

WHAT SHOULD I LOOK FOR IN AN ANKLE BRACE?

There are a plethora of ankle supports on the market. Many of the ankle supports that are available on the market are based upon copies of the Aircast brand of stirrup type ankle supports. The popularity of the Aircast products was based upon good marketing, an inexpensive product, and the marketing gimmick of the air filled bladders. This was further enhanced by the lack of other good products on the market. For years physicians have been asking for a good ankle brace. What was lacking was not only an ankle brace that could actually support a sprained ankle and permit a patient to return early to sports activity, but also the lack of understanding about how ankle braces function.

Ankle supports and braces are available in many types. The simplest supports are the elastic wrap, a neoprene wrap or pull-on sleeve, or an elastic pull-on bandage with no hard components. These provide compression and warmth, and in some cases permit the patient to walk without crutches for very mild sprains. More elaborate ankle supports with plates to add stiffness are available in several forms. Lace-up type supports and reinforced non-stretch carcass supports have been available for many years. Stirrup type ankle supports with double upright curved plates, internal padding, and a stirrup strap beneath the foot, similar to the Aircast, are the third type. The biggest problem with each of these categories is that they only provide sufficient support and proprioception for mild ankle sprains. Patients with some second-degree and all third degree sprains still require crutches to walk and must use a pillow at night to prevent the foot from dropping to allow them to sleep comfortably.

The next category of ankle devices can be called ankle braces. Until recently, this category included only custom-made AFOs (ankle foot orthosis) attached to the shoe with hinges, springs, or cables. Recently, Bledsoe Brace Systems introduced a new functional ankle brace that is very thin but unbelievably supportive. It is a double upright hinged off-the-shelf adjustable AFO with a rigid stirrup and foot plate that attaches to the shoe to permit the shoe to control the foot while the upright

arms control the lower leg. It may actually be capable of preventing an ankle sprain, but its biggest role is treating first, second, and third degree acute and chronic ankle sprains. The final category of ankle braces are the walking boots which prevent ankle motion while permitting a reasonable walking gait with their rocker bottom. Certain casts along with a cast shoe also fall into this category.

Ankle injuries can be divided into several categories. Spraining of one or more of the lateral ankle ligaments occurs in about 90% of the cases. The combination of inversion and internal rotation combined with differing degrees of plantar-flexion determines which structures are injured. Under severe circumstances a malleolar fracture can result both with and without a ligament injury. The most severe injuries also involve damage to the capsule and the syndesmosis. The degree to which the tibio-talar joint is injured vs. the sub-talar joint depends greatly on the injury mechanism. The ability to control the sub-talar joint is critical to the functioning of any ankle brace.

Ankle sprains are divided into three degrees. In a first-degree ankle sprain, slight swelling and some point tenderness is present, but the ligaments are not ruptured. In the second-degree sprain, there's some partial rupture of the ligaments along with considerable swelling, point tenderness, and the inability to bear weight. In a third-degree sprain there is usually complete disruption of one or more ligaments along with other structures, severe swelling, in bruising, considerable tenderness over many areas, and the complete inability to place weight on the leg.

Most first-degree ankle sprains can be treated with simple lace up or stirrup type ankle supports. The patients function fairly well and usually do not require crutches. The traditional rules about rest, ice, compression, and elevation to treat the injury always apply. However, first-degree sprains that must return quickly to sports play have only two options. The ankle can be taped, or a Bledsoe Ultimate ankle brace can be utilized. Most patients cannot return to their former level of activity with an ordinary ankle support without experiencing a sense of instability and a reduced ability to perform their sports activity. Taping loosens quickly during sports

play providing only about 10-15 minutes of adequate support while restricting ankle motion.

