Osteoarthritis of the Knee
Healthshare Information for Guided Patient Management
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**Introduction**

Healthshare is committed to improving your health and wellbeing. This information leaflet is produced by health professionals who are expert in improving musculoskeletal conditions. The information is based on the latest available evidence from research in the field. If you are not sure of any of the given information, please contact our physiotherapy helpline for further information.

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**Knee joint anatomy**

- The knee joint is made up of the thigh bone (femur), shin bone (tibia) and knee cap (patella).
- The bones of the knee joint are covered by a hard, slippery, shock absorbing plastic-like material called articular cartilage.
- The whole joint is surrounded by a thin lining of soft tissue known as the joint capsule, which is strengthened by ligaments on either side of the knee joint.
- The knee joint capsule is also lined with a membrane called a synovium which produces a lubricating, nutrition-filled fluid to help nourish and protect the joint.

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**What is Osteoarthritis?**

- When the articular cartilage gets damaged, the movement of the knee joint becomes painful as the bones no longer have a friction-free surface to glide over.
- Due to pain and subsequent immobility, the soft-tissue lining of the joint becomes tight and causes stiffness.
- Damage to the knee cartilage is common. It can occur due to sudden or repetitive trauma and is more common among those involved in high impact activities.
- Osteoarthritis is a slow process that develops over many years resulting in a gradual roughening and thinning of the joint cartilage.
- As we grow older, the water content of the joint cartilage reduces which increases joint friction leading to an increased risk of cartilage damage.
- An increased risk of osteoarthritis is thought to be linked to hereditary factors and is common in women over the age of 50. Other common risk factors includes ethnicity, obesity, smoking and previous injury of the knee.
- As your joint cartilage thins, the bone reacts by thickening (sclerosis) and producing bony spurs (osteophytes) that can develop around the joint edges.
• Osteoarthritis of the knee joint also irritates the synovium which leads to an increased production of fluid, causing joint swelling (effusion).
• Osteoarthritis of the knee may cause a weakness in the surrounding musculature and a thickening of the ligaments, with a general instability of the joint due to bony and soft tissue changes.
• Osteoarthritis of the knee commonly affects the inside of the joint and the knee cap. In most cases osteoarthritis of the knee causes little or no pain but can become troublesome when triggered by an incident such as a trip or fall.
• However, osteoarthritis of the knee joint can become severe, affecting the whole joint and can result in pain affecting your day-to-day activities, or interrupting sleep.
• In particular, osteoarthritis of the patella may affect your ability to kneel, climb stairs and sit for long periods of time.

What treatments are available?

Conservative treatment
There are a number of treatment methods that you can try to help manage your symptoms before considering any surgical intervention, such as a knee replacement. Remember these treatments will not cure your osteoarthritis, but may help to reduce the pain and improve your functional independence and quality of life.

<table>
<thead>
<tr>
<th>Physical Aids</th>
<th>There are a number of devices you can try to help to improve your walking. These include walking aids, shock-absorbing shoes, knee braces and splints. Your GP or physiotherapist should be able to advise you on the appropriate use of these aids based on the severity of your condition and your activity requirements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapy</td>
<td>Your physiotherapist may teach you an exercise programme which will aim to strengthen the muscles that support the knee joint and improve its flexibility. They may also consider joint and soft tissue manipulative therapy techniques. Treatment techniques such as TENS or acupuncture have also shown to be beneficial for improving pain and function in some cases.</td>
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<tr>
<td>Staying Active</td>
<td>Performing regular exercise is key in maintaining the range of movement in your knee and helping to slow down further deterioration. Regular exercise also helps to reduce pain. Swimming, walking and cycling have all been shown to have a beneficial effect on maintaining functional independence.</td>
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<tr>
<td>Medications</td>
<td>Paracetamol and/or non-steroidal anti-inflammatory medications may be suggested by your GP and can be beneficial in reducing pain and inflammation. Some patients report glucosamine and/or chondroitin have proved beneficial, although evidence for these supplements is currently lacking. These are widely available from health food shops or pharmacies.</td>
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<tr>
<td>Joint Injections</td>
<td>Corticosteroids and hyaluronic acid are the two most common drugs used for knee joint injections to reduce knee pain. Corticosteroids are very strong anti-inflammatories, while hyaluronic acid is the fluid naturally found in synovial joints for lubrication.</td>
</tr>
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</table>
Surgical management

Arthroscopy (keyhole surgery): This is not routinely done for osteoarthritis as the current evidence does not show any significant benefit in reducing pain. However, if you have a cartilage tear that causes locking and loss of movement of the knee, then joint arthroscopy may help to improve your mobility and reduce pain levels.

