

# body matters

treating you better

NOVEMBER 2008

## Biomechanics

### Who is at risk?

All the human population could be affected by biomechanical irregularities. However, the most commonly affected groups are runners (especially long distance) and women.

### What is Biomechanics?

In human terms it relates to the alignment of joints, the movement of those joints and the forces that go through muscles, tendons, ligaments.

### Why is this important?

If biomechanics are out of alignment then unusual and damaging forces can be put through the joints, ligaments and tendons. The lumbar spine, pelvis, hips, knees, ankles and toes are the areas most affected by altered biomechanics since they are weight bearing joints compared to the upper limb that does not have to sustain as much weight.

### Women's Biomechanics

A very common biomechanical alignment for women is shown in Fig 1. This is partly due to the fact that women have wider pelvises to aid with pregnancy. This can have a knock on affect to all other lower limb joints, particularly the knee, where the angulation at the knee joint (known as the Q angle) is increased, causing additional strain. This increased angle can also cause the arches in the foot to flatten.

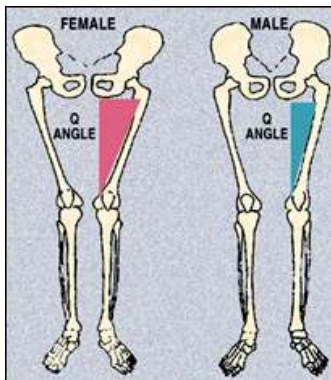
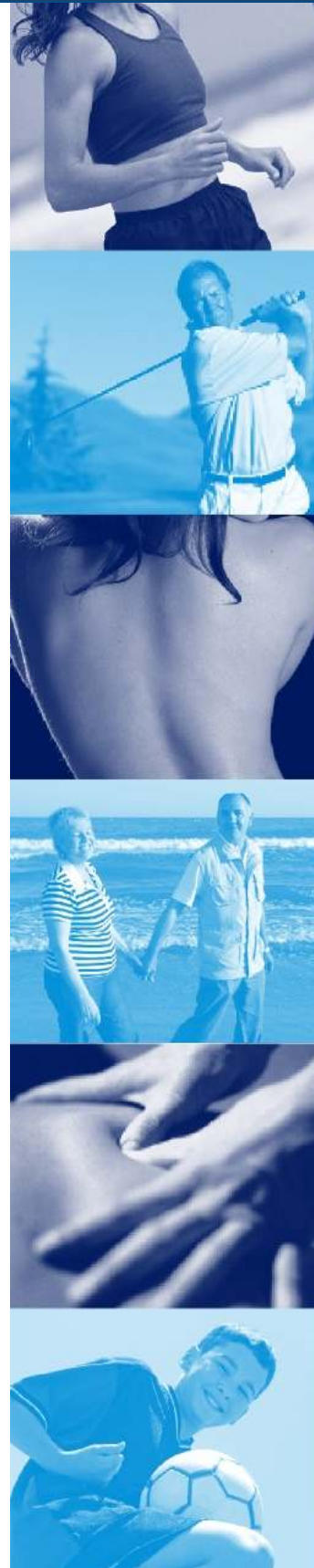


Fig. 1

What can this cause?

- Lumbar and pelvic pain,
- Piriformis syndrome,
- Trochanteric bursitis
- Iliotibial band (ITB) syndrome
- Knee pain
- Achilles tendonitis
- Plantar fasciitis
- Bunions



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## Biomechanics (cont.)

### Runners Biomechanics

Running puts more forces through your soft tissue and joints compared to walking, so poor biomechanics can be a real problem. In some cases, such as long distance runners, a person with normal biomechanics in standing can still have biomechanical issues and pain. This is due to 3 main reasons.

- Increased forces causing stresses through ligaments, muscles and joints.
- The repetitive nature of running. Each time you run and land on a foot, all your body weight goes through that leg. If you do this 10,000 times on a long run you can see how the forces build up.
- Fatigue: as your run goes on, fatigue means your muscles do not protect your joints and ligaments as much as at the beginning of your run. This therefore puts further stress through these structures.

### What can this cause?

- Lower back pain
- Piriformis syndrome
- ITB syndrome
- Achilles tendinitis
- Knee pain
- Plantar fasciitis
- Shin splints

### What can be done?

1. Physiotherapy, including stretches, strengthening, core stability/pilates and biomechanical assessment.
2. Buy the correct shoes. It would be advised to get a biomechanical assessment prior to buying the correct shoes to guide your decision
3. Foot orthotics. Depending on your biomechanics, orthotics can be prescribed to your feet to aid your biomechanics. This may be enough to resolve your pain.

Paul Gibson at Ruislip Physiotherapy and Essential Physio has teamed up with Taylor Made Orthotics from James Taylor & Son for this very reason. Combined with a biomechanical assessment, Paul is able to take an imprint of your feet and get prescription orthotics made to suit your feet.

