



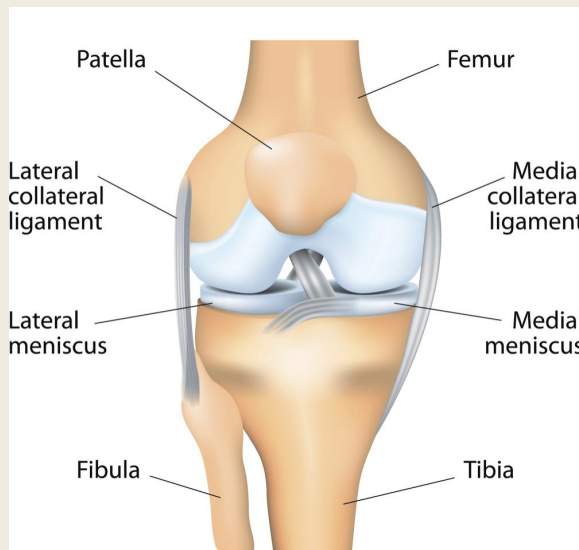
Medicine for Managers

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The Painful Knee

Knee pain is common and may be generated by a wide range of problems. The joint itself is amazing, strong and versatile. It can allow the human to stand upright without the need for muscles. It enables us to raise and lower the body and to make twisting movements. It allows us to walk efficiently and propel the body forwards and it acts as a shock absorber. It is a hinge joint comprised of bones, menisci, ligaments and tendons.

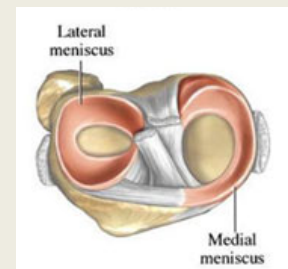
It is important to understand how the joint is formed. The femur, or thigh bone, the tibia (shin bone) and the patella (kneecap) make up the knee bones. The fibula is not part of the joint.



The femur articulates with the tibia. The ends of both bones are coated with **articular cartilage** and it is also present on the back of the patella. It is thin and shiny, helps the bones to move smoothly over each other and also acts in part as a shock absorber.

The patella is triangular-shaped and is located at the front of the knee within the quadriceps muscle. It is lined with the thickest layer of cartilage in the body because considerable force is applied to it.

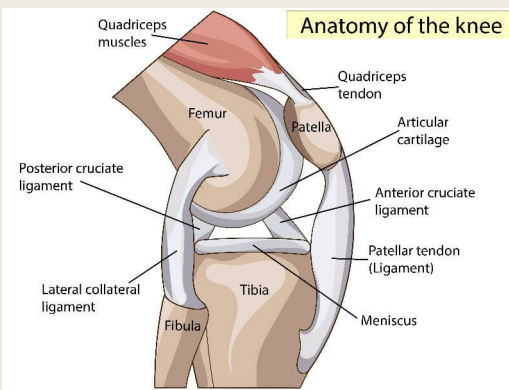
There is also a second type of cartilage in the knee in the form of two crescent-shaped discs that act as a cushion and form an effective shock absorber.



They protect the knee so that the bones can move without rubbing against each other. [The diagram shows the inner medial meniscus and the outer lateral meniscus on the lower end of the femur]. They contribute to stability and correct weight distribution.

The knee joint is stabilised by **ligaments** which are strong cords connecting bone to bone to produce joint stability. The knee has four.

- **Anterior Cruciate Ligament (ACL).**
Prevents the femur sliding backwards on the tibia
- **Posterior cruciate ligament (PCL)**
Prevents the femur sliding forwards on the tibia
- **Medial collateral ligament (MCL)**
Prevents side-to-side femoral movement
- **Lateral collateral ligament (LCL)** Also prevents side-to-side movement of the femur



Muscles are attached to the knee by tendons and two groups, the **hamstrings** and the **quadriceps** strengthen the knee. The quadriceps are four muscles at the front that straighten the knee. The hamstrings are three muscles at the back of the thigh that bend the knee.

The joint is surrounded by a **capsule** filled with **synovial fluid**, which lubricates the joint and provides nutrients.

Symptoms of Knee Pain.

Anyone of any age can experience knee pain. Apart from the pain itself, the sufferer may experience one of several other symptoms:

- Difficulty in weight bearing

- Stiffness of the knee
- Swelling of the joint
- Weakness and instability
- Inability to fully flex or straighten the knee
- If the pain becomes severe

It is important to seek medical advice if the swelling is marked, the knee is hot and the person feels feverish, or if the joint is unstable or appears deformed

Causes of knee pain

Sprains and Strains. Caused often during exercise through overstretching or twisting. **Arthritis** may be chronic or acute.

