CONDITION

Kneecap instability

Kneecap instability is repeated slipping or dislocation of the kneecap from its normal groove.

WHAT IT IS
Repeated slipping or dislocation of the kneecap

BODY SYSTEM
Bones, joints and muscles

MAIN SYMPTOMS
Kneecap shifting, front knee pain, swelling, buckling

WHAT CAUSES IT
Injury, joint shape, loose ligaments, muscle control

HOW IT IS DIAGNOSED
Examination and X-rays, sometimes MRI or CT

MAIN TREATMENT
Rehabilitation, bracing, and sometimes stabilising surgery

CAN IT BE CURED?
Sometimes - treatment can restore lasting stability

IS IT AN EMERGENCY?
Sometimes - kneecap stuck out or foot numb and cold

LONG-TERM OUTLOOK
Many regain function; recurrence and arthritis remain possible

Overview

Kneecap instability means the kneecap does not stay securely in its usual track. The medical name for the kneecap is the patella. It normally moves up and down in a groove at the end of the thigh bone as you bend and straighten your knee.

The kneecap may shift partly out of this groove, called a subluxation. If it comes fully out, it is called a dislocation. It usually moves toward the outside of the knee. Some people have one dislocation after an injury, while others develop repeated slipping or a constant sense that the knee is unreliable.

During a dislocation, the tissues that guide the kneecap can stretch or tear. The most commonly injured stabilising tissue is the medial patellofemoral ligament, or MPFL, on the inner side of the knee. The smooth joint cartilage may also be damaged.

Instability matters because repeated episodes can cause pain, swelling, loss of confidence in the knee and difficulty with sport or daily activities. Over time, cartilage damage may contribute to arthritis behind the kneecap.

Symptoms

Symptoms can begin suddenly during a dislocation or develop between repeated episodes.

Common symptoms include:

A dislocation may happen during a twist, awkward landing or direct blow. Some kneecaps slide back into place on their own. When this happens, the knee may still be painful and swollen, and it should be assessed for cartilage or bone injury.

Catching or locking can mean a fragment of cartilage or bone is moving inside the joint. Locking means the knee becomes physically stuck, rather than simply feeling painful or hesitant.

- A kneecap that visibly moves or sits toward the outside
- A feeling that the kneecap is slipping, especially when turning
- Pain at the front or inner side of the knee
- Swelling after an injury or instability episode
- Buckling or lack of confidence when using stairs
- Stiffness and difficulty straightening or bending the knee

Causes and risk factors

Kneecap instability often results from a combination of an injury and the natural shape or alignment of the knee.

A first dislocation may happen when the foot is planted and the body changes direction. It can also follow a direct impact that pushes the kneecap sideways. Afterward, stretched or torn stabilising tissues may make another episode more likely.

Some people are more vulnerable because of how their knee developed. These features include:

These features are not caused by anything you did. Some can run in families, but kneecap instability is not usually explained by one inherited condition.

Having had a previous dislocation is an important risk factor for another episode. Instability

that starts while the bones are still growing may also behave differently from instability beginning in adulthood.

- A shallow or uneven groove for the kneecap, called trochlear dysplasia
- A kneecap that sits higher than usual, called patella alta
- Alignment that pulls the kneecap toward the outside
- General joint looseness, also called ligament laxity
- Knock-kneed leg alignment or unusual rotation of the thigh or shin
- Reduced control of the hip and thigh muscles

Diagnosis

Diagnosis starts with the history of what happened. A healthcare professional may ask whether the kneecap moved fully out, whether it returned by itself, and whether you have had earlier episodes.

The examination checks swelling, tenderness, movement and how the kneecap tracks. The stability of the knee ligaments and the strength and control of the leg may also be assessed. Both legs may be compared because natural joint looseness and alignment can affect both sides.

X-rays show the position and shape of the bones. They may also reveal a fracture or a piece of bone pulled away during the injury.

An MRI scan gives a clearer view of cartilage, ligaments and other soft tissues. It is particularly useful when there is concern about an MPFL injury, a loose cartilage or bone fragment, or another knee injury.

A CT scan is not needed for everyone. It may be used to measure bone alignment or rotation, often when surgery is being considered.

No single scan explains every case. The diagnosis and treatment plan are based on the symptoms, examination, imaging and number of instability episodes together.

Treatment and management

A kneecap that remains dislocated needs to be put back into its groove, a procedure called reduction. This should be done by a trained healthcare professional. Do not repeatedly force the kneecap yourself, especially after a major injury or if the leg looks deformed.

After a first dislocation, treatment is often non-surgical if there is no large fracture or loose cartilage fragment. Early care may include short-term support, appropriate pain relief and gradual return of knee movement. A brace may be used for comfort or to guide the kneecap, although the type and length of use are chosen for the individual injury.

Physiotherapy is a central part of recovery. Rehabilitation commonly works on:

Exercise cannot change the shape of the bones, but better strength and movement control can improve function and confidence. Return to sport is usually based on recovery of movement, strength, control and stability rather than time alone.

