically necessary custom-fabricated lower limb orthosis:

CPT®*	Description
29799	Unlisted procedure, casting or strapping

HCPCS Codes	Description
S0395*	Impression casting of a foot performed by a practitioner other than the manufacturer of the orthotic

Repair/Replacement

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L4002*	Replacement strap, any orthosis, includes all components, any length, any type
L4010*	Replace trilateral socket brim
L4050*	Replace molded calf lacer, for custom fabricated orthotic only
L4055*	Replace non-molded calf lacer, for custom fabricated orthosis only
L4060*	Replace high roll cuff
L4070*	Replace proximal and distal upright for KAFO
L4080*	Replace metal bands KAFO, proximal thigh
L4090*	Replace metal bands KAFO-AFO, calf or distal thigh
L4100*	Replace leather cuff KAFO, proximal thigh
L4110*	Replace leather cuff KAFO-AFO, calf or distal thigh
L4130*	Replace pretibial shell
L4205*	Repair of orthotic device, labor component, per 15 minutes
L4210*	Repair of orthotic device, repair or replace minor parts
L4392*	Replacement, soft interface material; static AFO

IV. KNEE BRACES

Prefabricated Knee Brace

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L1810*	Knee orthosis, elastic with joints, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L1812*	Knee orthosis, elastic with joints, prefabricated, off-the-shelf
L1820*	Knee orthosis, elastic with condylar pads and joints, with or without patellar control, prefabricated, includes fitting and adjustment
L1830*	Knee orthosis, immobilizer, canvas longitudinal, prefabricated, off-the-shelf
L1831*	Knee orthosis, locking knee joint(s), positional orthosis, prefabricated, includes fitting and adjustment
L1832*	Knee orthosis, adjustable knee joints (unicentric or polycentric), positional orthosis, rigid support, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L1833*	Knee orthosis; adjustable knee joints (unicentric or polycentric), positional orthosis, rigid support, prefabricated, off-the shelf
L1836*	Knee orthosis, rigid, without joint(s), includes soft interface material, prefabricated, off-the-shelf
L1843*	Knee orthosis, single upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise

HCPCS Codes	Description
L1845*	Knee orthosis, double upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L1850*	Knee orthosis, Swedish type, prefabricated, off-the-shelf
L1851*	Knee orthosis (KO), single upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, prefabricated, off-the-shelf
L1852*	Knee orthosis (KO), double upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, prefabricated, off-the-shelf

Considered Not Medically Necessary:

HCPCS Codes	Description
L1847*	Knee orthosis, double upright with adjustable joint, with inflatable air support chamber(s), prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L1848*	Knee orthosis, double upright with adjustable joint, with inflatable air support chamber(s), prefabricated, off-the-shelf

Custom-Fabricated Knee Brace

Considered Medically Necessary:

HCPCS Codes	Description
L1834*	Knee orthosis, without knee joint, rigid, custom fabricated
L1840	Knee orthosis, derotation, medial-lateral, anterior cruciate ligament, custom fabricated
L1844	Knee orthosis, single upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, custom fabricated
L1846	Knee orthosis, double upright, thigh and calf, with adjustable flexion and extension joint (unicentric or polycentric), medial-lateral and rotation control, with or without varus/valgus adjustment, custom fabricated
L1860*	Knee orthosis, modification of supracondylar prosthetic socket, custom fabricated (SK)

Additions to Knee Brace

Considered Medically Necessary when criteria for a knee brace is met and the individual weighs more than 300 pounds:

HCPCS Codes	Description
L2385*	Addition to lower extremity, straight knee joint, heavy-duty, each joint
L2395*	Addition to lower extremity, offset knee joint, heavy-duty, each joint

Considered Medically Necessary for an individual who meets criteria for a custom-fabricated knee brace and either daily activity level requires a brace designed for high-impact/high stress activities or the individual weighs greater than 250 pounds:

HCPCS Codes	Description
L2755*	Addition to lower extremity orthosis, high strength, lightweight material, all hybrid lamination/prepreg composite, per segment, for custom fabricated orthosis only

Considered Not Medically Necessary:

HCPCS Codes	Description
K0672†*	Addition to lower extremity orthosis, removable soft interface, all components, replacement only, each
L2397*	Addition to lower extremity orthosis, suspension sleeve
L2820†*	Addition to lower extremity orthosis, soft interface for molded plastic, below knee section
L2830†*	Addition to lower extremity orthosis, soft interface for molded plastic, above knee section
L2840*	Addition to lower extremity orthosis, tibial length sock, fracture or equal, each
L2850*	Addition to lower extremity orthosis, femoral length sock, fracture or equal, each

†**Note:** Considered Not Medically Necessary when billed in addition to the initial dispensing of the device.

V. SHOES

Basic Shoe/Modifications to Shoe

Considered Medically Necessary only when coverage is available for shoes. Benefit exclusions and limitations may apply. Shoes and shoe modifications are specifically excluded under many plans and therefore are generally not covered.

HCPCS Codes	Description
A5500*	For diabetics only, fitting (including follow-up), custom preparation and supply of off-the-shelf depth-inlay shoe manufactured to accommodate multi-density insert(s), per shoe
A5501*	For diabetics only, fitting (including follow-up), custom preparation and supply of shoe molded from cast(s) of patient's foot (custom molded shoe), per shoe
A5503*	For diabetics only, modification (including fitting) of off-the-shelf depth-inlay shoe or custom-molded shoe with roller or rigid rocker bottom, per shoe
A5504*	For diabetics only, modification (including fitting) of off-the-shelf depth-inlay shoe or custom-molded shoe with wedge(s), per shoe
A5505*	For diabetics only, modification (including fitting) of off-the-shelf depth-inlay shoe or custom-molded shoe with metatarsal bar, per shoe
A5506*	For diabetics only, modification (including fitting) of off-the-shelf depth-inlay shoe or custom molded shoe with off-set heel(s), per shoe
A5507*	For diabetics only, not otherwise specified modification (including fitting) of off-the-shelf depth-inlay shoe or custom-molded shoe, per shoe
A5512*	For diabetics only, multiple density insert, direct formed, molded to foot after external heat source of 230 degrees Fahrenheit or higher, total contact with patient's foot, including arch, base layer minimum of 1/4 inch material of shore a 35 durometer or 3/16 inch material of shore a 40 durometer (or higher), prefabricated, each
A5513*	For diabetics only, multiple density insert, custom molded from model of patient's foot, total contact with patient's foot, including arch, base layer minimum of 3/16 inch material of shore a 35 durometer (or higher), includes arch filler and other shaping material, custom fabricated, each
A5514*	For diabetics only, multiple density insert, made by direct carving with CAM technology from a rectified CAD model created from a digitized scan of the patient, total contact with patient's foot,

HCPCS Codes	Description
	including arch, base layer minimum of 3/16 inch material of shore a 35 durometer (or higher), includes arch filler and other shaping material, custom fabricated, each

ICD-10 Diagnosis Codes	Description
E08.00- E08.9	Diabetes mellitus due to underlying condition
E09.00- E09.9	Drug or chemical induced diabetes mellitus
E10.10- E10.9	Type 1 diabetes mellitus
E11.00- E11.9	Type 2 diabetes mellitus
E13.00- E13.9	Other specified diabetes mellitus
G57.80- G57.83	Other specified mononeuropathies of lower limb
G60.0	Hereditary motor and sensory neuropathy
G60.1	Refsum's disease
G60.3	Idiopathic progressive neuropathy
G60.8	Other hereditary and idiopathic neuropathies
G60.9	Hereditary and idiopathic neuropathy, unspecified
G99.0	Autonomic neuropathy in diseases classified elsewhere
I67.0	Dissection of cerebral arteries, nonruptured
I73.00- I73.9	Other peripheral vascular diseases
I77.70- I77.79	Other arterial dissection
I79.1	Aortitis in diseases classified elsewhere
I79.8	Other disorders of arteries, arterioles and capillaries in diseases classified elsewhere

Considered Not Medically Necessary:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Other Shoe Modifications

Considered Not Medically Necessary:

HCPCS Codes	Description
A5508*	For diabetics only, deluxe feature of off-the-shelf depth-inlay shoe or custom molded shoe, per shoe
A5510*	For diabetics only, direct formed, compression molded to patient's foot without external heat source, multiple-density insert(s) prefabricated, per shoe

ICD-10-CM Diagnosis Codes	Description
	All codes

IV.SPINAL ORTHOSIS

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L0120*	Cervical, flexible, nonadjustable, prefabricated, off-the-shelf (foam collar)
L0130*	Cervical, flexible, thermoplastic collar, molded to patient
L0140*	Cervical, semi-rigid, adjustable (plastic collar)
L0150*	Cervical, semi-rigid, adjustable molded chin cup (plastic collar with mandibular/occipital piece)
L0160*	Cervical, semi-rigid, wire frame occipital/mandibular support, prefabricated, off-the-shelf
L0170*	Cervical collar, molded to patient model
L0172*	Cervical collar, semi-rigid thermoplastic foam, two piece, prefabricated, off-the-shelf
L0174*	Cervical collar, semi-rigid, thermoplastic foam, two piece with thoracic extension, prefabricated, off-the-shelf
L0180*	Cervical, multiple post collar, occipital/mandibular supports, adjustable
L0190*	Cervical, multiple post collar, occipital/mandibular supports, adjustable cervical bars (SOMI, Guilford, Taylor types)
L0200*	Cervical, multiple post collar, occipital/mandibular supports, adjustable cervical bars, and thoracic extension
L0220*	Thoracic, rib belt, custom fabricated
L0450*	TLSO, flexible, provides trunk support, upper thoracic region, produces intracavitary pressure to reduce load on the intervertebral disks with rigid stays or panel(s), includes shoulder straps and closures, prefabricated, off-the-shelf
L0452*	TLSO, flexible, provides trunk support, upper thoracic region, produces intracavitary pressure to reduce load on the intervertebral disks with rigid stays or panel(s), includes shoulder straps and closures, custom fabricated
L0454*	TLSO flexible, provides trunk support, extends from sacrococcygeal junction to above T-9 vertebra, restricts gross trunk motion in the sagittal plane, produces intracavitary pressure to reduce load on the intervertebral disks with rigid stays or panel(s), includes shoulder straps and closures, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0455*	TLSO, flexible, provides trunk support, extends from sacrococcygeal junction to above T-9 vertebra, restricts gross trunk motion in the sagittal plane, produces intracavitary pressure to reduce load on the intervertebral disks with rigid stays or panel(s), includes shoulder straps and closures, prefabricated, off-the-shelf
L0456*	TLSO, flexible, provides trunk support, thoracic region, rigid posterior panel and soft anterior apron, extends from the sacrococcygeal junction and terminates just inferior to the scapular spine, restricts gross trunk motion in the sagittal plane, produces intracavitary pressure to reduce load on the intervertebral disks, includes straps and closures, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0457*	TLSO, flexible, provides trunk support, thoracic region, rigid posterior panel and soft anterior apron, extends from sacrococcygeal junction and terminates just inferior to the scapular spine, restricts gross trunk motion in the sagittal plane, produces intracavitary pressure to reduce load on the intervertebral disks, includes straps and closures, prefabricated, off-the-shelf
L0458*	TLSO, triplanar control, modular segmented spinal system, two rigid plastic shells, posterior extends from the sacrococcygeal junction and terminates just inferior to the scapular spine,

