GLA:D™ Australia

Participant Information

Good Life with osteoArthritis in Denmark (GLA:D®)

Adapted for use in Australia

KEEP MOVING!
RESEARCH EXCELLENCE IN MUSCULOSKELETAL HEALTH AND EXERCISE
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What is Osteoarthritis?

Osteoarthritis is a very common disease. Osteoarthritis affects the whole joint, but most of all it affects the **articular cartilage** (the cartilage covering the ends of the bones). This articular cartilage becomes thin and fragile. This can be due to:

- healthy cartilage being exposed to heavy loads over a long period of time (for example, very heavy labour over several years), or
- unhealthy cartilage that for some reason cannot handle normal loads.

Osteoarthritis is the most common cause of difficulties with mobility and disability in older people. It is also common in younger and middle-aged people. Approximately 5% of people between 35 and 54 years of age have osteoarthritis. Many of these people have injured their joint earlier in life. Approximately 30% of the population between 50 and 70 years of age have problems related to osteoarthritis and the percentage increases in older age groups.

The Healthy Joint

A joint is a connection between two bones. The ends of bones are covered with **cartilage**, which create a smooth surface for the bones. An **articular capsule** surrounds the joint. This capsule secures the joint and contains **synovial fluid** (a lubricant providing nutrition to the cartilage). Muscles and ligaments surround the joint and help to secure it (Figure 1).

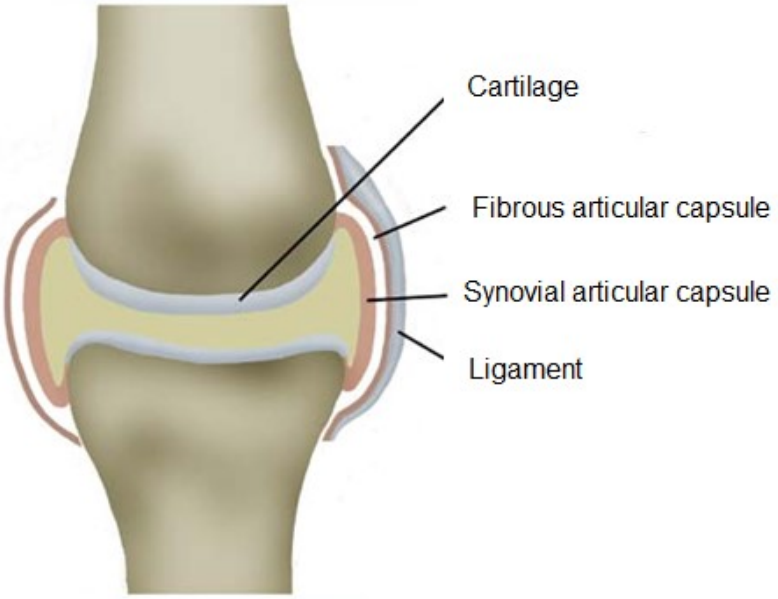


Figure 1: A healthy joint

The cartilage surface is smooth and lets bones slide easily when moving. Cartilage is solid, but flexible. It absorbs shock and spreads loads over its surface. As far as we know, cartilage has no pain sensors and so it cannot 'hurt'. The cartilage has no blood vessels. Nutrients are brought to the cartilage by the synovial fluid.

EXAMPLE:

Think of cartilage as a wet sponge; when loads are applied, fluids are pressed out of the sponge. When loads are removed, the sponge sucks the fluids back in. This is what happens with the fluid in and around our cartilage. When we walk for example, loads press down on our cartilage. The cartilage absorbs the shock and fluids squeeze out into the articular capsule. Once loads are removed, the cartilage sucks the fluid back in from the the surrounding area.

This is why loading the joint is needed for cartilage to be healthy. In a healthy joint, there is a balance between degeneration and regeneration of cartilage cells (Figure 2).

Changes in the Joint with Osteoarthritis

You may have heard osteoarthritis described as 'wear and tear' of the joint. This statement is incorrect because loads are still needed to keep cartilage healthy. In a healthy joint, there is a balance between the regeneration and degeneration of cartilage. Osteoarthritis occurs when there is more degeneration (breakdown) than regeneration of cartilage. This causes cartilage to thin, crack, and maybe disappear. Bones can then start to rub against each other. However, cartilage needs a certain amount of load to regenerate. This is why healthy loads need to be applied on joints for cartilage recovery.

