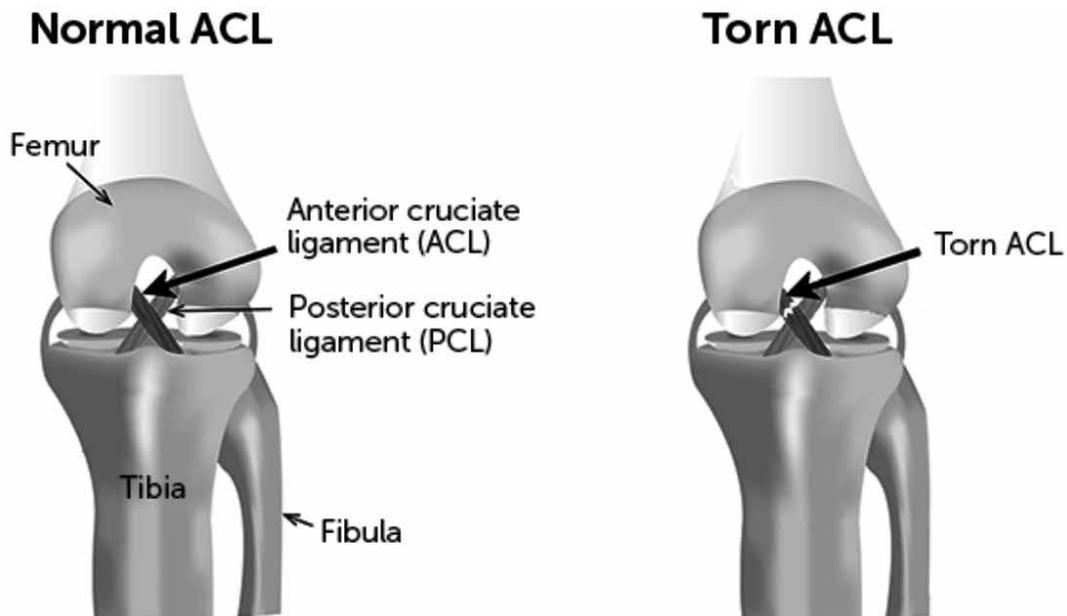


Information about
**Anterior Cruciate Ligament
(ACL) Rupture**



What is the ACL?

The anterior cruciate ligament is a structure within the knee which helps to provide stability. It attaches the thigh bone (femur) to the shin bone (tibia) within the knee and it helps to prevent unwanted movement of one bone relative to the other.



Why has the ACL torn?

The ACL most commonly tears when the foot is planted and there is a rotational force through the knee. It most commonly results from an injury sustained when participating in sport. It is not always clear why some people are more likely to rupture their ACL than others but we do know that women are at higher risk and also that we see ACL ruptures commonly in certain sports (eg. football, skiing and netball.)

What are the symptoms of an ACL tear?

When the ACL tears, there is usually a great deal of pain in the knee which occurs immediately. There is also often a sensation of a pop or something snapping in the knee. The knee becomes swollen rapidly because as the ligament tears it causes bleeding into the knee joint. The swelling and pain limit the range of movement of the knee and also the ability to walk comfortably. Over the following days, the swelling gradually settles down but does not go away completely for a number of weeks. Gradually the range of movement comes back but it can require a focused effort to regain it.

After the initial phase of injury, some patients have ongoing symptoms of instability in the knee. This may feel like the knee is shifting out of place when changing direction. Some patients simply report a lack of confidence in the knee. In many cases, when the knee has an episode of instability it can swell and become painful again almost as it did at the time of the original injury.

What are the options for treatment after ACL injury?

It is vitally important when considering surgery that normal knee range of movement and muscle strength has been achieved before having surgery because this gives them the best chance of a good result.

In general terms we can consider 3 main groups of patients:

- One third of patients are able to function fully without an ACL and are able to perform all of their usual activities without any adverse symptoms and these patients do not need any surgery.
- One third of patients are able to function for normal daily activities but have the feeling of instability when they are trying to do activities which involve pivoting or twisting e.g. playing football or tennis. These patients sometimes choose to have surgery depending on their individual wishes or needs.
- One third of patients have a feeling of instability when performing simple daily activities such as walking or jogging in a straight line. These patients often choose to have surgery.

What does treatment involve?

We can generally think about treatments as non-surgical or surgical:

Non-surgical

- This involves improving the range of movement and strengthening the muscles around the knee to compensate for the absent ACL. Physiotherapy can help with this.
- Simple pain killers, rest, icing and elevating the knee are useful if it is swollen and painful.
- Maintaining an active lifestyle and if required losing weight can also help.

Surgical

- Some patients may choose to have surgery for an ACL rupture. This most commonly involves using another tendon from your own body to make a new ACL within the knee.

More information about treatments including surgery and physiotherapy can be found at the links below. In deciding which treatment is the most appropriate for you it is important to consider the risks associated with that treatment. It is also important to consider the impact that any treatment may have on your lifestyle or occupation, as a period off work is almost always required following surgery. Surgical treatment is associated with extensive rehabilitation and is discussed further in the resources below.