HCPCS Codes	Description
	anterior extends from the symphysis pubis to the xiphoid, soft liner, restricts gross trunk motion in the sagittal, coronal, and transverse planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated, includes fitting and adjustment
L0460*	TLSO, triplanar control, modular segmented spinal system, two rigid plastic shells, posterior extends from the sacrococcygeal junction and terminates just inferior to the scapular spine, anterior extends from the symphysis pubis to the sternal notch, soft liner, restricts gross trunk motion in the sagittal, coronal, and transverse planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0462*	TLSO, triplanar control, modular segmented spinal system, three rigid plastic shells, posterior extends from the sacrococcygeal junction and terminates just inferior to the scapular spine, anterior extends from the symphysis pubis to the sternal notch, soft liner, restricts gross trunk motion in the sagittal, coronal, and transverse planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated, includes fitting and adjustment
L0464*	TLSO, triplanar control, modular segmented spinal system, four rigid plastic shells, posterior extends from sacrococcygeal junction and terminates just inferior to scapular spine, anterior extends from symphysis pubis to the sternal notch, soft liner, restricts gross trunk motion in sagittal, coronal, and transverse planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated, includes fitting and adjustment
L0466*	TLSO, sagittal control, rigid posterior frame and flexible soft anterior apron with straps, closures and padding, restricts gross trunk motion in sagittal plane, produces intracavitary pressure to reduce load on intervertebral disks, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0467*	TLSO, sagittal control, rigid posterior frame and flexible soft anterior apron with straps, closures and padding, restricts gross trunk motion in sagittal plane, produces intracavitary pressure to reduce load on intervertebral disks, prefabricated, off-the-shelf
L0468*	TLSO, sagittal-coronal control, rigid posterior frame and flexible soft anterior apron with straps, closures and padding, extends from sacrococcygeal junction over scapulae, lateral strength provided by pelvic, thoracic, and lateral frame pieces, restricts gross trunk motion in sagittal, and coronal planes, produces intracavitary pressure to reduce load on intervertebral disks, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0469*	TLSO, sagittal-coronal control, rigid posterior frame and flexible soft anterior apron with straps, closures and padding, extends from sacrococcygeal junction over scapulae, lateral strength provided by pelvic, thoracic, and lateral frame pieces, restricts gross trunk motion in sagittal and coronal planes, produces intracavitary pressure to reduce load on intervertebral disks, prefabricated, off-the-shelf
L0470*	TLSO, triplanar control, rigid posterior frame and flexible soft anterior apron with straps, closures and padding, extends from sacrococcygeal junction to scapula, lateral strength provided by pelvic, thoracic, and lateral frame pieces, rotational strength provided by subclavicular extensions, restricts gross trunk motion in sagittal, coronal, and transverse planes, produces intracavitary pressure to reduce load on the intervertebral disks, includes fitting and shaping the frame, prefabricated, includes fitting and adjustment
L0472*	TLSO, triplanar control, hyperextension, rigid anterior and lateral frame extends from symphysis pubis to sternal notch with two anterior components (one pubic and one sternal), posterior and lateral pads with straps and closures, limits spinal flexion, restricts gross trunk motion in sagittal, coronal, and transverse planes, includes fitting and shaping the frame, prefabricated, includes fitting and adjustment
L0480*	TLSO, triplanar control, one piece rigid plastic shell without interface liner, with multiple straps and closures, posterior extends from sacrococcygeal junction and terminates just inferior to

HCPCS Codes	Description
	scapular spine, anterior extends from symphysis pubis to sternal notch, anterior or posterior opening, restricts gross trunk motion in sagittal, coronal, and transverse planes, includes a carved plaster or cad-cam model, custom fabricated
L0482*	TLSO, triplanar control, one piece rigid plastic shell with interface liner, multiple straps and closures, posterior extends from sacrococcygeal junction and terminates just inferior to scapular spine, anterior extends from symphysis pubis to sternal notch, anterior or posterior opening, restricts gross trunk motion in sagittal, coronal, and transverse planes, includes a carved plaster or cad-cam model, custom fabricated
L0484*	TLSO, triplanar control, two piece rigid plastic shell without interface liner, with multiple straps and closures, posterior extends from sacrococcygeal junction and terminates just inferior to scapular spine, anterior extends from symphysis pubis to sternal notch, lateral strength is enhanced by overlapping plastic, restricts gross trunk motion in the sagittal, coronal, and transverse planes, includes a carved plaster or cad-cam model, custom fabricated
L0486*	TLSO, triplanar control, two piece rigid plastic shell with interface liner, multiple straps and closures, posterior extends from sacrococcygeal junction and terminates just inferior to scapular spine, anterior extends from symphysis pubis to sternal notch, lateral strength is enhanced by overlapping plastic, restricts gross trunk motion in the sagittal, coronal, and transverse planes, includes a carved plaster or cad-cam model, custom fabricated
L0488*	TLSO, triplanar control, one piece rigid plastic shell with interface liner, multiple straps and closures, posterior extends from sacrococcygeal junction and terminates just inferior to scapular spine, anterior extends from symphysis pubis to sternal notch, anterior or posterior opening, restricts gross trunk motion in sagittal, coronal, and transverse planes, prefabricated, includes fitting and adjustment
L0490*	TLSO, sagittal-coronal control, one piece rigid plastic shell, with overlapping reinforced anterior, with multiple straps and closures, posterior extends from sacrococcygeal junction and terminates at or before the T-9 vertebra, anterior extends from symphysis pubis to xiphoid, anterior opening, restricts gross trunk motion in sagittal and coronal planes, prefabricated, includes fitting and adjustment
L0491*	TLSO, sagittal-coronal control, modular segmented spinal system, two rigid plastic shells, posterior extends from the sacrococcygeal junction and terminates just inferior to the scapular spine, anterior extends from the symphysis pubis to the xiphoid, soft liner, restricts gross trunk motion in the sagittal and coronal planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated, includes fitting and adjustment
L0492*	TLSO, sagittal-coronal control, modular segmented spinal system, three rigid plastic shells, posterior extends from the sacrococcygeal junction and terminates just inferior to the scapular spine, anterior extends from the symphysis pubis to the xiphoid, soft liner, restricts gross trunk motion in the sagittal and coronal planes, lateral strength is provided by overlapping plastic and stabilizing closures, includes straps and closures, prefabricated, includes fitting and adjustment
L0621*	Sacroiliac orthosis, flexible, provides pelvic-sacral support, reduces motion about the sacroiliac joint, includes straps, closures, may include pendulous abdomen design, prefabricated, off-the-shelf
L0622*	Sacroiliac orthosis, flexible, provides pelvic-sacral support, reduces motion about the sacroiliac joint, includes straps, closures, may include pendulous abdomen design, custom fabricated
L0623*	Sacroiliac orthosis, provides pelvic-sacral support, with rigid or semi-rigid panels over the sacrum and abdomen, reduces motion about the sacroiliac joint, includes straps, closures, may include pendulous abdomen design, prefabricated, off-the-shelf
L0624*	Sacroiliac orthosis, provides pelvic-sacral support, with rigid or semi-rigid panels placed over the sacrum and abdomen, reduces motion about the sacroiliac joint, includes straps, closures, may include pendulous abdomen design, custom fabricated
L0625*	Lumbar orthosis, flexible, provides lumbar support, posterior extends from L-1 to below L-5 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include pendulous abdomen design, shoulder straps, stays, prefabricated, off-the-shelf

HCPCS Codes	Description
L0626*	Lumbar orthosis, sagittal control, with rigid posterior panel(s), posterior extends from L-1 to below L-5 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0627*	Lumbar orthosis, sagittal control, with rigid anterior and posterior panels, posterior extends from L-1 to below L-5 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0628*	Lumbar-sacral orthosis, flexible, provides lumbo-sacral support, posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include stays, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0629*	Lumbar-sacral orthosis, flexible, provides lumbo-sacral support, posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include stays, shoulder straps, pendulous abdomen design, custom fabricated
L0630*	Lumbar-sacral orthosis, sagittal control, with rigid posterior panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0631*	Lumbar-sacral orthosis, sagittal control, with rigid anterior and posterior panels, posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0632*	Lumbar-sacral orthosis, sagittal control, with rigid anterior and posterior panels, posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, custom fabricated
L0633*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid posterior frame/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panels, produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0634*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid posterior frame/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panel(s), produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, custom fabricated
L0635*	Lumbar-sacral orthosis, sagittal-coronal control, lumbar flexion, rigid posterior frame/panel(s), lateral articulating design to flex the lumbar spine, posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panel(s), produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, anterior panel, pendulous abdomen design, prefabricated, includes fitting and adjustment
L0636*	Lumbar-sacral orthosis, sagittal-coronal control, lumbar flexion, rigid posterior frame/panels, lateral articulating design to flex the lumbar spine, posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panels, produces

HCPCS Codes	Description
	intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, anterior panel, pendulous abdomen design, custom fabricated
L0637*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid anterior and posterior frame/panels, posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panels, produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0638*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid anterior and posterior frame/panels, posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panels, produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, custom fabricated
L0639*	Lumbar-sacral orthosis, sagittal-coronal control, rigid shell(s)/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, anterior extends from symphysis pubis to xyphoid, produces intracavitary pressure to reduce load on the intervertebral discs, overall strength is provided by overlapping rigid material and stabilizing closures, includes straps, closures, may include soft interface, pendulous abdomen design, prefabricated item that has been trimmed, bent, molded, assembled, or otherwise customized to fit a specific patient by an individual with expertise
L0640*	Lumbar-sacral orthosis, sagittal-coronal control, rigid shell(s)/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, anterior extends from symphysis pubis to xyphoid, produces intracavitary pressure to reduce load on the intervertebral discs, overall strength is provided by overlapping rigid material and stabilizing closures, includes straps, closures, may include soft interface, pendulous abdomen design, custom fabricated
L0641*	Lumbar orthosis, sagittal control, with rigid posterior panel(s), posterior extends from L-1 to below L-5 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0642*	Lumbar orthosis, sagittal control, with rigid anterior and posterior panels, posterior extends from L-1 to below L-5 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0643*	Lumbar-sacral orthosis, sagittal control, with rigid posterior panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0648*	Lumbar-sacral orthosis, sagittal control, with rigid anterior and posterior panels, posterior extends from sacrococcygeal junction to T-9 vertebra, produces intracavitary pressure to reduce load on the intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0649*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid posterior frame/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panels, produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, stays, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0650*	Lumbar-sacral orthosis, sagittal-coronal control, with rigid anterior and posterior frame/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, lateral strength provided by rigid lateral frame/panel(s), produces intracavitary pressure to reduce load on intervertebral discs, includes straps, closures, may include padding, shoulder straps, pendulous abdomen design, prefabricated, off-the-shelf
L0651*	Lumbar-sacral orthosis, sagittal-coronal control, rigid shell(s)/panel(s), posterior extends from sacrococcygeal junction to T-9 vertebra, anterior extends from symphysis pubis to xyphoid,

