

Why do some orthotics work, when others do not?

Today health care practitioners are prescribing an ever-increasing number of foot orthotics for their patients with limited and variable results. There are many different types of orthotics with different approaches and different casting or ordering methods. Some companies require a foam or plaster cast, while others require no foot impression at all, to deliver a biomechanical orthotic for their patient. We will address these issues and provide an overview as to the rational approach as to why some orthotics work and others do not.

What is a custom foot orthotic?

Our view is that a custom foot orthotic is an orthotic that is made from a plaster or foam impression of the foot, in a biomechanical neutral position.

Why must an orthotic be made from a biomechanical neutral position?

To understand why, one has to understand the gait cycle and continue with the fundamental biomechanics.

Picture the gait cycle. From careful observation, one can see that the neutral position comes right **after** the heel strike and right **after** midstance. The foot and subtalar joint pronates (internal rotation of the limb) during the first 25% phase of the gait and then begins to supinate (externally rotate) during the remainder of stance phase of **gait**. The foot and the limb are neither pronated (internally rotated) nor supinated (externally rotated) during this time.

Why is neutral so important? An orthotic made from a neutral position allows the foot and leg to go through the normal range of motion. It can pronate normally and supinate normally. The first 25% portion of the stance phase of the gate allows for normal pronation to occur. Knee flexion from an extended knee position is the main factor for the body to absorb shock (normal pronation) — internal limb rotation allows for knee flexion. After mid-stance (neutral) the foot re-supinates (leg externally rotates)

Why do some orthotics feel harder or uncomfortable if the material was properly chosen?

There are a number of reasons for this, but more often than not, the orthotic was made over a cast in the supinated or externally rotated position. An orthotic made from a supinated cast will not be tolerated by your patient. This orthotic will not allow your patient to have full contact phase pronation, which is essential for normal shock absorption. Your patient may experience knee pain and/or joint pain. The knee will not be able to flex from an extended position to allow for internal leg rotation.

When you send your cast to your orthotic laboratory, your laboratory must recognize a supinated, neutral and pronated cast to fabricate a comfortable and functional orthotic. Our scanning machines can compensate for casts that are pronated or supinated and will produce an orthotic that is in neutral position. Your laboratory must also make these allowances to ensure that your patients will tolerate their new orthotics.

Why do some prefabricated orthotics feel good and work adequately?

60% of prefabricated orthotics afford the patient with a limited amount of relief. Many prefabs have low arches or very flexible arches that allow the individual to pronate. Sometimes this approach works, however this approach is variable with variable results. If, on the other hand, the arch of the prefab is too high or too rigid, extra trauma to the body can and will occur.

There are different types of orthotics for different biomechanical conditions. There are indications for soft orthotics, flexible orthotics, semi-flexible orthotics and rigid orthotics. If you order an orthotic without knowing where neutral is, you are chancing a device that may be intolerable for your patient. There are times when this type of device may afford your patient with some form of relief, but don't you want your patient to have the best device?