



Practical Steps to Prevent Ankle Injuries

Part I

BY KIM GOSS

Don't let ankle injuries sideline you from achieving your goals

Ankle injuries—is there another type of injury that gets any less respect? If an athlete goes down grasping their knee in pain, time is stopped as players and fans alike look on in concern while coaches and trainers rush to lend support. But if an athlete twists an ankle and has to hop off the field or court, there's a collective sigh of relief that “it's probably just an ankle sprain.” In no time at all the athlete will be back in the game after a good taping job, or at worst, the next game after a little rest and ice. But the reality is that ankle injuries need to be taken seriously, not just for their effect upon performance but also because they can increase the risk of other injuries.

Let's look at some numbers. According to the National Center for Health Statistics, injuries to the feet, toes and ankles accounted for 11 million visits to physicians' offices in 2003. Of those visits 800,000 were for ankle fractures. In fact, because many of these injuries are often treated by coaches and trainers and therefore not reported, the numbers may be greater than this study suggests.

To make matters worse, a study conducted in Australia reported that an athlete who injures an ankle is five times more likely to injure that ankle again. On a personal note, a coach of a high school women's basketball team in Utah recently told me that she spends 45 minutes before practice taping ankles because approximately half the athletes on the team have had repeated ankle injuries!

PHOTO COURTESY OF Neise Hansen, eliteflight.com

BEYOND SENSIBLE SHOES

One field of study that addresses issues of the feet is called posturology, developed by Dr. Bernard Bricot of France. One of the practitioners and instructors in this field is Paul Gagné, a strength coach whose clients include two of the best golfers in the world, Michelle Wie and Michael Campbell, as well as numerous professional hockey and football players. Says Gagné, “Posturology is the science of posture. What regulates posture, basically, are the eyes and the feet. They provide information to the brain about body position, the eyes providing the horizontal reference and the feet the vertical reference.”

According to Gagné, it’s bad enough that ankle injuries stop athletes from participating in their sports, but often these injuries can lead to serious injuries to the knees and spine. “The feet and ankles are the foundation that the body is built upon; so if that foundation is weak, then everything above it is at risk.” One example is valgus feet.

Valgus feet, which resembles flat feet because the arches of the feet collapse, occurs when the ankle bones internally rotate. As shown in Figure 1, with a valgus foot the ankle does not rest directly above the foot. Gagné says this condition creates excessive stress on the ligaments of the ankles, stress that is magnified in athletics. “Athletes who have valgus feet are especially susceptible to ankle strains, sprains and fractures because the muscles are not as effective at absorbing force, especially in sports such as basketball where so much jumping occurs.” But that’s not all.

VALGUS FEET

With valgus feet, Gagné says the upper and lower leg bones internally rotate, placing excessive stress on the knees and thereby significantly increasing the risk of injury to this area. “Women have an intrinsically higher risk than men for

