
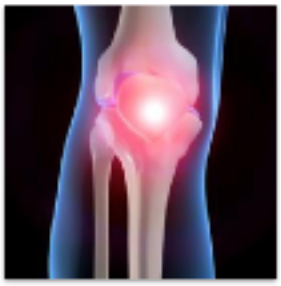

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## How Do Knees Work?

Sitting, standing, running, walking, squatting to pull a weed in your garden or jumping to shoot a basketball are all made possible by the knee's ability to bend and flex. The knee is one of the most complex joints in your body, and it uses a combination of bones, muscles, ligaments and tendons to work.

### Parts of the Knee

Your knee is made of the femur (thighbone), the tibia (shinbone) and the patella (knee cap), which sits over the knee to protect the joint. The fibula, the bone that runs parallel to the tibia in your lower legs, connects to the tibia immediately below the knee but is not part of the joint. Ligaments, bands of elastic tissue, attach these bones together.

The anterior cruciate ligament (ACL) and the posterior cruciate ligament (PCL) are the two main ligaments in your knee. (These are sometimes referred to as crucial ligaments.) These ligaments attach the tibia to the femur and help control the forward and backward motion of the knee and also keep it from rotating too far.

Strong cords of tissue, called tendons, attach muscles to the bones of the knee and make it possible for the joint to move. The main muscles involved in knee movement are the quadriceps and the hamstrings. Your quadriceps are a group of four muscles on the front of your thigh that are attached to the top of the patella by the quadriceps tendon. The hamstring muscles, located on the back of your thigh, are connected by ligaments to the tibia just below the knee joint.

## Common Knee Problems - Patella and Quadriceps Tendinitis

Patella tendinitis is a common injury following overuse or repetitive trauma to the extensor mechanism, such as basketball or volleyball. Patients usually present with pain in the front of their knee over the patella tendon associated with limited flexion and swelling. Treatment is directed towards a period of rest to allow the symptoms to subside followed by activity modification that limits high impact sports.

Stretching and strengthening exercises are initiated once the pain subsides. Ice and short courses of NSAID's are helpful adjuncts.
In a similar fashion, the quadriceps tendon may become sore and irritated. This is usually manifested with tenderness in the soft tissue just above the patella. Treatment is similar to patellar tendinitis as discussed above.

## Bursitis

Bursae are synovial lined cavities that overly a bony prominence around the knee. Repetitive trauma from overuse or, more commonly, chronic irritation results in local inflammation and fluid collection within the bursa. The prepatellar bursa is the most commonly affected and when inflamed is called "housemaid's knee." The bursa overlying the attachment of the medial hamstrings or pes anserinus tendons on the tibia can also become inflamed. This is usually termed a pes bursitis and is usually caused by a repetitive activity such as running. Treatment is directed at stopping the irritating activity. Ice and a short course of NSAID's are useful. A compressive wrap is sometimes helpful. Aspiration is sometimes required for extreme cases.

## Patellofemoral Pain and Chondromalacia Patella

Pain in the front of the knee is a common complaint and can be the result of numerous maladies. Sources of pain include patella malalignment, chondromalacia, osteoarthritis, osteochondral fractures, synovial plica, bursitis, tendinitis, and patella instability. An understanding of knee anatomy, as it relates to the mechanism of injury, is important in establishing a diagnosis. Your physician may need to perform ancillary tests in order to finalize a diagnosis. While the initial treatment is usually nonoperative, it is sometimes necessary to perform surgery to solve the problem.

Malalignment, along with acute or repetitive trauma, can lead to degenerative changes on the surface of the patella or femoral groove. Softening and erosive changes are referred to as chondromalacia. Initial treatment includes activity modification, ice and NSAID's. As the pain subsides, an exercise program is begun that usually focuses on stretching and strengthening. For those patients with recalcitrant cases, their physician may need to modify their treatment plan and consider surgical intervention.

## Anterior Cruciate Ligament Injuries

ACL tears are becoming more common, with an incidence of 250,000 cases per year in the United States. Women experience up to a sevenfold increase in ACL tears compared with men in competitive sports. The ACL is often torn during running sports when the foot is planted and the knee twists with a change of direction.

Classically the individual feels a "pop" in the knee, and is unable to continue running or playing because of pain and a sense of instability. Besides a physical examination and x-rays, it may be necessary to perform a MRI to confirm the diagnosis.

Treatment may be either operative or nonoperative and is dependent upon the individual's level of activity and degree of instability. It is important that the individual be counseled about the natural history of an ACL deficient knee by their patient before embarking on a course of treatment.

