

# Putting your best foot forward

FOOTBEDS CAN HELP, BUT THEY'RE NOT A CURE FOR EVERY ILL

**In skiing it has been said that a biomechanically stable foot will increase athletic efficiency and reduce the incidence of injury. Skiers are often told that foot orthotics are the key to achieving a biomechanically stable foot because they prevent or reduce pronation (excessive turning inward of the foot). You've probably been in shops where Zen meditation courses are required in order to resist the pressure to buy footbeds, the fix for all skiing ills. "My feet hurt!" Get a footbed. "My turns suck!" Get a footbed. "I wish I didn't always need to pee in the middle of each run when it is minus-20!" Get a footbed. "I am buying new ski boots." Definitely, get a footbed. So is it reasonable to believe that foot orthotics both reduce injuries and increase skiing efficiency for most to all skiers? Let's try an experiment.**

Brace the inner (medial) ankle bone against a wall. Try to rotate your leg inward without repositioning your hips. Very difficult and even stiff feeling, right? So stabilizing (locking) your foot can translate to a lack of ability to edge the ski, big hip movements to start turns and loss of fine balance control, among other issues. It seems the philosophy of supporting or stabilizing the foot in a neutral position is flawed. To understand why, you'll need a little background

The body can be divided into three planes or views – coronal (front), sagittal (side) and axial (top). All body movements take place in one or all of these planes. Nodding the head takes place in the side view and twisting the head left or right is top view. Moving the arms and legs out to the side in a jumping jack is primarily front view.

When weighted, the ankle joint complex doesn't permit motion in only one plane. If the foot is pronating, the leg is also rotating inward. If one movement is limited (i.e. the foot supported in neutral) the movement of the other (leg, knee, etc.) is as well. In the spirit of "the foot bone connected to the ankle bone, the ankle bone connected to the shin bone, etc." we can see that when we limit natural foot movement, the facilities throughout the body used for subtle edge

control become limited.

Also consider that most of the theory on the relationship between foot orthotics, pronation and injury has been developed from studies of runners. Foot orthotics seem to be effective in treating runners with existing injuries, but data on whether or not orthotics reduce pronation is all over the map.

A new theory suggests that orthotics work not so much by limiting movement, but by changing the way we activate our muscles to produce the movement. Despite the unstable condition overpronation is thought to cause, there are many of us with pronated feet that are not walking wounded. Yet the orthotics-reduce-pronation theory has been accepted as doctrine in the sporting world.

To further complicate the matter, the types of injuries typically observed in runners are overuse injuries, whereas ski injuries are most often traumatic, single event, blowups. The idea that footbeds will reduce injuries in skiing by reducing pronation because it works for runners doesn't quite add up.

In addition to reducing pronation, orthotics are also purported to reposition the foot to a

more powerful and stable neutral position. However, the medical community offers several definitions of neutral and methods of finding it. This can result in different foot positions. Furthermore, our bodies may not easily go where they have not gone before – decades of positioning may not simply go away with orthotics.

That said, there are numerous people that are in

better connected to their boots.

However, orthotics improperly made can actually hinder your skiing and may even cause painful foot cramps. A properly designed footbed should not hinder the natural motions of the foot. Unless medically necessary, the arch should not be so firm and supportive that it blocks foot motion. If it does, it will promote cramps and reduce subtle foot motions helpful for balance. Remember, pronation is a natural and necessary part of skiing, walking and running.

Orthotics such as the DFP (Dynamic Foot Positioning) or the Conformable Custom Pro TX are heated and directly molded to your foot, resulting in comfortable, even pressure. They are supple and the arch will actually move lower as a foot pronates during each turn. It is possible, but often more difficult, to

➤ **A new theory suggests that orthotics work not so much by limiting movement, but by changing the way we activate our muscles to produce the movement.**

pain, or limited when walking, running or even just standing all day without orthotics. Use orthotics if they have successfully treated a medical condition that is present during skiing. Many skiers report they are more comfortable skiing with foot orthotics, possibly because years of arch support in shoes has made them accustomed to support, especially in athletic endeavors. If more comfort equals more smiles, use foot orthotics. Better pressure distribution beneath the feet can also make many skiers feel

have success with a firmer footbed or one with a solid arch. Typically, some of the arch material can be ground away by the shop fitting you, resulting in more compliance.

The bottom line is that the human body is complex, as is its reaction to changes. We should not be so glib as to simply assume pronation is bad, orthotics are good. **SR**

■ **Lou Rosenfeld** has a master's in engineering with biomechanics specialty. He operates Lou's Skiing Performance Centre in Calgary, Alberta, and can be e-mailed at lou@lous.ca.