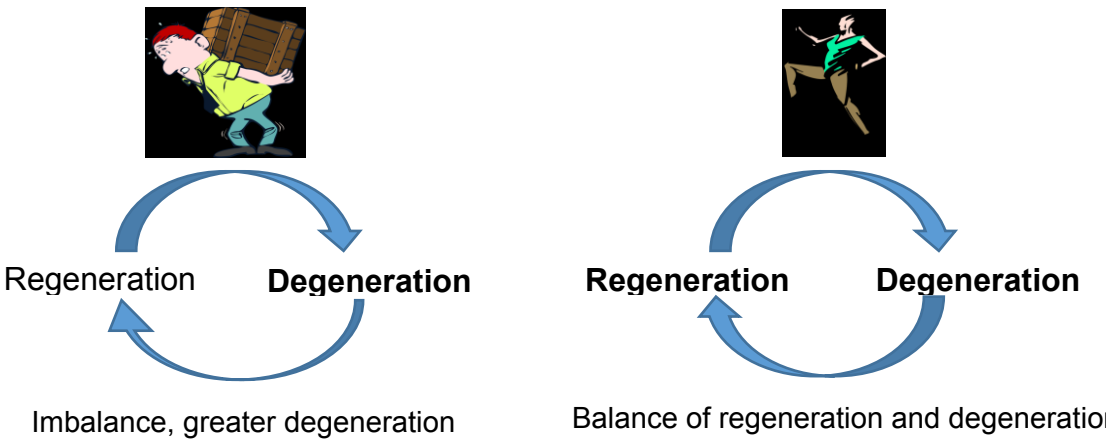


Figure 2: There is more degeneration than regeneration of cartilage in a joint with osteoarthritis. There is a balance between the regeneration and degeneration of cartilage in a healthy joint.

Three Joints that are Often Affected by Osteoarthritis

Knee:

- You may feel (or hear):
    - Pain with weight-bearing
    - Stiff and unstable leg
    - Knee giving out
    - Crunching or clicking noises
- It might be hard to walk up and down stairs, or get from sitting to standing
- Occurs with deformities like knock-knees or bowleg

Hip

- Pain can be located:
    - Often outside the hip or deep in the groin
    - Inside, outside, or down the thigh
    - Sometimes not in the hip, but instead pain on the inside of the knee
- Hip osteoarthritis often leads to reduced range of motion in the joint. This can lead to trouble getting in and out of a car, putting on socks, picking things up from the floor
- Often, your step length will often get shorter when walking. It may be hard for you to straighten your hips, so you may tend to bend forward when walking.

Hands

- Most commonly affects the end of fingers and the base of the thumb
- Fingers may feel stiff or tender. They may look 'lumpy' and have minor deformities
- It is common for the muscles in the hands to feel weak. It can be hard to clench your hands into a fist, carry something heavy, write or use scissors

REMEMBER:

Osteoarthritis can occur in any joint where the ends of the bones are covered with cartilage.

Why do you get osteoarthritis?

There are a number of factors that raise your chance of getting osteoarthritis.

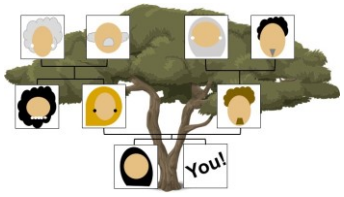
There are some factors we cannot affect, such as:

Age

Cartilage is a living tissue that can age and weaken over the years. Osteoarthritis can happen at the early age of 30. However, people are more likely to have osteoarthritis after the age of 50.

Sex

Women get osteoarthritis more often than men. Women get osteoarthritis more often in the knees and hands. Men get osteoarthritis more often in the hips.



Heredity

Delicate cartilage can run in the family. So, you are more likely to get osteoarthritis if someone in your family had it too.

Factors that we can change to reduce the risk of osteoarthritis:

Obesity

Being overweight puts more load on the joint. This can increase the risk of osteoarthritis in the knee. The risk of hand and hip osteoarthritis also increases with obesity. This tells us that other things about being overweight can be linked to getting osteoarthritis.

Physical inactivity

Little or no load on cartilage is not enough for regeneration. This happens when someone is not active enough. Cartilage needs a healthy amount of load to regenerate.

Muscle weakness

Weak muscles won't provide proper support to a joint. This leads to more loads being applied to areas of cartilage that don't take weight well. This can overload the cartilage and increase the risk for knee osteoarthritis.

