

## Orthotics

### WEIGHT BEARING VS. NON-WEIGHT BEARING

Keith M. Jeffers, DC, CCSP

Most chiropractors are familiar with the weight bearing casting procedure. The patient steps into a foam box and a weight-bearing impression of each foot is imprinted. A custom foot orthotic is then manufactured from this foot impression. Several manufacturers use this system and the resultant orthotic device can range from a soft leather to a hard, rigid plastic device. One of the concerns with the weight bearing method of casting is that when the impression is taken, the foot is in an overpronated position. Hopefully, the manufacturers of this type of orthotic understand this and correct the overpronation when manufacturing the orthotic.

The non-weight bearing procedure for custom foot orthotics is accomplished by placing the foot in the anatomically (talar) neutral position and forming an orthotic by a heat/suction method, by casting the foot with plaster of Paris and sending the mold to an orthotic laboratory, or by using a foam box without weight bearing.

For more than 20 years, sports podiatrists have been making custom foot orthotics to control overpronation. They have been the leaders in the diagnosis and treatment of overuse injuries. Through the years, the podiatrists have preferred the non-weight bearing casting procedure. This neutral casting procedure places the foot and sub-talar joint in its position of function. In this proper position, a functional foot orthotic can be made for the injured athlete.

In my opinion, both weight-bearing and non-weight bearing methods can produce an effective foot orthotic device that will reduce overpronation.

## Foot Orthotics

### Materials

There are three types of foot orthotics; soft, semirigid, and rigid:

Soft foot orthotics are usually made of leather. As a general rule these should only be used in cases where minimal support is needed to correct overpronation. James' study in 1979 found that a soft orthotic can affect the degree of pronation and rapidity of pronation.

Semirigid orthotics are made from a variety of plastics and fiberglass or carbon. Semirigid orthotics allow for some movement of subtalar joint and, therefore, some shock-absorption for the foot. For the majority of your patients, this type of orthotic is most suitable.

Rigid orthotics are traditionally made by podiatrists. These are usually made of a hard plastic called Rohadur. This type of orthotic device doesn't allow for overpronation of the foot. Rigid orthotics can be difficult to adapt to and decrease the shock absorbing capabilities of the foot which may lead to other injuries, including sacroiliac problems. "Shoe modification and orthotic devices should not be designed to completely eliminate pronation because it is a required function in the dissipation of normal stresses and accommodation of the foot to the running surface."<sup>1</sup>

## Injuries

Plantar fasciitis, arch and heel pain are usually found in athletes with overpronation. An orthotic device probably will be necessary for the endurance athletes to be able to return to their desired level of training.

The underlying cause of gastrocnemius and soleus strain may be overpronation. A biomechanical examination of the feet should be conducted in all lower extremity injuries.

The most common running/aerobic overuse injuries that orthotic therapy can assist in correcting are: patellar tracking syndrome and iliotibial band syndrome.

Patellar tacking is commonly known as "runner's knee" or chondromalacia patella. Excessive pronation of the foot leads to increased internal rotation of the tibia causing a patellar tacking syndrome. In my experiences, an orthotic should be prescribed as the primary treatment in patellar tacking syndrome. Much has been written about strengthening the vastus medialis muscle of the quadriceps group to treat patellar tacking syndrome. I have treated scores of patients who have strengthened their vastus medialis with no relief of their knee pain. Likewise, the surgical procedure to remove "plica" and to scrape the patella would only be tried after treatment with foot orthotics. The pelvis, foot, and knee should be checked for subluxations.

Iliotibial (IT) band syndrome is a common overuse injury. Overpronation of the foot leads to increased internal rotation of the tibia and femur. The IT band inserts on the lateral knee at Gerdy's tubercle. Overpronation of the foot will cause a tendinitis of the lateral knee. The pelvis should be checked for subluxations as well as the foot and knee. Deep tissue therapy to the IT band, hamstrings, and quadriceps should also be prescribed to reduce hypertonicity and scar tissue. A strengthening and stretching program should be implemented.

### *Reference:*

1. Bates BL, James SL, Osternig LR, Mason BR: Foot orthotic devices to modify selected aspects of lower extremity mechanics. American Journal of Sports Medicine, 7 (sup. 6):338-342, 1979.

*Keith Jeffers, D.C.*  
*San Diego, California*

OCTOBER 1991