

Knee stiffness and arthrofibrosis

What you're feeling

A stiff knee after surgery or injury usually feels tight rather than painful. You may notice it most when you try to bend or straighten the knee fully. The tightness often sits at the front of the knee, around the kneecap, and can come with swelling and a feeling of fullness in the joint.

Stiffness tends to flare after activity, and many people find it hardest on waking, when the knee has been still overnight. Sitting with the knee bent for long stretches, such as in a car or at a desk, can make it worse. Standing up and moving around often loosens things a little, though the tightness usually returns after rest.

Everyday tasks that need a deep bend become difficult. You might struggle to squat to a low cupboard, kneel to load a dishwasher, get into a bath, or put on socks and shoes. Walking downhill or down stairs can feel awkward because the knee will not bend smoothly. Some people also find the knee gives way or feels unstable on uneven ground.

The stiffness can come from different causes. Sometimes it is pain that stops you moving the knee. Sometimes it is scar tissue inside the joint, a condition called arthrofibrosis, where tight bands of scar limit how far the knee can bend or straighten. When the knee cannot straighten fully, standing and walking feel tiring because the leg is always working at a slight bend.

Stiffness is not rare after knee surgery. About 1 in 10 people who have a knee ligament reconstruction and start supervised rehabilitation within 30 days are diagnosed with arthrofibrosis within 12 months. After a knee replacement, stiffness is a relatively common complication, and it is generally defined as less than 90 degrees of motion lasting more than 12 weeks.

If your knee is not loosening in the weeks after surgery, or the tightness is getting worse rather than better, it is worth having it assessed early.

What's actually happening

A healthy knee is built to move. The joint surfaces glide smoothly, and the lining of the joint produces fluid that keeps everything sliding freely. When you bend and straighten, the kneecap, the thigh bone and the shin bone all move together in a set pattern.

Arthrofibrosis changes that. Inside the joint, the soft lining becomes thickened and inflamed, and scar tissue starts to grow where it should not. Think of the joint lining like a smooth gasket that lets parts slide over each other. When it thickens and stiffens, it acts more like glue. The tight bands of scar you were told about in the section above are this scar tissue at work. They hold the knee still, which is why bending, straightening and deep bends feel so restricted.

Time matters here. If a knee is kept still for more than 3 weeks, some permanent stiffness usually follows. Scar tissue that sets in early can shorten over time. In severe cases, the tendon below the kneecap shortens as well, which pulls the kneecap down and limits bending further. Once scar tissue has matured like this, simply forcing the knee to move often cannot undo it, because the scar holds the kneecap in a fixed position.

Stiffness after a knee replacement works in a similar way but has several possible causes. Some relate to the surgery itself, some to swelling and scarring afterwards, and some to how the knee was before. In most people who develop it, the knee settles at less than 90 degrees of motion beyond 12 weeks, which is the definition used earlier on this page.

The same process can follow a ligament reconstruction or an injury to the joint surface. Damage to the quadriceps, the muscle at the front of the thigh, or scarring around the kneecap can also restrict movement on its own, with or without scar tissue inside the joint.

Knowing what is going on inside the knee helps explain why early movement and early assessment matter so much.

What we can do about it

X-rays are usually the first scans we use. An MRI scan can show the soft tissues inside the joint in more detail, including scar tissue, tendons and cartilage.

For most people, we begin with non-operative care. Physiotherapy aims to restore bend and straighten in the knee before scar tissue sets. One approach is static progressive stretch, where the knee is held in a stretched position for a period of time. Another is gravity-assisted movement, where the weight of your leg does the stretching for you. If your knee was operated on recently, we aim to get it moving early rather than waiting. Keeping the knee still for more than 3 weeks usually leads to some permanent stiffness, so early movement matters. If the knee has not regained at least 90 degrees of bend by 8 to 10 weeks after a fracture around the knee, that is a sign we should step up treatment.

We also look for causes that need treating first. Infection must be ruled out before anything else in a stiff, painful knee replacement. Pain relief and anti-inflammatory medicine can make movement more comfortable while you work on it.

If physiotherapy has not given enough improvement, we consider surgery. The first option is manipulation under anaesthetic, where your knee is gently bent and straightened while you are asleep. This works better for stiffness that limits bending than stiffness that limits straightening. If that does not help, the next step is arthroscopic surgery, often called keyhole surgery. The surgeon uses a small camera to cut away the tight bands of scar tissue inside the joint. For severe stiffness that has not responded to keyhole surgery, open surgery may

be offered to release the scar tissue more widely. After a knee replacement, revision surgery, where some parts of the replacement are changed, is sometimes considered for severe stiffness. Each of these operations has its own page, and we will talk through which option, if any, suits your knee.

What to expect

Most stiff knees improve with treatment, especially when it is picked up early. The outlook depends on what is causing the stiffness and how long it has been there. If your knee starts moving well in the first weeks after surgery or injury, the tightness often settles as swelling goes down and you regain strength.

Time matters. If stiffness is left alone, scar tissue can mature and set, and a knee kept still for more than 3 weeks usually keeps some permanent stiffness. Once that happens, simply forcing the knee to move often cannot undo it. This is why we keep coming back to early movement and early assessment.

If stiffness does take hold, treatment can still help, but it is honest work. Physiotherapy and stretching programs can restore motion before scar tissue sets. If the knee stays stiff beyond that, manipulation under anaesthetic or keyhole surgery to release the scar tissue can improve how far the knee bends and straightens. Most people gain motion and function from these treatments, though the size of the gain varies from person to person.

After a knee replacement, revision surgery for stiffness improved motion in 93% of knees, though the benefits are described as modest. That number is worth reading carefully. It means most knees move better afterwards, but not every knee returns to full, free movement.

There are a few things that shape your outlook. If the stiffness affects the whole knee rather than one part of it, results from surgery tend to be poorer. The same is true if more than 6 months pass between the original reconstruction and a surgical release. Acting within the first year gives a better outcome than waiting longer.

Some good news on timing: having your ligament reconstruction soon after injury, within the first 6 weeks, does not appear to raise the risk of stiffness compared with waiting. And an early movement program after ligament reconstruction has shown no permanent arthrofibrosis in the people studied, with only 0.7% needing a further operation for knee motion problems.

If your knee is not loosening as expected, come back to us early rather than waiting to see if it settles on its own.

When to see someone

Give a stiff knee a few weeks of movement and gentle stretching after surgery or injury. If it is not loosening by then, or the tightness is getting worse rather than better, book in with your GP and ask about a specialist review. The same applies if you cannot straighten the knee fully, because a knee that hangs at a slight bend when you stand is a warning sign in its own right. Early assessment matters more than anything else with this condition. Scar tissue that sets in the first months is much harder to undo later, and acting within the first year gives a better outcome than waiting longer.

See your GP sooner rather than later if the knee is hot, red or swollen in a way that feels different from normal post-surgery swelling, or if you have a fever or feel generally unwell with the stiffness. Infection needs to be ruled out before anything else in a stiff, painful knee, especially after a knee replacement, and that check should not wait.

Go to an emergency department if you have recently injured the knee and cannot bear weight at all, or the knee is visibly out of shape or locked in one position.