



# Anterior Cruciate Ligament (ACL)



Changi  
General Hospital  

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SingHealth

Welcome to Changi General Hospital's Anterior Cruciate Ligament (ACL) Programme.

This is a comprehensive treatment programme tailored to help you recover from your ACL injury.

## **Programme aims and goals**

The primary aim of this programme is to help you regain the stability of your knee joint and prevent further injuries to other important structures like the meniscus and cartilage. The ultimate goal is to help you return to your sporting activities at or close to your pre-injury levels.

## **How this programme will help you**

1. We will help you understand your injury and treatment options by providing relevant information.
2. Your progress in this programme will be closely monitored by the providing sports orthopaedic surgeon, sports physiotherapist and exercise physiologist who will be with you until the end of your treatment.
3. You will be guided to have access to the current rehabilitation methods and gym equipment to help you recover.
4. You will be guided on how to prevent future knee ligament injuries.
5. We will be objectively monitoring your knee function to ensure you are on track with your recovery.

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Your healthcare team:

Orthopaedic Surgeon \_\_\_\_\_

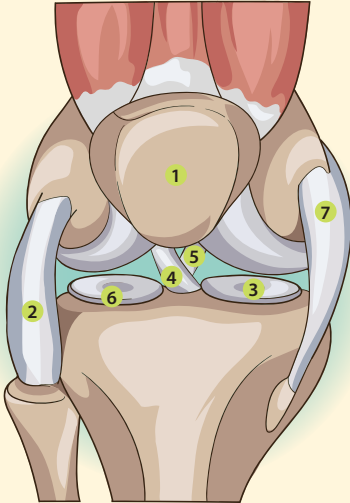
Sports Nurse Coordinator \_\_\_\_\_

If you have any enquiries: please call  
SSMC@CGH - (65) 6850 3333

We are committed to getting you back into the game!

# Understanding anterior cruciate ligament (ACL) injuries

The anterior cruciate ligament (ACL) is the major stabilising ligament of the knee. The ACL is located in the centre of the knee joint and runs through the femur (thigh bone) to the tibia (shin bone). In this position, it prevents a buckling of the knee.



- 1 Patella
- 2 Lateral Collateral Ligament
- 3 Medial Meniscus
- 4 Anterior Cruciate Ligament
- 5 Posterior Cruciate Ligament
- 6 Lateral Meniscus
- 7 Medial Collateral Ligament

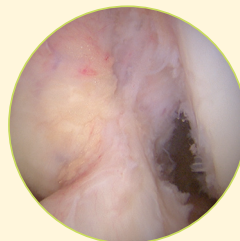
Tearing of the ACL occurs with a sudden directional change when a decelerating force crosses the knee. A “popping” sensation can be heard or felt with a rapid onset of knee swelling. There will be a buckling sensation in the knee when attempting a direction change.

Most patients will recall:

- ➔ A “pop” from the injured knee
- ➔ Rapid development of a swollen knee
- ➔ Inability to continue playing the game



Intact ACL (left side)



Torn ACL (left side)

## The untreated ACL

Studies have shown that:

1. Up to 86 per cent of these knees “give way” within four years.
2. Only 1.4 per cent of athletes were able to return to most athletic activities.
3. Increased incidence of meniscus injuries in the ACL deficient knee.
4. After 10 years, up to 78 per cent of the knees treated without surgery showed osteoarthritis.
5. ACL deficient knees are plagued by long term swelling and stiffness.

## Treatment options

### 1. Give up sports

The ACL is required for pivoting motions (rapid change in direction when running). If you walk on flat surfaces and do not engage in any sports that require pivoting, you can get by with a torn ACL.

Many activities such as running, biking, rowing may be done without undergoing surgery.

### 2. Surgical reconstruction

ACL reconstruction surgeries are suitable for young patients whose goal is to continue an active lifestyle and whose sports activities involve a lot of knee pivoting actions, such as jumping and cutting.

### 3. Use of brace with or without an arthroscopy

The use of a functional brace may be required if you want to return to recreational activities. The brace will stabilise the knee to allow low level recreational sports but is not effective for sports such as soccer.

Some sports such as wrestling, judo and rugby do not allow the use of a brace.

