

Osteoarthritis of the knee

Patient Guide



Quality for life



Dear patient,

Osteoarthritis is the most common of all joint diseases. Osteoarthritis refers to changes in the joint when the layer of cartilage is damaged or destroyed by wear and tear that ultimately can also cause changes to the bone itself. Joint mobility is compromised and this can lead to inflammation and pain. Approximately 60% of all cases of osteoarthritis involves the knee. There are various causes: joint malalignment, age, constant overuse (e.g. from manual labour or obesity), sports injuries and accidents.

However, the ways of actively combating the symptoms of osteoarthritis are as varied as the causes. Options include exercise, mobility aids, healthy nutrition and medication.

There's no “one size fits all”. Patient experience has proven that many options work. What's right for you will be something that you decide with your doctor.

This guide aims to provide you with support. It explains osteoarthritis in detail and offers useful tips on how to cope with this very common condition.

Your Ottobock osteoarthritis team

How

osteoarthritis of knee progresses

Bones that come in contact with other bones are covered by cartilage at their contact points. Cartilage does not have blood vessels - it is supplied with nutrients through movement of the joint. That's why regular exercise is so important.

Cartilage ensures that the joint surfaces move against each other in the most efficient way and with little friction. It cushions and distributes the forces acting on the joint.

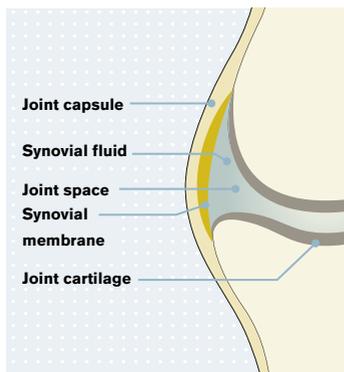
If the cartilage is damaged and its gliding properties are affected, it can no longer serve its purpose and the joint's range of movement can become limited. Because the cause of knee osteoarthritis (malalignment, as a result of an accident, etc.) is long term, damage to the cartilage is long-term and permanent too.

Ultimately, the cartilage develops cracks and begins to break down. At the same time, the bone thickens at the site of the damage. When the cartilage layer is completely worn away, the affected bones come in direct contact and rub against each other. Typical symptoms of osteoarthritis include joint pain and inflammation.

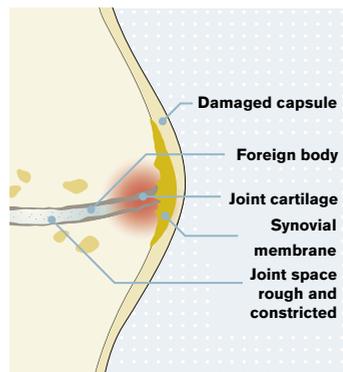
Because osteoarthritis (also known as degenerative arthritis) is a natural part of the aging process, it cannot be halted. By taking the right steps, however, you should be able to delay its onset.

A brief description of the four stages of osteoarthritis of the knee:

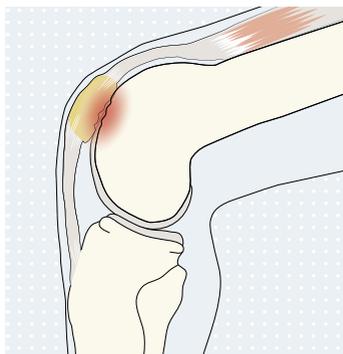
The progression of osteoarthritis is described by the medical community as having four stages. Stage one describes the initial cartilage changes – usually these cause no pain. Stages two and three mean that the deterioration has progressed, including cartilage damage – which is when knee pain generally begins.



▶ Healthy knee joint



▶ Arthritic knee joint



▶ Patellofemoral osteoarthritis

The the thickest joint cartilage in the human body is located behind the kneecap (patella). This is an area of high stress. Osteoarthritis occurring in this area is referred to as patellofemoral osteoarthritis.

