Amfit: Unique Perspective in Developing Foot Orthotics
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The lower extremity biomechanical chain includes more than the body's anatomy. It also includes the surface underneath the foot. In many cases, shoes and orthotics do not limit excessive pronation, and thus represent weak links in establishing an efficient biomechanical chain.
Like all human movement, pronation is beneficial only within a limited range of motion, whereas excessive pronation can be problematic. Amfit orthotics comfortably limit excessive pronation and thus lessen injury risk. All orthotics, however, work best when complimented by a stable shoe. The following analogy illustrates why.

A seat belt holds you in position relative to your car and as a consequence, you move with the car. In turn, shock absorbers keep the car stable. The tightest seat belt, however, will not adequately limit motion if the shocks are too soft. In addition, the best shocks will not keep you stable without a good seat belt. Both are essential.

Like seat belts, orthotics hold the foot in position relative to the shoe. In turn the midsole and other stability features act as shock absorbers, keeping the shoe stable. The most stable orthotic in an unstable shoe, however, will not adequately limit excessive pronation. In addition, the most stable shoe without a good orthotic will generally be ineffective. Both are essential to keep lower extremity movement within a satisfactory range of motion. The shoe's role as the weak link can be seen by examining the evolution of running shoes over the last twenty-five years.
During this time, the shoe has primarily been a shock absorber. Manufacturers neglected motion of the foot within the shoe, thinking that a generic supportive insert would be uncomfortable to a number of people who would therefore not buy the shoe. Thus the standard became a "marshmallow" insert.

As late as 1970, running shoes were fairly stable with little cushioning, and the majority of injuries were associated with excessive impact. As cushioning midsoles appeared which allowed more pronation, there followed a mix of impact and ponation/rotation problems. Finally very soft midsoles, which provided very little stability, became fashionable, and injuries associated with excessive pronation became more common. Today's shoes cover a range of stability characteristics which result in different lower extremity mechanics.

Knowledgeable salespeople know this.

Working with such salespeople and designing orthotics with the shoe's characteristics in mind greatly improves the chances of mechanical success. Nevertheless, the interaction between an orthotic and shoe can be complex, and watching the client walk or run with orthotics in his/her shoes is very helpful.

Just as many shoes are available today, so too are a wide variety of orthotics. Many podiatrists argue that hard "plastic" is essential to control foot motion. If that were the case, and the weak link defines the strength of the system, a shoe would also have to be hard plastic to control motion. However, it has been demonstrated both clinically and through research that shoes with EVA (softer material) midsoles can provide a stable base of support. It follows that orthotics made of similar material would have the same opportunity to be effective.

Amfit makes their orthotics from EVA, and they control motion very well.

There are advantages to EVA. Its forgiving nature makes it extraordinarily comfortable– remember your first aerobic shoe? In addition, EVA orthotics can be full length with no step off at the metatarsals to contend with, or they can be 3/4 length in necessary to fit into limited space shoes.
EVA is also easily cut with a computer controlled milling machine like the one Amfit uses, which fashions the orthotic exactly as prescribed (a technician never interprets the desires of the practitioner). Amfit uses over five hundred pin elements to digitize the bottom of the foot, and displays the information on a computer screen as a 2D topographical and 3D wire frame showing what the orthotic will look like.

The foot can be mapped weighted or unweighted, in the compensated and neutral positions, and the difference quantified, providing insight into the amount of pronation the foot undergoes. Biomechanical changes can be made to the neutral position contour with software, based upon knowledge of the patient and the amount of their pronation, etc. Small depressions can be made to accommodate depressed metatarsals, etc., and before the orthotic is made, the user can see exactly what it will look like.

Amfit as well provides a second way to make corrections. Plastic adjustments (posts, metatarsal pads, etc.) can be placed under the foot to physically change the shape and position of the foot before it is mapped. The pin elements pass through holes in the plastic so that the foot is mapped in its new position. In this way, the user can see the effect and the patient can feelthe shape of the orthotic before it is made.

With this system, forefoot needs can be effectively evaluated and addressed. If the forefoot rises when the foot is placed in sub-talar neutral, the elements rise and automatically post the forefoot. The user can also choose to physically push the forefoot down, and through software post the forefoot.

Another advantage of the Amfit is the ability to make small incremental changes to subsequent orthotics. If a 3 degree medial post is desired for the first orthotic and a 5 degree for the second, the second pair is a software click away.

Furthermore, modifications to the finished orthotic are easy. A wedge can be added, or a sander used to reduce posting, arch height, etc.

In addition, the Amfit process provides an extraordinary learning opportunity. For example, you can address mechanics and make the orthotic comfortable. By medially posting the heel and reducing arch height, you reduce pressure under the arch while accomplishing the mechanical change.

For anyone a little rusty with their biomechanics, this learning process is exciting and very satisfying. Such a system puts the user in control and provides a powerful means to address your patient's lower extremity biomechanics.