HCPCS Codes	Description
	produces intracavitary pressure to reduce load on the intervertebral discs, overall strength is provided by overlapping rigid material and stabilizing closures, includes straps, closures, may include soft interface, pendulous abdomen design, prefabricated, off-the-shelf
L0700*	Cervical-thoracic-lumbar-sacral orthoses (CTLSO), anterior-posterior-lateral control, molded to patient model, (Minerva type)
L0710*	CTLSO, anterior-posterior-lateral-control, molded to patient mode, with interface material, (Minerva type)
L0970*	TLSO, corset front
L0972*	LSO, corset front
L0974*	TLSO, full corset
L0976*	LSO, full corset
L0980*	Peroneal straps, prefabricated, off-the-shelf, pair
L0999†*	Addition to spinal orthosis, not otherwise specified
L1000*	Cervical-thoracic-lumbar-sacral orthosis (CTLSO) (Milwaukee), inclusive of furnishing initial orthosis, including model
L1001*	Cervical thoracic lumbar- sacral orthosis, immobilizer, infant size, prefabricated, includes fitting and adjustment
L1005*	Tension based scoliosis orthosis and accessory pads, includes fitting and adjustment
L1010*	Addition to cervical-thoracic-lumbar-sacral orthosis (CTLSO) or scoliosis Orthosis, axilla sling
L1020*	Addition to CTLSO or scoliosis orthosis, kyphosis pad
L1025*	Addition to CTLSO or scoliosis orthosis, kyphosis pad, floating
L1030*	Addition to CTLSO or scoliosis orthosis, lumbar bolster pad
L1040*	Addition to CTLSO or scoliosis orthosis, lumbar or lumbar rib pad
L1050*	Addition to CTLSO or scoliosis orthosis, sternal pad
L1060*	Addition to CTLSO or scoliosis orthosis, thoracic pad
L1070*	Addition to CTLSO or scoliosis orthosis, trapezius sling
L1080*	Addition to CTLSO or scoliosis orthosis, outrigger
L1085*	Addition to CTLSO or scoliosis orthosis, outrigger, bilateral with vertical extensions
L1090*	Addition to CTLSO or scoliosis orthosis, lumbar sling
L1100*	Addition to CTLSO or scoliosis orthosis, ring flange, plastic or leather
L1110*	Addition to CTLSO or scoliosis orthosis, ring flange, plastic or leather, molded to patient model
L1120*	Addition to CTLSO or scoliosis orthosis, cover for upright, each
L1200*	Thoracic-lumbar-sacral-orthosis (TLSO), inclusive of furnishing initial orthosis only
L1210*	Addition to TLSO, (low profile), lateral thoracic extension
L1220*	Addition to TLSO, (low profile), anterior thoracic extension
L1230*	Addition to TLSO, (low profile), Milwaukee type superstructure
L1240*	Addition to TLSO, (low profile), lumbar derotation pad
L1250*	Addition to TLSO, (low profile), anterior ASIS pad
L1260*	Addition to TLSO, (low profile), anterior thoracic derotation pad
L1270*	Addition to TLSO, (low profile), abdominal pad
L1280*	Addition to TLSO, (low profile), rib gusset (elastic), each
L1290*	Addition to TLSO, (low profile), lateral trochanteric pad
L1300*	Other scoliosis procedure, body jacket molded to patient model
L1310*	Other scoliosis procedure, post-operative body jacket
L1499††*	Spinal orthosis, not otherwise specified

†Note: Considered Medically Necessary when used to report an addition to a medically necessary spinal orthosis in the absence of a specific code and when criteria in the applicable policy statements listed above are met

††Note: Considered Medically Necessary when used to report a medically necessary spinal orthosis in the absence of a specific code and when criteria in the applicable policy statements listed above are met

Considered Experimental/Investigational/Unproven when used to report Copes scoliosis brace or SpineCor® brace:

HCPCS Codes	Description
L1005*	Tension based scoliosis orthosis and accessory pads, includes fitting and adjustment
L1499*	Spinal orthosis, not otherwise specified

Considered Not Primarily Medical in Nature/Convenience Items/Not Covered:

HCPCS Codes	Description
L0982*	Stocking supporter grips, prefabricated, off-the-shelf, set of four (4)
L0984*	Protective body sock, prefabricated, off-the-shelf, each

Custom Foot Orthosis

Custom Foot Orthosis When Benefit Plan Document Excludes Treatment for Plantar Fasciitis

When a custom foot orthosis for the treatment of plantar fasciitis is specifically excluded in a benefit plan document the following items are excluded, even if a benefit exists for a custom foot orthosis:

HCPCS Codes	Description
L3000*	Foot, insert, removable, molded to patient model, "UCB" type, Berkeley shell, each
L3001*	Foot, insert, removable, molded to patient model Spenco, each
L3002*	Foot, insert, removable, molded to patient model, Plastazote or equal, each
L3003*	Foot, insert, removable, molded to patient model, silicone gel, each
L3010*	Foot, insert, removable, molded to patient model, longitudinal arch support, each
L3020*	Foot, insert, removable, molded to patient model, longitudinal/metatarsal support, each
L3030*	Foot, insert, removable, formed to patient foot, each
L3031*	Foot, insert/plate, removable, addition to lower extremity orthosis, high strength, lightweight material, all hybrid lamination/prepreg composite, each

ICD-10-CM Diagnosis Codes	Description
M72.2	Plantar fascial fibromatosis

When a benefit exists for a custom foot orthosis, the following are considered Medically Necessary when criteria in the applicable policy statements listed above are met:

HCPCS Codes	Description
L3000*	Foot, insert, removable, molded to patient model, "UCB" type, Berkeley shell, each
L3001*	Foot, insert, removable, molded to patient model, Spenco, each
L3002*	Foot, insert, removable, molded to patient model, Plastazote or equal, each
L3003*	Foot, insert, removable, molded to patient model, silicone gel, each

HCPCS Codes	Description
L3010*	Foot, insert, removable, molded to patient model, longitudinal arch support, each
L3020*	Foot, insert, removable, molded to patient model, longitudinal/metatarsal support, each
L3030*	Foot, insert, removable, formed to patient foot, each
L3031*	Foot, insert/plate, removable, addition to lower extremity orthosis, high strength, lightweight material, all hybrid lamination/prepreg composite, each

ICD-10-CM Diagnosis Codes	Description
A52.15	Late syphilitic neuropathy
E08.40- E08.49	Diabetes mellitus due to underlying condition with neurological complications
E08.51- E08.59	Diabetes mellitus due to underlying condition with circulatory complications
E08.610	Diabetes mellitus due to underlying condition with diabetic neuropathic arthropathy
E09.40- E09.49	Drug or chemical induced diabetes mellitus with neurological complications
E09.51- E09.59	Drug or chemical induced diabetes mellitus with circulatory complications
E09.610	Drug or chemical induced diabetes mellitus with diabetic neuropathic arthropathy
E09.65	Drug or chemical induced diabetes mellitus due to underlying condition with hyperglycemia
E10.40- E10.49	Type 1 diabetes mellitus with neurological complications
E10.51- E10.59	Type 1 diabetes mellitus with circulatory complications
E10.610	Type 1 diabetes mellitus with diabetic neuropathic arthropathy
E11.40- E11.49	Type 2 diabetes mellitus with neurological complications
E11.51- E11.59	Type 2 diabetes mellitus with circulatory complications
E11.610	Type 2 diabetes mellitus with diabetic neuropathic arthropathy
E13.40- E13.49	Other specified diabetes mellitus with neurological complications
E13.51- E13.59	Other specified diabetes mellitus with circulatory complications
E13.610	Other specified diabetes mellitus with diabetic neuropathic arthropathy
G11.4	Hereditary spastic paraplegia
G12.0- G12.9	Spinal muscular atrophy and related syndromes
G13.0	Paraneoplastic neuromyopathy and neuropathy
G13.1	Other systemic atrophy primarily affecting central nervous system in neoplastic disease
G24.09	Other drug induced dystonia
G24.2	Idiopathic nonfamilial dystonia
G24.8	Other dystonia
G57.00- G57.93	Mononeuropathies of lower limb
G58.8	Other specified mononeuropathies
G58.9	Mononeuropathy, unspecified
G59	Mononeuropathy in diseases classified elsewhere
G60.0- G60.9	Hereditary and idiopathic neuropathy

ICD-10-CM Diagnosis Codes	Description
G61.0- G61.9	Inflammatory polyneuropathy
G62.0- G62.9	Other and unspecified polyneuropathies
G63	Polyneuropathy in diseases classified elsewhere
G65.0	Sequelae of Guillain-Barre syndrome
G65.1	Sequelae of other inflammatory polyneuropathy
G65.2	Sequelae of toxic polyneuropathy
G71.0	Muscular dystrophy
G71.11- G71.19	Myotonic disorders
G71.2	Congenital myopathies (Code invalid effective 10/1/2020)
G71.20	Congenital myopathy, unspecified
G71.21	Nemaline myopathy
G71.220	X-linked myotubular myopathy
G71.228	Other centronuclear myopathy
G71.29	Other congenital myopathy
G80.0- G80.9	Cerebral palsy
G81.00- G81.04	Flaccid hemiplegia
G81.10- G81.14	Spastic hemiplegia
G81.90- G81.94	Hemiplegia, unspecified
G99.0	Autonomic neuropathy in diseases classified elsewhere
I67.0	Dissection of cerebral arteries, nonruptured
I69.041- I69.049	Monoplegia of lower limb following nontraumatic subarachnoid hemorrhage
I69.051- I69.059	Hemiplegia and hemiparesis following nontraumatic subarachnoid hemorrhage
I69.141- I69.149	Monoplegia of lower limb following nontraumatic intracerebral hemorrhage
I69.151- I69.159	Hemiplegia and hemiparesis following nontraumatic intracerebral hemorrhage
I69.241- I69.249	Monoplegia of lower limb following other nontraumatic intracranial hemorrhage
I69.251- I69.259	Hemiplegia and hemiparesis following other nontraumatic intracranial hemorrhage
I69.341- I69.349	Monoplegia of lower limb following cerebral infarction
I69.351- I69.359	Hemiplegia and hemiparesis following cerebral infarction
I69.841- I69.849	Monoplegia of lower limb following other cerebrovascular disease
I69.851- I69.859	Hemiplegia and hemiparesis following other cerebrovascular disease
I69.941- I69.949	Monoplegia of lower limb following unspecified cerebrovascular disease
I69.951- I69.959	Hemiplegia and hemiparesis following unspecified cerebrovascular disease

