

# Orthopaedic Observations

*A Matter of Medicine...*

*TM Pending*

## Orthotic Materials: What's the Best Choice?

By Michael DeChello, MS, PT



The foot consisting of 26 different bones, and connected by numerous joints, muscles, tendons and ligaments, is one of the most complex parts of the body. It is also the foundation of the body when the foot is in contact with the ground. Like any foundation, when you change the support structure, you change the alignment and the stresses

on that structure. Changes in the alignment of the foot can lead to changes up the entire kinetic chain eventually leading to dysfunction or malalignment. These changes of the lower kinetic chain can be reduced by proper fitting orthotics. **Orthotics can be helpful in eliminating, reducing and preventing painful conditions of the foot, knee, hip and lower back.**

When it comes to **prescribing the proper orthotic**, there are a host of materials now available, both basic materials and high tech material. Along with the variety of materials, there are a number of ways to properly evaluate and mold the foot for orthotics, again both basic and high tech. The actual fabrication of the orthotic also varies a great deal. All of these factors effect cost. Many insurance companies do not cover the cost of the orthotic, so cost is an issue for patients.

**Orthotics** come in three types: **soft, rigid, and semi-rigid**. Each material has its special application for specific patients.



**Soft Orthotics** are used, mostly, for shock absorption purposes. They are inexpensive and serve a small portion of the patients who require orthotic intervention.

intervention. Soft orthotics will provide no benefit for a patient who needs correction in alignment, and can usually be purchased as an over-the-counter product.

### **Rigid Orthotics**

applies to the name itself. The material is the most difficult to work with and is expensive. Often patients will have difficulty tolerating rigid orthotics due to the hard nature of the material. Materials such as acrylic or graphite do not move, give or flex.



Rigid orthotics will generally fail on patients with hypersensitivity in the foot, decreased fatty tissue on the plantar aspect of the foot and should be avoided in the patient where the sensitivity is at all compromised, (ie: peripheral neuropathy.)

**Semi-rigid Orthotics** are, by far, the best choice and will address most foot problems requiring orthotic intervention. Cork-based semi-rigid orthotics are considerably less expensive and easy to work with, when adjustments need to be made. This material allows for direct molding to the foot and allows the needed flexibility in the foot while providing appropriate support. This material is tolerated very well by patients and compliance is high.

**Obtaining the proper mold for orthotics is key** and can be done in a variety of ways. Historically, making a plaster cast mold has been the most common method. More recently, foam box impressions, foot pressure plates and foot imprints have been used. High tech computer aided laser technology is also

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now available. All can be effective in obtaining the proper mold. However, the high tech computer aided method is excellent for the more difficult foot problems such as severe diabetic neuropathy and loss of sensation of the foot. The more direct methods are very effective in addressing more of the foot pathologies that cause pain. Understanding the materials and molding techniques guides us to the proper orthotic material in the **best interest** of the patient while achieving the **desired outcome** as well as provide **the most cost efficient option**.

Proper footwear is also important for the correct fit of the orthotic on the foot. New shoes, if possible, should be used when starting out with an orthotic. Extra depth and a removable liner are often needed to accommodate the correction. The following are some basic footwear considerations that should be made to help minimize problems associated with the foot:

*Shoes should be comfortable and fit properly*

*Fashion should not dictate the footwear*

*Shoes should have adequate room around the ball of the foot*

*Wear sneakers as often as possible especially when walking*

*Avoid narrow-toed shoes and high heels*

*Replace running shoes often*

*Deep heel cups help to control positioning of the foot*

*Adequate cushion in the insert and sole is necessary*

If you are interested in learning more about the use of semi-rigid cork based orthotic fabrication, contact Michael DeChello, MS, PT at **ProPT**, a division of The Orthopaedic Group, LLC at (203) 865-6784.  
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