## Meniscus surgery

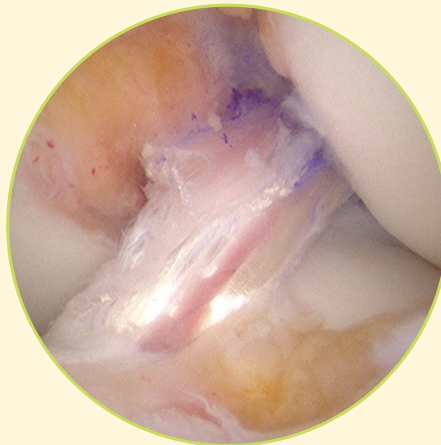
Since about 50 per cent of ACL injuries have associated meniscal tears, the joint may have to undergo arthroscopy to deal with the tear. In older patients, removal of a portion of the meniscus is the usual treatment. In younger patients, the repair of the meniscus is preferable. However, the results of meniscal repair are more successful when the ACL is also reconstructed.

This is why younger athletes who are involved in competitive sports are advised to have a surgical reconstruction. We also know that the long-term results of surgery depend upon having a normal intact meniscus.

## ACL reconstruction surgery

During this surgery, the remnants of your torn ACL need to be removed and a graft (hamstring tendon, bone patellar tendon or quadriceps tendon) needs to be inserted in the place of the original ACL.

The grafts that are most commonly used in our centre are the medial hamstring tendons. Other graft options include the quadriceps tendon or central third of your patellar tendon and occasionally “allograft” from a cadaver is used. You can speak to your surgeon regarding the advantages and disadvantages of these grafts.



Reconstructed ACL

## Frequently asked questions

**Q** Can my torn ACL heal?

**A** Complete tear of the ACL does not heal. It is a permanent injury.

**Q** How long does the surgery take?

**A** The surgery takes about one to two hours depending on whether additional procedures such as meniscus repair or resection are needed. You will spend another one to two hours in the recovery room after surgery.

**Q** When can I return to sports?

**A** The entire treatment process of surgery and post-surgery intensive physiotherapy rehabilitation takes up to nine months.

**Q** Do I need crutches after surgery?

**A** Yes, this is to help you get around in the early postoperative days. Most patients stop using the crutches after one to two weeks when they regain muscle control of the operated leg and feel secure. In certain cases where the cartilage surgery is also performed, the surgeon may advise restricted weight bearing on the operated leg for a few weeks to allow the repair site to heal properly.



**Q** How long will I use the knee brace?

**A** Between six weeks to two months unless otherwise instructed by your doctor. The brace is used to protect your knee in risky situations and until you gain the confidence and strength to go without it. It does not need to be applied when you are resting at home and not walking.

**Q** When can I start driving?

**A** This is usually possible once you discard the use of your crutches. Do check with your surgeon if you are not sure.

**Q** **When can I take a shower?**

**A** It is important to keep the wounds dry for two weeks after the surgery. You may shower as long as protective coverings are applied to keep the wounds dry during this period.

**Q** **How much time off work should I take?**

**A** One to two weeks of rest is recommended for a desk-bound job. It can be up to three months for moderately physical work and up to six months for strenuous physical work.

Examples:

Occupation	Estimated recovery time
Student, secretary, computer operator	1 to 2 weeks
Army soldier, airline baggage attendant (with restricted work duties)	2 to 3 months
Construction worker	4 to 6 months

**Q** **How long will I use the knee brace?**

**A** Between six weeks to two months unless otherwise instructed by your doctor. The brace is used to protect your knee in risky situations and until you gain the confidence and strength to go without it. It does not need to be applied when you are resting at home and not walking.

**Q** **Why is my knee/ leg numb?**

**A** The numb area along the front and outside of your knee (and sometimes lower leg) is the result of making the incision in the front of the knee. The incision interrupts small superficial skin nerves that supply the skin on the front and outside of the knee. The area of numbness shrinks in size over time. This process can take six months to a year. This area of numbness is not harmful. For some patients, this numbness can be permanent.





Also, if the operation takes two hours or more, some people may experience temporary numbness in the whole leg which disappears within 48 hours.

**Q** **How much activity can I do after surgery?**

**A** Initially most of your activity will be done through physical therapy. Swimming and stationary exercise biking are two activities you can do in early rehabilitation, followed by stairmaster and treadmill later on. It will take about six months for you to return to strenuous physical activities such as soccer. The reason you need to avoid strenuous physical activity is due to the ACL graft, which is placed in your knee at the time of surgery, that takes more than six months to strengthen.