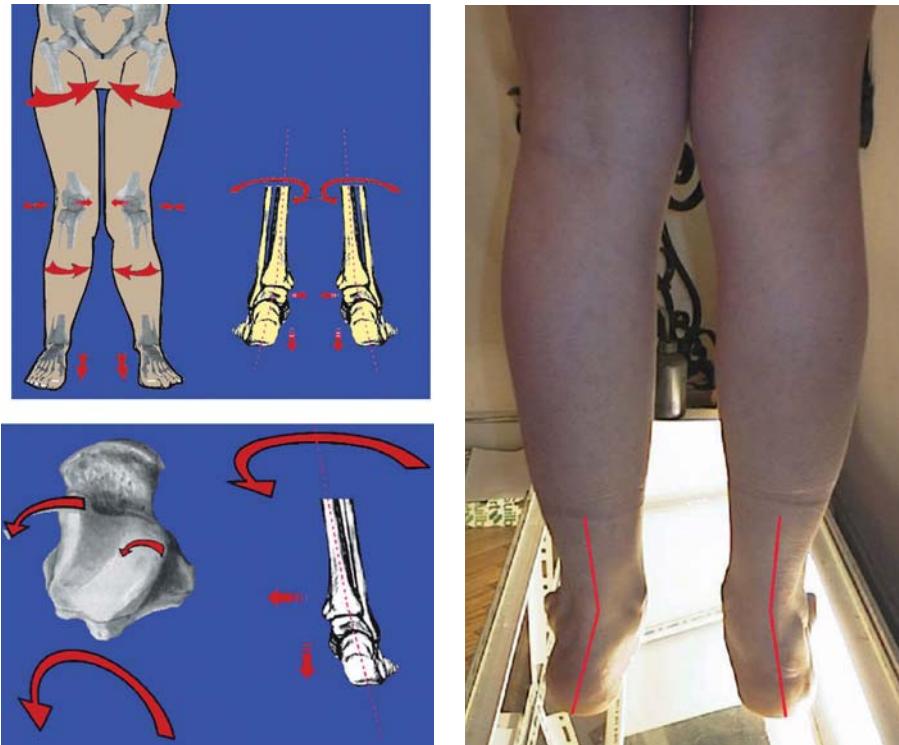


Figure 1: Valgus feet causes the upper and lower leg bones to internally rotate, placing excessive stress on the knees.

such injuries, as they have wider hips and thus their leg bones come inward, making them less structurally stable compared to men.” Further, as shown in Figure 2, Gagné says that the rotation of the upper leg bones causes the lower back to arch excessively, a condition that increases the risk of lower back injury as the spine loses much of its ability to absorb shock.

In the past, valgus feet was a relatively rare occurrence – the only attention it seemed to merit was as a diagnosis that could excuse someone from military

service. However, Gagné says that now approximately 75 percent of Americans suffer this condition to some degree. The reason so many of us have flat feet is that we wear shoes. “The arch of the foot was not meant to be in constant contact with a surface such as the arch of a shoe. The skin on the feet has very sensitive receptors, and the constant pressure on the arch will cause the muscles of the arch to relax, in effect to become lazy.”

To correct valgus feet, the most common solution is to wear orthotics, such as

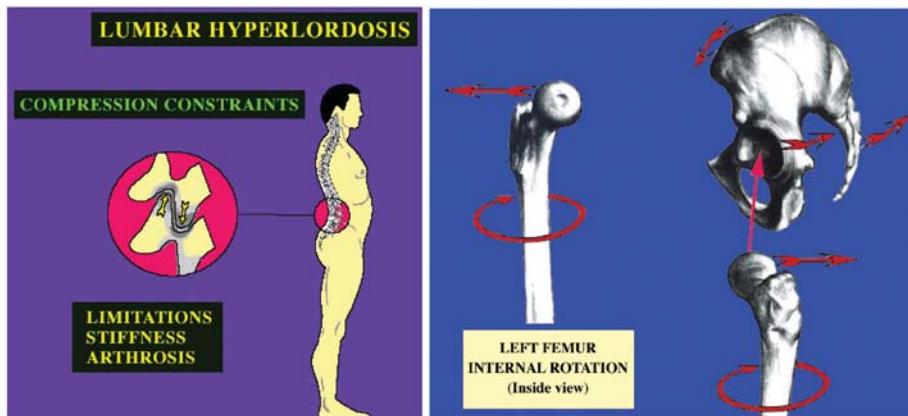


Figure 2: Valgus feet results in not only a buckling of the knees but also an excessive arching of the lower back.

PHOTOS AND ILLUSTRATIONS COURTESY OF Dr. Bernard Bricot



Figure 3: Orthotics

those shown in Figure 3. However, these do nothing to strengthen the muscles of the arch, says Gagné. “First, you need to see a foot doctor who can assess you to determine if you need orthotics – just going to a local drugstore and picking up a cheap pair of arch supports may make the problem worse. And if orthotics are prescribed, they should be worn only when performing a sport, and when performing plyometrics or lifting heavy weights, to ensure proper positioning of the foot.

“Take, for example, the squat,” says Gagné. “If an athlete with a valgus foot squats and does not have a good arch support in their shoes, it can be hard on the knees because the foot will rotate outward and the knees will buckle in. It’s not that the squat is a bad exercise but that the weakness of the muscles of the feet can predispose an athlete to injury when performing this exercise. The same holds true for plyometrics, perhaps even more so, as the forces in these activities can be far greater than those that occur in squatting and other weight training exercises.”

