Becky Miller Photo

Lateral speed is a key ingredient in many sports, even those performed on ice by skaters. Shown are Michelle Hyselle of the MedCity Mafia roller derby team pulling ahead of the Moose Lake Mafia; and football player Eric Corona of Fruitand High School, which was featured in our January/February 2013 issue.

Forgotten Secrets to Improving Lateral Speed

The biomechanics of moving side to side

BY **KIM GOSS, MS**

The 40-yard dash is considered the standard measurement of speed for football players, and whether or not this test is relevant to the gridiron, the test is here to stay. But with inexpensive and practical electronic timing systems now available, football coaches, along with coaches from other sports, are taking into consideration sprints of shorter distances. That's a start, but there's more to speed than running in straight lines.

Having the ability to change direction fast – lateral speed – is key to success in many sports. Without this ability, some athletes who score well in 10-, 20- and 40-yard sprints are unable to transfer that speed to the court or playing field. The question then becomes, how does an athlete improve this athletic quality?

One common way to improve lateral speed is simply to practice it with shuttle runs and cone drills. For some athletes, these drills will help. But athletes who want to achieve their full physical potential but are struggling with lateral speed will need to work on the foundation of speed. That foundation is posture, which begins from the ground up.

"Whenever we talk about improving speed, we should always consider the functioning of the feet, because a problem with the feet will affect not just posture but also movement," says Paul Gagné, a Canadian Posturologist and strength coach. "With today's athletes there's an epidemic of valgus, or flattening of the feet. What happens with such misalignment is that the athlete's balance is distributed to the inside of the feet, and the ankles follow the feet and the knees follow the ankles. This sequence will cause a delay when the athlete tries to cut or move laterally, reducing their ability to produce force and creating large shearing forces on the ankles and knees. All this can increase the risk of sprains, strains and more serious injuries such as ACL tears."

Paul Gagné
Posturologist and
Strength Coach

One of the major causes of valgus

feet, says Gagné, is wearing athletic shoes. "Well-cushioned athletic shoes decrease the sensitivity of the skin on the bottom of the feet, and then the nerves in the skin cannot provide adequate postural information to the brain. Further, it's not natural to force the arch of the foot to be in constant contact with a surface, because its flexibility serves as a shock absorber during movement. When the insoles of these shoes press against the bottom of the arches, a reflex reaction causes the arches to collapse, or flatten. The feet also become wider, which is why as individuals get older, they often need to wear wider shoe sizes."

Now that we've recognized the problem and one of its major causes, the next step is to fix it.

The Science of Orthotics

Orthotics has become big business, with major drug stores offering computerized foot assessment machines that will help people determine what type of orthotic is best for their posture. Although Gagné recognizes that many individuals are helped by using these machines, he doesn't recommend them for athletes.

"One problem with this system is that your two feet don't have identical alignment. Even though the arch support might help one foot, it's unlikely that it will help correct the other," says Gagné. As for alignment tools that use a foam box to take an imprint of the foot, he says the fundamental problem is that they take an imprint of a faulty foot. "The only health care professionals who should be prescribing orthotics are podiatrists. They have gone to school a long time to become experts in the foot and know how to properly address any mechanical issues with feet."

Orthotics are useful, especially in sports that require additional support to the feet, such as weightlifting and hockey. Another treatment method is postural insoles, which contain a small battery that stimulates the nerves of the foot. "Postural insoles will cause the arch to reform by stimulating several muscles of the feet, especially the adductor hallucis, flexor digitorum longus and brevis," says Gagné. "Many of my clients have been able to completely resolve valgus feet such that orthotics are not necessary. In fact, often I've found that these clients have to buy smaller shoes as their feet become narrower. Shoe sizes for women may drop by a half to one shoe size, and one adult male I know who had been wearing orthotics for 10 years dropped from size 13-wide shoes to size 10 ½-normal shoes after wearing the insoles for a year."

The three photos on the left show how correction of the feet can improve overall posture. The three photos below show how poor foot mechanics can affect knee stability, and then how knee alignment can improve with appropriate training. In fact, the two after-photos show that the athlete not only achieved better knee alignment but also could perform a full single-leg squat without shoes.

