



**Medical Policy:  
Ankle Orthoses**

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## Policy

**Definition:** An external orthopedic appliance, as a brace or splint, that prevents or assists movement of the foot, ankle, or knee.

A system of standard terminology has been developed to describe orthoses. The system uses the first letter of each joint that the orthosis crosses in correct sequence, with the letter “O” for orthosis at the end. Thus, the more common orthoses would be named AFO (ankle-foot orthosis), KAFO (knee-ankle-foot orthosis), and KO (knee orthosis). A properly written orthotic prescription does not just state the name of the orthosis; it also is necessary to state the desired function to be obtained, the specific material from which the device is to be made, and the specific design and construction that is to be employed.

VCHCP considers ankle orthoses, ankle-foot orthoses (AFOs), and knee-ankle-foot orthoses (KAFOs) medically necessary durable medical equipment (DME) according to the criteria set forth below.

**Note:** In general, VCHCP adopts Medicare guidelines.

### I. Ankle Orthotics

VCHCP considers ankle orthoses medically necessary DME for members who meet the criteria set forth below.

- *Rigid ankle casts:* Rigid ankle casts are considered medically necessary DME when used to treat ankle fractures. Rigid ankle casts are considered experimental and investigational when used after ankle sprains, for chronically unstable ankles, or when used to prevent re-injury because of a lack of adequate evidence of the effectiveness of rigid ankle casts for these indications.
- *Semi-rigid ankle casts:* Semi-rigid ankle casts are considered medically necessary DME when used to treat ankle sprains. Semi-rigid ankle casts are considered experimental and investigational when used after ankle fractures, for use in chronically unstable ankles, or when used to prevent re-injury because of a lack of adequate evidence of effectiveness of semi-rigid ankle cases for these indications.
- *Unna boots:* Unna boots are considered medically necessary DME when used after ankle sprains with accompanying ulcerative skin changes. Unna boots are considered experimental and investigational when used after ankle fractures, or when used in chronically unstable ankles or to prevent re-injury because of a lack of adequate evidence of the effectiveness of Unna boots for these indications.

- *Ankle air-stirrups:* Ankle air-stirrups (e.g., Air Cast) are considered medically necessary DME when used after an ankle injury (fractures or Grade II or III sprains). Air-stirrups are considered experimental and investigational for chronically unstable ankles or to prevent ankle re-injury because of a lack of adequate evidence of the effectiveness of ankle air-stirrups for these indications.
- *Orthopedic ankle cast-braces:* Orthopedic ankle cast-braces are considered medically necessary DME when used after an ankle injury (fractures or Grade II or III sprains).
- *Lace-up ankle braces:* Lace-up ankle braces are considered medically necessary DME when used in members with ankle injuries, when used in members with chronically unstable ankles, or when used to prevent ankle re-injury.
- *Orthoplast ankle stirrups:* Orthoplast ankle stirrups are considered medically necessary DME for use after an acute injury. Use of orthoplast ankle stirrups in chronically unstable ankles or to prevent ankle re-injury is considered experimental and investigational because of a lack of adequate evidence of the effectiveness of orthoplast ankle stirrups for these indications.
- *Stabilizing shoes:* Stabilizing shoes for ankle injuries (acute or chronic) are considered experimental and investigational. Note: In addition, most plans contractually exclude foot orthotics.
- *Ankle tapes and wrapping:* Note: VCHCP does *not* cover ankle tapes and wrapping (elastic, cloth, or nylon) as these items are not reusable and thus do not meet the contractual definition of durable medical equipment. However, tapes and wrapping applied by a healthcare provider in the office is covered.
- *Post-operative rehabilitative ankle braces:* VCHCP considers postoperative rehabilitation ankle braces medically necessary when applied within six weeks of surgery. Such postoperative rehabilitative braces are considered an integral part of surgery.

## II. Ankle Foot Orthoses (AFOs) and Knee Ankle Foot Orthoses (KAFOs)

### A. AFOs and KAFOs Used in Non-ambulatory Persons: Ankle Contracture Splints and Foot Drop Splints

1. *Ankle contracture splints:* VCHCP considers ankle contracture splints medically necessary DME if *all* of the following criteria are met:
  - a. The member has a 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), *and*
  - b. There is a reasonable expectation of the ability to correct the contracture, *and*
  - c. The contracture is interfering or expected to interfere significantly with the member's functional abilities, *and*

- d. The ankle contracture splint is used as a component of a therapy program that includes passive stretching of the involved muscles and/or tendons.

