



Anterior Cruciate Ligament Surgery



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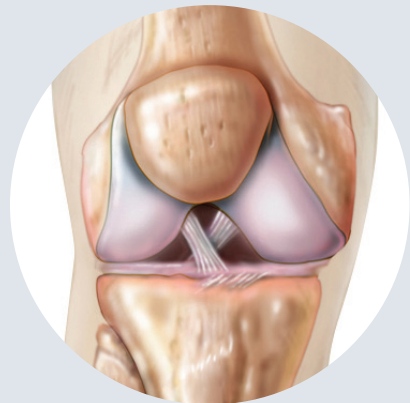
The Department of Orthopaedic Surgery offers specialist medical and surgical treatments on musculoskeletal disorders, joint replacements, foot and ankle disorders, among other trauma injuries to patients. Our consultants and surgeons work closely with sports medicine physicians, physiotherapists, podiatrists and other healthcare professionals to help patients return to normal activities after surgery.

What is the Anterior Cruciate Ligament?

The anterior cruciate ligament (ACL) helps to stabilise the knee joint. It can get torn by a sports-related injury, from twisting injuries to the knee or from a fall.

Once torn, the knee becomes unstable and this can lead to:

- A sensation that the knee is “giving way”, particularly during pivoting movements.
- Further damage to other structures in the knee such as the menisci (which act as the shock absorbers of the knee) and cartilage.
- Higher risk of developing secondary osteoarthritis in the future.



What are my options?

Some patients get better with physiotherapy and may resume their physical activities.

The degree of recovery depends on the severity of the ligament tear, the daily functional demands required of the knee and type of sporting activity undertaken.

With a complete ACL tear, you should not return to pivot sports without surgery.

Should your knee remain unstable in daily activities even after physiotherapy, surgery may be required.

What is an Anterior Cruciate Ligament Reconstruction?

A tear in the anterior cruciate ligament (ACL) does not usually heal on its own.

A substitute graft (tissue) has to be harvested to replace it. This procedure is known as an ACL reconstruction.

This graft is usually harvested from the thigh muscle (hamstring tendons), patella tendon or quadriceps muscles of the same leg (autograft).

Alternatively, a tendon graft can be used from a donor (allograft).

In ACL reconstruction surgery, an arthroscope is used to perform a minimally-invasive keyhole surgery.



During the procedure, bone tunnels are drilled into the femur (thigh) and tibia (shin) bone. The graft is passed through these tunnels inside the knee, tensioned and secured using implants to reconstruct the torn ACL.

It is common to have associated tears of the menisci in addition to the ACL injury. These tears can be trimmed or repaired in the same surgery. It is preferable to repair the meniscus in young patients to protect the knee joint.

This procedure may be done as a day surgery or with an overnight stay in the hospital.

What are the benefits of surgery?

- + Upon recovery, you should experience improved knee stability, especially with pivoting activities.
- + You will also have a significantly improved chance of returning to sporting activities at your previous level of performance with an ACL reconstruction.

What are the possible risks of the surgery?

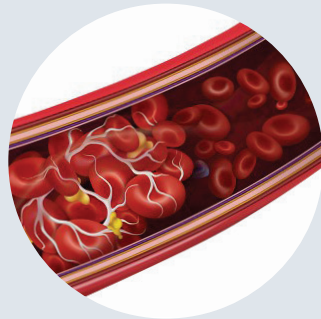
The majority of patients recover well after surgery. There are, however, risks of complications in any surgery.



– **Joint Infection**

To reduce the risk of infection, the surgery is carried out under strict sterile conditions with antibiotics administered intravenously. Please notify your surgeon and anaesthetist if you are allergic to any antibiotics or medication.

Despite these measures, there is still a small risk of joint infection developing. Superficial infections may be treated with antibiotics and surgery if indicated. If the infection is severe, further surgeries, including graft removal, may be required.



– **Blood clots**

- Deep Vein Thrombosis (DVT) in the leg
- Pulmonary Embolism (PE) in the lung

Blood clots can occur after any surgery but are more likely after a major orthopaedic lower limb procedure. They develop in the lower limb veins and cause swelling, pain and increased warmth. In rare cases, blood clots can develop in the lung, which may be life-threatening. Typical symptoms include shortness of breath, chest pain, and blood in the phlegm. If in doubt, please check with your doctor.

To minimise the risk of blood clots, we encourage early mobilisation on the same day post-surgery or the day after. This helps to maintain the blood circulation in your legs. You may be given stockings, compression calf pumps or medication to reduce the risk of blood clots.

Any past history of blood clots should be brought to the attention of your surgeon before surgery.