Sports Related Joint Injury

Half of all people with a severe knee injury (meniscus or cruciate ligament injury), often from sports, get osteoarthritis 10-15 years later. Most people hurt their knee as a teenager, which means that they can get osteoarthritis in their 30s. Top level sports can cause great loads on the whole body without allowing for regeneration. This can lead to degeneration of cartilage.

Work or Leisure Time Related Joint Injury

Lots of load over a long period of time without rest can cause osteoarthritis later in life. People who work as labourers (farmers, firefighters, etc.) are more at risk of hip and knee osteoarthritis. Teachers seem to get more hand osteoarthritis.

How do you know you have osteoarthritis?

X-rays

At later stages, osteoarthritis can be seen on an x-ray. It will show a smaller joint space, **osteophytes** (extra bone growth), **cysts** (liquid-containing cavities) in the bone, and **sclerosis** (hardening) of the bone under the cartilage. Magnetic Resonance Imaging (**MRI**) or arthroscopic surgery can also show these changes. Despite seeing these changes, a person may not feel any symptoms. On the other hand, symptoms can be felt for 10-15 years before changes show up on an x-ray or MRI. This is why diagnosis for osteoarthritis is done based on **symptoms** (something you feel that tells us about a problem).

Symptoms

A clinical diagnosis for osteoarthritis is done based on symptoms. Osteoarthritis often affects one joint and symptoms often progress slowly. Symptoms can start for no apparent reason. For some people, symptoms stop fully. For others, symptoms quickly turn into more serious problems and spread to other joints. Symptoms can come and go. Early symptoms are more commonly felt in the morning for long periods of time. These include:

- Pain when moving or loading the joint. In time, pain can happen at rest or at night.
- Joint stiffness and problems starting your day.
- Less range of motion.
- Heat and swelling at the joint.
- Muscle tightness.
- Difficulty moving around.

EXAMPLE:

Symptoms can make it harder to do things , like squatting, putting on socks, or grabbing objects.

At this time, we can't predict how each person will experience osteoarthritis. We do know that exercise works to slow or stop the increase in symptoms. Weight loss for people who are overweight will help as well.

How can you treat osteoarthritis?

Currently, there is no known way of curing cartilage loss. Treatment is used to reduce symptoms and improve function of the joint. Learning about osteoarthritis is part of the treatment. Special exercises can be done to relieve pain and boost joint function. When function improves, the next step is to get more active. Being physically active can help maintain weight loss and improve overall health. These things should be done as early as possible by people who have osteoarthritis. The usual treatment for osteoarthritis is outlined by the pyramid in Figure 3. Below are explanations of each line of treatment organized by color.