If an ankle contracture splint is used for the treatment of a plantar flexion contracture, the pre-treatment passive range of motion must be measured with a goniometer and documented in the medical record. There must be documentation of an appropriate stretching program carried out by professional staff (in a nursing facility) or caregiver (at home).

If an ankle contracture splint is considered medically necessary, a replacement interface is also considered medically necessary DME as long as the member continues to meet medical necessity criteria for the splint. Up to one replacement interface per six months is considered medically necessary.

An ankle contracture splint and replacement interface is NOT CONSIDERED MEDICALLY NECESSARY for the following indications:

- Fixed contractures;
- Members with foot drop but without an ankle flexion contracture.

Note: In addition, an ankle contracture splint and replacement interface is *not* considered medically necessary when it is used solely for the prevention or treatment of a heel pressure ulcer because Medicare does not consider it medically necessary for these indications.

A component of an ankle contracture splint that is used to address positioning of the knee or hip is considered experimental and investigational because the effectiveness of this type of component is not established.

2. *Foot drop splint/ recumbent positioning device:* VCHCP does not consider a foot drop splint/ recumbent positioning device or replacement interface medically necessary. A foot drop splint/ recumbent positioning device and replacement interface is *not* considered medically necessary when it is used solely for the prevention or treatment of a heel pressure ulcer because Medicare does not consider it medically necessary for these indications. A foot drop splint/ recumbent positioning device and replacement interface is not considered medically necessary for members with foot drop who are non-ambulatory because there are other more appropriate treatment modalities.
3. *Additions to AFOs and KAFOs:* Additions to AFOs or KAFOs are not considered medically necessary if either the base orthosis is not medically necessary or the specific addition is not medically necessary.

## B. AFOs and KAFOs Used in Ambulatory Persons

1. *AFOs in ambulatory members:* Ankle-foot orthoses (AFO) are considered medically necessary DME for ambulatory members with weakness or deformity of the foot and ankle, which require stabilization for medical

reasons, and have the potential to benefit functionally. Members prescribed custom-made “molded-to-patient-model” AFOs must also meet the criteria set forth in section II.B.3, below. AFOs are not considered medically necessary for ambulatory members who do not meet these medical necessity criteria.

VCHCP does NOT consider AFOs and any related addition medically necessary when used solely for the treatment of edema and/or for the prevention or treatment of a heel pressure ulcer in ambulatory patients, as Medicare does not consider AFOs medically necessary for these indications.

Additions to AFOs or KAFOs are not considered medically necessary if either the base orthosis is not medically necessary or the specific addition is not medically necessary.

2. *KAFOs in ambulatory members:* Knee-ankle-foot orthoses (KAFO) are considered medically necessary DME for ambulatory members for whom an ankle-foot orthosis is covered and for whom additional knee stability is required. Members prescribed custom-made “molded-to-patient model” KAFOs must also meet the criteria set forth in section II.B.3, below. KAFOs are not medically necessary and are *not* covered for ambulatory members who do not meet these coverage criteria.
3. *Molded-to-patient model AFOs and KAFOs in ambulatory members:* Custom-made AFOs and KAFOs that are “molded-to-patient-model” are considered medically necessary DME for ambulatory members when the basic medical necessity criteria listed in sections II.B.1 and II.B.2 above are met and one of the following criteria is met:
  - i. The member could not be fit with a prefabricated (off-the-shelf) AFO; *or*
  - ii. The condition necessitating the orthosis is expected to be permanent or of longstanding duration (more than 6 months); *or*
  - iii. There is a need to control the knee, ankle or foot in more than one plane; *or*
  - iv. The member has a documented neurological, circulatory, or orthopedic status that requires custom fabricating over a model to prevent tissue injury; *or*
  - v. The member has a healing fracture that lacks normal anatomical integrity or anthropometric proportions.

VCHCP does *not* consider KAFOs and any related addition medically necessary when used solely for the treatment of edema and/or for the prevention or treatment of a heel pressure ulcer in ambulatory members, as Medicare does not consider KAFOs medically necessary for these indications.

4. *Additions to AFOs and KAFOs:* Additions to AFOs and KAFOs are not considered medically necessary if either the base orthosis is not medically necessary and/or the specific addition is not medically necessary.

