CONDITION

Kneecap tracking disorder

Kneecap tracking disorder is abnormal movement of the kneecap within its groove during knee motion.

WHAT IT IS
Abnormal kneecap movement in its thighbone groove

BODY SYSTEM
Bones, joints, and muscles

MAIN SYMPTOMS
Front knee pain, grinding, catching, giving way

WHAT CAUSES IT
Knee anatomy, muscle control, overuse, or injury

HOW IT IS DIAGNOSED
Clinical examination, with X-rays or MRI when needed

MAIN TREATMENT
Activity changes and targeted physical therapy

CAN IT BE CURED?
Sometimes - symptoms resolve with rehabilitation

IS IT AN EMERGENCY?
Sometimes - kneecap stays displaced or foot becomes cold

LONG-TERM OUTLOOK
Often manageable, but pain or instability can recur

Overview

Kneecap tracking disorder describes abnormal movement of the kneecap as you bend or straighten your knee. The medical term is patellar maltracking .

Your kneecap, or patella, normally slides within a V-shaped groove at the lower end of your thighbone. This is called the trochlear groove. Muscles, tendons, ligaments, and the shape of your bones help keep the kneecap centred.

With a tracking disorder, the kneecap may move too far toward one side, tilt, or fail to stay centred. This can place extra pressure on the joint and the cartilage covering the back of the kneecap.

Kneecap tracking disorder is a description of how the joint moves, rather than one single

disease. It may be associated with patellofemoral pain , meaning pain where the kneecap meets the thighbone. In some people, it is linked to kneecap instability, including partial slipping called subluxation or complete dislocation.

A kneecap that looks or feels slightly off-centre does not always cause symptoms. Treatment usually focuses on pain, instability, and loss of function rather than the appearance of the kneecap alone.

Symptoms

Symptoms often develop gradually, especially after a change in exercise, work, or daily activity. They may affect one or both knees.

Common symptoms include:

Clicking or grinding without pain is common and does not, by itself, prove that the joint is damaged.

If the kneecap partially or completely dislocates, there may be sudden pain, rapid swelling, or a visible change in shape. Some kneecaps move back into place on their own. Even when this happens, an assessment is important because cartilage, bone, or stabilising ligaments may have been injured.

- Pain at the front of or around the kneecap
- Pain when using stairs, squatting, running, jumping, or walking downhill
- Aching after sitting with the knee bent for a long time
- Grinding, clicking, or a catching feeling during movement
- A feeling that the knee may give way
- Swelling after activity
- A sense that the kneecap is shifting sideways

Causes and risk factors

Kneecap tracking is controlled by several structures working together. Symptoms often arise from a combination of joint shape, muscle control, and the amount of stress placed on the knee.

Possible contributing factors include:

Some anatomical features can run in families, but kneecap tracking disorder is not usually

caused by one inherited gene.

Foot position and flexibility may influence knee movement in some people. However, there is rarely one simple cause such as "weak inner thigh muscles" or "flat feet." A complete assessment is more useful than focusing on one body part.

- A shallow or uneven groove in the thighbone
- A kneecap that sits unusually high
- Differences in leg alignment or the rotational shape of the bones
- Loose or injured tissues that normally stabilise the kneecap
- Reduced strength or control in the hip and thigh muscles
- A previous kneecap dislocation or other knee injury
- A sudden increase in running, jumping, squatting, or stair use
- Repeated knee loading without enough recovery

Diagnosis

There is no blood test for kneecap tracking disorder. Diagnosis usually begins with your symptoms and a physical examination.

A clinician may ask when the pain started, what movements make it worse, and whether the kneecap has ever shifted or dislocated. They may watch you stand, walk, squat, or step down. The examination can assess knee alignment, tenderness, swelling, muscle control, and how the kneecap moves.

The clinician may also check for signs of instability. One example is discomfort or fear that the kneecap will slip when it is gently moved sideways.

Imaging is not always needed for mild symptoms without an injury. It may be recommended when pain continues, the knee has been injured, or there is possible instability.

X-rays can show the position of the kneecap, the shape of its groove, fractures, and some signs of joint wear. Special kneecap views may be used.

An MRI scan gives more detail about cartilage, ligaments, tendons, bone bruising, and other soft tissues. It is particularly useful after a dislocation or when another knee condition is suspected. CT scans are sometimes used to examine bone alignment or plan surgery.

Other conditions can cause similar symptoms, including tendon problems, meniscus injuries, arthritis, or pain referred from the hip. The diagnosis should not be based on clicking or knee appearance alone.

Treatment and management

Treatment depends on whether the main problem is pain, instability, a recent injury, or a combination of these. Most people begin with nonsurgical care.

You may need to temporarily reduce movements that clearly increase pain, such as deep squats, running hills, or repeated jumping. Complete rest is not usually the goal. A gradual return to comfortable movement can help maintain strength and fitness.

Exercise-based physical therapy is a central treatment for patellofemoral pain. A program may work on the muscles around the hip and knee, movement control, balance, and flexibility. Exercises are adjusted to your current ability and activities rather than being limited to one thigh muscle.

Taping or a kneecap-supporting brace may reduce symptoms for some people. These are usually used as short-term aids alongside exercise, not as permanent ways to force the kneecap into position.

Shoe inserts may help selected people, particularly when foot movement contributes to symptoms. They do not correct every cause of kneecap tracking.

Cold packs and nonprescription pain medicines may provide short-term relief. Medicines do not correct tracking, and they may not be suitable for everyone. A pharmacist or clinician can help you consider factors such as stomach, kidney, heart, pregnancy, or medication concerns.