**Q** **Will my constructed ACL be as good as the original one?**

**A** Many athletes who have opted for a surgical reconstruction and rehabilitation have returned to sports, won national championships, and enjoyed long professional careers. Most recreational athletes are also very satisfied with the results of knee surgery and find that they can continue doing things that they like to do after the surgery and rehabilitation. From this point of view, the function of the knee is nearly completely restored by reconstructive surgery.

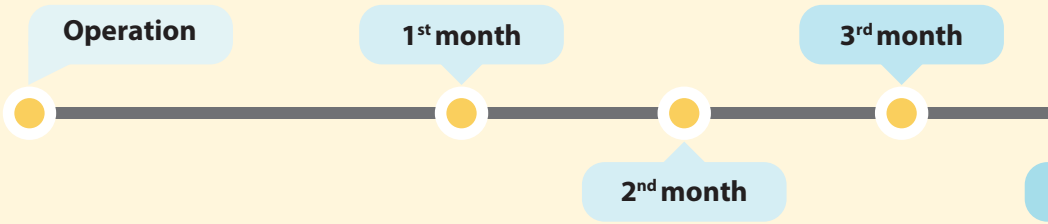
However, the original ligament has special nerve fibres that provide each person with a sense of the position of joint. This function is not replaced when a new ligament is used to reconstruct the original one. The original ACL also has special properties that allow it to stretch and relax, and it has a complicated arrangement of individual fibres that perfectly balances the tension in the ligament during flexion and extension of the knee. These properties are also not completely restored when the ligament is replaced.

Surveys have indicated that in the long run, nearly 90 per cent of people who have had ACL surgery, are glad to have gone through the procedure.

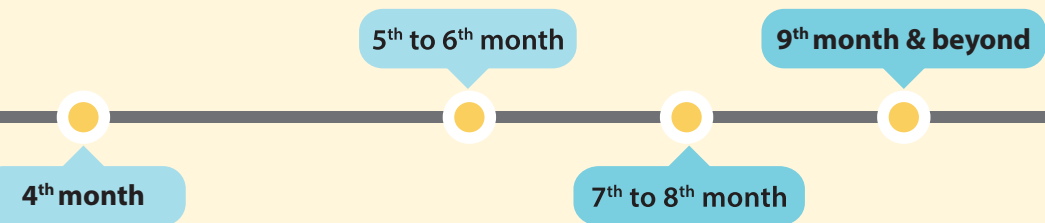
# ACL reconstruction recovery timeline

The following is a guide on what your rehabilitation journey will look like after the reconstruction surgery.

Aims of therapy across the phases of rehabilitation:



Phase 1a Protection	Phase 1b Protected loading	Phase 2 Strengthening
0 to 2 weeks	2 to 6 weeks	6 to 16 weeks
<ul style="list-style-type: none"> <li>➔ Control swelling</li> <li>➔ Pain management</li> <li>➔ Full knee extension</li> <li>➔ Knee flexion as instructed</li> <li>➔ Facilitate muscle recruitment</li> </ul>	<ul style="list-style-type: none"> <li>➔ Normal muscle recruitment</li> <li>➔ Increased knee flexion</li> <li>➔ Normal gait without a knee brace</li> </ul>	<ul style="list-style-type: none"> <li>➔ Progression of strengthening exercises</li> <li>➔ Regular cardiovascular exercise at 65 to 75 per cent HRmax</li> <li>➔ Balance and proprioception training</li> </ul>



	Phase 3 Advanced rehabilitation	Phase 4 Return to sports training
	4 to 6 months	6 to 9 months
ng	<ul style="list-style-type: none"> <li>➔ Progress strength and endurance training – aim for more than 70 per cent strength</li> </ul>	<ul style="list-style-type: none"> <li>➔ Sport-specific training – including multidirectional movement, plyometric, reaction drills</li> </ul>
t	<ul style="list-style-type: none"> <li>➔ Advanced balance and proprioception training</li> </ul>	<ul style="list-style-type: none"> <li>➔ Aim for more than 90 per cent strength</li> </ul>
n	<ul style="list-style-type: none"> <li>➔ Agility training</li> <li>➔ Power training</li> </ul>	



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Operating hours:  
8.30 am to 5.30 pm (Monday to Friday)  
8.30 am to 12.30 pm (Saturday)  
Closed on Sunday & Public Holiday

For more information, please visit [www.cgh.com.sg](http://www.cgh.com.sg)

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Information is valid as of October 2022 and subject to revision without prior notice.

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