C. General Notes:

- *Shoes:* Please see Foot Orthotics Policy for medical necessity criteria for shoes and related items that are an integral part of a leg brace.
- *Socks:* Socks used in conjunction with ankle orthoses, AFOs, or KAFOs are *not* covered because socks do not meet the contractual definition of durability for covered durable medical equipment (DME).
- *Prophylactic orthotics:* VCHCP does *not* consider ankle orthotics, AFOs, and KAFOs medically necessary treatment of disease when used to prevent injury in a previously uninjured ankle or knee. Such use is solely preventive, and therefore is considered not considered medically necessary treatment of disease or injury.
- *Sports orthotics:* VCHCP does *not* consider ankle orthotics, AFOs, and KAFOs medically necessary if they are to be used only during participation in sports. Such use is considered not medically necessary, as participation in sports is considered an elective activity.
- *Repairs and replacements:* Repairs to a medically necessary ankle orthosis, AFO, or KAFO due to wear and tear are considered medically necessary DME when they are needed to make the orthosis functional. Replacement of a complete ankle orthosis, AFO, or KAFO or component of these orthoses due to a significant change in the member's condition or irreparable wear is considered medically necessary DME if the device is still medically necessary.
- *Spare orthotics:* *Identical* spare orthotics purchased for the member's convenience are not considered medically necessary. More than one set of *different* orthotics, however, may be medically necessary.

## Background

An orthosis (brace) is a rigid or semi-rigid device that is 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. An orthosis can be either prefabricated or custom fabricated.

### *Custom-made versus prefabricated (off-the-shelf) orthoses:*

A prefabricated (off-the-shelf) orthosis is one that is manufactured in quantity without a specific patient in mind. A prefabricated orthosis may be trimmed, bent, molded (with or without heat), or otherwise modified for use by a specific patient (i.e., custom fitted). An orthosis that is assembled from prefabricated components is considered prefabricated. Any orthosis that does not meet the definition of a custom fabricated (custom-made) orthosis is considered prefabricated.

A custom fabricated (custom-made) orthosis is one that is individually made for a specific patient starting with basic materials including, but not limited to, plastic, metal, leather, or cloth in the form of sheets, bars, etc. It involves substantial work such as cutting, bending, molding, sewing, etc. It may involve the incorporation of some prefabricated components. It involves more than trimming, bending, or making other

modifications to a substantially prefabricated item. A molded-to-patient-model orthosis is a particular type of custom fabricated orthosis in which an impression of the specific body part is made (by means of a plaster cast, CAD-CAM technology, etc.) and this impression is then used to make a positive model (of plaster or other material) of the body part. The orthosis is then molded on this positive model.

*Ankle orthotics:*

Ankle orthotics may potentially be useful after an acute ankle injury (acute ankle sprain (ligament injury) or fracture), for rehabilitation, to prevent ankle re-injury, and for chronically unstable ankles. Whether a specific ankle orthotic is effective depends on the particular indication for its use.

There are four potential uses for ankle supports: 1) treatment of acute injury (i.e., beginning within 3 days following injury); 2) rehabilitation (for the first few weeks following injury until full function is obtained); 3) prophylaxis (used primarily in patients with a history of ankle injury); and 4) treatment of chronic instability. The length of time that ankle supports need to be used following injury varies depending largely on the type and severity of the injury.

Treatment after acute injury: The ankle begins to swell after injury, and swelling continues to increase for about three days following injury. Significant swelling persists for about two weeks following injury.

Rehabilitation: Ankle supports have been used for the first few weeks following injury to prevent re-injury during early return to activity. After the pain has subsided and the patient can walk without a limp, use of the ankle support is only appropriate during high-risk activities (i.e., especially racquetball, football, and basketball). Leaving the ankle support on all the time only serves to restrict functional range of motion and encourage psychological dependence.

Prophylaxis: Ankle supports have been used to prevent injury in uninjured individuals and persons with a history of ankle sprain. There is generally no reason for prophylactic bracing in low-risk activities, such as standing, walking, or climbing stairs. And it is not clear that prophylactic bracing should be advocated for use during high-risk sports as well, because of prophylactic bracing's cost, inconvenience, and possible detraction from athletic performance.

Chronic instability: Ankle supports are used to stabilize the ankle in patients with chronic instability. In most instances, they are to be used only during high-risk sports and activities. It is unusual for ankle supports to be prescribed for use during normal daily activities.

Many types of ankle supports exist as an alternative to ankle taping. In addition, shoes for some sports (particularly basketball) are available with high tops and built in straps for additional ankle protection.

