

“Healthy Running”

Highlights of UVA Running Medicine 2015

The Department of Physical Medicine and Rehabilitation at the University of Virginia presents a Running Medicine Conference each year in Charlottesville, VA. Since 2009, I've been fortunate to attend this annual 2-day meeting that updates information about runners' health, training, biomechanics, and running injuries. For this month's *Healthy Running*, I'll summarize some of the interesting and important issues that were presented at the March 6-7, 2015 conference.

- What are the “ingredients” of injury-free energy efficient running? It comes down to 3 essentials: 1) enough motion to push off with your leg behind you, which requires adequate joint mobility for hip extension, ankle dorsiflexion, and great toe dorsiflexion (dorsiflexion = bending back); 2) core control from the lumbo-pelvic muscles for energy transfer; and 3) glut strength to drive the body up and forward.

- Having trouble correcting that forward lean of your upper body? When you are bent forward at the upper body, your running form suffers. Your hips tend to remain flexed, you get less hip extension, and you tend to overstride to get any stride length. A forward rotation of your shoulders, called protracted shoulders, may contribute to this. Rolling your shoulders back and pulling the shoulder blades together will strengthen the back muscles that hold your shoulders in proper position of retraction. A strategy to assist this is taping to bring the shoulder blades closer to the spine. With shoulders back and retracted, you eliminate a source of forward trunk lean.

- Can medications increase the risk of running injury? With antibiotics, the answer is yes. The fluoroquinolone antibiotics that include ciprofloxacin (Cipro), levofloxacin (Levaquin), and moxifloxacin (Avelox) are often prescribed in the treatment of urinary and respiratory infections. As of July 2008, the FDA mandated that all FQ products have a black-box warning indicating a risk of adverse effects on tendons including tendinopathy and tendon rupture. More than 95 percent of cases of tendinopathy/rupture due to these antibiotics involve the Achilles tendon. While this complication is more common in older people, it is believed that the rapid and immense loading during running may place runners on these medications at greater risk of Achilles tendon rupture as well. A prudent precaution for any runner taking these antibiotics is to back off training (both mileage and intensity) while on the medication and for an additional 2 weeks after.

- More on Achilles tendinopathy – can the problem be higher up in the leg? While local factors such as tight calf muscles or limited ankle/rearfoot mobility can contribute to the development of Achilles tendinopathy, so can problems at the hip. Runners who can't generate force at the hip increase the power demands on the calf. Or the problem may be tightness of the IT band or the muscle that pulls it, the “TFL” (tensor fasciae latae). Tightness here will roll the hip outward and keep the foot supinated (the opposite of pronation), resulting in stress on the Achilles due to a poor base of support in the foot.

- Is an MRI always the answer to hip problems? There are multiple problems that can cause hip or groin pain in runners. But structural problems, such as femoral-acetabular

impingement and labral tears, may be the underlying reason for recurrent hip-related injuries. A labral tear is a rent in the cartilage ring that serves as a bumper to deepen the hip socket. Femoral-acetabular impingement is a mismatch of the shape of the rim of the hip socket, the acetabulum, and the shape of the ball of the hip joint, the head of the femur. These conditions can be detected on MRI, but here's the problem: In a study of 45 volunteers with no history of hip pain or injury and no symptoms, 73% of them had abnormalities on MRI. For the runner with hip pain and abnormal MRI, a useful procedure to determine the significance of the MRI finding is a diagnostic injection of the hip with an anesthetic agent. This can be performed easily as an outpatient with little discomfort by using ultrasound to guide the injection. Unlike the error rate for MRI, the response to hip injection with anesthetic has been shown to be 90% accurate for determining an abnormality in the hip joint. If the injection relieves the hip symptoms, the MRI findings are the likely cause of the problem.

- Can someone running behind you observe a clue that you might have trouble with hip control? If your running partner behind you tells you that you have a "heel whip", he or she is observing what might indicate inadequate control of leg rotation by the hips, particularly the gluteus medius muscle. When striking the ground and bearing your weight on your stance leg, it is normal for your thigh to rotate inward to a small degree (clockwise for the left side, counterclockwise for the right). If that motion is not controlled by the gluts, the inward rotation will be excessive. When on your stance leg, the ground resists that force of inward rotation. But when you swing your leg back and toe off, those rotation forces cause your trailing foot to turn your toes out and your ankle in - the heel whip. A heel whip might also arise from limited mobility of the big toe that forces you to toe off the side of your foot and whip your heel instead of toeing off straight back. Your partner might turn out to be your "poor man's gait lab". If so, get it checked out. Glut weakness and great toe mobility can be corrected.

- It probably bears repeating that pronation is a normal and necessary part of the biomechanics of running. Stability shoes and orthotics are often recommended to correct excessive pronation. The problem, however, is not the excessive or peak pronation that occurs when you are in mid-stance on one leg. The more important issue is prolonged pronation that persists up to toe-off, when the pronated foot remains flexible and does not assume the rigid lever structure needed for propulsion. Stability shoes and orthotics only correct peak pronation of the foot when it is flat on the ground (which often is a hip weakness issue and not a shoe issue anyway). When the foot comes off the ground, the support of the orthotic or stability shoe is off the ground as well and cannot correct pronation that is lasting too long. To address this, strengthen the posterior tibial muscle, located on the inside of the calf behind the ankle. Start with sets of turning in the ankle against a resistance band. After 2 to 3 weeks, progress to sets of heel raises. Start with these basics before moving on to more ballistic exercises such as jumping rope or box jumps.

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