Knee replacement surgery

- A knee replacement is an operation which involves the removal and replacement of the damaged or worn parts of the knee joint with a prosthesis that is made up of metal and plastic parts.
- A knee replacement is usually performed on patients who have severe osteoarthritis that adversely affects their day-to-day activities.
- A total knee replacement involves the resurfacing of your whole knee joint, which can include the femur and tibia only, or the femur, tibia and patella. A partial knee replacement involves the resurfacing of one half of your knee i.e. either the inner or outer side of the joint.
- Partial knee replacements will only be performed on people who have arthritis on one side of the knee joint. It is also typically performed for people under 55 who have an active lifestyle. Typically, movement will be regained earlier with this procedure than with a total knee replacement.
- Not all people who suffer from arthritis in their knees need a knee replacement and many find conservative treatment is sufficient in managing their symptoms.
- Only a small percentage of people who have knee osteoarthritis will need a knee replacement, and this will be identified by a specialist doctor or a specialist physiotherapist.

Half knee replacement

Total knee replacement
When do I need knee replacement?
- Conservative treatments have not improved your symptoms and your pain is getting worse with your knee hurting most of the time.
- Your knee pain is affecting the quality of your sleep.
- The knee pain is limiting your enjoyment of life and activities of daily living such as work, gardening, walking etc.
- Your knee keeps giving way or locking.
- Knee X-Rays show severe arthritic changes and you are experiencing severe symptoms.

Am I too young or too old?
- There is no specific limit to the age of a patient who can have a knee replacement, but surgical intervention is less favoured in those under the age of 60.
- Typically materials used for a knee replacement only last for about 10-15 years and the probability of you requiring a second knee replacement is a lot higher if you are younger during your first replacement.
- When you have a second knee replacement, the rehabilitation after the operation is usually a lot more difficult.
- Therefore, if you are younger and considering having a knee replacement, it is important that you are aware of these potential problems and you should exhaust all other conservative options first.

What should I do before knee replacement?
If you are waiting to have a knee replacement, there are a number of things you can do to help improve your post-operative recovery.

**Lose weight:** Excess weight will put extra pressure on your new knee reducing its longevity. Evidence suggests that overweight people are more likely to have problems after surgery. Losing weight will reduce the risk of post-operative complications and premature wear and tear of the new joint.

**Exercise:** Exercises prescribed by your physiotherapist will help improve your muscle strength before the operation and this will have a significant positive effect on your post-operative rehabilitation.

In hospital – after the operation
- You may have a few tubes coming out of your knee which are drains that help prevent fluid collecting under the incision site. These will probably be removed 1 to 2 days after the operation.
- If you have had an epidural anaesthetic, you may not be able to feel or move your legs for several hours after the operation. Once this has worn off, your knee may feel stiff and sore but should not be too painful.
- If you experience severe pain, it is important to tell the nurse so that your medication can be adjusted appropriately.
- Your physiotherapy sessions will start on the day after your operation, and will continue throughout your hospital stay.
- They will help to get your knee moving, and to get you mobile and walking within about 3-4 days with the use of a walking aid. They will ensure that you are fully functional and independent before discharging you home.
- You may be required to wear a compression stocking on your leg to help prevent a DVT (blood clot).

At home
- You should continue to use the walking aids that were provided by the hospital for up to 6 weeks and gradually reduce the amount of aid required, depending on progress.
- On returning home, it is important that you continue with the exercises that you were shown in the hospital.
- You should be able to start driving again after about 6-12 weeks, but before you do, it is important that you consult with your GP or physiotherapist.
- Post-operative physiotherapy will help you regain as much range of movement in your knee as possible and enable a quicker return to independent and active living.
**What are the possible complications?**

Complications of total knee replacement are minimal. Bleeding during or soon after the procedure is a commonly reported complication. Infection and an abnormal reaction to the anaesthetic are possible complications of any surgery.

**Complications specific to knee replacement surgery are:**

- Wound and/or joint infection. Antibiotics are routinely given straight after surgery as a preventative measure against this.
- Instability of the new knee (this may require a further operation to rectify).
- Patella dislocation due to new joint profile changes.
- A leg length difference due to excessive bone loss. This can be rectified with a small raise in the shoe of the shorter leg if necessary.
- Excessive build-up of scar tissue in the knee which may restrict movement. However, this can often be addressed by your physiotherapist who will try and break down this scar tissue. In rare cases a further operation may be required to remove this tissue.
- After any big operation it is possible to develop a blood clot in the veins of the legs (DVT) which may break off and form a blockage in the lungs. It is usually treatable, and many measures will be taken before, during and after your operation to help prevent this from happening (i.e. medication or wearing a compression stocking).