Although Gagné sees the benefit of using orthotics during athletics and conditioning, he doesn’t believe they should be used continuously: “Unless a doctor

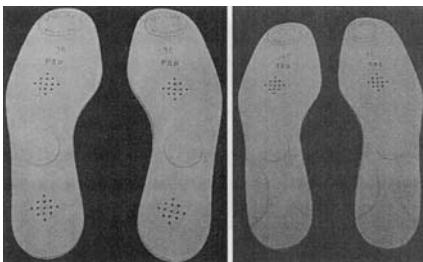


Figure 4: Postural Insoles

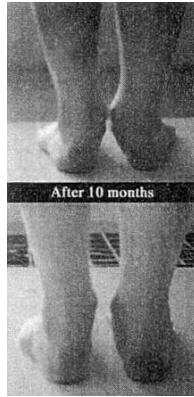


Figure 5: An example of the improvement that can occur to dysfunctional feet after 10 months of training and proper foot care.

prescribes otherwise, orthotics should not be used in your regular shoes because they are like a crutch – your feet become used to having the support, and the arches get weaker. What can be used in place is a special type of therapeutic postural insole [Figure 4] that will stimulate the receptors of the feet to reform the arch [Figure 5], but these should only be prescribed by a foot doctor or someone trained in posturology.”

In addition to appropriate use of orthotics and therapeutic insoles, Gagné believes it’s also important that athletes perform specific exercises to ensure maximum prevention of ankle injuries.

STRENGTH TRAINING FOR ANKLES

Just as athletes perform weight training exercises to strengthen the major muscles used in their sport, they should also direct adequate attention to special exercises for the feet and ankles. “The purpose of these exercises is not only to strengthen the muscles of the feet that have become weakened through the use of shoes but also to increase the proprioception, or awareness, of the lower extremities,” says Gagné.

Although Gagné says that it’s best to consult a posturologist as to the best approach to correcting foot problems, he was willing to share a few of the exercises he uses to correct valgus feet. Gagné credits his colleague Dr. Guy Voyer for developing many of these exercises. Here

are three of the exercises Gagné uses: a single-leg support, a Hex bar deadlift and a step-up with the big toes lifted.



Figure 6: Single-Leg Support, Beginner’s Version

Single Leg Support. Although this appears to be a simple exercise, it can be extremely difficult for many individuals to perform; therefore, beginners should perform it while standing next to a wall. Says Gagné, “Even if you perform it correctly, you will be pretty wobbly; and being able to rest one hand on a wall will help your balance.”

Standing next to the wall, with one hand resting on the wall for support, bend your right knee so that it is not touching the floor. Now tighten your left glute muscle, then lift only your big toe off the floor, pressing the other toes to the floor. Hold for 30-60 seconds, then repeat with the other leg. When this becomes easy, perform it without touching the wall, but instead hold your arms out to the side. The next progression is to perform it with your hands at your sides, then with your eyes closed. After you’ve mastered this exercise, repeat the sequence (with wall, without wall, etc.) but with your working leg slightly bent.



Figure 7: Hex Bar Deadlift, Big Toes Up

Hex Bar Deadlift, Big Toes Up. This exercise is simply the standard BFS Hex bar deadlift, but performed with your big toes off the floor. As you perform the exercise, you'll find that lifting your big toes dramatically increases the tension on the arches of the feet.

To save time, an athlete can perform this variation as part of their regular Hex bar deadlift program. Simply perform the same weight, sets and reps as you normally would, but lift the big toes on the first or second warm-up sets.



Figure 8: Low Step-Up, Big Toe Up

The reality is that ankle injuries need to be taken seriously, not just for their effect upon performance but also because they can increase the risk of other injuries.

Low Step-Up, Big Toes Up. This exercise is performed on a low, sturdy platform. Because of its stable pyramid design, a 10-inch Readiness Plyo Box is perfect for this exercise. Also, its solid base will prevent the athlete from catching the foot of the non-working leg under the top of the platform.

Stand in front of the platform and place one foot on top of it, with the foot pointed straight ahead. Place the other leg against the edge of the platform. In this starting position and throughout the entire exercise the posture is upright, keeping the hips under the shoulders as much as possible, with the chin held slightly up. To ensure proper neck alignment, the eyes should be focused on a

point on the wall that is slightly higher than eye level.

To begin the exercise, lift up the toes of the trailing leg; this will prevent you from pushing off with the back leg. Now lift the big toe of the forward leg and stand up until the knee is straight, then return to the start. Rather than thinking about stepping up with the trailing leg, focus on pushing down with the front leg. It is not necessary to place the foot of the trailing leg on the platform, and you should keep this leg slightly flexed, as locking it can make it too difficult to balance. Perform this as you would any standard auxiliary exercise, such as 2-3 sets of 10 reps with each leg.

