Anatomy of the knee

I may be biased, but the knee joint is the most interesting joint in the body. It is the largest synovial joint and forms a specialised articulation between the lower end of the femur (thigh bone), the upper end of the tibia (shin bone) and the patella (kneecap). The surfaces of the joint are covered with hyaline cartilage which is a unique structure allowing an almost frictionless articulation between the joint surfaces. The knee joint has three compartments, the medial or inner compartment, the lateral or outer compartment and the patello-femoral joint which is the articulation between the kneecap and the end of the thigh bone. The medial and lateral compartments both contain a meniscus that is generally referred to as 'the cartilage'. The function of the meniscus is to act as a shock absorber between the joint surfaces, help transmit load across the joint and help to provide some stability and feeling of co-ordination from the joint.

The knee joint is stabilised by four main ligaments that prevent excessive and abnormal movement of the joint. The collateral ligaments lie on either side of the knee – the medial collateral ligament on the inner side of the knee and the lateral collateral ligament on the outer side. The anterior cruciate ligament lies within the centre of the knee and the posterior cruciate ligament lies at the back of the knee. For more information see page on knee ligament injuries.

The knee is contained within a strong joint capsule and this in turn is lined with synovium that produces the synovial fluid to lubricate the joint and help cushion the joint surfaces as loads are transmitted through the knee. The synovium can become inflamed and produce excess fluid as a result of either mechanical problems within the knee or various inflammatory types of arthritis.

The joint capsule, the menisci and the ligaments which support the knee have a rich nerve supply which helps transmit messages to the brain to help with joint position sense (proprioception) and co-ordination. Proprioception can be slow to recover after many knee injuries and this contributes to the feeling of insecurity that many people have after a knee injury.