Nonoperative treatment involves a physical therapy program for restoration of motion and strength. Most athletes return to sports in 6- 8 weeks provided that they have achieved appropriate strength. The use of a brace is debatable, but may provide some subjective benefit. If an athlete suffers episodes of giving way with sports, then it should be assumed that the knee is functionally unstable and reconstructive surgery should be considered.

Current reconstructive techniques use an arthroscopic approach. The graft choices for an ACL reconstruction include the central one-third bone-patella tendon-bone; hamstring tendons and quadriceps tendon. Sometimes, allograft tissue is considered. Following the reconstructive procedure, a supervised and specialized rehabilitation program is necessary to restore motion and strength. In general most athletes return to sports by 6 to 9 months after surgery, but each case is individualized.

## Posterior Cruciate Ligament Injuries

PCL injuries occur less often than ACL tears. Two common mechanisms of injury include a fall on a hyperflexed knee with the foot plantar flexed and striking the front of the tibia with the knee flexed - like a dashboard injury in a motor vehicle accident. Treatment may be operative or nonoperative depending upon the degree of instability and involvement of associated structures.

### Meniscal Tears

Meniscal tears usually result from a twisting injury. Because the medial meniscus is less mobile than the lateral meniscus, it has a greater chance of being entrapped between the femur and tibia in the knee joint. Beyond the physical exam and x-rays, MRI has been useful in confirming the diagnosis. While some meniscal tears may heal with rest and activity modification, failure to respond to nonoperative treatment or repetitive episodes of catching or locking suggest that a surgical arthroscopy should be considered. Depending on the pattern and extent of the tear, the arthroscopy may involve either a partial menisectomy or meniscal repair. Following arthroscopy, an exercise program facilitates restoration of motion and strength.

## Preparing for Knee Surgery

Before having knee surgery, you may need to wait for any swelling to go down and the full range of movement to return to your knee. You may also need to wait until the muscles at the front of your thigh (quadriceps) and the back of your thigh (hamstrings) are as strong as possible. If you don't have the full range of movement in your knee before having surgery, your recovery will be more difficult. It's likely to take at least three weeks after the injury occurred for the full range of movement to return. Your GP may refer you to a physiotherapist to help you prepare for surgery.

### Physiotherapy

Physiotherapists, or physios, are healthcare professionals who use physical methods, such as massage and manipulation, to encourage healing. A physio will be able to help you regain the full range of movement in your knee. Your physio may show you some stretches you can do at home to help keep your leg flexible. They may also recommend low-impact exercises, such as swimming or cycling. These types of activities will help

improve your muscle strength without placing too much weight on your knee. You should avoid any sports or activities that involve twisting, turning or jumping.

## Pre-Admission Clinic

Before having anterior cruciate ligament (ACL) surgery, you'll be asked to attend a pre-admission clinic. You'll be seen by a member of the team who will look after you while you're in hospital. A physical examination will be carried out and you'll be asked about your medical history. You may also need to have some investigations and tests, such as a knee X-ray. You'll be asked about any tablets or other types of medication that you're taking, both prescribed and over-the-counter medication (bought from a pharmacy). You'll also be asked whether you've had anaesthetic (painkilling medication) in the past, and whether you experienced any problems or side effects, such as nausea.

You'll also be asked some questions about your teeth, including whether you wear dentures, caps or a plate. This is because during the operation a tube may be put down your throat to help you breathe and any loose teeth could be dangerous. The pre-admission clinic is a good time to ask any questions you have about the procedure. However, you can discuss any concerns with your surgeon at any time.

## Preparing for Hospital

It's a good idea to be fully prepared before going into hospital for surgery. Below is a list of things to consider if you're about to have an operation. Do your homework – find out as much as you can about your operation and what it involves. Information or a video about the procedure may be available at your hospital. Ask your surgeon if you're unsure about anything. Other medical problems – ask your GP to check that any other medical problems you have are under control, such as high blood pressure (hypertension).

**Keep clean** – have a bath or shower before going into hospital and put on clean clothes. This will help reduce the chances of taking unwanted bacteria into hospital.

**Eating before your operation** – anaesthetics are often safer if your stomach is empty, so you'll usually have to stop eating several hours before your operation. You should be given more advice about this during your pre-admission clinic.

**Prepare for returning home** – stock up on food that's easy to prepare, such as tinned foods and staples like rice and pasta. You could also prepare meals and put them in the freezer. Put things that you'll need, such as books and magazines, where you can easily reach them.