ICD-10-CM Diagnosis Codes	Description
I73.00- I73.9	Other peripheral vascular diseases
I77.70- I77.79	Other arterial dissection
I79.1	Aortitis in diseases classified elsewhere
I79.8	Other disorders of arteries, arterioles and capillaries in diseases classified elsewhere
L40.50- L40.59	Arthropathic psoriasis
M05.071- M05.079	Felty's syndrome, ankle and foot
M05.171- M05.179	Rheumatoid lung disease with rheumatoid arthritis of ankle and foot
M05.271- M05.279	Rheumatoid vasculitis with rheumatoid arthritis of ankle and foot
M05.371- M05.379	Rheumatoid heart disease with rheumatoid arthritis of ankle and foot
M05.471- M05.479	Rheumatoid myopathy with rheumatoid arthritis of ankle and foot
M05.571- M05.579	Rheumatoid polyneuropathy with rheumatoid arthritis of ankle and foot
M05.771- M05.779	Rheumatoid arthritis with rheumatoid factor of ankle and foot without organ or systems involvement
M05.871- M05.879	Other rheumatoid arthritis with rheumatoid factor of ankle and foot
M06.071- M06.079	Rheumatoid arthritis without rheumatoid factor, ankle and foot
M06.271- M06.279	Rheumatoid bursitis, ankle and foot
M06.371- M06.379	Rheumatoid nodule, ankle and foot
M06.4	Inflammatory polyarthropathy
M06.871- M06.879	Other specified rheumatoid arthritis, ankle and foot
M07.671- M07.679	Enteropathic arthropathies, ankle and foot
M08.071- M08.079	Unspecified juvenile rheumatoid arthritis, ankle and foot
M08.271- M08.279	Juvenile rheumatoid arthritis with systemic onset, ankle and foot
M08.3	Juvenile rheumatoid polyarthritis (seronegative)
M08.471- M08.479	Pauciarticular juvenile rheumatoid arthritis, ankle and foot
M08.871- M08.879	Other juvenile arthritis, ankle and foot
M12.071- M12.079	Chronic post rheumatic arthropathy [Jaccoud], ankle and foot
M12.171- M12.179	Kaschin-Beck disease, ankle and foot
M12.571- M12.579	Traumatic arthropathy, ankle and foot
M12.871- M12.879	Other specific arthropathies, not elsewhere classified, ankle and foot

ICD-10-CM Diagnosis Codes	Description
M13.171- M13.179	Monoarthritis, not elsewhere classified, ankle and foot
M13.871- M13.879	Other specified arthritis, ankle and foot
M19.071- M19.079	Primary osteoarthritis, ankle and foot
M19.171- M19.179	Post-traumatic osteoarthritis, ankle and foot
M19.271- M19.279	Secondary osteoarthritis, ankle and foot
M21.071- M21.079	Valgus deformity, not elsewhere classified, ankle
M21.171- M21.179	Varus deformity, not elsewhere classified, ankle
M21.371- M21.379	Foot drop (acquired)
M21.531- M21.539	Acquired clawfoot
M21.541- M21.549	Acquired clubfoot
M21.6X1- M21.6X9	Other acquired deformities of foot
M21.961- M21.969	Unspecified acquired deformity of lower leg
M24.571- M24.576	Contracture, ankle and foot
M24.671- M24.676	Ankylosis, ankle and foot
M34.83	Systemic sclerosis with polyneuropathy
M76.811- M76.819	Anterior tibial syndrome
M76.821- M76.829	Posterior tibial tendinitis
Q05.0- Q05.9	Spina bifida
Q07.01	Arnold-Chiari syndrome with spina bifida
Q07.03	Arnold-Chiari syndrome with spina bifida and hydrocephalus
Q66.00- Q66.92	Congenital deformities of feet
Q72.10- Q72.13	Congenital absence of thigh and lower leg with foot present
Q72.20- Q72.23	Congenital absence of both lower leg and foot
Q72.30- Q72.33	Congenital absence of foot and toe(s)
Q72.40- Q72.43	Longitudinal reduction defect of femur
Q72.50- Q72.53	Longitudinal reduction defect of tibia
Q72.60- Q72.63	Longitudinal reduction defect of fibula

ICD-10-CM Diagnosis Codes	Description
Q72.70- Q72.73	Split foot
Q72.811- Q72.819	Congenital shortening of lower limb
Q72.891- Q72.899	Other reduction defects of lower limb
Q72.90- Q72.93	Unspecified reduction defect of lower limb
Q90.9	Down syndrome, unspecified
S98.011D	Complete traumatic amputation of right foot at ankle level, subsequent encounter
S98.011S	Complete traumatic amputation of right foot at ankle level, sequela
S98.012D	Complete traumatic amputation of left foot at ankle level, subsequent encounter
S98.012S	Complete traumatic amputation of left foot at ankle level, sequela
S98.019D	Complete traumatic amputation of unspecified foot at ankle level, subsequent encounter
S98.019S	Complete traumatic amputation of unspecified foot at ankle level, sequela
S98.021D	Partial traumatic amputation of right foot at ankle level, subsequent encounter
S98.021S	Partial traumatic amputation of right foot at ankle level, sequela
S98.022D	Partial traumatic amputation of left foot at ankle level, subsequent encounter
S98.022S	Partial traumatic amputation of left foot at ankle level, sequela
S98.029D	Partial traumatic amputation of unspecified foot at ankle level, subsequent encounter
S98.029S	Partial traumatic amputation of unspecified foot at ankle level, sequela
S98.111D	Complete traumatic amputation of right great toe, subsequent encounter
S98.111S	Complete traumatic amputation of right great toe, sequela
S98.112D	Complete traumatic amputation of left great toe, subsequent encounter
S98.112S	Complete traumatic amputation of left great toe, sequela
S98.119D	Complete traumatic amputation of unspecified great toe, subsequent encounter
S98.119S	Complete traumatic amputation of unspecified great toe, sequela
S98.121D	Partial traumatic amputation of right great toe, subsequent encounter
S98.121S	Partial traumatic amputation of right great toe, sequela
S98.122D	Partial traumatic amputation of left great toe, subsequent encounter
S98.122S	Partial traumatic amputation of left great toe, subsequent encounter
S98.129D	Partial traumatic amputation of unspecified great toe, subsequent encounter
S98.129S	Partial traumatic amputation of unspecified great toe, sequela
S98.131D	Complete traumatic amputation of one right lesser toe, subsequent encounter
S98.131S	Complete traumatic amputation of one right lesser toe, sequela
S98.132D	Complete traumatic amputation of one left lesser toe, subsequent encounter
S98.132S	Complete traumatic amputation of one left lesser toe, sequela
S98.139D	Complete traumatic amputation of one unspecified lesser toe, subsequent encounter
S98.139S	Complete traumatic amputation of one unspecified lesser toe, sequela
S98.141D	Partial traumatic amputation of one right lesser toe, subsequent encounter
S98.141S	Partial traumatic amputation of one right lesser toe, sequela
S98.142D	Partial traumatic amputation of one left lesser toe, subsequent encounter
S98.142S	Partial traumatic amputation of one left lesser toe, sequela
S98.149D	Partial traumatic amputation of one unspecified lesser toe, subsequent encounter
S98.149S	Partial traumatic amputation of one unspecified lesser toe, sequela
S98.211D	Complete traumatic amputation of two or more right lesser toes, subsequent encounter
S98.211S	Complete traumatic amputation of two or more right lesser toes, sequela
S98.212D	Complete traumatic amputation of two or more left lesser toes, subsequent encounter
S98.212S	Complete traumatic amputation of two or more left lesser toes, sequela
S98.219D	Complete traumatic amputation of two or more unspecified lesser toes, subsequent encounter
S98.219S	Complete traumatic amputation of two or more unspecified lesser toes, sequela

ICD-10-CM Diagnosis Codes	Description
S98.221D	Partial traumatic amputation of two or more right lesser toes, subsequent encounter
S98.221S	Partial traumatic amputation of two or more right lesser toes, sequela
S98.222D	Partial traumatic amputation of two or more left lesser toes, subsequent encounter
S98.222S	Partial traumatic amputation of two or more left lesser toes, sequela
S98.229D	Partial traumatic amputation of two or more unspecified lesser toes, subsequent encounter
S98.229S	Partial traumatic amputation of two or more unspecified lesser toes, sequela
S98.311D	Complete traumatic amputation of right midfoot, subsequent encounter
S98.311S	Complete traumatic amputation of right midfoot, sequela
S98.312D	Complete traumatic amputation of left midfoot, subsequent encounter
S98.312S	Complete traumatic amputation of left midfoot, sequela
S98.319D	Complete traumatic amputation of unspecified midfoot, subsequent encounter
S98.319S	Complete traumatic amputation of unspecified midfoot, sequela
S98.321D	Partial traumatic amputation of right midfoot, subsequent encounter
S98.321S	Partial traumatic amputation of right midfoot, sequela
S98.322D	Partial traumatic amputation of left midfoot, subsequent encounter
S98.322S	Partial traumatic amputation of left midfoot, sequela
S98.329D	Partial traumatic amputation of unspecified midfoot, subsequent encounter
S98.329S	Partial traumatic amputation of unspecified midfoot, sequela
S98.911D	Complete traumatic amputation of right foot, level unspecified, subsequent encounter
S98.911S	Complete traumatic amputation of right foot, level unspecified, sequela
S98.912D	Complete traumatic amputation of left foot, level unspecified, subsequent encounter
S98.912S	Complete traumatic amputation of left foot, level unspecified, sequela
S98.919D	Complete traumatic amputation of unspecified foot, level unspecified, subsequent encounter
S98.919S	Complete traumatic amputation of unspecified foot, level unspecified, sequela
S98.921D	Partial traumatic amputation of right foot, level unspecified, subsequent encounter
S98.921S	Partial traumatic amputation of right foot, level unspecified, sequela
S98.922D	Partial traumatic amputation of left foot, level unspecified, subsequent encounter
S98.922S	Partial traumatic amputation of left foot, level unspecified, sequela
S98.929D	Partial traumatic amputation of unspecified foot, level unspecified, subsequent encounter
S98.929S	Partial traumatic amputation of unspecified foot, level unspecified, sequela

Considered Not Medically Necessary:

ICD-10-CM Diagnosis Codes	Description
	All other codes

Considered Experimental/Investigational/Unproven when used to report foot adductus positioning device (e.g., UNFO foot brace) or AposTherapy® Biomechanical device:

HCPCS Codes	Description
K1015	Foot, adductus positioning device, adjustable
L3649*	Orthopedic shoe, modification, addition or transfer, not otherwise specified

*Current Procedural Terminology (CPT®) ©2020 American Medical Association: Chicago, IL.