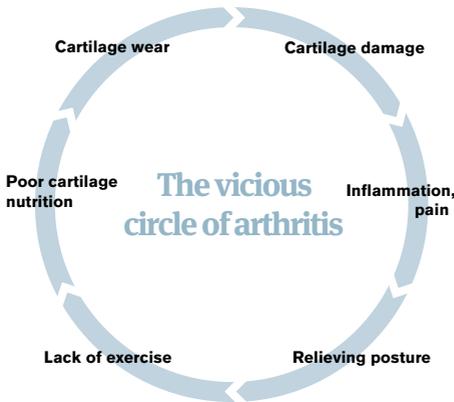
The signs of osteoarthritis of the knee

There are several common symptoms that signal knee osteoarthritis. They can occur individually or together.

With the initial onset of osteoarthritis, however, you may not notice any of these symptoms.

When symptoms appear, they usually occur in the following order:

- 1 Cracking in the joint
- 2 Pain during load-bearing activities, such as carrying heavy objects
- 3 Pain during everyday activities, such as climbing stairs
- 4 Reduced mobility
- 5 Swelling and inflammation



Classic progression of osteoarthritis

As soon as knee osteoarthritis causes pain, it creates a vicious circle: to get relief for a painful knee, the individual adopts a compensatory posture and limits their knee movement. Because this compensatory posture is unnatural, it can cause problems in other parts of the body, such as the hips. This reduced movement has a further effect, in that it reduces the supply of nutrients to the cartilage. The cartilage breaks down even more, which in turn increases pain.

DIY test for Osteoarthritis

Use the following test to determine whether you have developed osteoarthritis or if you might be susceptible to it in the future.

If you answer 'yes' to more than three questions, or simply suspect that you may have osteoarthritis, please consult your doctor.

- ▶ Does your knee make any noise during certain movements?
- ▶ Do you have pain when you climb stairs?
- ▶ Are you over 50 years old?
- ▶ Do you often perform load-bearing activities?
- ▶ Do you do any sports that involve sudden movements?
- ▶ Do you have joint pain following periods of activity?
- ▶ Do you have any pain when you get up in the morning?
- ▶ Have you ever had a joint injury?

Helpful treatments for osteoarthritis of the knee

As it's not possible to regenerate damaged cartilage, the treatment of osteoarthritis is generally aimed at alleviating its symptoms. The aim of treatment is therefore pain relief, and to maintain or even increase mobility.

Joint preservation (invasive) therapy

- **Lavage (joint cleaning):** Osteoarthritis grinds away cartilage. During a lavage procedure, a saline solution is injected into the knee. This dislodges any adhesions and washes loose cartilage particles out of the knee joint.
- **Shaving (cartilage smoothing):** a shaver – a medical instrument used to remove soft tissue and cartilage – is used to remove any frayed cartilage and smooth the cartilage edges. A lavage usually follows any shaving procedure.
- **Hyaluronic acid:** hyaluronic acid is injected into the knee, improving the consistency of the synovial fluid and thereby relieving the cartilage. This reduces discomfort and improves the function of the knee.
- **Corrective osteotomy (joint correction):** corrects faulty alignment of the bones and the resulting stress within the knee joint. This includes separating misaligned bones and relocating them to the correct position.

Joint replacement

- **Endoprosthesis (joint replacement):** here, the natural knee joint is replaced with an artificial joint. In the UK, this is a routine operation for knee pain caused by osteoarthritis. According to the NHS Choices website, over 70,000 such procedures are carried out annually in England and Wales, and the number is rising.

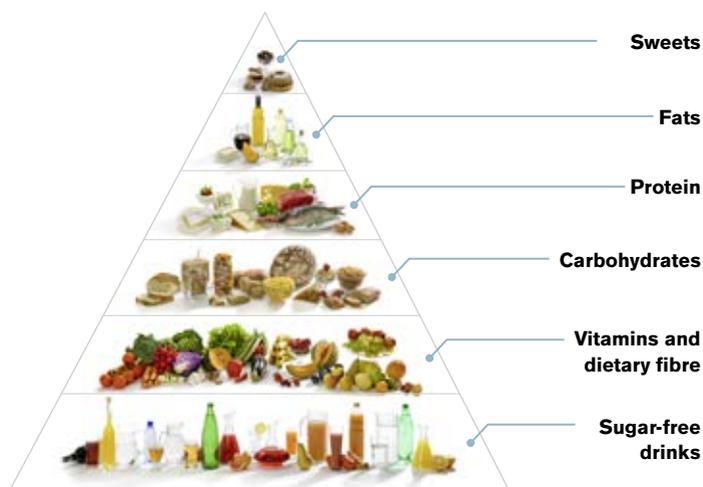
Joint-preserving (non-invasive) treatments

