

Osteoarthritis of the knee

Introduction

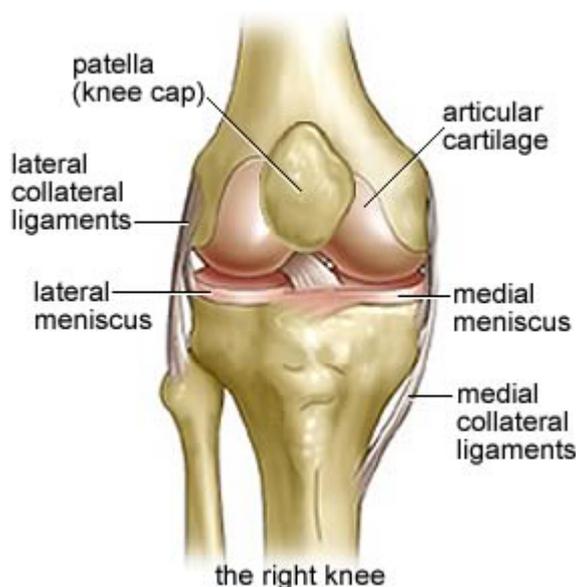
Osteoarthritis (OA) is the most common disease affecting joints. It is the wear and tear process that occurs in joints in varying degrees, most commonly in weight bearing joints. This condition involves the gradual roughening of the articular cartilage covering the ends of the bones making up the knee joint. It is associated with changes in the underlying bone, which may ultimately cause pain and impaired function. These changes can be seen on an x-ray, but the changes seen and the amount of pain you feel may not always relate. This condition does not follow the same course in everybody and there are certain things that you can do to help yourself and prevent problems in the future.

Basic anatomy

In the knee joint the ends of the bone are covered in articular cartilage, which reduces friction, promotes smooth movement and acts as a shock absorber. The knee joint lining contains synovial fluid which lubricates the joint and promotes friction free movement of the joint and the structures inside the joint.

There are strong ligaments both inside and outside the joint capsules in order to protect the joint and to provide stability during movement. The capsule reinforces joint protection and the ligaments within the joint capsules.

There are muscles surrounding the knee joint which help to support, protect and move the knee, helping to dissipate some of the joint load.



The effects of OA

- The cartilage becomes thin and worn away especially where more weight is borne.
- New bone forms at the edge of the joint which can be quite rough (osteophytes).
- The joint space becomes narrower allowing less space between the bones for movement.



- Cartilage may fragment to give loose pieces causing symptoms of locking or giving way of the knee.
- Increased stress/load on the ligaments and muscles and the capsule may lead to inflammation (swelling). The capsule may become thickened.
- The inflammation and swelling may cause pain.
- Decreased mobility due to pain/ aching and fear of making the knee worse may lead to muscles wasting and weakening, therefore causing more stress and decreased protection to the knee joint.
- The knee becomes stiff as it is moved less through its available range of movement.

What causes OA?

The cause of OA is not clear, but appears to be premature ageing and may be associated with certain recognized factors such as:

- Age – OA usually starts from the late 40s onwards. It is more common in older people; this may be due to factors like weakening of the muscles, the body being less able to heal itself or gradual wearing out of the joint with time.
- Gender – OA of the knee is twice as common in women as in men.
- Being overweight. This puts extra stress of the knee joint and can increase the amount of pain you feel.
- After trauma (injury) e.g. an old injury or fracture.
- Family history. – Genetic factors play a major part in osteoarthritis of the knee. If you have a parent, brother or sister with knee osteoarthritis then you'll have a greater chance of developing it yourself.
- Overuse of the joint. Certain occupations are more at risk of some forms of OA.
- Faulty development which can put excessive stress on small areas of the joint.
- Inflammation or infection of the joint in the past.
- Metabolic conditions e.g. gout which can affect the joint.
- Neuropathic conditions e.g. diabetes.
- Hormonal or endocrine disorders.

Common symptoms

- Aching in/around the joint.
- Pain – usually dull and achy but can be sharp with sudden movements.
- Stiffness – especially on waking or after periods of rest.
- Swelling.
- Joint deformity, due to the changing shape of the bones and muscle spasm.
- Limitation of movement.
- Muscle wasting, especially of the quadriceps (thigh muscles) as a result they become weaker and tire more quickly.
- Crepitus (creaking) of the joint, as a result of the irregular joint surfaces.