– **Meniscus or graft tear requiring revision surgery**

There can be many reasons for a revision surgery. A possible reason is a torn ACL graft or meniscus re-tear. If this is necessary, your surgeon will discuss the details with you.

– **Stiffness**

Early mobilisation and individualised exercises are recommended by the physiotherapy team to improve rehabilitation and maximise your chances of returning to an ideal range of motion. Regular physiotherapy is important for optimal recovery.

– **Persistent Pain**

Some patients encounter residual discomfort even after a successful surgery and this usually does not affect day-to-day activities. Rarely, patients develop complex regional pain syndrome which causes pain, swelling, skin changes and stiffness.

– **Nerve and Vascular Injury**

You may feel some numbness near the surgical site. This may persist but does not normally cause problems.

Rarely, the larger nerves may be damaged and cause permanent weakness, altered sensation and pain in the lower limb. Major vascular injury is rare for knee surgeries.



– **Medical Risks**

You will be thoroughly assessed by our doctors before surgery, with any risks explained to you in detail. Such risks include heart attacks, strokes and lung problems such as pneumonia. They are rarely life-threatening.

Before Surgery

+ At the Outpatient Orthopaedic Clinic

You and your orthopaedic surgeon have decided that an ACL reconstruction is suitable. The risks of this procedure will be explained in detail before your written consent is obtained.

You will then be referred to the Pre-operative Assessment Clinic and for pre-operative education and physiotherapy before the surgery.

+ At the Pre-operative Assessment Clinic

Your fitness for surgery will be assessed by our anaesthetic team and any pre-operative investigations may be arranged as necessary.

Occasionally, referrals to other medical specialties may be required.

+ Pre-operative Education and Physiotherapy

Before your surgery, your surgeon may recommend a physiotherapist to show you some exercises you can do before and after surgery. He/she may also recommend minor home adjustments to aid in your home care after surgery.

We strongly advise you to attend physiotherapy sessions before surgery to improve the range of motion of your knee. This prevents excessive loss of strength and flexibility in your knee after surgery.

+ Preparing Your Home After Surgery and Identifying A Caregiver

A safe home environment is crucial in helping you recover after surgery. The following home modifications may be helpful:

- Arrange or remove furniture to provide a clear and wide enough path in your home.
- Keep floor surfaces dry and use non-slip mats.
- Tie loose electrical cables and cords to avoid tripping over them.
- Ensure your home is well-lit. Use night lights between your bedroom and bathroom.
- Check that you can get up from the toilet seat (do not use a squatting toilet), chair with an arm rest, and bed.
- Inform the physiotherapy and occupational therapy teams if you need to use stairs at home.
- Identify a caregiver to help you with daily activities, such as household chores and showers, for the first one to two weeks after surgery.



+ Your Health Matters

- Eating healthily before and after surgery promotes healing and recovery.
- Stop smoking before surgery as smoking increases the risk of complications during and after surgery.
- Stay active. Do the exercises recommended to you by your physiotherapist. They will help you maintain muscle strength and joint flexibility which will be helpful for your rehabilitation after surgery.
- If you develop a cold or experience health changes closer to your surgery, please inform the orthopaedic team.

Your Hospital Stay

Day of Admission and Duration of Hospital Stay

You will be asked to come to the hospital on the day of your surgery (unless otherwise advised). To prevent delays, please arrive on time.

At the hospital, your vital signs will be taken and these include your heart rate, blood pressure, body temperature and oxygen saturation. The anaesthetic and orthopaedic teams will discuss the proposed anaesthetic and surgery with you. You will have the opportunity to clarify any questions you may have.

Anaesthesia

The surgery is usually performed under general anaesthesia.

You will be unconscious and have your breathing assisted or controlled. The breathing tube placed in your airway (mouth/throat) will be removed after surgery.

In some cases, a nerve block (an injection of local anaesthesia near the nerves around the knee) may be used to reduce pain after surgery. They can last up to 24 hours.

Surgery and Recovery

The surgery will last approximately 2 hours. After surgery, you will be transferred to the recovery ward, where you will be monitored before being transferred back to the general wards.

The ACL reconstruction may be done as a day surgery or with an overnight stay in the hospital.

After surgery, pain relief in the form of tablets and/or injections will be administered to you to help with the normal post-operative pain and swelling. With rehabilitation, the pain and swelling will subside. On the day of discharge, painkillers will be given to you. Most patients experience resolution of pain and swelling after 4 to 6 weeks.

In addition, you may need to wear a knee brace to protect a meniscal tear while it heals. Unless otherwise advised by your doctor, you should be able to walk with the aid of crutches immediately after surgery.