Surgery may be considered after repeated dislocations, ongoing symptoms despite rehabilitation, or an injury that has detached a significant piece of cartilage or bone.

The operation is matched to the reason for the instability. MPFL reconstruction replaces the damaged inner stabilising ligament using a tendon graft. Bone realignment surgery may change the direction of pull on the kneecap. In selected people with a severely abnormal groove, surgery can reshape that groove. More than one procedure is sometimes required.

Surgery does not guarantee that all pain will disappear. Possible risks include stiffness, infection, blood clots, continued instability, pain and later arthritis. Recovery usually involves several months of rehabilitation.

- Restoring comfortable knee movement
- Strengthening the thigh, hip and trunk muscles
- Improving balance and control during turns and landings
- Gradually rebuilding walking, running and sport-specific skills

Complications

A dislocation can damage the smooth cartilage covering the kneecap or thigh bone. A fragment may break loose and move within the knee, causing swelling, catching or locking.

Other possible complications include repeated instability, persistent front-of-knee pain, stiffness and weakness. Some people begin avoiding activities because they do not trust the knee.

Repeated dislocations and cartilage injury can increase the chance of patellofemoral arthritis. This is wear in the joint between the kneecap and thigh bone. Arthritis is possible, but it does not develop in everyone with instability.

Prevention

Kneecap instability cannot always be prevented. Bone shape, leg alignment and natural ligament looseness are not under your control.

After an instability episode, completing rehabilitation may improve muscle control and reduce avoidable risks when returning to activity. A gradual return allows strength, balance and landing technique to recover. Bracing or taping may help some people during selected activities, but it does not correct underlying bone shape or prevent every dislocation.

If instability is caused mainly by severe structural features, exercise alone may not stop it. Specialist assessment can clarify whether continued rehabilitation or surgery is more appropriate.

Living with it and what to expect

Pain and swelling from a first dislocation often settle gradually, but rebuilding movement, strength and confidence takes longer. Some people return to their usual activities after rehabilitation and never have another dislocation. Others continue to notice slipping, pain or fear during twisting movements.

Repeated episodes may lead to changes in activity, further imaging or a discussion about surgery. If an operation is needed, improvement usually develops over months as the knee heals and strength returns. Rehabilitation remains important after surgery.

The underlying shape of the knee does not change with exercise. However, stronger muscles and better movement control may help the kneecap track more reliably. If symptoms continue, lower-impact activities can sometimes be easier to manage than sports involving rapid turns or contact.

Routine follow-up is appropriate if the knee remains painful, swollen or unreliable, even if the kneecap has returned to place. New locking, repeated swelling or reduced movement also deserves reassessment.

When to get medical help

Seek emergency care if:

Do not force a visibly dislocated kneecap back into place. Keep the knee supported in the position that is most comfortable while arranging care.

Get prompt medical assessment after a suspected dislocation, even if the kneecap moved

back by itself. An examination and imaging may be needed to check for a fracture or cartilage injury.

Arrange routine follow-up if you have repeated slipping, ongoing front-of-knee pain, difficulty returning to normal activities, or a sense that the knee may give way. Persistent locking or recurrent large swelling should be assessed sooner because they can indicate a loose fragment inside the joint.

- The kneecap remains out of place or the knee looks badly deformed
- The foot becomes cold, pale, blue, numb or unusually weak
- There is an open wound over the injured joint
- A major injury leaves you unable to move the leg

Common questions

Can a kneecap dislocation fix itself?

The kneecap sometimes slides back into its groove without assistance. This corrects its position but does not rule out ligament, cartilage or bone damage. A first suspected dislocation should still be assessed, particularly if there is marked swelling, locking or difficulty bearing weight.

Will I need surgery for kneecap instability?

Not everyone needs surgery. A first uncomplicated dislocation is often managed with rehabilitation. Surgery is more likely to be discussed after repeated dislocations, continued instability despite rehabilitation, or significant cartilage, bone or alignment problems.

Can I walk after my kneecap has dislocated?

Some people can walk after the kneecap returns to place, while others cannot because of pain, swelling or another injury. Avoid testing the knee forcefully. Support and weight-bearing advice should be based on the examination and imaging findings.

Can physiotherapy stop my kneecap from slipping?

Physiotherapy can improve strength, balance and control around the knee and hip. This may reduce symptoms and help prevent some repeat episodes. It cannot reshape a shallow groove or correct major bone alignment, so it may not fully control instability caused by those features.

Can I return to sport?

Many people return to sport after appropriate rehabilitation, but timing is individual. The knee should have recovered movement, strength, control and confidence. Repeated instability,

swelling or pain during turning and landing may mean further assessment is needed.

Does kneecap instability cause arthritis?

It can increase the risk, especially when dislocations repeatedly damage joint cartilage. Arthritis is not inevitable. The long-term risk is influenced by the amount of cartilage injury, the number of episodes and the alignment of the kneecap.

Sources

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