Self-help/management

Some people only ever have mild symptoms which do not worsen. In unfortunate cases, the disease progresses more rapidly and the joint function deteriorates to such a degree that surgery may become necessary. However, many people are able to manage their OA themselves and alleviate or decrease the progression of the disease themselves.

The following may be helpful.

- Avoid becoming overweight as this can lead to increasing stress on the knee and increased pain. If overweight, losing weight can help. For every one pound in weight lost, there is a four pound reduction in the load exerted on the knee for each step taken during daily activities.
- Maintain joint stability and movement. Non-weight bearing exercises will help to build up the muscles so that the stress is reduced on the joint and surrounding soft tissues and can help to maintain the range of movement. Do your exercises daily, 10-15 minutes is all that is needed.
- Adapting your lifestyle to avoid unnecessary stress on the knee may help.
- Avoid long, hilly walks on hard ground. Be careful and slow down when walking on uneven ground.
- Avoid, where possible carrying heavy loads. Balance loads between both hands and decrease the loads by increasing the number of journeys when possible.
- Avoid twisting the knee, move the whole body and feet as one.
- Avoid long periods of standing. If unavoidable, shift weight from one leg to the other. Sitting for long periods may cause stiffness, try to get up and walk around or change your position regularly e.g. every 20 -30 minutes. Remain as active as you can and find the right balance between exercise and rest for your knee.
- Use a stick to reduce the stress on the joints when walking or standing for long periods.
- Try to wear sensible shoes that support your feet and have low heels.
- Activities: Swimming is good, be careful with breaststroke as some knees do not like the twisting action. Cycling can also be helpful. It is important to have the saddle correctly adjusted and not too low. Avoid lots of hills as the extra effort may aggravate your knee.

Possible treatments

Although there is no cure, much can be done to help relieve some of the symptoms.

Home treatments

1. **Non weight bearing exercises** to:

- increase muscle power
- decrease swelling
- maintain joint ranges of movement and alleviate stiffness.

2. **Ice** – for 15-20 minutes. Place a dampened cloth over the knee and apply the ice pack over this to prevent an ice burn. Wrap the knee in a towel if necessary to keep the ice

pack in place. Packets of frozen peas or crushed ice in a bag are the most convenient and re-usable, although re-usable gel packs are also available.

3. **Heat** – a hot water bottle or heat pad is the easiest. Heat, is generally, pleasant after having done your exercises. Wrap the hot water bottle/heat pad in a dry towel to prevent burning the area.

Physiotherapy

1. **Exercises** – to increase muscle power to support the knee joint and to maintain range of movement are one of the most important treatments for OA knees. They may help to alleviate pain and stiffness.
2. **Pain relieving modalities** e.g. electrotherapy modalities and/or T.E.N.S. may provide temporary pain relief, reduce inflammation and swelling and increase muscle power.
3. Use of **heat and/or ice** for pain relief. The use of ice may help to ease inflammation and pain this may then be continued at home. Heat treatment can also be used to reduce aches and pains, muscle spasm and pain.

Aids

1. **Knee supports.** A simple Tubigrip support may help to provide some relief and a feeling of stability to the knee. In addition, there are some braces designed to provide more support and some may alter the joint mechanics when the OA is only in one particular area of the knee.
2. **Provision of aids** – a walking stick or crutches may sometimes help to aid walking.

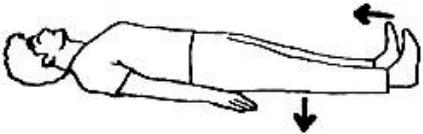
Medication

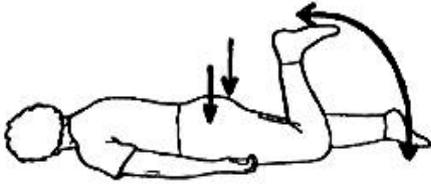
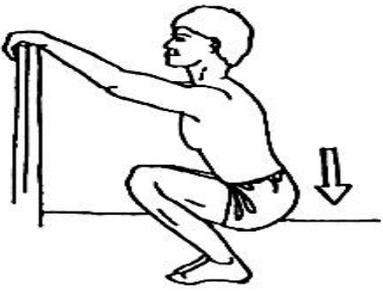
1. **Painkillers** e.g. Paracetamol.
2. **Anti-inflammatory drugs.**
3. **Glucosamine and Chondroitin Sulphate** - use of these supplements has been shown in many studies to cause mild to moderate improvement in patient's symptoms with OA. However, the long term benefits are not known.
4. **Intra-articular steroid injections** – can provide short term pain relief in patients with severe OA. The effects can last for a variable length of time between a few weeks and a few months. Injections are generally limited to three injections for weight bearing joints.