Another alternative to orthotics is vibration training. A mechanical stimulus administered through a base platform that moves up and down transfers the vibrations to the body. Gagné advises that standing on vibration platforms provides an effect similar to that provided by postural insoles, but to obtain similar results such training would probably need to be performed daily. For more information

about vibration training, check out the article "What's Shaking with Vibration Training," which appeared in the March/April 2008 issue of *BFS* magazine.

The Exercise Factor

In addition to orthotics, postural insoles and vibration platforms, another method of improving the function of the foot is exercise. Gagné says there are many muscles that, when strengthened, will help reform the arch of the foot and enable the foot to function properly. "The key muscle is the extensor hallucis longus, which is a muscle that helps lift the big toe and creates lateral tension on the foot.

"One simple way to work this muscle is to stand on one leg barefoot, lift the big toe of that leg, and then twist your body towards your toe. Do this for a minute each day for both feet," says Gagné. "Another exercise I like that helps restore proper functioning of the feet is to stand on one leg, lock your knees, and lift all your toes. I've found that many athletes can only support themselves for a few seconds before losing balance."

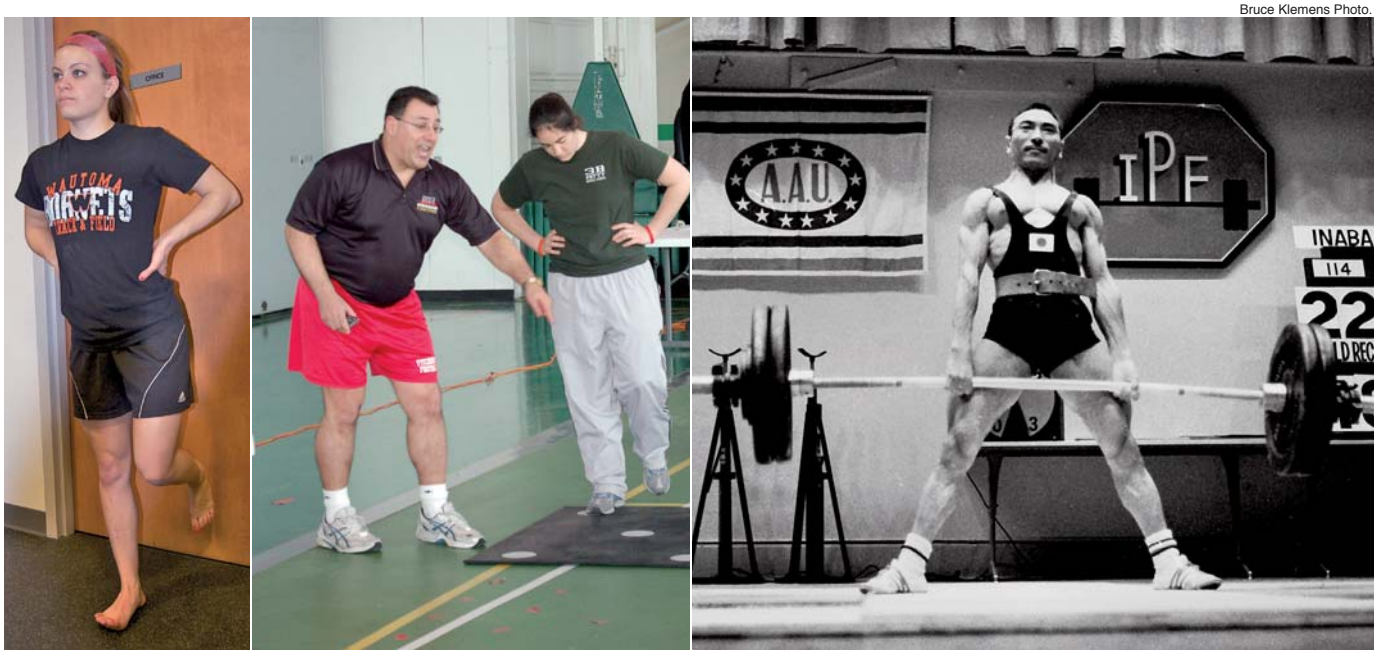
As a corrective exercise, Gagné says, you could perform this exercise for one minute every day for both feet, and then progress to performing it with your eyes closed to increase proprioception/body awareness. "When you lift the toes with the knee locked, you take the foot out of the exercise so that, in effect, you're standing on your ankle. The next progression would be to perform the exercise with the knee slightly bent, first with your eyes open and then with eyes closed. After you develop a base of strength and body awareness, then you can progress into hopping movements in bare feet, such as BFS recommends with its dot drill."