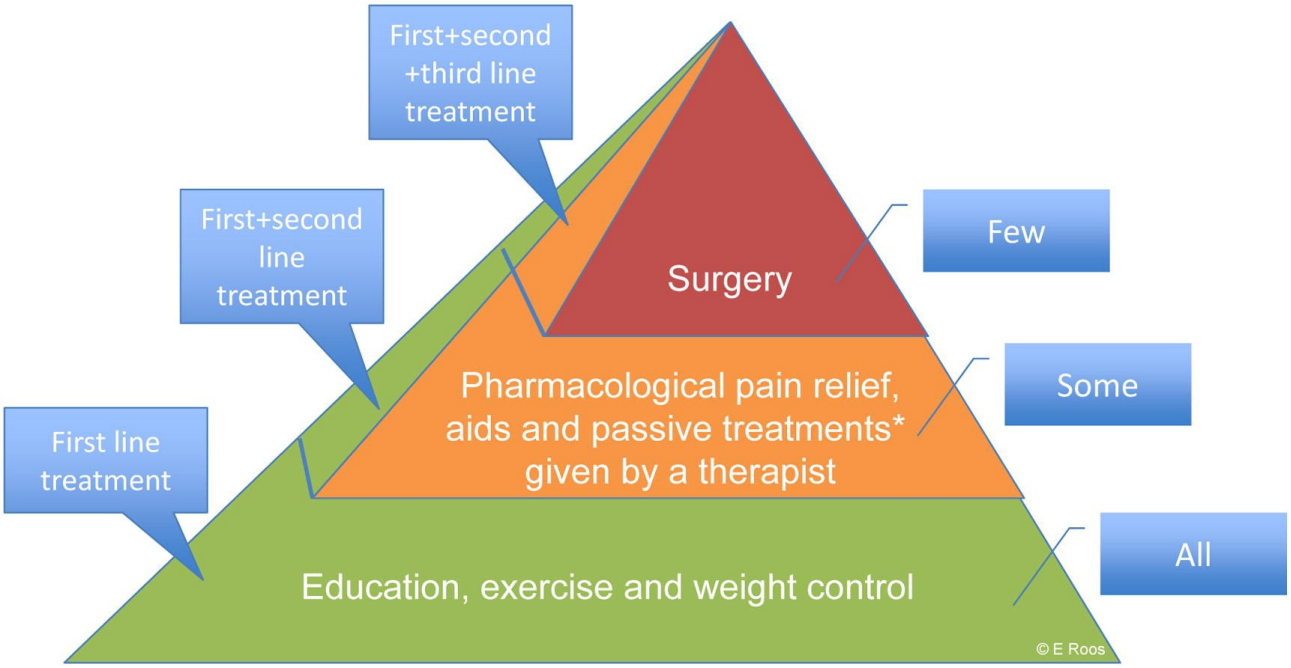


Figure 3. The treatment of osteoarthritis can be shown by this pyramid. The lower part is education, exercise and weight loss (if necessary). This should be offered to anyone with osteoarthritis right away. The middle part should be offered to those who did not improve with education and exercise. Surgery (typically joint replacement) should only be offered when no other treatment has worked.

1. Education, exercise and weight control

1.1 Education

Everyone with osteoarthritis should get basic information about how it affects your life. People with osteoarthritis might feel worried or scared. Supporting and helping someone with this condition to exercise can help improve their health and wellness. Learning about the condition is a good way to improve knowledge and confidence in one's ability to manage it.

1.2 Exercise

Exercise has been shown to be the best treatment for people who have trouble with their osteoarthritis. Exercise reduces pain and makes it easier for people to do their daily activities. Being active can lead to lots of positive things like a strong heart and good overall health. It is easier to control your weight with exercise compared to without exercise.

1.3 Weight Reduction

Being obese is linked to lots of diseases including osteoarthritis of all joints. When moving, the load on the joint is much more than the actual amount of body weight applied. This means even a small difference in body weight can greatly affect the load on the joint. Being obese is also linked to changes in **metabolism** (rate of chemical reactions in your cells), which may be linked to osteoarthritis in the hands. Obesity is also linked to faster breakdown of cartilage. Losing weight is important for lowering pain and improving function for those who are overweight.

1.4 Activities of Daily Living

Being active is good for your body and mind. This can be done through daily tasks like cooking, cleaning and gardening. Exercising can help you do these daily tasks. You might think that exercising with osteoarthritis is bad because it causes pain. But exercise will help reduce pain and improve daily function with time. Doing things that you enjoy in your free time will keep you happy and improve your overall health. Being active can also help distract from the pain.

2. Pharmacological pain relief, aids and passive treatments from therapists

Education, exercise and weight loss (if needed) might not work to control symptoms. Other treatments such as medications, walking aids, braces and insoles can also be used. These can be seen in the second tier of the pyramid (Figure 3).

2.1 Medications

- **Acetaminophen** (for example Tylenol) is usually the first choice for pain relief for osteoarthritis. It gives the fewest side effects and can be used as needed. Too much can damage the liver, therefore you should not go over the prescribed dose.

NSAID or COX-inhibitors

(For example Ibuprofen, Motrin, Advil and Naproxen) can be used when Acetaminophen is not working well enough. These can also be used if the joints are hot and swollen. Both drugs reduce pain, swelling and stiffness. There is a low chance that these drugs can cause a side effect in the stomach. Therefore, they are not suggested for those with ulcers. These drugs have also been seen to raise the risk of some heart diseases.

- **Corticosteroid injection** (cortisone) may also be used if the joint is hot and swollen. This can decrease pain in 1-4 weeks. Research has not found any long-term effects from corticosteroid injections.

Other medications

- **Glucosamine** is a building block of cartilage. It can be found in foods and through supplements. More research is still needed to know if some individuals will benefit from glucosamine supplements. Currently, groups of people taking glucosamine do not benefit more than people taking a placebo or sugar pill. To see if glucosamine might work for you, try taking it for six weeks without changing your daily routine. Stop taking the supplement after six weeks. If you felt better while taking glucosamine than since stopping, it may be working for you.

2.2 Aids or Assistive Devices

A brace can help ease loads on the joint. Knee and wrist braces surround the joint and make it more stable. Some people may need to change the load pattern on the foot or knee with insoles from an orthopedic shoemaker or physiotherapist. If you are limping, a walking aid, such as a cane or Nordic walking poles, can help ease the pain and prevent straining other joints. There are other tools that can be useful for people with hand osteoarthritis. These can provide a larger grip and avoid harsh positions of the hands.