Surgery

1. **Arthroscopy** – to further evaluate the knee regarding the extent of the OA or as a means to alleviate some of the symptoms by “washing the joint out”.
2. **Osteotomy** – where a wedge of bone may be taken out to change the area of loading on the knee, away from the worn area.
3. **Joint replacement** – where either part of (unicompartmental knee replacement) or the total knee is replaced dependent on the extent of the damage.

Home exercises

	<p>1. In sitting with your back supported and your legs out straight in front of you.</p> <ul style="list-style-type: none"> • Bend your knee as far as possible. Gently bend your knee a little more. • Hold for 10 seconds. • Repeat 10 times. • To help bend your knee, you may put a towel around your foot, or help bend your knee with your hands around your thigh.
	<p>2. Lying on your back or sitting with your back supported and your legs out straight in front of you.</p> <ul style="list-style-type: none"> • Pull your feet up towards you. Push your knee down firmly so that your thigh muscles tighten. • Hold for 10 seconds. • Repeat 10 times.
	<p>3. Lying on your back or sitting with your back supported and your legs out straight in front of you.</p> <ul style="list-style-type: none"> • Pull your feet up towards you. Push your knee down firmly so that your thigh muscles tighten. • Keeping your knee straight, lift your leg up to just clear the bed. • Hold for 10 seconds and lower slowly. • Repeat 10 times.
	<p>4. Lying on your back or sitting with your back supported and your legs out straight in front of you.</p> <ul style="list-style-type: none"> • Place a rolled up towel or cushion under your knee. • Push your knee down hard and straighten your leg. • Hold for 10 seconds. Repeat 10 times.
	<p>5. Lying on your back or sitting with your back supported and your legs out straight in front of you.</p> <ul style="list-style-type: none"> • Bend your knee to 45 degrees. • Pull your toes up towards you, and dig your heel into the bed. • You should feel the muscles of the front and back of your thigh tighten. • Hold for 10 seconds. • Repeat 10 times.

	<p>6. Lying face down with your hips straight and knees together.</p> <ul style="list-style-type: none"> • Bend your knee as far as possible, keeping your hip straight and your ankle flexed. • Hold for 10 seconds. • Repeat 10 times. • To make this exercise more difficult, you can put a small weight around your ankle.
	<p>7. In standing, hold onto a support and bring one leg slightly backwards.</p> <ul style="list-style-type: none"> • Bend your knee and lift your foot off the floor, taking it towards your buttocks. • Hold for 10 seconds. • Repeat 10 times. • To make this exercise more difficult, you can put a small weight around your ankle.
	<p>8. From a sitting position, try to stand up from the chair without using your hands.</p> <ul style="list-style-type: none"> • Slowly lean forwards and stand up, then slowly sit down again. • You may need to use your arms to help at first. Try not to drop into the chair but try to control the movement. • This can be made easier and more difficult by changing the height of the chair. • Repeat 10 times.
	<p>9. Stand in front of a table or chair, holding on to the support with both hands.</p> <ul style="list-style-type: none"> • Slowly crouch down, keeping your back straight and your heels on the floor. • Stay down for approximately 30 seconds and feel the stretching in your buttocks and the front of your thighs. • Repeat 10 times.

Please note: During the above exercises you should not push into pain but mild discomfort is acceptable.

As is usual with any new exercise, your muscles may ache and you may experience new aches and pains for a few days, these should settle. If they do not, try to establish the aggravating exercise and leave this out of your exercise programme for a few days and then try again.

Exercise pictures © Physio Tools Ltd.

Further information

Visit the Trust website at www.royalberkshire.nhs.uk

Physiotherapy Outpatient Department
Physiotherapy East
Royal Berkshire NHS Foundation Trust
London Road
Reading, RG1 5AN
T: 0118 322 7811
T: 0118 322 5111 (switchboard)

This document can be made available in other languages and formats upon request.

Debbie Burden, Orthopaedic Physiotherapy Specialist
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