Second-degree ankle sprains are often treated with simple stirrup-type ankle supports along with crutches to aid walking activity. These patients experience pain during walking or may not be able to walk at all without crutches. The inability to walk or perform plantar-flexion or dorsi-flexion of the ankle, or the necessity of using crutches, should be a red flag to most physicians. The chosen device is not providing sufficient support to alleviate the patient's symptoms. It is difficult for many of these patients to sleep without placing a pillow under the foot to prevent the foot from falling into equinus. For this group of patients, either a walking boot or a Bledsoe Ultimate ankle brace can be utilized to permit walking without crutches. The cost of a traditional ankle support plus the cost of the crutches exceeds the cost of a walking boot or an Ultimate ankle brace.

Third degree ankle sprains, with or without fractures of the malleolus (these fractures are usually internally fixed), need to be treated in a two-step fashion. These patients require compression, ice, rest, elevation, and the use of a walking boot to immobilize the ankle, and in some cases use crutches to permit walking. It is almost impossible for these patients to place any weight on their foot, to plantar-flex or dorsi-flex the ankle, or to sleep without the foot adequately supported. Traditional ankle supports cannot immobilize the ankle properly. The second step is to permit patients to undergo early rehabilitation or an early return to sports activity through the use of taping or a Bledsoe Ultimate ankle brace, along with the appropriate physical therapy.

Unlike ankle supports, the Bledsoe Ultimate ankle brace is manufactured from a formed aerospace-aluminum super alloy shell. It is 10-15 times stronger in construction than most ankle supports. It features compression-molded padding that is very comfortable. The brace attaches to the shoe beneath the innersole using hook and loop fastener material. It can be fitted to the shoe in less than five minutes. The most effective device that we currently have for controlling a foot is a shoe. Therefore, it is best to permit the shoe to control the foot, then to allow the brace to control the lower leg so that the ankle is adequately contained. This brace is not so stiff as to completely prevent ankle motion. In fact, plantarflexion and dorsiflexion are not inhibited. Inversion and eversion is also possible up to a limit. The brace is very springy and strong. As the ankle begins to reach the normal limits of inversion and

eversion, the force rises very rapidly preventing the ankle from going too far.

The Bledsoe Ultimate ankle brace also performs three other very important functions. The first function is to increase proprioception. The stiffness of the device gives the patient increased information about the position of the foot and ankle. The second function is to decrease the time required to perceive force. As the ankle tries to invert, the leg runs into the brace causing the force to rise very rapidly. This feeling of pressure is perceived earlier than the ligaments of the ankle would normally perceive excess strain. This opens the front-end of the reflex reaction window. The third function is to slow the rate at which abnormal movement occurs. The stiffness of the Bledsoe Ultimate ankle brace slows down the rate in which ankle inversion and eversion movement occurs. This opens the back end of the reflex reaction window. In a recent study by Rose Musculoskeletal Research Laboratory (Denver, CO), the time required for a patient to step down on a platform and reach 30° of ankle movement was measured both with and without a Bledsoe Ultimate ankle brace. The patients did not know how far the platform would permit the foot to move or whether the platform would move in inversion or eversion. Without an ankle brace, the ankle required about 150 milliseconds to reach 30°. This is not sufficient time for the nerves in the ligaments to sense the force, cause a reflex reaction, and for the muscles to reach peak torque. In other words, if the patients had been allowed to invert or evert completely, their ankle would have been sprained. With the Bledsoe Ultimate ankle brace in position, the patients required about 300 milliseconds to reach the same 30° of motion. This is sufficient time to sense the force, cause the muscles to react, and reach peak torque to control the movement. The brace, therefore, allows the patients muscles to react in time to save the ligaments.

The Bledsoe Ultimate ankle brace fulfills a functional role that no other ankle support or brace has ever achieved. It can act as a comfortable acute care device, then play the role of a functional ankle brace for early motion therapy followed by early return to sports activity, and finally act as a prophylactic brace to help prevent further ankle sprains. It can also be utilized as a functional brace to replace ankle taping, and to treat chronically unstable ankles on patients that are performing high-level sports activity.

There is a difference!

The difference is in the details!