

#### **4. A weak butt can ruin the runner**

The gluteus medius should be considered in every running injury. So many athletes with running overuse injuries of the lower limb present with poor gluteus medius function that I have come to the view that the strength and function of this muscle is probably the most important active component in the achievement of a biomechanically efficient running technique.

This is not so surprising when you consider that during running you are always either completely in the air or dynamically balanced on one leg. All sports injury practitioners should, I believe, be able to assess and retrain gluteus medius function.

The gluteus medius muscle originates at the dorsal ilium below the iliac crest and inserts at the top outside surfaces of the greater trochanter. It is the major abductor of the thigh. The anterior fibres rotate the hip internally and the posterior fibres rotate externally. The muscle is innervated by the superior gluteal nerve (L4, L5, S1) and gains its blood supply via the superior gluteal artery.

During closed kinetic chain actions, such as the stance phase of running, the normal role of gluteus medius as a mover muscle is reversed, causing it to act as a pelvic stabiliser. So, for instance, during right stance phase, the muscle contracts to slow the downward motion of the left side of the pelvis so that the pelvis doesn't tilt more than seven to eight degrees from parallel to the ground. If the gluteus medius is not functioning well enough to achieve this control, the athlete is said to have a 'Trendelenburg gait'. Often, but not always, you may see the same weakness in walking (producing a waddling motion or, in extremis, a limp), and the dysfunction will then be more marked when they run.

The therapist should analyse the function of gluteus medius dynamically and manually. This is not easy. The assessor must be properly alert to the adaptations to running technique that an athlete can adopt to offload a weak or fatigued gluteus medius muscle. To scrutinise the dynamic function accurately, you will need to use video analysis.

In my experience, runners with poor dynamic pelvis stability, for which gluteus medius is vital, will decrease their stride length and adopt a more shuffling pattern to reduce the ground reaction force at contact and thereby the muscle control required to maintain pelvic posture. Weakness in gluteus medius will have implications all the way down the kinetic chain. From heel contact to mid stance phase, gluteus medius weakness allows:

- the femur to adduct and internally rotate excessively
- the knee to fall into a valgus position
- the tibia to rotate internally relative to the foot
- an increase in weight transfer to the medial aspect of the foot.

As a result the athlete is at increased risk of any condition relating to excessive and/or prolonged pronation of the foot, such as medial tibial stress syndrome or Achilles tendinitis. It occurs when the athlete is running in excessive anterior tilt and forward trunk position. At ground contact the knee is thrown laterally so that the gluteus medius is offloaded and the foot is forced into a more supinated position. Shock absorption through the lower limb is affected, leading to lower leg injuries.