References

Cranial Orthotic Devices for Positional or Deformational Plagiocephaly

1. American Academy of Orthotists and Prosthetists (AAOP). Orthotic Treatment of Deformational Plagiocephaly, Brachycephaly and Scaphocephaly. Clinical Standards of Practice (CSOP) Consensus Conference on Orthotic Management of Plagiocephaly, 2004.
2. American Academy of Orthotists and Prosthetists (AAOP). Academy position statements. Executive Summary on Remolding Helmets. Accessed May 22, 2021. Available at URL Address: <http://www.oandp.org/?page=PositionStatements>
3. Buchanan EP, Hollier LH, Jr. Overview of craniosynostosis. UpToDate Inc., Waltham, MA. Last reviewed Jan 2019. Accessed August 10, 2020.
4. Canadian Pediatric Society. Practice Point. Positional plagiocephaly. Oct 1, 1011: Reaffirmed Feb 1, 2018. Accessed May 22, 2021. Available at URL address: <https://www.cps.ca/en/search-recherche?q=plagiocephaly>
5. Chin LS, Aldrich EF, DiPatri AJ, Eisenberg HM. Hydrocephalus. In: Townsend CM, Beauchamp RD, Evers BM, Mattox KL, editors; Sabiston Textbook of Surgery, 19th ed., Copyright © 2012 Saunders. Ch 68, Neurosurgery.
6. Collett B, Breiger D, King D, Cunningham M, Speltz M. Neurodevelopmental implications of "deformational" plagiocephaly. *J Dev Behav Pediatr*. 2005 Oct;26(5):379-89.
7. Collett BR, Gray KE, Starr JR, Heike CL, Cunningham ML, Speltz ML. Development at age 36 months in children with deformational plagiocephaly. *Pediatrics*. 2013 Jan;131(1):e109-15. doi: 10.1542/peds.2012-1779. Epub 2012 Dec 24.
8. Congress of Neurological Surgeons (CNS). Guidelines for the management of patients with positional plagiocephaly. Nov 2016. Accessed May 22, 2021. Available at URL address: <https://www.cns.org/search/results?q=guidelines%20for%20the%20management%20of%20patients%20with%20positional%20plagiocephaly&realmName=HTTP&wt=json&rows=10&start=0>
9. Farkas LG, Munro IR, editors. Anthropometric facial proportions in medicine. Springfield, IL: Charles C. Thomas; 1987.
10. Hayes, Inc. Hayes Medical Technology Directory Report. Cranial Orthotic Devices for the Treatment of Positional Cranial Deformity. Lansdale, PA: Hayes, Inc.; 2014 Jul. Reviewed Jun 2017.
11. Hutchison BL, Stewart AW, de Chalain T, Mitchell EA. Serial developmental assessments in infants with deformational plagiocephaly. *J Paediatr Child Health*. 2011 Nov 14.
12. Kane AA. An overview of craniosynostosis. *JPO*. 2004;16(4S):50-55. Copyright © American Academy of Orthotists & Prosthetists (AAOP).
13. Kelly KM, Littlefield TR, Pomatto JK, Ripley CE, Beals SP, Joganic EF. Importance of early recognition and treatment of deformational plagiocephaly with orthotic cranioplasty. *Cleft Palate Craniofac J*. 1999 Mar;36(2):127-30.
14. Kim SY, Park MS, Hang JI, Yim SY. Comparison of helmet therapy and counter positioning for deformational plagiocephaly. *Ann Rehabil Med*. 2013;37(6):785-95.

15. Kluba S, Kraut W, Reinert S, Krimmel M. What is the optimal time to start helmet therapy in positional plagiocephaly? *Plast Reconstr Surg.* 2011 Aug;128(2):492-8.
16. Laughlin J, Luerssen TG, Dias MS, Committee on Practice and Ambulatory Medicine Section on Neurological Surgery. Prevention and management of positional skull deformities in infants. *Pediatrics.* 2011 Dec;128(6):1236-41.
17. Lee RP, Teichgraeber JF, Baumgartner JE, Waller AL, English JD, Lasky RE, Miller CC, Gateno J, Xia JJ. Long-term treatment effectiveness of molding helmet therapy in the correction of posterior deformational plagiocephaly: a five-year follow-up. *Cleft Palate Craniofac J.* 2008 May;45(3):240-5. Epub 2007 Jul 17.
18. Lee WT, Richards K, Redhed J, Papay FA. A pneumatic orthotic cranial molding helmet for correcting positional plagiocephaly. *J Craniofac Surg.* 2006 Jan;17(1):139-44.
19. Littlefield TR, Beals SP, Manwaring KH, Pomatto JK, Joganic EF, Golden KA, Ripley CE. Treatment of craniofacial asymmetry with dynamic orthotic cranioplasty. *J Craniofac Surg.* 1998 Jan; 9(1):11-7.
20. Littlefield TR, Pomatto JK, Beals SP, Manwaring KH, Joganic EF, Ripley CE. Efficacy and stability of Dynamic Orthotic Cranioplasty™: an eight year investigation. *Proceedings of the 7th International Congress of the International Society of Craniofacial Surgery; 1997; Santa Fe, NM.* p. 109-11.
21. Lipira AB, Gordon S, Darvann TA, Hermann NV, Van Pelt AE, Naidoo SD, Govier D, Kane AA. Helmet versus active repositioning for plagiocephaly: a three-dimensional analysis. *Pediatrics.* 2010 Oct;126(4):e936-45.
22. Loveday B, de Chalain TB. Active counterpositioning or orthotic device to treat positional plagiocephaly? *J Craniofac Surg.* 2001 Jul;12(4):308-13.
23. McGarry A, Dixon MT, Greig RJ, Hamilton DR, Sexton S, Smart H. Head shape measurement standards and cranial orthoses in the treatment of infants with deformational plagiocephaly. *Dev Med Child Neurol.* 2008 Aug;50(8):568-76.
24. Moss SD. Nonsurgical, nonorthotic treatment of occipital plagiocephaly: what is the natural history of the misshapen neonatal head? *J Neurosurg.* 1997 Feb;87(5):667-70.
25. Mulliken JB, Woude DLV, Hansen M, LaBrie RA, Michael SR. Analysis of posterior plagiocephaly: deformational versus synostotic. *Plast Reconstr Surg.* 1999 Feb;103(2):371-80.
26. Naidoo SD, Skolnick GB, Patel KB, Woo AS, Cheng AL. Long-term outcomes in treatment of deformational plagiocephaly and brachycephaly using helmet therapy and repositioning: a longitudinal cohort study. *Childs Nerv Syst.* 2015 Sep;31(9):1547-52.
27. Paquereau J. Non-surgical management of posterior positional plagiocephaly: orthotic versus repositioning. *Ann Phys Med Rehabil.* 2013;56:231-49.
28. Persing J, James H, Swanson J, Kattwinkel J. Prevention and management of positional skull deformities in infants. American Academy of Pediatrics Committee on Practice and Ambulatory Medicine, Section on Plastic Surgery and Section on Neurological Surgery. *Pediatrics.* 2003 Jul;112(1 Pt 1):199-202.
29. Pollack IF, Losken HW, Fasick P. Diagnosis and management of posterior plagiocephaly. *Pediatrics.* 1997 Feb;99(2):180-5.
30. Rekake HL. Occipital plagiocephaly: a critical review of the literature. *Neurosurg Focus.* Accepted in final form 1997 Feb 4. ©Copyright 2004 AANS. *J Neurosurg.* 1998 Jul;89(1):24-30.

31. Spiegel DA, Dormans JP. Torticollis. In: Kliegman: Nelson Textbook of Pediatrics, 19th ed. Copyright © 2011 Saunders
32. Spitzer MJ, Kramer M, Neukam FW, Nkenke E. Validation of optical three-dimensional plagiocephalometry by computed tomography, direct measurement, and indirect measurements using thermoplastic bands. *J Craniofac Surg.* 2011 Jan;22(1):129-34.
33. Steinberg JP, Rawlani R, Humphries LS, Rawlani V, Vicari FA. Effectiveness of conservative therapy and helmet therapy for positional cranial deformation. *Plast Reconstr Surg.* 2015 Mar;135(3):833-42.
34. U.S. Food and Drug Administration (FDA). Code of Federal Regulations. Cranial orthosis. Title 21, Vol. 8, Sec. 882.5970. Apr 1, 2015. Accessed May 22, 2021. Available at URL address: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=882.5970>
35. U.S. Food and Drug Administration (FDA). Medical devices; neurological devices; classification of cranial orthosis. Federal Register. 1998 Jul 30;63(146):40650-2. Accessed August 4, 2020. Available at URL address: <http://www.fda.gov/ohrms/dockets/98fr/073098b.txt>
36. Wilbrand JF, Lautenbacher N, Pons-Kühnemann J, Streckbein P, Kähling C, Reinges MH, Howaldt HP, Wilbrand M. Treated Versus Untreated Positional Head Deformity. *J Craniofac Surg.* 2016 Jan;27(1):13-8.
37. Xia JJ, Kennedy KA, Teichgraeber JF, Wu KQ, Baumgartner JB, Gateno J. Nonsurgical treatment of deformational plagiocephaly: a systematic review. *Arch Pediatr Adolesc Med.* 2008 Aug;162(8):719-27.

Upper Limb Orthosis

1. Hayes, Inc. Search and Summary. MyoPro Orthosis (Myomo, Inc.) for Upper Extremity Paralysis/Paresis After Stroke. Landsale, Pa. Hayes, Inc. Published Nov 6, 2018.
2. Mehrholz J, Pohl M, Platz T, Kugler J, Elsner B. Electromechanical and robot-assisted arm training for improving activities of daily living, arm function, and arm muscle strength after stroke. *Cochrane Database Syst Rev.* 2018 Sep 3;9:CD006876.
3. Page SJ, Hill V, White S. Portable upper extremity robotics is as efficacious as upper extremity rehabilitative therapy: a randomized controlled pilot trial. *Clin Rehabil.* 2013; 27(6):494-503.
4. Peters HT, Page SJ, Persch A. Giving them a hand: wearing a myoelectric elbow-wrist-hand orthosis reduces upper extremity impairment in chronic stroke. *Arch Phys Med Rehabil.* 2017; 98(9):1821-1827.
5. Pundik S, McCabe J, Kesner S, Skelly M, Fatone S. Use of a myoelectric upper limb orthosis for rehabilitation of the upper limb in traumatic brain injury: A case report. *J Rehabil Assist Technol Eng.* 2020;7:2055668320921067. Published 2020 Jun 18.
6. Rodgers H, Bosomworth H, Krebs HI, et al. Robot assisted training for the upper limb after stroke (RATULS): A multicentre randomised controlled trial. *Lancet.* 2019;394(10192):51-62.
7. Stein J, Narendran K, McBean J, Krebs K, Hughes R. Electromyography-controlled exoskeletal upper-limb-powered orthosis for exercise training after stroke. *Am J Phys Med Rehabil.* 2007 Apr;86(4):255-61.
8. United States Food and Drug Administration. Myomo e100. 510(k) K062631. April 2007. Accessed May 22, 2021. Available at URL address: https://www.accessdata.fda.gov/cdrh_docs/pdf6/K062631.pdf
9. Webster J, Murphy D. Section 3: Upper Limb Orthoses. In: Atlas of Orthoses and Assistive Devices. Elsevier Health Sciences Nov 24, 2017.