- ▶ Joint-specific exercises (such as physiotherapy and sports): with regular exercise you'll maintain your mobility, strengthen muscles and ensure your cartilage is supplied with the nutrients it needs, thus breaking the vicious circle of osteoarthritis.
- ▶ Temperature: warm or cold? The answer depends on the situation. With acute inflammation, cold relieves pain and helps control swelling. Heat may be applied only if the joint is not inflamed. It relaxes muscles and tendons and increases the flow of nutrients.
- ▶ Creams: various over-the-counter products are available at your local pharmacy, including pain gels and creams that can help relieve osteoarthritis pain.
- ▶ Dietary supplements: There are many supplements available that are intended to prevent further deterioration of cartilage. Most of them contain various quantities of the cartilage components glucosamine and chondroitin. Their effects are presently under debate.
- ▶ Orthopaedic devices (braces and supports): these are applied externally to the knee or leg and are intended to help relieve pain and improve mobility.
- ▶ Lifestyle: One of the most important things you can do to manage osteoarthritis is to live a healthy lifestyle. You can find out more about how to achieve this in the pages that follow.

Lifestyle and diet

There are several things you can do yourself to combat osteoarthritis. Living a healthy lifestyle definitely helps. If possible, avoid smoking and drinking. Eat plenty of salad, vegetables and fish and use cold-pressed oils. Apart from that, try to be calorie conscious and limit high fat foods, since every pound matters and the less you weigh, the easier it will be on your knees. If you are severely overweight, it may be advisable to diet under the supervision of your doctor.

The food pyramid below gives a quick overview of how you can eat in a balanced, nutritious way that will benefit your joints.

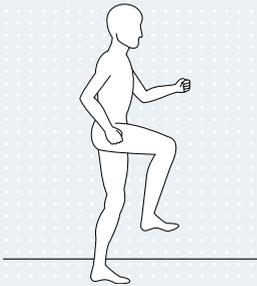




Four exercises that can help your knees

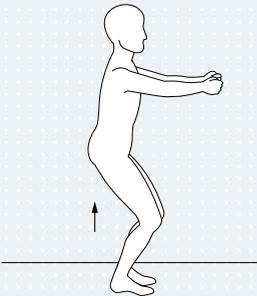
To promote muscle growth and to provide the cartilage with the necessary nutrients, it's important to exercise your knees.

1 Warm-up exercise – marching on the spot



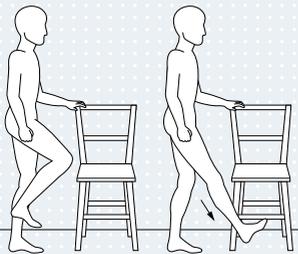
- 1 Before you begin joint exercises, you should warm up well. Your body will be prepared for the exercises, which will help you avoid injury.
- 2 For this reason, warm-up for at least half a minute by marching on the spot.
- 3 Take a short break, then repeat this exercise.

2 Gentle knee bends



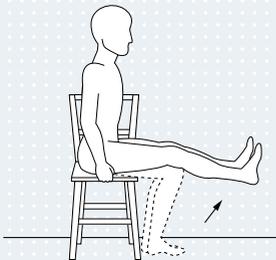
- 1 Stand upright, with your feet at hip-width apart.
- 2 Extend your arms in front of you at shoulder height.
- 3 Now go into a slight knee bend. Make sure you don't push your knees too far forward. Instead, focus on keeping your seat directed backwards. Your back should stay straight throughout the exercise. Finally, extend your legs and stand up.
- 4 Repeat the exercise 10 times.

3 Leg stretches



- 1 Stand upright and hold onto a wall or a chair. This will help you maintain your balance.
- 2 Lift one leg off the floor and bend it slightly.
- 3 Now, extend your leg as shown in the illustration. The foot should be flexed, with the toes pulled upwards.
- 4 Repeat the exercise 10 times. Now perform the exercise with your other leg.

4 Alternating steps while sitting



- 1 Sit down on a stable stool or chair.
- 2 Extend one leg forwards by sliding your heel along the floor. Do not overextend your knee. The other leg should remain bent, with the foot flat on the floor.
- 3 Now swap legs.
- 4 Repeat the exercise for about one minute.

