

Patient information from BMJ

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Anterior cruciate ligament injury

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Your anterior cruciate ligament connects your thigh bone to your shin bone and helps keep your knee joint stable. Anterior cruciate ligament tears are common sporting injuries and can make your knee unstable. Physical therapy can help you to recover. But if you're very active you might need surgery in order to do everything you did before your injury.

We've looked at the research on anterior cruciate ligament injuries and talked to experts about the best way to treat them. You can use our information to talk to your doctor and decide which treatments are best for you.

How do anterior cruciate ligament injuries happen?

Sporting injuries are a common cause of a torn knee ligament. Anterior cruciate ligament tears are most common in sports that involve changing direction quickly, pivoting, or jumping, such as basketball, skiing, football, or gymnastics.

You're most likely to tear your anterior cruciate ligament if you over-extend or twist your knee joint. Direct blows to the knee or leg may also tear the anterior cruciate ligament.

What are the symptoms?

When you injured your knee you may have heard a popping noise as the ligament tore. Your knee may feel unstable or keep giving way. For some people the injury isn't too painful, but others find that it hurts a lot.

If you tear your ligament while doing sports your knee will probably be too painful or unstable for you to carry on playing. Your knee might swell up quickly, but people don't always notice it.

What treatments work?

The treatment you need will partly depend on how severe the injury was, and on whether you've damaged other parts of your knee.

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But the thing that might guide your treatment the most is your lifestyle. If you don't place too many demands on your knee joint - for example, if you don't play sports and don't have a very physical job - you may not need, or want, a lot of treatment.

But if you have a job that involves a lot of physical activity, or if you play a lot of sports, you may need intensive physical therapy to help you heal, and even surgery to rebuild the ligament.

Soon after the injury

The things to do in the first few days after your injury can be remembered using the abbreviation **PRICEM**:

- **Protected** weight-bearing exercise ("protected" means you use crutches, a brace, a knee immobilizer, or a combination of these). You need to keep your knee moving a little, now and then, so that it doesn't stiffen up so much that you lose any of what doctors call your "range of motion." But you shouldn't do anything that causes you pain.
- **Rest.** It sounds obvious, but you need to rest as much as possible to avoid making the injury worse. Getting a good balance between rest and exercise can help you recover more quickly. Your doctor or physical therapist will be able to help with this.
- **Ice** helps with pain and swelling in the first few days after the injury, but you should wrap the ice in a towel to stop it damaging your skin.
- **Compression** with an elasticated bandage will help with support and swelling.
- **Elevation.** For the first few days you should rest with your foot at a level that's higher than your hip.
- **Medicines.** Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, can help reduce pain and inflammation. But they don't help the ligament to heal. Your doctor can prescribe a stronger drug than ibuprofen if you need it.

You might need an x-ray to investigate the damage to your knee. Some people also need an MRI scan.

If you're not very active

There are several reasons why you may choose not to have extensive treatment for your injury:

- You don't have a very physical job
- You don't play a lot of sports
- You have health problems that mean you aren't very active
- You're older and less active than you used to be
- You just don't want to have surgery.

If this is the case your doctor will probably recommend some physical therapy exercises that you can do at home. He or she may also recommend that you sometimes wear a knee brace to support your knee, and that you take care about the kinds of physical activity that you do.

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Physical therapy helps strengthen the muscles around your knee. This supports the joint and helps to make up for the instability caused by the torn ligament. Physical therapy can also help you be more aware of your body, so you learn to move your knee in a way that doesn't risk injury.

Home physical therapy should strengthen your knee enough so that you can do the everyday activities you need to do, such as walking and getting about as normal. But you may not be able to do everything you could do before the injury.

If you're moderately active

If the demands you place on your knee are going to be a little more strenuous - for example, maybe you enjoy golf, swimming, cycling, jogging, or tennis - you may need treatment that's more intensive.

This should involve sessions with a trained physical therapist, tailored to the activities you want to do.

Your physical therapist may also recommend that you sometimes wear a knee brace that's been specially designed for you. This can help support your knee while you are playing the sports you enjoy, while allowing you a good amount of movement.

If you're very active

If your lifestyle involves you putting a lot of pressure on your knee joint you will probably need surgery to rebuild the ligament. For example, you may need surgery if:

- You have a job with a lot of physical demands, such as working in construction, the police, or the military
- You are a professional athlete
- You're not a professional athlete but you play contact sports such as football or rugby.

The aim of surgery is to rebuild your torn ligament. It's done using a graft, which can come from your own body (an autograft) or a donor (an allograft).

If you have an autograft, your surgeon will take a section of healthy tendon from another part of your leg (for example, from your hamstring or from near your kneecap) and use it to repair your anterior cruciate ligament. You should talk to your surgeon about which type of graft is best for you.

This kind of surgery will usually take between one and three hours. The operation can be done as a keyhole surgery through several small cuts in your skin, or as open surgery through a larger cut. You'll either have a general anesthetic to make you sleep, or an injection into your spine to numb the lower part of your body.

You may be ready for surgery within one or two weeks of your injury, but there's no need to rush into deciding whether you want the operation. You can decide to have surgery later on if you wish.

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Although anterior cruciate ligament reconstruction operations are common, like all surgeries they carry risks, such as infection, a blood clot in a vein (deep vein thrombosis or "DVT"), or damage to the nerves or blood vessels in your knee.

Some people end up with a smaller range of movement in their knee after surgery or feel pain around their kneecap. You should thoroughly discuss the potential risks and benefits of surgery with your surgeon.

How quickly you get back to normal after surgery will depend on lots of things, such as how fit you are and how badly you hurt your knee in the first place. Full recovery can take between six and 12 months. Most people can run after about four months and are ready for strenuous activity by eight months.

You should start physical therapy within a few days of the operation. To make as full a recovery as possible it's important to stick to your physical therapy plan, and not to start strenuous exercise too soon.

You need to be reasonably fit to be suitable for surgery. In general, there's nothing to stop you choosing surgery if you are older, if an unstable knee is stopping you from doing the things you want to do.

What will happen to me?

Without surgery, your knee probably won't be quite as strong as before. You'll be able to get back to your everyday activities, but you might need to adjust your lifestyle.

The damage caused by the injury means there's a higher chance you'll get arthritis in your knee at some point in the future. It's not clear whether having surgery to rebuild the ligament can reduce this risk.

Surgery offers the best chance of getting your knee strong and stable enough for sports and other demanding activities, but the benefits won't last unless you stick to a physical therapy program. Among athletes with a torn anterior cruciate ligament, between 4 in 10 and 9 in 10 eventually get back to full fitness. However, psychological factors, such as anxiety and confidence, may play a role in whether an athlete returns to full competitive sports.

If you're starting to play sports again, good technique and footwork are important to prevent another injury. Strengthening the muscles around your knee and having good general fitness will also help.

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