Please remember that risks for any operation will differ for every individual and it is important to discuss these with your surgeon to determine how these risks may relate to you.
# Exercises for Osteoarthritis

## Stretching exercises

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Calf stretch</td>
<td>Keeping your back leg straight, and your heel on the floor turned slightly outward, lean into the wall until you feel a stretch in the calf. Hold this position for 20 seconds x 5. Repeat this at least 3 times a day.</td>
</tr>
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<td>Quadriceps stretch - Lying</td>
<td>Lie on the opposite side of the leg being stretched. Slowly bend the leg to be stretched towards your buttock and pull the leg further by holding your hand or wrapping a towel around the ankle. You should feel the stretch at the front of your knee. Remember to keep your hip joint straight. Hold this position for 20 seconds x 5 reps. Repeat 3 times a day.</td>
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<td>Hamstring stretch</td>
<td>Lie on your back with one leg straight, raise the bent knee towards you and hold behind your knee. Now slowly straighten your knee until a stretch is felt in the back of the thigh. You can also use a towel to help with this stretch if needed. Hold for 20 seconds x 5 reps. Repeat 3 times a day.</td>
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<td>Quadriceps stretch - Standing</td>
<td>Stand on one leg with the affected leg on top of a chair or stool. Keep your back straight and gently lean forward while pulling your toes towards you. Hold this position for 20 seconds x 5. Repeat 3 times a day.</td>
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<td>Stage 1: Strengthening exercises</td>
<td>Heel slide</td>
</tr>
<tr>
<td>Quadriceps exercises</td>
<td>Sit on the floor with one leg outstretched in front of you with a pillow/rolled up towel under the knee. Push your knee into the pillow, straightening it as much as you can. Your foot should lift off the floor as you do this. It is important that you tighten your thigh muscles as you straighten your knee. Repeat 15 times x 3, 3 times a day.</td>
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</table>
Osteoarthritis of the Knee

Exercises for Osteoarthritis/Continued

Stage 1: Strengthening exercises/continued

SLR (Straight leg raises)
Lie on your back with your arms next to by side. Keep one leg straight and the other bent. Now raise the straightened leg to the height of the bent knee.
Repeat 10 times x 3. Repeat this at least 3 times a day. Repeat on both sides.
You can vary this exercises by pointing your toes outwards or inwards. You can also add some ankle weights to make this exercise more difficult.

Bridging
Lie on your back with your back flat on the floor or a bed. Now slowly pull your belly button towards your spine and slowly raise your buttocks from the floor. Try to bring your chest, hips and legs into a straight line.
Hold this position for 10 seconds x 10 times.
Repeat 3 times a day.

Single leg bridging
Lie on your back, bend both knees to 90° with your feet flat on the bed/floor.
Slowly lift your hips off the floor and hold for 10 seconds x 10.
Repeat the same on the other side x 10.

Ball squeeze and push
Lying on your back with your knees bent, place a ball or pillow between your knees and squeeze.
Hold for 10 seconds x 10.
Repeat 3 times a day.
Then place the ball between your knee and the wall, push out for 10 seconds x 10.
Repeat 3 times day.

Calf raises
Stand close to a support surface such as a kitchen worktop or a doorway frame.
Now slowly raise up onto your toes first, then onto your big toe, then the middle of your foot and then onto your little toe.
Repeat this sequence 10 x 3 times a day.

Wall slides
Stand leaning up against a wall, your feet a little away from the wall with your toes pointing forwards.
Push your back against the wall and slowly lower your body into a seated position.
Now hold this position for 10 seconds x 10. Repeat 3 times a day.
This exercise must be pain free and don’t bend more than the seated position.
### Stage 2: Strengthening exercises/continued

**Stork standing**
- Balance on one leg for 30 seconds and repeat with the other leg x 5.
- Repeat the above with your eyes closed x 5.
- You can progress the above to standing on an unsteady surface, e.g. a cushion or a narrow piece of wood.

**Prone hamstring curls**
- Wrap a resistance band (theraband) around a stable object i.e. table leg. Attach the free ends to ankle straps and secure to each ankle.
- Lie on your stomach far enough from the attachment site of the band so that there is no slack and then attempt to bring your foot towards your buttocks without allowing your knee or hips to lift off the floor.
- You can get the theraband from a local sport store. Repeat 10 x 3 sets.

**Hip abduction and adduction**
- Attach a theraband around the table leg. Place the furthest leg in the loop of the band and raise it out to the side away from your body.
- Keep your knee straight and pelvis stable.
- Now turn around and bring your leg away from the table towards your midline (the other leg).
- Make sure you keep your body stable and just use your leg.
- Repeat 10 x 3 sets.

**Semi squats**
- Stand with your feet hip width apart and hold onto a chair if you need to.
- Bend the knees keeping your feet flat on the floor, and ensure that your knees do not exceed a 90° angle.
- Return to the starting position.
- Repeat 10 times x 3 sets.

**Quadriceps: Step-down backwards**
- Stand on one leg on a step.
- Slowly lower yourself by bending your knee.
- Return to the starting position without pushing off with the opposite leg.
- Have your weight on your heel more than your toe, but keep your foot flat. Your knee should be in line with your second toe when bending it i.e. be aware that your knee and foot do not roll inwards.
- Repeat 10 x 2 sets.

**Quadriceps: Forward step-down**
- Stand on one leg on a step.
- Slowly lower yourself by bending your knee and touch the floor with your heel.
- Return to the starting position without pushing off from the ground.
- Repeat 10 x 2 sets.
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