What are mobility aids and what is available?

Orthopaedic mobility devices for the knee normally refer to orthoses - or braces - and supports. Both orthoses and supports are medical devices that are applied externally to the knee (and in the case of a brace, to the leg too).

The difference between braces and supports is fluid. In general, one can say that supports are made from a textile material, while braces also employ more stabilising materials.



Use the stairs without pain again – but how?

The Agilium Patella Pro is particularly effective in relieving patellofemoral osteoarthritis, i.e. that which occurs behind the kneecap.

The Agilium Patella Pro is a very good example of a crossover between a support and an orthosis. It consists of a fabric framework with stabilising elements. It uses what is called a dynamic re-centring technique to ensure the patella tracks precisely in the centre. This has been shown to reduce pressure on the patella.

Agilium Patella Pro

Dynamic patellar tracking

- ▶ Patellar tracking with the Patella Pro is only as strong as necessary for a given movement

High level of wearer comfort

- ▶ The setting option on the patella bar makes it possible to adjust the Agilium Patella Pro to various everyday situations
- ▶ The padding on the patella bar makes it comfortable to wear even for those with sensitive kneecaps



“The orthosis is perfect for me because I have a very sensitive kneecap and I can always adjust the Agilium Patella Pro so that it is comfortable for me.”

Kadri, 38



Avoid surgery – but how?

We developed the Agilium Freestep to treat general knee osteoarthritis – although it is not applied to the knee, but is instead worn on the foot, right inside the shoe! For targeted relief of the damaged cartilage in the knee joint, the innovative Agilium Freestep alters the load-line of the knee. The load line describes the point where the body weight primarily impacts the cartilage.

Agilium Freestep

Dynamic relief for the knee joint

- ▶ When standing or when walking and running, the orthosis provides relief as and when, especially for the knee is weight-bearing.

Easy to wear below the knee

- ▶ Optimal comfort
- ▶ The knee is kept free
- ▶ No restriction when sitting
- ▶ It cannot slip down the leg

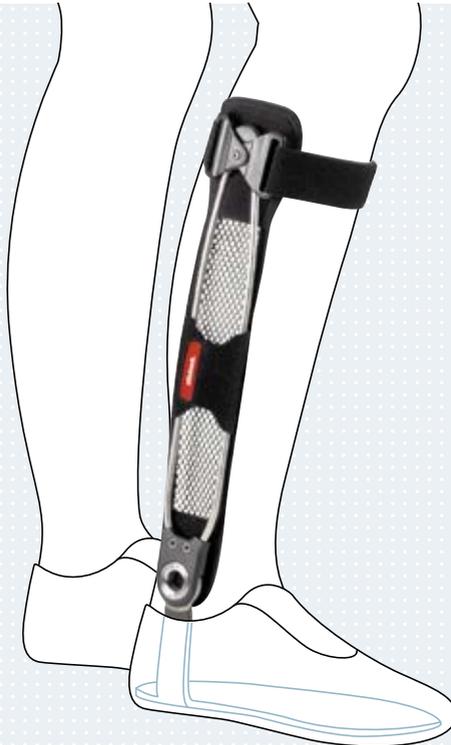
Support in many situations

- ▶ During everyday activities such as shopping or going for a walk
- ▶ During high-stress activities such as running or hiking



“Most of my patients are very satisfied with the new orthosis. Half of them have been able to avoid surgery so far.”

Dr. Hartmut Stinus,
Specialist in Orthopaedics and Trauma Surgery



Shopping, walking, exercising

Heike remains mobile in spite of her osteoarthritis

Living with osteoarthritis – just going to the supermarket - meant knee pain for Heike. The 49-year old developed osteoarthritis in her left knee four years ago after meniscus surgery, and it was made worse by having bowed legs. She wanted to avoid an operation, and even a knee brace was a burden, in spite of her pain.

Heike laughs now thinking back on the moment her orthotist applied the Agilium Freestep to her leg. The brace extends from her foot to the outside of her calf, and is about as light as a sandal.