Recent studies have shown that use of ankle supports during early rehabilitation of acute grade I or grade II ankle sprains (partial ligament rupture) produced results as good as cast immobilization, with more rapid return to activity.

The following is a description of various types of ankle supports, and a summary of the evidence of their effectiveness. Numerous difficulties arise in interpreting the studies of the various treatments for ankle sprains. First, most ankle sprains heal well regardless of the form of treatment; thus, almost all treatments produce good results. It is difficult to measure marginal differences among them.

Second, difficulties arise in comparing different treatment protocols and brands of products. Research is needed to standardize forms of treatment and to compare the many products on the market.

Third, research has focused on which provide the best mechanical support of the ankle in laboratory stress testing, but it has not been demonstrated that this is the most important factor in predicting clinical outcomes. It may be that the quality of the proprioceptive (position-sense) feedback from the device is the most important predictor of clinical outcomes.

*Taping:*

A number of studies have supported the use of tape in helping stabilize the ankle and reducing sprains in persons with previous sprains.

The goal of taping is to prevent the ankle ligaments from being stressed to the point of injury. Taping should limit ankle inversion and eversion but allow functional dorsiflexion and plantarflexion. There is evidence that ankle taping also helps prevent injury by stimulating proprioceptive (position-sense) nerve fibers, causing the peroneus brevis muscle to be activated just before heel strike.

For treatment of acute injury (beginning within about 3 days following injury), taping may be used to provide support and to help reduce edema (swelling). Felt or foam pads may be applied under the tape to help reduce edema.

Taping may be used for rehabilitation (i.e., to prevent re-injury during early return to activity). About three days after the injury, swelling subsides, and tape is reapplied to decrease the risk of re-injury. Using tape to prevent injury, however, is a time-consuming procedure, so it is recommended for early stages of rehabilitation only. Tape may be applied for the first few weeks after return to activity for rehabilitation of ankle injuries. Taping may be used prophylactically in persons with or without a prior ankle sprain, although it is not recommended for routine use for this indication. Although taping probably reduces the rate of ankle injuries, it loses support rapidly with movement and sweating. For use prophylactically, however, it is not a time- and cost-effective option compared to the alternatives described below.

Taping has also been recommended as a possible treatment for chronic instability, although it is not recommended for routine use in this situation. With movement and sweating, tape rapidly loses support. Also, if used permanently, tape becomes expensive. This approach is probably not as cost- and time-effective as other options described below.

One-inch wide standard tape is used for the foot, and 1½-inch tape for the ankle. Areas sensitive to blistering must be protected with lubricated gauze sponges. Special adherent spray may be applied under the tape. If tape is to be reapplied often, an underwrap is used to prevent chronic skin irritation.

Tape should only be wrapped by a person well trained in its application, such as a trainer, physician, nurse, or physician assistant. Improperly applied tape may cause further injury. Elastic tape has also been studied, and although it provides more compression than non-elastic tape, it loses its restriction of range of motion even more than standard tape. Tape does not meet the durability requirement for covered durable medical equipment, in that it is not reusable and is not “made to withstand prolonged use.” Although VCHCP will cover taping or wrapping provided by a healthcare provider in his/her office, take-home tape is not covered.

*Elastic wrapping and sleeves:*

Wrapping with elastic bandages is useful in the early stages (about the first three days) of ankle sprain to provide compression that reduces swelling. It is used as an adjunct to ice and elevation. It needs to be changed often to monitor the skin. Wrapping has not been proven to be useful for other indications: prevention of re-injury, prophylactic use, and use for chronic ankle instability. This is because wrapping provides little or no support during activity.

Elastic ankle sleeves that are pulled over the foot like open-ended socks offer no value as supports. They may, however, enhance proprioception. They may also provide even compression to reduce ankle edema. Thus, they have been shown to be useful only in treating an acute ankle sprain (i.e., within about three days after injury). Like elastic wrapping, elastic ankle sleeves have not been proven to be useful for rehabilitation, prophylaxis, or use in chronically unstable ankles and thus will not be covered by VCHCP for these indications.

*Bracing:*

Like taping, bracing can be used in an acute injury, during rehabilitation to prevent re-injury, prophylactically, and in chronically unstable ankles. Braces come in three main types: casts, lace-up wraps, and plastic orthoses. Casts can be either semi-rigid or rigid; lace-up braces and plastic orthoses are considered semi-rigid.