At Home

Follow-up and Wound Care

The orthopaedic team will schedule a follow-up appointment for you at the outpatient clinic. Skin stitches or staples used during surgery will be removed 2 weeks post-surgery. Occasionally, absorbable stitches are used and they need not be removed.



Do not allow water to come into contact with your wound until 2 weeks after your surgery and take sponge baths instead. You may find using a bath chair useful. Do not scratch or pick at your wound. If you notice a large amount of fluid draining from the wound and the dressing soaks through despite repeated changes, please inform the orthopaedic team. Be careful of wet and slippery surfaces in the bathroom as your knee's muscle strength and coordination may not have fully recovered.

You may shower normally once the stitches/staples are removed 2 weeks after surgery and when your doctor is satisfied with the healing of your wound.

Post-discharge Rehabilitation

You will have to attend regular follow-up and physiotherapy sessions post-surgery. This is important in regaining muscle strength and improving the range of your knee's movement and control.

Full recovery and return to sports may take up to 12 months.

Frequently Asked Questions

+ Who is this surgery for?

- Patients whose goal is to continue sport activities that involve knee pivoting as well as jumping and cutting; especially those who engage in competitive sports
- Patients who feel unstable in daily activities such as brisk walking on uneven terrain or coming down the stairs
- Patients whose jobs are physically demanding and require agility in movements

+ What should I do if I am not feeling well before surgery?

Please inform the hospital and the orthopaedic team. You may need to be reassessed and have your surgery rescheduled.

+ How much time off work should I take?

One to two weeks for a desk-bound job, approximately three months for moderately physical work, and up to six months or more for strenuous physical work.

+ What do I need to look out for when I'm discharged?

Pain and swelling is common after the operation and it may persist up to a few weeks after the operation. You can manage your pain and swelling by applying ice on your knee for 20 minutes, once or twice a day. Elevating your leg at night with a pillow under the ankle may also help to reduce the swelling. However, if you experience any excessive pain, any new numbness, tingling or discoloration in your foot, do consult your doctor or visit the clinic immediately.

Every individual's experience following surgery is different. Your course of rehabilitation will be customised based on your needs. Should you have queries, please consult your doctor or physiotherapist.

+ When should I call my doctor?

- If you develop a fever (over 38°C)
- If you experience sudden, severe pain at your knee
- If you experience pain in your calf or chest
- If your surgical wound turns red, swollen and/or is persistently draining fluid

+ How much weight can I put on my operated leg after surgery?

For ACL reconstructions without meniscal repairs and unless advised, you may be allowed to put your full body weight (as tolerated) on the operated knee immediately after surgery. Please follow instructions from your doctor and physiotherapist.

Limitations may apply if you had meniscal repairs or cartilage procedures performed.

+ How much activity can I do after surgery?

Initially, most of your activity is done in physical therapy. Stationary exercise bike, stair master, and elliptical machine are activities you can do early in rehabilitation, usually from 4 to 6 weeks onwards after surgery. It will take about 4 to 5 months for you to start jogging (first on treadmill) once your targeted strength recovery is achieved. Cutting activities and agility drills only commences at 7 to 9 months after surgery.

Full release to sports is upon clearance from your surgeon and physiotherapist approximately at the one year mark. This is only after strength recovery in the operated limb has been achieved, sports-related drills have been accomplished, and the operated limb remains pain free.

Another reason to avoid early strenuous physical activity is that the ACL graft takes at least 6 to 9 months to "re-vascularise" and integrate. Too early a return to sports after surgery risks ACL graft re-tear.

+ Why is my knee numb?

The incision made during the surgery interrupts small superficial skin nerves that supply the skin on the front and outside of the knee, causing numbness around the area. The area of numbness can take 6 months to 1 year to shrink in size. For some patients, this numbness can often be permanent.

+ Will my replacement ACL be as good as the original one?

Many athletes who have torn their ACL and have opted for a surgical reconstruction and rehabilitation have returned to their sports, won national championships, and enjoyed long professional careers.

Most recreational athletes are also satisfied with the results and find that they can continue engaging in their favourite activities after surgery and rehabilitation. From this point of view, the function of the knee is nearly completely restored by reconstructive surgery.

Surveys of patients have also indicated that in the long run, over 90% of people who have had ACL surgery are glad they had it done, and would choose to have it done again.

Our Patient Care Institutions

National University Hospital
Ng Teng Fong General Hospital &
Jurong Community Hospital
Alexandra Hospital
National University Polyclinics
Jurong Medical Centre
National University Cancer Institute, Singapore
National University Heart Centre, Singapore
National University Centre for Oral Health, Singapore
NUHS Diagnostics
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