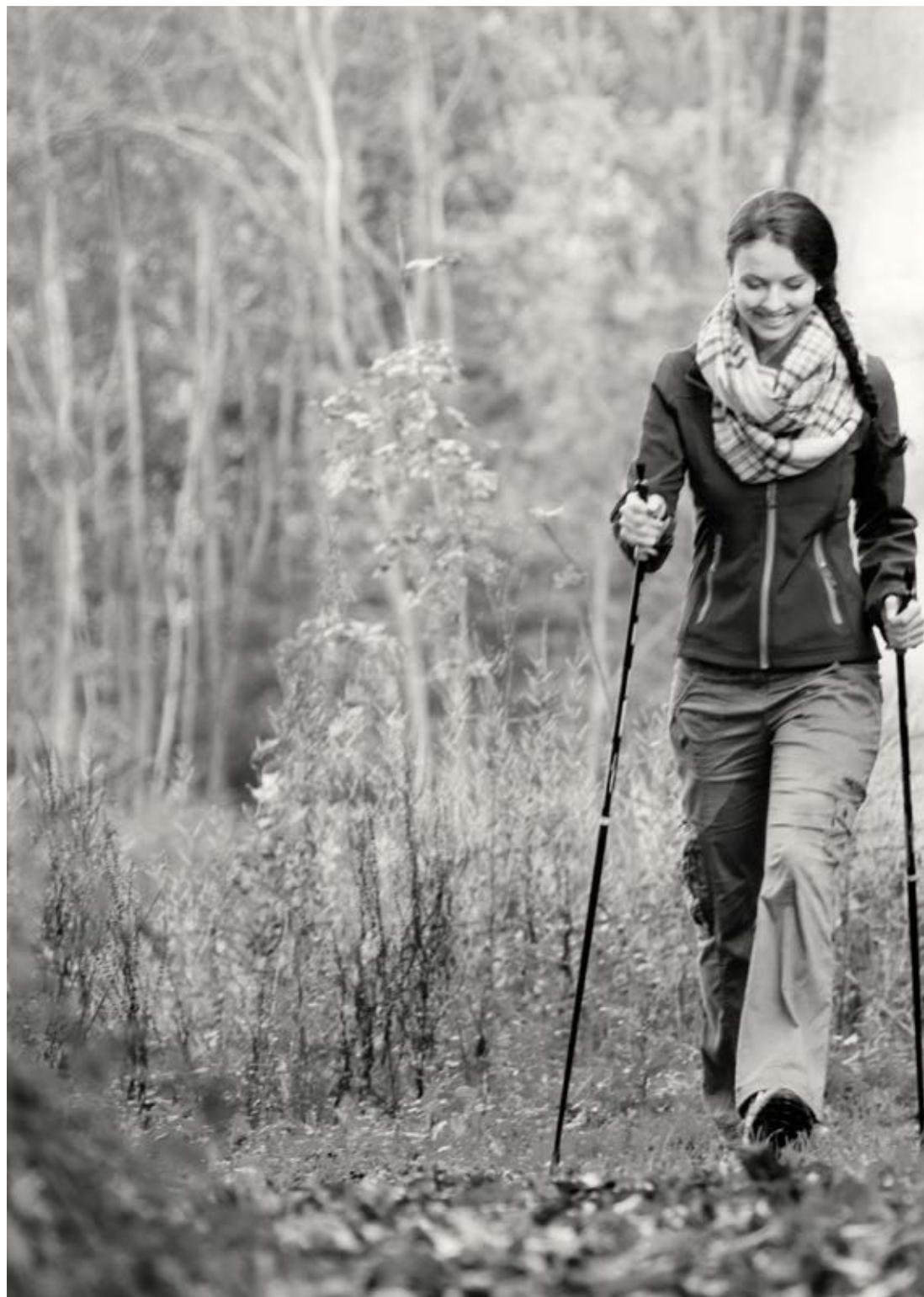
What about the other benefits of the Agilium Freestep? Heike says, “It's easy to put on. When I wear it, the effect is instantaneous and the pain reduces. And, at the moment, the orthosis is saving me from having to have an operation.”

With the Agilium Freestep, Heike is mobile again - in spite of osteoarthritis – whether she's walking in the woods with her daughter or working as a coach on the tennis court. The orthosis fits comfortably inside her shoe.



“As soon as I put the orthosis on, the pain in my knee reduces.”

Heike, 49





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