10. Willigenburg NW, McNally MP, Hewett TE, Page SJ. Portable myoelectric brace use increases upper extremity recovery and participation but does not impact kinematics in chronic, poststroke hemiparesis. *J Mot Behav.* 2017; 49(1):46-54.
11. Yozbatiran N, Francisco GE. Robot-assisted therapy for the upper limb after cervical spinal cord injury. *Phys Med Rehabil Clin N Am.* 2019;30(2):367-384.
12. Yoo HJ, Lee S, Kim J, Park C, Lee B. Development of 3D-printed myoelectric hand orthosis for patients with spinal cord injury. *J Neuroeng Rehabil.* 2019;16(1):162. Published 2019 Dec 30.

Lower Limb Orthosis

1. Asselin: Asselin P, Knezevic S, Kornfeld S, Cirnigliaro C, Agranova-Breyter I, Bauman WA, Spungen AM. Heart rate and oxygen demand of powered exoskeleton-assisted walking in persons with paraplegia. *J Rehabil Res Dev.* 2015;52(2):147-58
2. Bernhardt K, Oh T, Kaufman K. Stance control orthosis trial in patients with inclusion body myositis. *Prosthet Orthot Int.* 2011 Mar;35(1):39-44.
3. Centers for Medicare and Medicaid Services (CMS) Local Coverage Determination. Ankle-Foot/Knee-Ankle-Foot Orthosis (L33686). Effective 1/1/2020. Accessed May 22, 2021. Available at URL address: https://www.cms.gov/medicare-coverage-database/indexes/lcd-alphabetical-index.aspx?Cntrctr=373&ContrVer=1&CntrctrSelected=373*1&DocType=Active%7cFuture&s=All&bc=AggAAAQAAAA&
4. Deems-Dluhy S, Hoppe-Ludwig S, Mummidisetty CK, Semik P, Heinemann AW, Jayaraman A. Microprocessor Controlled Knee Ankle Foot Orthosis (KAFO) vs Stance Control vs Locked KAFO: A Randomized Controlled Trial. *Arch Phys Med Rehabil.* 2021 Feb;102(2):233-244.
5. Duddy D, Doherty R, Connolly J, McNally S, Loughrey J, Faulkner M. The Effects of Powered Exoskeleton Gait Training on Cardiovascular Function and Gait Performance: A Systematic Review. *Sensors (Basel).* 2021 May 5;21(9):3207.
6. Esquenazi A, Lee S, Packel AT, Braitman L. A randomized comparative study of manually assisted versus robotic-assisted body weight supported treadmill training in persons with a traumatic brain injury. *PM R.* 2013; 5(4):280-290.
7. Esquenazi A., Talaty M., Jayaraman A. Powered Exoskeletons for Walking Assistance in Persons with Central Nervous System Injuries: A Narrative Review. 2017. *PM and R*, 9(1), 46-62.
8. Esquenazi A, Talaty M, Packel A, Saulino M. The ReWalk powered exoskeleton to restore ambulatory function to individuals with thoracic-level motor-complete spinal cord injury. *Am J Phys Med Rehabil.* 2012 Nov;91(11):911-21.
9. Ferris DP, Sawicki GS, Domingo A. Powered lower limb orthoses for gait rehabilitation. *Top Spinal Cord Inj Rehabil.* 2005;11(2):34-49.
10. Fineberg DB, Asselin P, Harel NY, Agranova-Breyter I, Kornfeld SD, Bauman WA, Spungen AM. Vertical ground reaction force-based analysis of powered exoskeleton-assisted walking in persons with motor-complete paraplegia. *J Spinal Cord Med.* 2013 Jul;36(4):313-21.
11. Goffredo M, Guanziroli E, Pournajaf S, et al. Overground wearable powered exoskeleton for gait training in subacute stroke subjects: clinical and gait assessments. *Eur J Phys Rehabil Med.* 2019;55(6):710-721.

12. Gorgey AS, Wade R, Sumrell R, Villadelgado L, Khalil RE, Lavis T. Exoskeleton Training May Improve Level of Physical Activity After Spinal Cord Injury: A Case Series. *Top Spinal Cord Inj Rehabil.* 2017 Summer;23(3):245-255.
13. Guanziroli E, Cazzaniga M, Colombo L, et al. Assistive powered exoskeleton for complete spinal cord injury: correlations between walking ability and exoskeleton control. *Eur J Phys Rehabil Med.* 2019 Apr;55(2):209-216.
14. Hartigan C, Kandilakis C, Dalley S, et al. Mobility Outcomes Following Five Training Sessions with a Powered Exoskeleton. *Top Spinal Cord Inj Rehabil.* 2015 Spring;21(2):93-9.
15. Hebert JS, Liggins AB. Gait evaluation of an automatic stance-control knee orthosis in a patient with postpoliomyelitis. *Arch Phys Med Rehabil.* 2005 Aug;86(8):1676-80.
16. Irby SE, Bernhardt KA, Kaufman KR. Gait of stance control orthosis users: the dynamic knee brace system. *Prosthet Orthot Int.* 2005 Dec;29(3):269-82.
17. Irby SE, Bernhardt KA, Kaufman KR. Gait changes over time in stance control orthosis users. *Prosthet Orthot Int.* 2007 Dec;31(4):353-61.
18. Juszcak M, Gallo E, Bushnik T. Examining the Effects of a Powered Exoskeleton on Quality of Life and Secondary Impairments in People Living With Spinal Cord Injury. *Top Spinal Cord Inj Rehabil.* 2018 Fall;24(4):336-342.
19. Khan AS, Livingstone DC, Hurd CL, et al. Retraining walking over ground in a powered exoskeleton after spinal cord injury: a prospective cohort study to examine functional gains and neuroplasticity. *J Neuroeng Rehabil.* 2019;16(1):145. Published 2019 Nov 21.
20. Kim JH, Ji SG, Jung KJ, Kim JH. Therapeutic Experience on Stance Control Knee-Ankle-Foot Orthosis With Electromagnetically Controlled Knee Joint System in Poliomyelitis. *Ann Rehabil Med.* 2016 Apr;40(2):356-61.
21. Kozlowski AJ, Bryce TN, Dijkers MP. Time and Effort Required by Persons with Spinal Cord Injury to Learn to Use a Powered Exoskeleton for Assisted Walking. *Top Spinal Cord Inj Rehabil.* 2015 Spring;21(2):110-21.
22. Louie DR, Eng JJ. Powered robotic exoskeletons in post-stroke rehabilitation of gait: a scoping review. *J Neuroeng Rehabil.* 2016 Jun 8;13(1):53.
23. Marchand DK, MacDougall D. Motorized Walking Devices for Patients with Compromised Mobility: A Review of Clinical Effectiveness, Cost-Effectiveness, and Guidelines. Ottawa (ON): Canadian Agency for Drugs and Technologies in Health; August 22, 2019.
24. Miller LE, Zimmerman AK, Herbert WG. Clinical effectiveness and safety of powered exoskeleton-assisted walking in patients with spinal cord injury: systematic review with meta-analysis. *Med Devices (Auckl).* 2016; 9: 455–466.
25. Molteni F, Gasperini G, Gaffuri M, et al. Wearable robotic exoskeleton for over-ground gait training in sub-acute and chronic hemiparetic stroke patients: preliminary results. *Eur J Phys Rehabil Med.* 2017 Jan 24.
26. Molteni F, Guanziroli E, Goffredo M, Calabrò RS, Pournajaf S, Gaffuri M, Gasperini G, Filoni S, Baratta S, Galafate D, Le Pera D, Bramanti P, Franceschini M, On Behalf Of Italian Eksogait Study Group. Gait Recovery with an Overground Powered Exoskeleton: A Randomized Controlled Trial on Subacute Stroke Subjects. *Brain Sci.* 2021 Jan 14;11(1):104.

27. Mortenson WB, Pysklywec A, Chau L, Prescott M, Townson A. Therapists' experience of training and implementing an exoskeleton in a rehabilitation centre [published online ahead of print, 2020 Jul 10]. *Disabil Rehabil.* 2020;1-7.
28. Platz T, Gillner A, Borgwaldt N, Kroll S, Roschka S. Device-Training for Individuals with Thoracic and Lumbar Spinal Cord Injury Using a Powered Exoskeleton for Technically Assisted Mobility: Achievements and User Satisfaction. *Biomed Res Int.* 2016;2016:8459018.
29. Pröbsting E, Kannenberg A, Zacharias B. Safety and walking ability of KAFO users with the C-Brace® Orthotronic Mobility System, a new microprocessor stance and swing control orthosis. *Prosthet Orthot Int.* 2017 Feb;41(1):65-77.
30. Rafiaei M, Bahramizadeh M, Arazpour M, et al. The gait and energy efficiency of stance control knee-ankle-foot orthoses: A literature review. *Prosthet Orthot Int.* 2016 Apr;40(2):202-14.
31. Rojek A, Mika A, Oleksy Ł, Stolarczyk A, Kielnar R. Effects of Exoskeleton Gait Training on Balance, Load Distribution, and Functional Status in Stroke: A Randomized Controlled Trial. *Front Neurol.* 2020;10:1344. Published 2020 Jan 15.
32. Sawicki GS, Domingo A, Ferris DP. The effects of powered ankle-foot orthoses on joint kinematics and muscle activation during walking in individuals with incomplete spinal cord injury. *J Neuroengineering Rehabil.* 2006 Feb 28;3:3.
33. Sczesny-Kaiser M, Trost R, Aach M, Schildhauer TA, Schwenkreis P, Tegenthoff M. A Randomized and Controlled Crossover Study Investigating the Improvement of Walking and Posture Functions in Chronic Stroke Patients Using HAL Exoskeleton - The HALESTRO Study (HAL-Exoskeleton STROKE Study). *Front Neurosci.* 2019;13:259. Published 2019 Mar 29.
34. Tefertiller C, Hays K, Jones J. et al. Initial Outcomes from a Multicenter Study Utilizing the Indego Powered Exoskeleton in Spinal Cord Injury. *Top Spinal Cord Inj Rehabil.* 2018 Winter;24(1):78-85.
35. Wu CH, Mao HF, Hu JS, Wang TY, Tsai YJ, Hsu WL. The effects of gait training using powered lower limb exoskeleton robot on individuals with complete spinal cord injury. *J Neuroeng Rehabil.* 2018 Mar 5;15(1):14.
36. Yakamovich T, Lemaire ED, Kofman J. Preliminary kinematic evaluation of a new stance-control knee-ankle-foot orthosis. *Clinical Biomechanics.* 2006 Dec;21(10):1081-9.
37. Yang A, Asselin P, Knezevic S, Kornfeld S, Spungen AM. Assessment of In-Hospital Walking Velocity and Level of Assistance in a Powered Exoskeleton in Persons with Spinal Cord Injury. *Top Spinal Cord Inj Rehabil.* 2015 Spring; 21(2): 100–109.
38. Zeilig G, Weingarden H, Zwecker M, Dudkiewicz I, Bloch A, Esquenazi A. Safety and tolerance of the ReWalk™ exoskeleton suit for ambulation by people with complete spinal cord injury: a pilot study. *J Spinal Cord Med.* 2012 Mar;35(2):96-101.