**Arrange help and transport** – ask a friend or relative to take you to and from hospital. You'll also need to arrange for someone to help you at home for a week or two after you come out of hospital.

## Risks following Knee Surgery

In over 80% of cases, surgery to repair an anterior cruciate ligament (ACL) fully restores the functioning of the knee. ACL surgery will help improve the stability of your knee and stop it giving way. You should be able to resume normal activities after six months.

However, your knee may not be exactly like it was before the injury. You may still experience some pain and swelling in the replacement ligament. If other structures in your knee are also damaged, it may not be possible to fully repair them.

**As with all types of surgery, there are some risks associated with knee surgery.** They include:

**Infection** – the risk of infection is small (less than 1%); you may be given an antibiotic after your operation to prevent infection developing.

**Blood Clot** – the risk of a blood clot forming and causing problems is very low (about 1 in 1,000), if you're thought to be at risk, you may be given medication to prevent blood clots forming.

**Knee Pain** – affects up to 18% of people who have ACL surgery and is more likely to occur when the patellar tendon is used as graft tissue; you may have pain behind your kneecap or when kneeling down or crouching knee weakness and

**Stiffness** – some people experience long-term weakness or stiffness in their knee.

After ACL surgery, there's also a small chance (less than 10%) that the newly grafted ligament will fail and your knee will still be unstable. If the first operation is unsuccessful, further surgery may be recommended. However,

subsequent operations are often more difficult and don't usually have the same long-term success rate as a first tendon repair.

## Recovery

Recovering from anterior cruciate ligament (ACL) knee surgery can take up to a year. After knee surgery, the wound will be closed with stitches. If the stitches are dissolvable, they should disappear after about three weeks. If your stitches aren't dissolvable, they'll need to be removed by a healthcare professional. Your surgeon will advise you about this. They'll also tell you how to care for your wound. Washing it with mild soap and warm water is usually all that's required.

Your knee will be bandaged and you may also be given a cryocuff to wear. This is a waterproof bandage that contains iced water to help reduce swelling. You may also be given painkilling medication to control any pain. You may have painful bruising, swelling and redness down the front of your shin and ankle. This is caused by the fluid inside your knee joint (synovial fluid) leaking down your shin. These symptoms are temporary and should start to improve after about a week.

## Rehabilitation

Your surgeon or physiotherapist will be able to advise you about a structured rehabilitation programme. It's very important that you follow the programme so that your recovery is as successful as possible. You'll be given exercises you can start in hospital after your surgery and continue when you get home. The exercises will include movements to bend, straighten and raise your leg. Ask if you're unsure about how to do any of the exercises. You'll also be given crutches to help you move around. You may need to use them for about two weeks, but you should only put as much weight on your injured leg as you feel comfortable with.

## Weeks 1-2 of Your Recovery

For a few weeks, your knee is likely to be swollen and stiff, and you may need to take painkillers. Your surgeon or GP will advise about the type of pain relief that's best for you to use. You'll be advised to raise your leg as much as possible. For example, by putting pillows under your heel when you're lying in bed. You may be given a cryocuff to take home with you to help ease the pain and swelling. Ask your surgeon or physiotherapist how often you should use the cryocuff. If you don't have a cryocuff, you could place a pack of frozen peas wrapped in a towel on your injured knee.

## Weeks 2-6 of Your Recovery

Once the pain and swelling have settled, you may be advised to increase or change your exercises. Your physiotherapist will advise you about what exercises to do. The exercises will help you to:

**Fully extend and bend your knee / Strengthen your leg muscles**
**Improve your balance / Begin to walk properly**

After 2-3 weeks, you should be able to walk without crutches. As well as specific exercises, activities that don't put much weight on your knee may also be recommended, such as swimming and cycling.

## Weeks 6-24 of Your Recovery

Six weeks to six months after your knee operation, you should gradually be able to return to your normal level of activity. You'll be encouraged to continue with activities such as cycling and swimming, but you should avoid sports that involve a lot of twisting, jumping or turning. This is because you need to allow enough time for the grafted tissue to anchor itself in place inside your knee.

## After 6 Months

After six months you may be able to return to playing sport. Some people may need to take more time to feel confident enough to play sports again, and elite athletes may need longer to return to their previous level of performance.

## Returning to work

How quickly you can return to work after having knee surgery will depend on what your job involves. If you work in an office, you may be able to return to work after 2-3 weeks. If you do any form of manual labour, it could be up to three months before you can return to work, depending on your work activities.

## Driving

Your GP will be able to advise you about when you can drive again. This will usually be after 3-4 weeks, or whenever you can comfortably put weight on your foot.