Braces have been shown to have several advantages over taping. They can be used by persons who do not have access to a person skilled in taping techniques. In some cases, they can be more cost-effective than taping. But some braces may migrate during vigorous movement because of the lack of adhesion to skin. This movement may cause

the brace to fail to provide support. But tape adhesion or straps to reduce migration may help. During wear-and-tear, Velcro fasteners tend to fail and release, straps or buckles break, and elastic stretches out. Off-the-shelf braces may not fit persons who are too tall, are obese, or deformed. Custom-made braces are available, but are generally more expensive.

*Rigid plaster casts:*

Rigid plaster casting, once a common treatment for acute ankle sprains, has now been generally abandoned for this use. Plaster casting continues to be used in foot and ankle fractures.

Compared with taping, rigid plaster casting has been shown to increase the time to return to activity and has not been shown to produce a better outcome, even in patients with grade III ankle sprains (complete rupture of a ligament).

Still, rigid casting is an option to consider for the early postoperative phase or in cases of gross ankle instability. When acute swelling subsides, the cast should be replaced with a better fitting one. It should be replaced with semi-rigid bracing as soon as possible, usually within 1 to 2 weeks.

Rigid casting is not used to prevent re-injury during rehabilitation, for prophylaxis, or for chronic instability and thus will not be covered by VCHCP for these indications.

*Lace-up braces:*

Lace-up braces have been proven to be as effective as tape at restricting ankle range of motion, and unlike tape, lace-ups do not tend to lose their supportive ability during activity. Lace-up braces are a cost-effective alternative to taping. They are safe, easy to apply, and reusable. They are not of much value in the acute stage of injury because they do not provide good uniform compression. They are probably of some value in preventing re-injury during rehabilitation, for prophylactic use, and for use in patients with chronic ankle instability.

There are a number of brands of lace-ups available; no controlled comparisons have been performed to determine if one brand offers advantages over others. Examples of variants of standard lace-ups include: 1) braces that use Velcro closures in place of laces; 2) the Cramer brace (Cramer Products, Gardner, KS), which incorporates a lace-up design with outside straps to provide a heel lock; 3) the McDavid ankle lace-up brace (McDavid Knee Guard, Chicago, IL) and the Swede-O ankle lace-up brace (Swede-O Universal, North Branch, MN), which can accommodate steel or plastic stays for extra support.

*Air-stirrups:*

The air-stirrup is a prefabricated semi-rigid orthosis. The largest-selling brand is the Aircast air-stirrup ankle brace (Aircast, Summit, NJ), which is composed of a rigid outer plastic shell that fits up both sides of the leg and is connected under the heel. It is lined with inner air bags and is attached to the leg with Velcro. As with lace-up ankle supports,

some clinicians combine use of the air-stirrup with taping. The air-stirrup is an off-the-shelf device that does not require custom fitting. It can be worn under regular shoes. The air-stirrup decreases inversion and eversion, and protects the already injured ligament and soft tissues from re-injury, thereby decreasing rehabilitation time. The pressure in the air-stirrup increases when weight-bearing, which is thought to provide intermittent compression during walking that aids in the milking out of edematous fluid. The air-stirrup can also be readjusted to allow total contact fitting while swelling is fluctuating.

The air-stirrup can be used after acute ankle sprains and in the early stages of rehabilitation to prevent recurrent sprain. It can also be used after rigid casting and for treatment of some fractures. There is currently insufficient evidence for their use for prophylaxis or in chronic instability and thus will not be covered by VCHCP for these indications.

*Other semi-rigid orthoses:*

Other semi-rigid orthoses have not been studied adequately to make accurate comparisons with taping or with air-stirrups. These include the following:

- DonJoy Ankle Ligament Protector (DonJoy, Carlsbad, CA) is a plastic brace that seems to restrict range of motion as well as the air-stirrup and possibly better than tape, although no head-to-head comparisons have been published.
- The Active Ankle (Active Ankle Systems, Louisville, KY) has a stirrup and air cell liner with a hinged ankle may also be useful.
- The Malleoloc (Bauerfiend USA, Kennesaw, GA) is a stabilizing ankle orthosis that uses a wrap-around ankle brace in conjunction with Velcro strapping. Although it shows promise, definitive proof if its effectiveness is not yet available.