- **Osteoarthritis** (where the knee deteriorates with use and age) and **rheumatoid arthritis** (an autoimmune condition) tend to be slowly progressive. The symptoms may come and go according to use and variability of inflammatory change.
- **Gout** is the result of accumulation of uric acid crystals in the joint.
- **Septic arthritis** is the result of infection in the joint. It may rapidly cause joint damage. If the joint is suddenly hot, painful and with any systemic symptoms, treatment is urgent.

Trauma may cause a range of injuries leading to pain:

- **Ligament injuries** which may result from the ligament being torn. The Anterior Cruciate Ligament is particularly vulnerable to sporting damage.
- **Fractures** of the knee bones can occur during falls or in bones weakened by osteoporosis

- **Meniscus damage** can occur resulting in tears of the structure as a result of twisting the knee while weight-bearing
- **Bursitis.** The knee contains small sacs of fluid (bursae) that cushion the knee joint and may become inflamed if injured
- **Patellar tendinitis.** The tendon joins the patella and the tibia and may become injured, especially in cycling and jumping

Other factors:

- **Leg pain** may affect walking and place more load or stress on the knee joint
- **Dislocated patella.** Usually occurs to the outside of the knee, is obvious to see and may be very painful
- **Loose body.** Fragments of bone or cartilage may break off and may interfere with joint movement causing pain.
- **Patellofemoral syndrome.** Pain between the patella and the femur occurring because of abnormal movement or arthritic change

Risk Factors for knee injuries include:

- **Excess weight**
- **Previous injury.** Knee injury may be recurrent
- **Muscle weakness** reduces joint stability which protects the joint
- **Particular occupations and activities** such as sports involving jumping or jobs with repetitive strain may result in knee damage

The Diagnosis of Knee Injuries.

Anyone experiencing knee pain or limitation of movement may need medical assessment. The GP will:

- **Examine the knee,** assessing appearance, degree of swelling, range and limitation of movement and review of the structure and stability of the knee by pulling or pushing the joint.



- **Undertake laboratory tests** which may involve blood tests to check inflammatory or

- infective change or raised uric acid levels as in gout
- **Arthrocentesis** If the swelling is marked, some fluid may be drawn from the joint using a syringe and needle for analysis.
- **X-rays** to identify degeneration of the joint or fracture.

The patient may need hospital assessment. Other tests may include

- **Ultrasound testing** to produce images of soft tissue structures and assess movement.
- **CT or MRI imaging** to obtain three-dimensional images of the knee to assess bones and soft tissues such as
- tendons, ligaments and the cartilages in the joint

Treatment of Knee Pain

Because of the plethora of possible causes and their degree of significance, treatment will depend on the specific nature of the injury.

Many knee problems are minor and transient, without any long-lasting damage, and they can be managed by rest and analgesia, perhaps with subsequent exercises to strengthen the muscles and to restore the normal movement patterns.

Treatment in general varies according to the nature of the injury and may include:

- **Medication** which will be tailored to the particular condition but may be necessary for pain, inflammation, the treatment of rheumatoid or gouty changes or for other disorders.
- **Injections** of drugs directly into the joint. These may include:
 - **Corticosteroid** to treat inflammation and assist in pain relief
 - **Hyaluronic Acid** is sometimes used in an attempt to improve mobility and ease pain. Study results are mixed and the jury is still out.
- **Physiotherapy** and strengthening exercises may be valuable to restore activity and joint flexibility.
- **Surgery** may be required following injury and reconstruction of the joint may be the option of choice. It may be done by:
 - **Arthroscopy**. Small access incisions round the knee to remove damaged cartilage and reconstruct injured ligaments



- **Partial or total knee replacement** to resolve knee damage with new parts made



of plastic or metal, or the whole joint. The radiograph illustrates a total knee replacement made of high grade metal alloys and plastics.

Knee disorders result in many lost hours of work and much pain. As with much of medicine, treatment is improving but injuries do cause so much incapacity. Sometimes it is so difficult to take care of the knees. Relatively minor activities can cause damage and pain. Cartilage injuries are common and many develop arthritic change.

As Mary Quant said,

“You are as young as your knees”.

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