Surgery is not usually needed for pain alone. It may be considered after repeated dislocations, major cartilage or bone injury, or ongoing instability despite appropriate rehabilitation. The procedure is chosen according to the specific cause. It may repair or reconstruct a stabilising ligament, address damaged cartilage, or change bone alignment. Recovery usually includes several months of rehabilitation.

Complications

Ongoing pain can make stairs, work, exercise, and prolonged sitting difficult. Avoiding activity for a long time may lead to reduced muscle strength and confidence in the knee.

Repeated kneecap instability can stretch or tear the tissues that hold the kneecap in place. A dislocation may also damage cartilage or break off a small piece of bone. These injuries can increase the chance of continuing pain and later joint wear, although this does not happen to everyone.

A knee that repeatedly gives way can also increase the risk of falls or further injury. Prompt assessment after a first dislocation can identify damage and guide rehabilitation.

Prevention

Kneecap tracking disorder cannot always be prevented. Bone shape, joint looseness, and some alignment differences are not caused by anything you did.

You may be able to reduce symptoms or future flare-ups by increasing exercise loads gradually. Sudden changes in running distance, hill training, jumping, or heavy squatting can overload the joint.

Maintaining hip and thigh strength may improve control of the kneecap during movement. If you have had a dislocation, completing rehabilitation can help restore strength, balance, and confidence before returning to sport.

Braces, taping, and footwear do not guarantee prevention. Their usefulness depends on your symptoms, activities, and the reason the kneecap is unstable.

Living with it and what to expect

Kneecap pain often changes over time. It may settle and then return after a rapid increase in activity, a new sport, prolonged kneeling, or repeated stair use.

Improvement with rehabilitation usually takes time. Strength, movement control, and tolerance for activity often build over weeks to months rather than days. Progress is not always steady, and a brief flare does not necessarily mean that the knee has been newly damaged.

Some anatomical features will not change with exercise. Even so, better muscle control and sensible activity progression can reduce the stress placed on the kneecap. Many people can remain active by adjusting training and continuing strengthening exercises.

Instability has a less predictable course. Some people have one dislocation and no further episodes. Others experience repeated slipping, particularly when there are strong anatomical risk factors. Ongoing instability may lead to a discussion about surgery.

Routine follow-up is appropriate if pain is not improving, swelling keeps returning, or the knee limits normal activities. A review can check the diagnosis and adjust rehabilitation rather than simply telling you to stop being active.

When to get medical help

Arrange a routine appointment if pain lasts for several weeks, regularly returns, or interferes

with walking, stairs, sleep, work, or exercise. You should also seek assessment if the kneecap feels unstable or has previously slipped out of place.

Seek urgent medical care after an injury if:

Do not try to force a visibly displaced kneecap back into place.

Get emergency help if the foot becomes cold, pale, blue, numb, or unusually weak after a knee injury. These symptoms may indicate a problem with blood flow or nerves.

A hot, red, very swollen knee with fever also needs urgent assessment because infection is a possible cause. These symptoms are not typical of a simple tracking problem.

- The kneecap looks out of place or remains displaced
- You cannot put weight on the leg
- The knee becomes very swollen soon after the injury
- The knee locks and cannot fully bend or straighten
- You felt a pop followed by instability or major swelling

Common questions

Is kneecap tracking disorder the same as runner's knee?

Not exactly. "Runner's knee" commonly refers to patellofemoral pain, which is pain around or behind the kneecap. Abnormal tracking may contribute to that pain, but not everyone with patellofemoral pain has obvious maltracking.

Can I push my kneecap back into alignment?

Do not force a kneecap that is visibly dislocated. It needs urgent medical care. For gradual tracking problems, treatment focuses on movement, strength, and the causes of instability rather than repeatedly pushing the kneecap into position.

Will a knee brace fix the tracking problem?

A brace may reduce pain or provide a sense of support, but it does not permanently change bone shape. It is usually most useful as an addition to rehabilitation.

Does grinding mean the cartilage is wearing away?

Not necessarily. Grinding or crackling can occur without significant damage, especially when it is painless. Painful grinding, swelling, or loss of function deserves assessment, but sound alone cannot show the condition of the cartilage.

Can I still exercise with kneecap tracking pain?

Often, yes. You may need to reduce or change painful activities while building strength and tolerance. Lower-impact options may be more comfortable during a flare. Sharp pain, repeated giving way, or increasing swelling should be assessed.

Will I need surgery?

Most people with pain alone do not need surgery. It is more likely to be considered for repeated dislocations, significant structural injury, or persistent instability that has not improved with appropriate rehabilitation.

Sources

- American Academy of Orthopaedic Surgeons. Patellofemoral Pain Syndrome . OrthoInfo.
- American Academy of Orthopaedic Surgeons. Unstable Kneecap . OrthoInfo.
- Willy RW, Hoglund LT, Barton CJ, et al. Patellofemoral Pain: Clinical Practice Guidelines Linked to the International Classification of Functioning, Disability and Health . Journal of Orthopaedic & Sports Physical Therapy . 2019;49(9):CPG1-CPG95.
- Collins NJ, Barton CJ, van Middelkoop M, et al. 2018 Consensus statement on exercise therapy and physical interventions to treat patellofemoral pain . British Journal of Sports Medicine . 2018;52(18):1170-1178.
- American College of Radiology. ACR Appropriateness Criteria: Chronic Knee Pain .
- NHS. Dislocated kneecap . NHS health information.