Moving up the chain of muscles, the next exercises would be single-leg exercises, such as lunges and step-ups, and then more dynamic exercises such as those performed on a plyo ramp. "If you think about it, when you change direction you are supporting yourself on one leg," says Gagné. "One important technique point with these exercises is to try to keep the knee of the working leg aligned with the big toe. There will always be some degree of internal rotation, or buckling of the knee, but the key is to not allow this buckling to become excessive."

From there, Gagné says exercises that target the glutes, such as glute-ham gastro raises and reverse back extensions, are important. "It also may be necessary to work the adductors of the thighs to ensure there are no muscle imbalances in these muscles that could affect knee alignment and lateral movement. One practical exercise that can be used for this purpose is the sumo-style deadlift, which uses a wider foot stance than a conventional deadlift."

All this information may seem overwhelming at first, but for athletes who are determined to fulfill their physical potential, it's just a portion of what they may need to consider along the way. The good news is that by applying just a few of these ideas to their training, athletes will find that they will see the benefits in increased lateral speed with less chance of injury. BFS

Bruce Klemens Photo.



Exercises to improve lateral speed that are discussed in this article include a toes-up exercise for body awareness, the BFS dot drill and a sumo deadlift. The athlete performing the deadlift is Hideaki Inaba, one of the greatest powerlifters of all time. He was the first man to squat four times bodyweight and a total of 10 times bodyweight.

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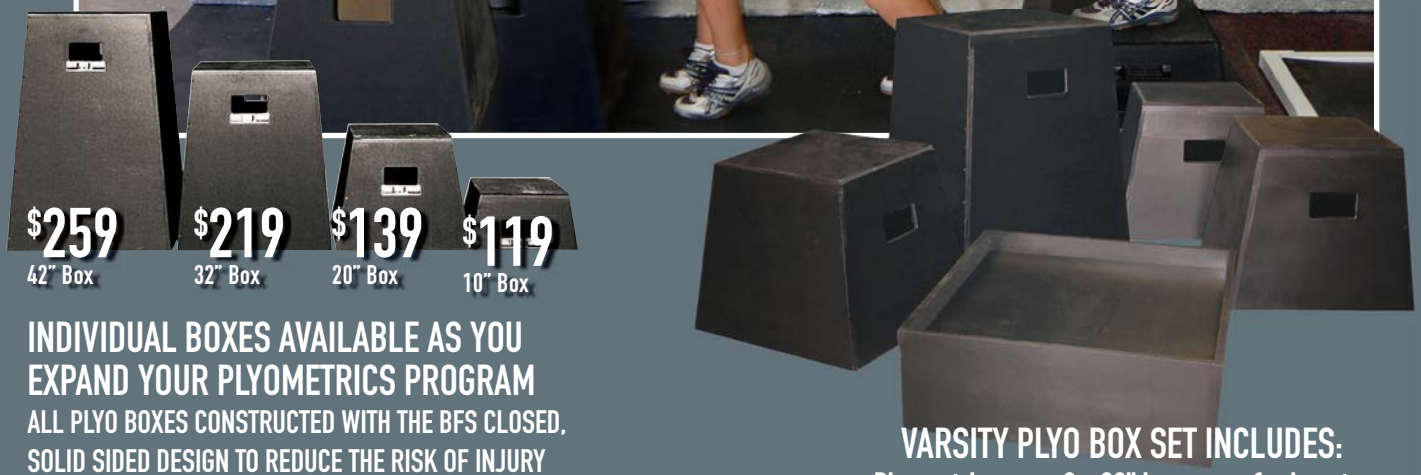

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