*Other ankle-stabilizing orthoses:*

- Non-elastic Cloth Wrapping: Non-elastic cloth wrap (also known as the Louisiana heel lock) has been applied over socks to prevent ankle injury. The advantage of this system is that the wrap can be washed or reused, thus reducing cost. Cloth wrapping may improve position-sense, but it appears to offer less benefit than taping. Its use in ankle injuries has not been adequately studied.
- Nylon and Nylon/Elastic Wrapping: Nylon or Nylon/Elastic heel wraps to be placed over socks may also improve position sense, but like non-elastic cloth wrapping, their use in ankle injuries has not been adequately studied.
- Orthoplast Stirrup: The orthoplast stirrup is a strip of thermoplastic material custom-fitted to run under the heel and up both sides of the leg. The ankle bones (malleoli) and other bony prominences are covered with foam padding, and the stirrup is fitted with an elastic bandage.

Orthoplast is a low-temperature thermoplastic that becomes pliable when submerged in hot water. It is applied directly to the patient and molded evenly around the ankle. The fabrication is simple enough to be carried out in the office or clinic.

The orthoplast stirrup has been successfully used to treat ankle sprains, but because it is relatively hard, it does not adapt to reduction in swelling. It has not been shown to decrease inversion range of motion more than tape, and is most commonly used in the acute or early rehabilitative stages. Orthoplast deteriorates with long-term use, limiting its usefulness in prophylaxis and for chronic ankle sprains.

*Cast-braces:*

A number of hinged polypropylene cast braces have been used in the treatment of ankle sprains. These involve have a foot section with heel stabilizer, a lateral ankle extension, and an articulating ankle joint joining the two. An example is the Sarmiento cast brace, which is removable and fits in the patient's shoe. They were designed primarily for long-term use in athletes who suffer from recurrent ankle sprains (i.e., prophylaxis and chronic instability).

Cast-braces require custom fitting by an orthotist for proper impression, fabrication, and fitting. Fitting of a fresh ankle sprain with a cast-brace is usually not recommended because changes in swelling of the ankle during the initial recovery phase will compromise the cast-brace's fit.

Although these cast-braces have reportedly given good results in the treatment of ankle sprains, they are cumbersome, expensive, and have not been shown to offer any benefits over other forms of treatment and thus will not be covered by VCHCP.

*Ice pack with air-stirrup:*

The Cryo/Strap (Aircast, Summit, NJ) ice pack with air-stirrup uses a U-pad for compression of the soft tissue around the ankle. The pad contains a liquid that can be frozen and is held in place by an elastic strap. A modified air-stirrup is worn over this device. This system has been shown to provide uniform compression and to decrease skin temperature for up to 90 minutes. It has not been shown, however, to improve long-term outcomes and thus will not be covered by VCHCP.

*Ankle-foot orthoses (AFOs) and knee-ankle-foot orthoses (KAFOs):*

Ankle-foot orthoses (AFOs) extend well above the ankle (usually to near the top of the calf) and are fastened around the lower leg above the ankle. These features distinguish them from foot orthotics, which are shoe inserts that do not extend above the ankle. Below the knee, the components of a KAFO are the same as those of an AFO. However, the KAFO extends to the knee joint and thigh.

A non-ambulatory ankle-foot orthosis may be either an ankle contracture splint or a foot drop splint.

*Ankle contraction splint:*

According to Medicare Durable Medical Equipment Carrier Guidelines, an ankle contracture splint is a prefabricated ankle-foot orthosis that has all of the following characteristics:

1. Designed to accommodate an ankle with a plantar flexion contracture up to 45°, *and*
2. Applies a dorsiflexion force to the ankle, *and*
3. Used by a patient who is non-ambulatory, *and*
4. Has a soft interface.

Ankle flexion contracture is a condition in which there is shortening of the muscles and/or tendons that plantarflex the ankle with the resulting inability to bring the ankle to 0 degrees by passive range of motion. (0 degrees ankle position is when the foot is perpendicular to the lower leg.)

*Foot drop splint:*

Foot drop is a condition in which there is weakness and/or lack of use of the muscles that dorsiflex the ankle but there is the ability to bring the ankle to 0 degrees by passive range of motion. A foot drop splint/recumbent positioning device is a prefabricated ankle-foot orthosis, which has all of the following characteristics:

1. Designed to maintain the foot at a fixed position of 0° (i.e., perpendicular to the lower leg), *and*
2. Not designed to accommodate an ankle with a plantar flexion contracture, *and*
3. Used by a patient who is non-ambulatory, *and*
4. Has a soft interface.

