Article 3

PHYSIOTHERAPY ADVICE
KNEE INJURIES IN ATHLETES

By Phil Sadler Bsc (Hons), MCSP, LCSP (phys), ST Dip.

The knee is a complex joint and although it can withstand 3 to 4 times your body weight in compressive loads, because of its bony make up it has a much lower tolerance to twisting and rotational loads. The knee primarily relies on ligament, muscular and capsular support with 4 ligaments (anterior cruciate, posterior cruciate, medial collateral, lateral collateral) mainly supporting excessive motion between the tibia (shin bone) and femur (thigh bone). Secondary support is provided by the menisci (cartilage) the knee capsule, and dynamic muscular activation of the thigh and lower leg muscles that cross the knee joint.

The knee is commonly injured in athletes because of its lack of bony stability, its reliance on soft tissue for stability, and the large mechanical forces imposed on it during activity.

Below is an outline of what I feel are the most common KNEE injuries that can occur in athletics. Remember that this is not a definite and conclusive list and different signs and symptoms may occur as everyone has a different physiological and biomechanical setup. I have written them purely as a guide for informative purposes. If in doubt call me on 07979 504596.

ACUTE INJURIES:

Fat pad bruising
If the knee is hyper extended the infrapatella (below the knee cap) fat pad can get compressed resulting in a bruise. This can be painful to touch just below the patella (knee cap) either side of the tendon. Movement will be painful in leg extension. Treatment is RICE.

SPRAIN to Anterior Cruciate Ligament (ACL)
The ACL is attached inside the knee and connects from the back of the fibia and runs forward and upwards to the medial base of the femur. The ACL can be injured with a sudden deceleration or change of direction. The knee is usually at full or nearly full extension and the knee feels like it “gives way” during a sudden stop of landing from a jump. Signs and symptoms include immediate pain and an unwillingness to move the knee. Sometimes a “pop” noise is heard. The knee will usually swell very quickly and it will be difficult to weight bear.
Treatment should consist of RICE for the first 24-48hrs depending on the severity, and then seek medical advice for physiotherapy. This type of injury can take months to rehabilitate properly and may require surgical intervention. It is important to make sure it has healed properly before returning to sport.

SPRAIN to Posterior Cruciate Ligament (PCL)
The PCL is attached inside the knee and connects from the front of medial femur and then runs under the ACL and attaches to the lateral back part of the top of the tibia. The PCL is most injured after direct contact to the front of the tibia (shin) that pushes it back on the fixed femur (thigh bone). In athletics, any hyper flexion or hyperextension movement that forces the tibia backwards in relation to the femur can stretch or tear the PCL. Signs and symptoms include pain, swelling, and it will be hard to move knee. Treatment is as ACL, but athletes with PCL tears can often return to sport without surgery if they follow a good rehabilitation program.

SPRAIN to Medial Collateral Ligament (MCL)
The MCL connects the femur and tibia on the inside of the knee and is often injured when the foot is planted in neutral or external rotation, and force is applied from the lateral side of the leg, resulting is stress to medial ligament. Sometimes the ACL and medial meniscus (cartilage) can also be damaged if the lateral force continues after the MCL fails. Signs and symptoms include pain, point tenderness, and mild swelling on the inside of the knee. There will be pain when the ligament is taut during full knee flexion and extension. Treatment consists of RICE for 24 – 48 hours, then physiotherapy and rehabilitation.

SPRAIN to Lateral Collateral Ligament (LCL)
The LCL connects the femur and tibia on the outside of the knee and is injured less frequently than other knee ligaments. It can be strained from medial force pushing the knee to the lateral side. It is most vulnerable if the force is applied while the leg is adducted and the tibia internally rotated. Signs and symptoms and treatment are the same for the MCL.

Meniscal (cartilage) injuries
The menisci are 2 cartilages that sit on top of the tibia. Their functions are to stabilise the joint, absorb shock, lubricate the joint and improve weight distribution. Injury to the menisci occurs as a consequence of compression and rotation of the femur onto the tibia. It can also be injured through hyper flexion and in conjunction with ligament injuries.
Signs and symptoms are difficult because there is virtually no pain sensation the menisci and the pain normally comes from surrounding tissue, therefore the athlete may not recall the injury. Symptoms can include clicking, catching or locking of the joint, and the athlete may have pain, instability or feel like the knee is giving way. Pain can also occur on deep squatting. If a meniscus is torn surgical intervention is normally necessary via key hole.

CHRONIC INJURIES:

Caused by repetitive friction and overuse, or poor training techniques.

Bursitis
There are numerous bursas in the knee between tendons and other joint structures to prevent friction during knee movement. Signs and symptoms include pain, redness and localised swelling. The area is normally tender and warm to touch. Treatment includes RICE and determining the cause of the inflammation which is normally muscle tightness or imbalance.

Patellar tendonitis (jumper's knee)
This occurs frequently from overuse such as repetitive jumping, running or weight lifting (squats, lunges). This can cause micro tearing and inflammation through the tendon which runs below the patella (knee cap). Symptoms include pain, inflammation and tenderness on the tendon. Pain will occur with stretching or resisted knee flexion. Treatment includes RICE, stretching, strengthening and quadriceps muscles.

Illiotibial Band Syndrome
This is most often seen in runners from overuse. It is caused by excessive friction between the IT band and the lateral side of the knee. Signs and symptoms include pain and tenderness over the lateral side of the knee on the bone and can sometimes radiate up the side of the knee and leg into the hip. Pain normally occurs during running and disappears while resting. Treatment includes RICE, loosening and stretching the IT Band, strengthening the gluteal muscles and checking for other hip imbalances.

Patellofemoral pain syndrome

This is a general term used to describe pain at the front of the knee. This can be caused by a variety of factors that result in patella malalignment, patella compression or patella tracking. These can include muscular weakness, imbalance and training errors such as an abrupt change in training activity, surface, intensity or duration that increases the load on the knee. Signs and symptoms include general pain around the front of the knee that is increased with activity or surprisingly sitting with the knees bent for long periods. Swelling is minimal but it may be tender to palpate under the patella. This is a difficult injury to manage but normally consists of a good rehabilitation program to increase mobility and increase lower extremity alignment and muscle function.

Osgood-Schlatter Disease

This occurs in younger athletes who do lots of sport while going through adolescence. It is characterised by pain at the top of the tibia (shin bone) where the patella tendon attaches and can form into a small lump that is very painful to touch. It is caused by muscle tightness, repetitive running and jumping and significant growth spurts. It is treated with RICE and stretching of the quadriceps muscle.

Phil Sadler © (22/5/07)

Phil is a Chartered Physiotherapist, Sports Therapist, Remedial Masseur, Sport Scientist and member of the Health Professional Council.
He can be contacted on 07979 504596 and is based in Hornchurch