Knee Brace

1. American Academy of Orthopaedic Surgeons (AAOS). The use of knee braces [position statement]. Rosemont, IL: AAOS; 1997 Oct. Revised 2003 Dec. Retired December 2008. Accessed April 9, 2008. Available at URL address: <http://www.aaos.org/about/papers/position/1124.asp>
2. American Academy of Orthopaedic Surgeons (AAOS). Treatment of Osteoarthritis of the Knee. Evidence-based Guideline 2nd Edition. Adopted May 2013. Accessed August 4, 2020. Available at URL address: <http://www.aaos.org/research/guidelines/GuidelineOAKnee.asp>

3. American Academy of Orthopaedic Surgeons (AAOS). Clinical Practice Guideline on Management of Anterior Cruciate Ligament Injuries. American Academy of Orthopaedic Surgeons (AAOS); 2014 Sep 5. 619 p.
4. American Academy of Pediatrics Committee on Sports Medicine. Knees brace use in the young athlete. Pediatrics. 2001 Aug;108(2):503-7.
5. Beaudreuil J, Bendaya S, Faucher M, Coudeyre E, Ribinik P, Revel M, Rannou F. Clinical practice guidelines for rest orthosis, knee sleeves, and unloading knee braces in knee osteoarthritis. Joint Bone Spine. 2009 Dec;76(6):629-36.
39. Centers for Medicare and Medicaid Services (CMS) Local Coverage Determination. Knee Orthosis (L33318). Effective 1/1/2020. Accessed May 22, 2021. Available at URL address: https://www.cms.gov/medicare-coverage-database/indexes/lcd-alphabetical-index.aspx?Cntrctr=373&ContrVer=1&CntrctrSelected=373*1&DocType=Active%7cFuture&s=All&bc=AggAAAQAAAA&
6. Richmond J, Hunter D, Irrgang J, Jones MH, Levy B, Marx R, Snyder-Mackler L, Watters WC 3rd, Haralson RH 3rd, Turkelson CM, Wies JL, Boyer KM, Anderson S, St Andre J, Sluka P, McGowan R; American Academy of Orthopaedic Surgeons. Treatment of osteoarthritis of the knee (nonarthroplasty). J Am Acad Orthop Surg. 2009 Sep;17(9):591-600.
7. U.S. Food and Drug Administration (FDA). Code of Federal Regulations. Title 21. Ch 1. Sec 890.3475. Limb orthosis. Revised April 1, 2015. Accessed May 22, 2021. Available at URL address: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=890>

Shoes

1. American Diabetes Association. Preventive Foot Care in People with Diabetes. Position Statement. Diabetes Care 2003 Jan;26 (Suppl 1):S78-9.
2. American Diabetes Association. Standards of medical care in diabetes - 2007. Position statement. Accessed August 4, 2020. Available at URL address: http://care.diabetesjournals.org/cgi/reprint/30/suppl_1/S4
3. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determination. Therapeutic Shoes for Persons with Diabetes (L33369). Effective 1/1/2020. Accessed May 22, 2021. Available at URL address: https://www.cms.gov/medicare-coverage-database/indexes/lcd-alphabetical-index.aspx?Cntrctr=373&ContrVer=1&CntrctrSelected=373*1&DocType=Active%7cFuture&s=All&bc=AggAAAQAAAA&
4. Janisse DJ, Janisse E. Shoe modification and the use of orthoses in the treatment of foot and ankle pathology. J Am Acad Orthop Surg. 2008 Mar;16(3):152-8.
5. Rosenfeld SB, Phillips WA, Torchia MM. Approach to the child with in-toeing. UpToDate. October 29, 2020. © 2021 UpToDate, Inc.
6. UNFO med ltd. Metatarsus Adductus, Metatarsus Varus and Pigeon toed Treatment Shoes – UNFO-S (Short). Accessed June 11, 2021. Available at URL address: Pigeon Toed Treatment Shoes | UNFO foot brace (unfo-med.com)

Spinal Orthosis

1. Agabegi SS, Asghar FA, Herkowitz HN. Spinal orthoses. J Am Acad Orthop Surg. 2010 Nov;18(11):657-67.

2. American Academy of Orthopedic Surgeons. Idiopathic Scoliosis in Children and Adolescents. Copyright 1995-2021 by the American Academy of Orthopaedic Surgeons. March 2015, last reviewed April 2021. Accessed May 22, 2021. Available at URL address: <https://orthoinfo.aaos.org/en/diseases--conditions/idiopathic-scoliosis-in-children-and-adolescents/>
3. American Academy of Orthopaedic Surgeons® (AAOS). Low back pain. Copyright 1995-2021 by the American Academy of Orthopaedic Surgeons. Last reviewed December 2013. Accessed May 22, 2021. Available at URL address: <http://orthoinfo.aaos.org/topic.cfm?topic=A00311>
4. American Academy of Orthopedic Surgeons® (AAOS). Fracture of the Thoracic and Lumbar Spine. Copyright 1995-2021 by the American Academy of Orthopaedic Surgeons. Last reviewed September 2015, June 2020. Accessed May 22, 2021. Available at URL address: <http://orthoinfo.aaos.org/topic.cfm?topic=A00368>
5. American Academy of Physical Medicine and Rehabilitation. PM&R KnowledgeNow®. Disorders of the Spine. Accessed August 4, 2020. Available at URL address: <https://now.aapmr.org/category/musculoskeletal-medicine/>
6. Ammendolia C, Kerr MS, Bombardier C. Back belt use for prevention of occupational low back pain: a systematic review. *J Manipulative Physiol Ther.* 2005 Feb;28(2):128-34.
7. Bigos SJ, Holland J, Holland C, Webster JS, Battie M, Malmgren JA. High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults. *Spine J.* 2009 Feb;9(2):147-68.
8. Centers for Medicare and Medicaid Services (CMS). Local Coverage Determination. Spinal Orthosis (L33790). Effective 1/1/2020. Accessed May 22, 2021. Available at URL address: <https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33790&ver=15&DocType=1&bc=AAIAAAAAAAAA&>
9. Chou R. Subacute and chronic low back pain: Nonpharmacologic and pharmacologic treatment. In: UpToDate, Libman H (Ed). UpToDate. Waltham, MA. Literature review current through: July 10, 2020. Updated May 2021. Accessed May 22, 2021.
10. Chou R, Loeser JD, Owens DK, Rosenquist RW, American Pain Society Low Back Pain Guideline Panel, et al. Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: an evidence-based clinical practice guideline from the American Pain Society. *Spine (Phila Pa 1976).* 2009 May 1;34(10):1066-77. Accessed on September 2018. Available at URL address: <http://americanpainsociety.org/education/guidelines/overview>
11. Choosing Wisely® Initiative (2017). American Chiropractic Association August 2017. Accessed May 22, 2021. Available at URL address: <http://www.choosingwisely.org/clinician-lists/aca-lumbar-supports-or-braces-for-long-term-treatment-of-low-back-pain/>
12. Dailey AT, Ghogawala Z, Choudhri TF, Watters WC 3rd, Resnick DK, et al. Guideline update for the performance of fusion procedures for degenerative disease of the lumbar spine. Part 14: brace therapy as an adjunct to or substitute for lumbar fusion. *J Neurosurg Spine.* 2014 Jul;21(1):91-101. Accessed Sept 2018. Available at URL address: <http://thejns.org/doi/full/10.3171/2014.4.SPINE14282> (American Association of Neurological Surgeons)
13. Erdil M. Occupational low back pain: Treatment. In: UpToDate, Libman H (Ed). UpToDate. Waltham, MA. Literature review current through: Aug 2018. Topic last updated: Aug 28, 2018, March 2021. Accessed on May 22, 2021.

14. Guo J, Lam TP, Wong MS, Ng BK, Lee KM, Liu KL et al. A prospective randomized controlled study on the treatment outcome of SpineCor brace versus rigid brace for adolescent idiopathic scoliosis with follow-up according to the SRS standardized criteria. *Eur Spine J.* 2014 Dec;23(12):2650-7.
15. Gutman G, Benoit M, Joncas J, Beauséjour M, Barchi S, Labelle H, et al. The effectiveness of the SpineCor brace for the conservative treatment of adolescent idiopathic scoliosis. Comparison with the Boston brace. *Spine J.* 2016 May;16(5):626-31.
16. Lahad A, Malter AD, Berg AO, Deyo RA. The effectiveness of four interventions for the prevention of low back pain. *JAMA.* 1994 Oct 26;272(16):1286-91.
17. National Institute for Health and Clinical Excellence (NICE). Low back pain and sciatica in over 16s: assessment and management. NG59. Published: 30 November 2016, updated November 2020. Accessed May 22, 2021. Available at URL address: <http://nice.org.uk/guidance/ng59>
<https://www.nice.org.uk/Search?q=>
18. Negrini S, Minozzi S, Bettany-Saltikov J, Chockalingam N, Grivas TB, et al. Braces for Idiopathic Scoliosis in Adolescents. *Spine (Phila Pa 1976).* 2016 Dec 1;41(23):1813-1825.
19. Newman M, Minns Lowe C, Barker K. Spinal Orthoses for Vertebral Osteoporosis and Osteoporotic Vertebral Fracture: A Systematic Review. *Arch Phys Med Rehabil.* 2016 Jun;97(6):1013-25.
20. North American Spine Society (NASS). Clinical Guidelines. Accessed September 2018. Available at URL address: <https://www.spine.org/ResearchClinicalCare/QualityImprovement/ClinicalGuidelines>
21. Qaseem A, Wilt TJ, McLean RM, Forciea MA; Clinical Guidelines Committee of the American College of Physicians. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. *Ann Intern Med.* 2017 Apr 4;166(7):514-530. (American College of Physicians)
22. Scherl S. Adolescent idiopathic scoliosis: Management and prognosis. In: UpToDate, Phillips W, Torchia MM (Ed), UpToDate, Waltham, MA. Literature review current through July 2020, updated March 2021. Accessed May 22, 2021.
23. Scoliosis Research Society. Conditions and Treatments. Accessed May 22, 2021. Available at URL address:
<https://www.srs.org/professionals/online-education-and-resources/conditions-and-treatments>
24. Skoch J, Zoccali C, Zaninovich O, Martirosyan N, Walter CM, et al. Bracing After Surgical Stabilization of Thoracolumbar Fractures: A Systematic Review of Evidence, Indications, and Practices. *World Neurosurg.* 2016 Sep;93:221-8.
25. Takasaki H, Miki T. The impact of continuous use of lumbosacral orthoses on trunk motor performance: a systematic review with meta-analysis. *Spine J.* 2017 Jun;17(6):889-900.
26. Urquhart JC, Alrehaili OA, Fisher CG, Fleming A, Rasoulinejad P, Gurr K, et al. Treatment of thoracolumbar burst fractures: extended follow-up of a randomized clinical trial comparing orthosis versus no orthosis. *J Neurosurg Spine.* 2017 Jul;27(1):42-47.
27. van Duijvenbode IC, Jellema P, van Poppel MN, van Tulder MW. Lumbar supports for prevention and treatment of low back pain. *Cochrane Database Syst Rev.* 2008 Apr 16;(2):CD001823. Accessed May 22, 2021. Available at URL address: <https://www.cochranelibrary.com/search>
28. van Poppel MN, Hooftman WE, Koes BW. An update of a systematic review of controlled clinical trials on the primary prevention of back pain at the workplace. *Occup Med (Lond).* 2004 Aug;54(5):345-52.