Finally, Gagné says that it's impor-



Raising the Bar in Strength

The models selected for this article are Mary Beth Lofgren (above, right) and Chloe Van Tussenbroek (above, left), both gymnasts who train at the Olympus School of Gymnastics in Sandy, Utah. They are coached by Mary Wright, the owner of Olympus, who meticulously details every aspect of her athletes' training and conditioning. Coach Wright showed me her yearlong periodization program – it was so complex it made my brain hurt!

Mary Beth and Chloe are among the best gymnasts in Utah, and they train about 30 hours a week. I wanted to use gymnasts for this article because the stresses associated with their training make these athletes extremely susceptible to ankle injuries, and as such their training includes specific exercises to help condition this area. In fact, when I asked Chloe to perform a single-leg squat, she whipped out several reps effortlessly with an expression that seemed to

convey, "Like, is this supposed to be hard?"

Mary Beth is an 8th grader who attends Wasatch Junior High School in Salt Lake City, Utah, where she carries a 4.0 GPA. Last year Mary Beth was the 2005 Utah State Level 10 Junior Champion. She took the silver medal in the Region 1 Championships and also competed in the Junior Olympic National Championships, where she placed 22nd in the all-around. Her nicknames are "Biz" and "MB."

Chloe is an 8th grader who attends West Jordan Junior High School in West Jordan, Utah. Chloe took up gymnastics upon the recommendations of doctors to correct benign hypermobile joint syndrome, a medical condition in which joints easily move beyond the range of motion usually associated with those joints. A natural dancer whose floor routine captivates audiences, Chloe won her first Utah state championship when she was seven years old, and has won that title annually ever since.

tant to stretch the calves to prevent ankle injuries (Figure 9), as these muscles affect the biomechanics of the foot. Standing on one of the side platforms on a BFS Plyo ramp (first with both legs straight to work the upper calf, then with the legs the slightly bent to work the lower calf) is a good stretch, as is the calf stretch used in the BFS Readiness program. However, with the wall stretch Gagné recommends you occasionally vary the exercise by pointing the front foot outward and then inward.

You can also increase the effectiveness of the stretch by lifting the toes of the trailing leg up and by tightening the glute of that leg; however, you should be very conservative with these variations for the first

several weeks (such as by only taking the stretch to a 5-level on a scale of 10), as the increased intensity of these variations can easily cause injury. Stretching the calves should be performed daily, as it can be difficult to increase the flexibility of calves and maintain it as well.

Next issue we'll conclude our current look at preventing ankle injuries. Hopefully, the ideas presented in this two-part series will encourage you to devote serious attention to posture and the proper training for the muscles of the feet and ankles.

Part II of this series will explore many more-advanced exercises that can be performed to not only prevent ankle injuries but also dramatically improve athletic performance. **BFS**



Figure 9: Stretching the calves can be performed with one leg in front of the other, or on the edge of an angled box. To stretch the upper calf, the knees should be straight; to stretch the lower calf, the knees should be slightly bent.

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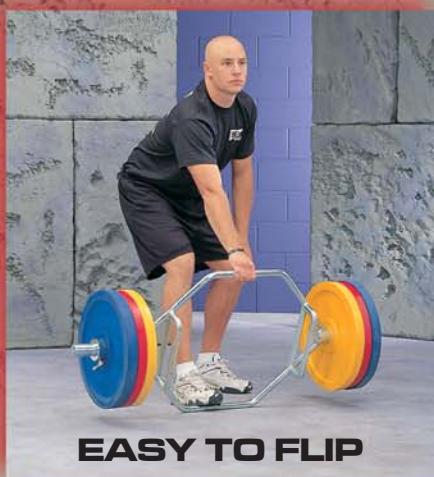
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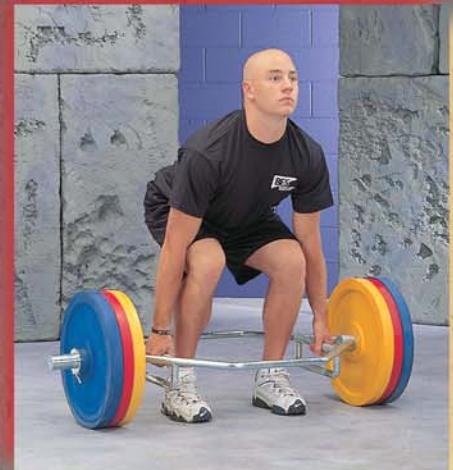
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