Useful resources

<https://www.nhs.uk/conditions/knee-ligament-surgery/>

<https://www.frankgilroyphysiotherapy.co.uk/knee/acl-reconstruction-rehabilitation-programme/>

The Importance of Pre-Surgery Exercises:

We recommend an exercise program or 'pre habitation' before surgery. Regaining the strength and movement in your knee before surgery will improve your recovery after ACL reconstruction surgery. This exercise program has several important benefits:

- Return range of motion to normal and decrease the risk of stiffness after surgery
- Increase muscle strength in your legs and core
- Improve balance
- Maintain fitness in preparation for surgery

Ideally, you should do these exercises every day, as recommended below.

Exercises:

- 20-30 minutes of cardio exercise, **at least** 3 times a week (all low-impact, straight-line activities, e.g. cycling, cross trainer etc.)
- 15-20 minutes of strength training - please see below.

1. Strength Exercises:

- ◆ **Quadriceps Contraction** – In sitting, with your knee straight and leg supported, tighten the thigh muscle to hold the knee straight. **Avoid lifting your leg from your hip.**

- ▶ Perform 5-10 times holding each contraction for 5 seconds. Progress to 30 times holding each contraction for 10 seconds, resting for 5 seconds in between reps.



- ◆ **Straight Leg Raises** – In the position shown, tighten your thigh muscle while keeping your knee straight and lift your leg 3-5 cm.

- ▶ Perform exercise 5-10 times holding each contraction for 5 seconds. Progress to 30 times holding each contraction for 5-10 seconds.



- ◆ **Hip Adduction** – In lying, with your knees bent as shown, squeeze a soft ball or a pillow between your knees.

- ▶ Perform exercise 5-10 times holding each contraction for 5 seconds. Progress to 30 times holding each contraction for 10-15 seconds, resting for 5 seconds between reps.



◆ **Calf Raises –**

- ▶ **Both legs:** Start with feet shoulder width apart and toes pointed straight ahead, and raise up onto your toes.
 - Start with one set of 10, holding each raise for 5 seconds. Increase the number of reps up to 30 with 5 seconds hold. Start by using support at a wall or table and progress to no support as able.
- ▶ **Single leg:** Start on one leg with toes pointed straight ahead, and raise up onto your toes.
 - Start with one set of 10, holding each raise for 5 seconds. Increase the number of reps up to 30 with 5 second hold. Start by using support at a wall or table and progress to no support as able.



- ▶ **Gluteals –** In lying, with your knees bent and your arms by your sides, squeeze your buttocks and lift up to create a bridge. Keep equal weight on each leg and straight alignment from your shoulders to your knees. Be careful not to push down on your neck or shoulder – use your buttocks to do the work.
 - Start with one set of 10, holding each lift for 5 seconds. Increase the number of reps as your strength increases. Once you can complete 20 reps holding or 10 seconds each, change to single leg bridges.



- ▶ **Hamstrings –** In sitting place a resistance band around your ankle and also have it attached to a chair or table leg in front of you. Bend your knee backwards, slowly against the resistance of the band using the muscles under your thigh.
 - Start with 1 set of 10 reps and increase to 3 sets of 15 reps.



► **Squats (Quadriceps)** – Slowly squat with equal weight on each leg. Bend your knees from 0° to a maximum of 90° of flexion, making sure your knees do not move beyond your toes.

- › Start with one set of 10, holding each squat for 5 seconds and increase the number of reps as your strength increases, up to 30 reps x 15 seconds hold.



► **Single Leg Squats** – Standing on one leg, slowly squat bending your knee from 0° to a maximum of 90°, making sure your knee does not move beyond your toes.

- › Start with one set of 10, holding each squat for 5 seconds and increase the number of reps as your strength increases, up to 30 reps x 15 seconds hold.



2. Balance and Proprioception Exercises:

- **Single Leg Stance** (eyes open, eyes closed)
- **Double Leg Squats on an Unstable Surface** (thick carpet, foam block, camping mattress)
- **Single Leg Stance on an Unstable Surface** (thick carpet, foam block, camping mattress)



► **Single Leg Squats on Trampoline** – Standing on one leg, slowly squat bending your knee from 0° to a maximum of 90°, making sure your knee does not move beyond your toes.

- › Start with one set of 10, holding each squat for 5 seconds and increase your number of reps as your strength increases, up to 30 reps x 15 seconds hold.



► **Squats on a balance board** – Slowly squat with equal weight on each leg. Bend your knees from 0° to a maximum of 90° of flexion, making sure your knees do not move beyond your toes.

- › Start with one set of 10, holding each squat for 5 seconds and increase the number of reps as your strength increases, up to 30 reps x 15 seconds hold.



► **Lunges on a balance board** – Step forward and back and lunge as shown. Control the descent making sure your knee that is forward does not move beyond your toes.

- › Start with one set of 10, holding each lunge for 5 seconds. Increase the number of reps as your strength increases up to three sets of 10.