3. Surgery

Surgery is at the top of the treatment pyramid (Figure 3). Most people can control their osteoarthritis with other forms of treatment. If this is not possible, surgery may be needed. Only 10-15% of people with osteoarthritis will need surgery.

3.1 Arthroplasty/Joint Replacement

Metal or plastic artificial joint surfaces replace the damaged joint. This surgery is most common in the hip, knee and some fingers. The advantage of this surgery is that pain lessens or stops completely. Often, range of motion in this joint is still slightly limited.

3.2 Osteotomy

In severe deformities like knock knee or bow-leg, only one part of the knee has thin or no articular cartilage. The other parts of the knee are well. In this case, osteotomy can help. Osteotomy takes a wedge of bone from the lower leg bone, straightening the leg. This helps to change the load so that the part of the knee with osteoarthritis doesn't take as much load. A metal plate and screws are used to support the bone so that it heals properly.

Everybody benefits from exercise

Exercising has many positive effects on your health. **Physical fitness** refers to traits that make a person healthy or unhealthy. These traits mostly relate to the heart, greater blood vessels and muscle mass, and less fat mass. A good level of physical fitness will leave you less tired after exercising. You may also experience improved sleep, sense of wellbeing, and find it easier to cope with everyday life. Here is how exercise will improve your body's structures:

- **Heart and vessels**

Exercising makes the heart stronger and able to pump more blood with each beat. This means that work can be performed with a lower heart rate and less load on the heart. Exercising will help your body grow more small blood vessels. This will lower your blood pressure and improve blood flow to your muscles. Muscles will then have more energy to work longer.

- **Muscles**

Muscles are made up of muscle fibers. When you move, your brain sends electrical impulses to these fibers. This causes your muscles to contract, which moves your bones and creates movement. Exercise will boost the number of muscle fibers that contract. Your muscles fibers will grow, which will lead to larger muscles. Exercise also improves the speed in which your brain sends the electrical impulses to your muscles. Overall, this leads to more strength and better ability to perform activities.

- **Bones**

Bones are similar to muscles in that they get stronger with more load applied. When muscles carry a load or contract, pressure is applied to the bones. Your bones will adapt and increase their density in response. In adolescent years, bones are in a state of growth. More exercise during these years will create stronger bones for later life. You can build bone strength through weight bearing or non-weight bearing exercises like swimming.

- **Weight**

Exercise will change your appetite and your body's energy metabolism. Fat weighs less than muscle. Since regular exercise makes your muscles grow, you might only see slight weight loss. However, the amount of fat in your body is reducing, and the amount of functional muscle is increasing. Decreasing your weight if you are overweight will take load off the joints and make it easier to do everyday activities. Weight loss often leads to other positive

health effects like lowering your risk of diabetes and lowering stress on the heart and vessels.

Exercising at a high heart rate is good for weight loss. However, you can also exercise at a moderate heart rate and be successful in losing weight. The most important thing is that you feel good and want to continue doing your exercises.

- **Pain relief**

During exercise, your body releases **endorphins**, which is your body's natural form of morphine. The release of endorphins results in less pain and increased feelings of well-being. Exercise can also reduce pain through loading the sensory systems. The brain is busy taking in the information from joints and muscles instead of impulses from pain nerves.

Exercise Recommendations

- Everyone, regardless of injury, illness or age should aim to be physically active for 30 minutes a day.
- These 30 minutes can be done in 10 minute bouts. At least twice a week, these bouts should be 20 minutes long and either maintain or increase in intensity.
- These activities should be slightly difficult and be done on top of your normal everyday activities. This is needed to maintain good health and prevent diseases (e.g. diabetes, certain types of cancer, high blood pressure among others).

These recommendations apply to people with osteoarthritis. The ideal type and amount of exercise depends on the person's age, abilities, functional limitations, and health status. If you have not been physically active in the past, it may be a good idea to start slowly. See how you feel, and then gently increase the intensity.

Exercising also benefits the cartilage

Exercising has added benefit for people with osteoarthritis.

- Nutrients are pumped in and out of the cartilage when it is loaded and unloaded. This promotes growth and reformation of the cartilage which boosts its strength.
- Exercising will have your joints moving through their range of motion. This will make it easier to do everyday things you used to have trouble with (putting on socks, climbing stairs, getting in and out of the car).
- Exercise helps build stronger muscles, which helps make daily activities easier.