**A. Attachments:** None

**B. History:**

- a. Reviewer/Author: Cynthian Wilhelmy, MD Date: 01-16-07  
Committee Review: UM on 02- 20-07 & QA on 02-27-07
- b. Reviewed/Revised by Albert Reeves, MD Date: 11/1/11  
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- c. Reviewed/No Changes: Albert Reeves, MD Date: 4/17/12  
Committee Reviews: UM on 5/10/12 & QA on 5/22/12
- d. Reviewed/No Changes: Albert Reeves, MD Date: 1/28/13  
Committee Review: UM on 2/14/13; QA on 2/26/13
- e. Reviewed/ No Changes: Catherine Sanders, MD  
Committee Review: UM on 2/13/14; QA on 2/25/14

**C. References:**

1. American Academy of Orthopedic Surgeons. Athletic Training and Sports Medicine. 2nd ed. Rosemont, IL: American Academy of Orthopedic Surgeons; 1991:705-715.
2. Barringer WJ. Principles of orthotic management of athletic injury. In Clinical Sports Medicine. WA Grana, A Kalenak, eds. Philadelphia, PA: WB Saunders Co.; 1991:315-331.

3. Bono CM, Berberian WS. Orthotic devices. Degenerative disorders of the foot and ankle. *Foot Ankle Clin.* 2001;6(2):329-340.
4. Buonomo LJ, Klein JS, Keiper TL. Orthotic devices. Custom-made, prefabricated, and material selection. *Foot Ankle Clin.* 2001;6(2):249-252.
5. Buschbacher RM. Ankle sprain evaluation and bracing. In *Physical Rehabilitation of the Injured Athlete*. JR Andrews, GL Harrelson, eds. Philadelphia, PA: WB Saunders Co.; 1991:221-239.
6. Disler P, Turner-Stokes L, Wade D, Sackley C. Rehabilitation interventions for foot drop in neuromuscular disease (Protocol for Cochrane Review). *Cochrane Database Syst Rev.* 2002;(3):CD003908.
7. Gok H, Kucukdeveci A, Altinkaynak H, et al. Effects of ankle-foot orthoses on hemiparetic gait. *Clin Rehabil.* 2003;17(2):137-139.
8. Grissom SP, Blanton S. Treatment of upper motoneuron plantarflexion contractures by using an adjustable ankle-foot orthosis. *Arch Phys Med Rehabil.* 2001;82(2):270-273.
9. Hald RD, Fandel DM. Taping and bracing. In *Sports Medicine and Rehabilitation: A Sports-Specific Approach*. RM Buschbacher, RL Braddom, eds. Philadelphia, PA: Hanley & Belfus, Inc; 1994:337-354.
10. Handoll HH, Rowe BH, Quinn KM, et al. Interventions for preventing ankle ligament injuries. *Cochrane Database Syst Rev.* 2001;(3):CD000018.
11. HealthNow NY, Inc. Ankle-Foot/Knee-Ankle-Foot Orthosis. DMERC A Regional Medical Review Policy 16.4. Wilkes Barre, PA: HealthNow Upstate Medicare Division; October 1, 1999. Available at: [http://www.umd.nycpic.com/ch16\\_prosth-ankle-foot.html](http://www.umd.nycpic.com/ch16_prosth-ankle-foot.html). Accessed April 24, 2001.
12. Kerkhoffs GMMJ, Struijs PAA, Marti RK, et al. Different functional treatment strategies for acute lateral ankle ligament injuries in adults. *Cochrane Database Syst Rev.* 2002;(3):CD002938.
13. Mauritz KH. Gait training in hemiplegia. *Eur J Neurol.* 2002;9 Suppl 1:23-29; discussion 53-61.
14. Pinzur MS, Slovenkai MP, Trepman E, et al. Guidelines for diabetic foot care: Recommendations endorsed by the Diabetes Committee of the American Orthopaedic Foot and Ankle Society. *Foot Ankle Int.* 2005;26(1):113-119.
15. Reider B, Belniak R, Miller DW. Football. In *Sports Medicine: The School-Age Athlete*. 2nd ed. B Reider, ed. Philadelphia, PA: WB Saunders Co.; 1996:613-645.
16. Rome K, Brown CL. Randomized clinical trial into the impact of rigid foot orthoses on balance parameters in excessively pronated feet. *Clin Rehabil.* 2004;18(6):624-630.