29. van Poppel MNM, Koes BW, van der Ploeg T, Smid T, Bouter LM. Lumbar supports and education for the prevention of low back pain in industry. A randomized controlled trial. *JAMA*. 1998 Jun;279(22):1789-94.
30. Yee AJ, Yoo JU, Marsolais EB, Carlson G, Poe-Kochert C, et al. Use of a postoperative lumbar corset after lumbar spinal arthrodesis for degenerative conditions of the spine. A prospective randomized trial. *J Bone Joint Surg Am*. 2008 Oct;90(10):2062-8.

Custom Foot Orthosis

1. Abdo RV, Iorio LJ. Rheumatoid arthritis of the foot and ankle. *J Am Orthop Surg*. 1994;2:326-32.
2. American Academy of Orthopaedic Surgeons (AAOS). Posterior tibial tendon dysfunction. Copyright ©1995-2021 by the American Academy of Orthopaedic Surgeons. Accessed May 22, 2021. Available at URL address: <http://orthoinfo.aaos.org/topic.cfm?topic=A00166>
3. Arias-Martín I, Reina-Bueno M, Munuera-Martínez PV. Effectiveness of custom-made foot orthoses for treating forefoot pain: a systematic review. *Int Orthop*. 2018 Feb 8. doi: 10.1007/s00264-018-3817-y.
4. Atoun E, Mor A, Segal G, et al. A non-invasive, home-based biomechanical therapy for patients with spontaneous osteonecrosis of the knee. *J Orthop Surg Res*. 2016 Nov 14;11(1):139.
5. Barzilay Y, Segal G, Lotan R et al. Patients with chronic non-specific low back pain who reported reduction in pain and improvement in function also demonstrated an improvement in gait pattern. *Eur Spine J*. 2016 Sep;25(9):2761-6.
6. Bar-Ziv Y, Debbi EM, Ran Y, Benedict S, Halperin N, Beer Y. Long-Term Effects of AposTherapy in Patients with Osteoarthritis of the Knee: A Two-Year Followup. *Arthritis*. 2013;2013:689236
7. Burns J, Crosbie J, Ouvrier R, Hunt A. Effective orthotic therapy for the painful cavus foot: a randomized controlled trial. *J Am Podiatr Med Assoc*. 2006 May-Jun;96(3):205-11.
8. Caselli MA, Clark N, Lazarus S, Velez Z, Venegas L. Evaluation of magnetic foil and PPT Insoles in the treatment of heel pain. *J Am Podiatr Med Assoc*. 1997 Jan;87(1):1-16.
9. Chang TJ, Camastra CA. Hallux limitus and hallux rigidus. In: Banks AS, Downey MS, editors; Martin DE, Miller SJ, authors: *McGlamry's comprehensive textbook of foot and ankle surgery*. 4th revised edition. Nov 2012. Ch 23.
10. Clark H, Rome K, Plant M, O'Hare K, Gray J. A critical review of foot orthoses in the rheumatoid arthritic foot. *Rheumatology (Oxford)*. 2006 Feb;45(2):139-45.
11. Cole C, Seto C, Gazewood J. Plantar fasciitis: evidence-based review of diagnosis and therapy. *Am Fam Physician*. 2005 Dec;72(11):2237-42.
12. Debbi EM, Bernfeld B, Herman A, et al. A Biomechanical Foot-Worn Device Improves Total Knee Arthroplasty Outcomes. *J Arthroplasty*. 2019;34(1):47-55.
13. Drexler M, Elbaz A, Mor A, et al. Effects of a customized biomechanical therapy on patients with medial compartment knee osteoarthritis. *Ann Phys Rehabil Med*. 2012;55(4):213-228.
14. Elbaz A, Mor A, Segal G, Debbi E, Haim A, Halperin N, Debi R. APOS therapy improves clinical measurements and gait in patients with knee osteoarthritis. *Clin Biomech (Bristol, Avon)*. 2010 Nov;25(9):920-5.

15. Haim A, Segal G, Elbaz A, et al. The outcome of a novel biomechanical therapy for patients suffering from anterior knee pain. *Knee*. 2013 Dec;20(6):595-9.
40. Hawke F, Burns J, Radford JA, du Toit V. Custom-made foot orthoses for the treatment of foot pain. *Cochrane Database Syst Rev*. 2008 Jul 16;(3):CD006801
41. Hayes, Inc. Health Technology Assessment. Apos therapy system (APOS Medical Assets Ltd.) for treatment of osteoarthritis of the knee. March 2020. © 2002 Hayes, Inc. Landsale, Pa.
42. Harris EJ, Vanore JV, Thomas JL, Kravitz SR, Mendelson SA, Mendicino RW, Silvani SH, Gassen SC; Clinical Practice Guideline Pediatric Flatfoot Panel of the American College of Foot and Ankle Surgeons. Diagnosis and Treatment of Pediatric Flatfoot. Clinical Practice Guideline. *J Foot Ankle Surg*. 2004 Nov-Dec;43(6):341-73.
43. Janisse DJ, Janisse E. Shoe modification and the use of orthoses in the treatment of foot and ankle pathology. *J Am Acad Orthop Surg*. 2008 Mar;16(3):152-8.
44. Kilmartin TE, Barrington RL, Wallace WA. A controlled prospective trial of foot orthosis for juvenile hallux valgus. *Journal of Bone and Joint Surgery.Br* 1994 Mar;76(2):210-4.
45. Lee MS, Vanore JV, Thomas JL, Catanzariti AR, Kogler G, Kravitz SR, Miller SJ, Gassen SC; Clinical Practice Guideline Adult Flatfoot Panel. Diagnosis and Treatment of Adult Flatfoot. Clinical Practice Guideline. American College of Foot and Ankle Surgeons. *Journal of Foot and Ankle Surgery*. March/April 2005;44(2):78-113.
46. Lubovsky O, Mor A, Segal G, et al. A novel self-care biomechanical treatment for obese patients with knee osteoarthritis. *Int J Rheum Dis*. 2017 Jul;20(7):818-824.
47. Martin RL, Davenport TE, Reischl SF, McPoil TG, Matheson JW, Wukich DK, McDonough CM; American Physical Therapy Association. Heel pain-plantar fasciitis: revision 2014. *J Orthop Sports Phys Ther*. 2014 Nov;44(11):A1-33.
48. Martin DE, Pontious J. Introduction and evaluation of hallux abducto valgus. In: Banks AS, Downey MS, editors; Martin DE, Miller SJ, authors: McGlamry's comprehensive textbook of foot and ankle surgery. 4th revised edition. Nov 2012. Ch 13.
49. Pedorthic Association of Canada. Position statement: Custom-made orthoses. Copyright © 2021 - Pedorthic Association of Canada. Accessed May 22, 2021. Available at URL address: <https://www.pedorthic.ca/insurance-providers/the-pedorthic-journey/custom-made-orthotics/>
50. Prenton S, Hollands KL, Kenney LP. Functional electrical stimulation versus ankle foot orthoses for foot drop: a meta-analysis of orthotic effects. *J Rehabil Med*. 2016;48:646-656.
51. Reichenbach S, Felson DT, Hincapié CA, et al. Effect of Biomechanical Footwear on Knee Pain in People With Knee Osteoarthritis: The BIOTOK Randomized Clinical Trial. *JAMA*. 2020;323(18):1802-1812.
52. Sackley C, Disler PB, Turner-Stokes L, Wade DT, Brittle N, Hoppitt T. Rehabilitation interventions for foot drop in neuromuscular disease. *Cochrane Database Syst Rev*. 2009 Jul 8;(3):CD003908. Updated Feb 2015.
53. Segal G, Bar-Ziv Y, Velkes S, et al. A non-invasive biomechanical device and treatment for patients following total hip arthroplasty: results of a 6-month pilot investigation. *J Orthop Surg Res*. 2013 May 21;8:13.

54. Solomonow-Avnon D, Herman A, Levin D, et al. Positive outcomes following gait therapy intervention for hip osteoarthritis: A longitudinal study. *J Orthop Res.* 2017 Oct;35(10):2222-2232.
55. Spencer S. Pressure relieving interventions for preventing and treating diabetic foot ulcers. *The Cochrane Database of Systematic Reviews.* In: *The Cochrane Library, Issue 1, 2003.* ©2004 The Cochrane Collaboration.
56. Tenenbaum S, Chechik O, Bariteau J, et al. Gait abnormalities in patients with chronic ankle instability can improve following a non-invasive biomechanical therapy: a retrospective analysis. *J Phys Ther Sci.* 2017 Apr;29(4):677-684.
57. Vanore JV, Christensen JC, Kravitz SR, Schuberth JM, Thomas JL, Weil LS, et al. Clinical Practice Guideline First Metatarsophalangeal Joint Disorders Panel of the American College of Foot and Ankle Surgeons. Diagnosis and treatment of first metatarsophalangeal joint disorders. Section 1: Hallux valgus. *J Foot Ankle Surg.* 2003 May-Jun;42(3):112-23.
58. Vanore JV, Christensen JC, Kravitz SR, Schuberth JM, Thomas JL, Weil LS, et al. Clinical Practice Guideline First Metatarsophalangeal Joint Disorders Panel of the American College of Foot and Ankle Surgeons. Diagnosis and treatment of first metatarsophalangeal joint disorders. Section 2: Hallux rigidus. *J Foot Ankle Surg.* 2003 May-Jun;42(3):124-36.
59. Vanore JV, Christensen JC, Kravitz SR, Schuberth JM, Thomas JL, Weil LS, et al. Clinical Practice Guideline First Metatarsophalangeal Joint Disorders Panel of the American College of Foot and Ankle Surgeons. Diagnosis and treatment of first metatarsophalangeal joint disorders. Section 3: Hallux varus. *J Foot Ankle Surg.* 2003 May-Jun;42(3):137-42.
60. Yaari L, Kosashvili Y, Segal G, et al. A Novel Non-Invasive Adjuvant Biomechanical Treatment for Patients with Altered Rehabilitation after Total Knee Arthroplasty: Results of a Pilot Investigation. *Clin Orthop Surg.* 2015 Jun;7(2):191-8.
61. Younger A. Customized or prefabricated foot orthoses improved function only in the short term in patients with plantar fasciitis. *J Bone Joint Surg Am.* 2007 Feb;89(2):458.

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