- Exercising will train your coordination; the ability to use the right muscles at the right time with the right amount of force. This will make it easier to control movements like walking on uneven ground.

The benefits of exercise disappear when you stop exercising. To keep the effects of exercise, you have to keep exercising regularly. This is why it's important to do exercises that you enjoy. This will help make exercise part of your daily routine. Examples of exercises that might work well are: walking, Nordic pole walking, aquatic (water) exercises, dancing, cycling, and strength training.

Is it okay to exercise when it hurts?

If you have osteoarthritis and start exercising, you might start to feel pain. The pain may last a while, but it's not dangerous to keep exercising. Everybody reacts to pain differently. Some people stop activities completely and rest as much as they can. This can lead to even more lost function. Some people ignore pain signals, which can lead to more injuries.

It's normal to feel a bit of pain when exercising. You may have a bit of muscle soreness if you haven't used these muscles regularly, or have some joint pain. The muscle soreness will decrease as you get used to exercising. The **joint** pain should not go over your *acceptable limit* of pain (see Figure 4). The joint pain should lessen 24 hours after exercise to the same level as before exercise. These pain limits will be different for everyone and can change over time. Lower the intensity of your exercise if joint pain goes over your acceptable limit or continues for over 24 hours.

It's important to listen to your body and strike a balance when exercising. Focus on your exercise goals to distract yourself from the pain. Don't forget to have fun!

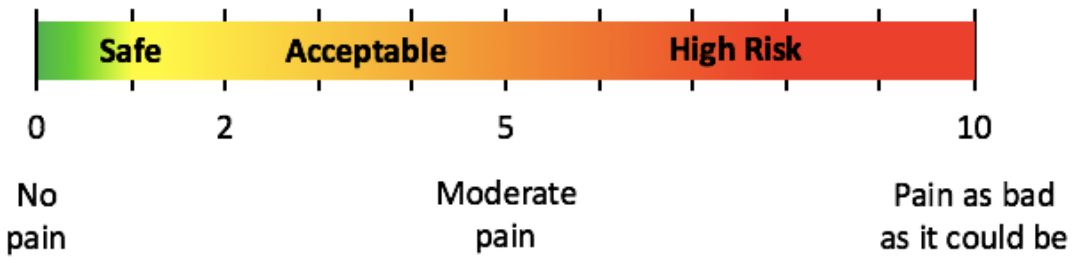


Figure 4: Pain scale; the safe zone represents joint pain from 0 to 2, the acceptable zone represents joint pain from 2 to 5, and the high risk zone represents pain from 5 to 10.

Physiotherapy and Occupational Therapy

Self-management is the most important treatment method for osteoarthritis. Self-management is the ability to care for yourself through your own behaviours.

You may find that you need a little extra help to get active. A **physiotherapist** is a skilled health professional in the understanding of body movement and function. A physiotherapist can help with:

- Assessment. A physiotherapist can assess your joint difficulties, your function and your level of activity. This will help them find a treatment that fits you best.
- Exercise. A physiotherapist can help you find the right ways to exercise and adjust the exercises to your needs.
- Knowledge. You can get advice if you're unsure of how to exercise or how it should feel when exercising.
- Pain relief. The physiotherapist has tools that can ease your joint pain so that you can proceed with your exercises (for example: Transcutaneous Electrical Nerve Stimulation and acupuncture).
- Walking Aids. If needed, the physiotherapist can help you get a walking aid if your joint is painful and needs relief.
- Inspiration and motivation. It can be hard to get started if you haven't exercised for a while or if you are in pain. Starting with a physiotherapist for 6-8 weeks can help you shift into an active lifestyle.

An **occupational therapist** is a health professional skilled in enabling people who may have suffered from injury, illness or disability to perform everyday activities. An occupational therapist can help with:

- Assessment. An occupational therapist can assess joints and function of the hand.
- Exercising. An occupational therapist can help design a hand exercise program.
- Knowledge. You can get advice on how to relieve your pain during work.
- Aids. An occupational therapist can advise on equipment that can ease your hand function during everyday activities. You can also get a tailored bandage that gives hand support and assists with your function.

More information on osteoarthritis

You can find more information on the internet at:

GLA:D Australia - https://gladaustralia.com.au

My Joint Pain - https://www.myjointpain.org.au

Arthritis Australia - http://www.arthritisaustralia.com.au/

Move: Muscle, bone and joint health - http://www.move.org.au/Home