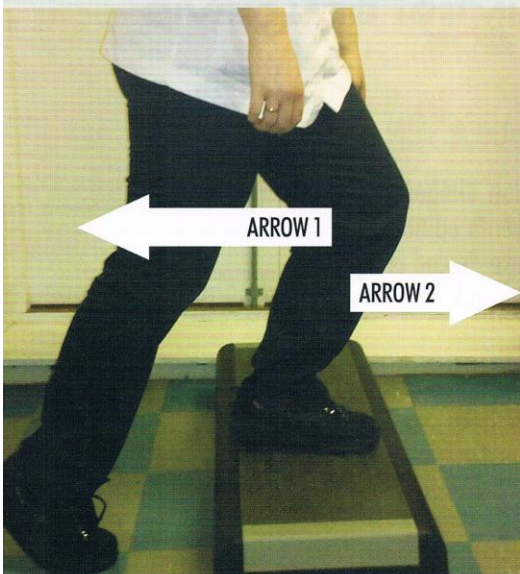


# Healthstuff...

## THE PROBLEM WITH KNEES

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Knees are often misunderstood – seemingly solid and dependable but eventually revealing themselves to be complex, frail structures that cannot be relied upon. It will be assumed that you currently have no serious knee problems or symptoms such as locking, clicking, giving way or swelling, redness or tenderness.



For this article I am going to ask you to stand with your right foot on a step with your knee bent and your left foot **just** leaving the floor (Figure 1), while I try to explain some of the complex forces your knee deals with. (I have chosen this position as it is the simplest movement your knee can perform, including standing straight).

We'll start from the floor as the first thing you'll notice is that your leg is wobbling. Even for a strong climber, the sudden lack of stability caused by bending the knee causes the muscles that 'operate' your ankle to work overtime. The **gastroc**, or calf muscle, crosses your knee and exerts a strong rearward force on the thigh bone (**femur**) (Arrow 1).

Now what do you notice? The burning in your thigh? You'll know your **quads** – very powerful and do most of the uphill work. This is also pulling your shinbone (**tibia**) forward (Arrow 2).

Now you may have noticed an aching in your groin – this is caused by your **adductors** – there's not really any common name for them but they are normally implicated in groin strains. They pull your leg inwards (Figure 2: Arrow 3).

Here, it is also worth mentioning the **ITB**, as you will have heard of it. It is a dense, fibrous band that transmits forces (mainly) from your **gluteus maximus** (bum muscle) down the outside of your leg, to your knee to move it outwards and oppose the adductors (Arrow 4). Your glutes are also trying to straighten your leg so this force is transmitted through your knee.

In this position it'll take a while but you'll eventually feel your **hamstrings** – they bend your knee

but although you are not currently trying to bend your knee they will tire as the 'other end' is stopping you from falling forwards. You can feel them behind your knee – there are two distinct bands, if you feel carefully you'll feel the third on the inside. They also exert twisting forces through the knee (Arrow 5).

I will mention for completeness the following – please feel free to look them up. They exert forces through your knee but are rarely implicated in longstanding pain.

- **Sartorius**
- **Gracilis**
- **Popliteus**

We also need a basic understanding of what resists all these forces – ligaments essentially (Figure 3). You will have heard of the main ones, the **cruciates** – two bands that join your tibia and femur and are deep within the knee.

● **Anterior cruciate ligament** – stops your tibia from being pulled forward and your knee from twisting.

● **Posterior cruciate ligament** – stops the tibia from going back and twisting.

● **Medial collateral ligament** – on the inside of your knee.

● **Lateral collateral ligament** – on the outside of your knee.

All ligaments have specific jobs but they all contribute to the overall stability of the knee – there are many more than the four listed above.

We mustn't forget your **cartilaginous meniscus** – two cups that provide a large surface for your femur to articulate against as well as providing joint stability.

So, why impart all this information? If you have knee pain, you need to work out how to manage it. Ask yourself:

- Where is the pain? Is it on the surface or deep?
- What structures are at the site of pain?





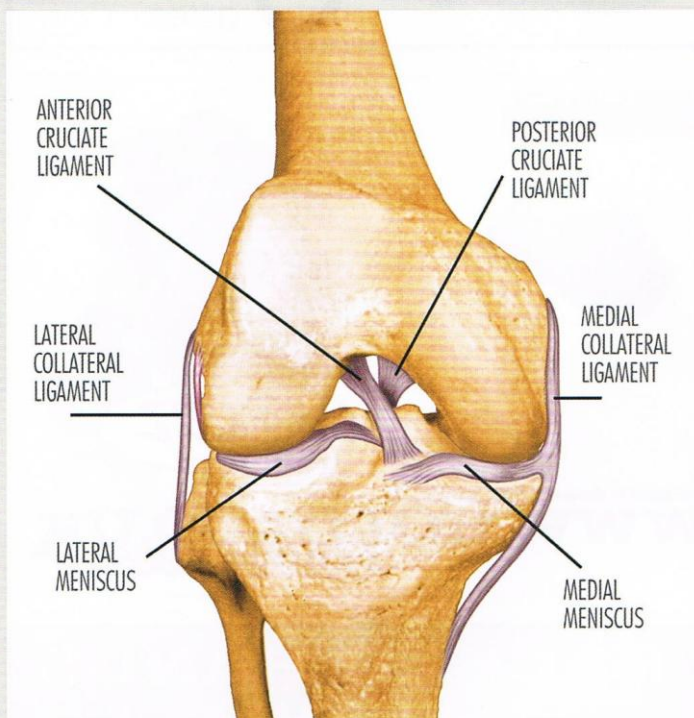


FIGURE 3

- Where else is affected by these structures?
- What actions cause the pain?
- Can I change any of these things?

You will then need to think a little bit harder whether the knee pain you experience is when going downhill, as all the muscles work in a different direction which is more tiring – unless your heel strikes the ground with a locked knee (best avoided) then all the muscles have to work harder to control the rate of contraction.

Can you determine whether the pain is muscular, ligamentous or cartilaginous? This is important as it will guide how you should treat them as they all have very different rehabilitation requirements.

To make things even more complicated, knee pain can be referred from the spine for a multitude of reasons and, if suspected, this should definitely be assessed by a physiotherapist. Pain can also be caused by problems in

your ankle as these forces are transmitted directly via your tibia. Indeed, it is recommended you always see a physio for diagnosis, treatment and advice.

So remember – your knees need to be looked after but, on a day to day basis, you have to put one foot in-front of the other on the hill and probably cannot afford the luxury of an on-site medical team. Understanding is the key to managing your knee problem and avoiding the ‘putting up with’ culture is the way forward and will ensure you can merrily tromp up and down hills throughout a lengthy career.

DANNY BROWN HAS BEEN A FULL TIME INSTRUCTOR SINCE 1990 AND MIA SINCE 2003. NOW PART TIME PHYSIOTHERAPIST AND PART TIME INSTRUCTOR DELIVERING COACHING AND COURSES INCLUDING MLT, SPA, CWA AND CWLA. PHONE: 07929 834 693