



## **What is osteoarthritis ?**

Broadly speaking, arthritis means any joint pain associated with signs of inflammation (swelling, redness, warmth etc). Osteoarthritis (OA) is one of the most commonest arthritis seen in general population. It is a painful condition that can involve one or more of the joints in the body. It is commonly a disease which occurs with increasing age.

## **What actually happens in osteoarthritis ?**

Often you would hear that there is no or decreased “lubricant” or oil in the joint! Major joints in the body are formed by two end of bones coming together. This end of bones are covered by a cushion, which is known as cartilage. These bone ends along with the cartilage in between forms the joint. This cushion of cartilage is very important in normal functioning of the joint. However in osteoarthritis, there is degeneration and wearing out of the out of this cushion or cartilage. In OA the cartilage thins out along with some other changes in the surrounding bone of the joint and this leads to various problems of osteoarthritis

## **What are the most common joints involved in osteoarthritis ?**

Osteoarthritis can virtually affect any joint. OA most commonly occurs in knees, hips, spine hands, and feet.

## **What causes osteoarthritis in the joints ?**

We are not exactly sure what causes osteoarthritis. However, it is strongly associated with **increasing age**. Hence age related degeneration of the joint plays a major role. But it is not as simple as that. Many people can develop osteoarthritis at an early age. Many people with osteoarthritis do not have much pain. Many people have osteoarthritis which is much more advanced at an unexpected age. Different patients have variable levels of pain even with same amount of osteoarthritis. Family history is important as well. We are still trying to understand many of these factors.

## **What are the risk factors associated with osteoarthritis ?**

As mentioned above, we don't totally understand what causes osteoarthritis. However we do know that certain factors play a role in increasing risk of having osteoarthritis.

**Age** : Advancing age is one of the most commonest risk factors for osteoarthritis. In general public above 60 years of age, at least 80% have some evidence of osteoarthritis, in at least one of their joints. This may be just seen on X rays and patient may or may not have pain. However as mentioned above, not everyone with the same degree of osteoarthritis will have the same amount of pain.

**Gender** : For some unknown reasons, females have more chances of osteoarthritis than males. Females also tend to have more pain compared with same degree of osteoarthritis in men.



**Obesity and weight :** Osteoarthritis occurs more frequently in people who are obese (weight is well above required for that age and height). There is also some evidence that people who reduce weight can decrease the risk of developing osteoarthritis in the future.

**Sports and rigorous physical activity :** There is evidence that playing excessive injury sports like football, wrestling or repeated kneeling and squatting jobs can increase the risk of osteoarthritis. Having any injury in the ligament in the knee or any other joint can also increase the risk of osteoarthritis in the future . There is good evidence to suggest that routine, non-competitive running or exercises done for personal fitness does not increase the risk of osteoarthritis.

**Previous ligament or meniscus injury :** Any person who has had a history of injury to their supporting structures in joints like ligaments, meniscus etc at a young age, have higher chances of osteoarthritis in future. This is commonly seen in knee joint ligament and meniscus injuries. Even if one undergoes surgery to repair same, they are still at higher risk for developing osteoarthritis of respective joint in the future.

**Family history:** Osteoarthritis, particularly, nodal OA, can have remarkable familial predisposition.

#### **Do all patients with age get Osteoarthritis?**

No, not all patient get OA and it depends on multiple other factors, some of them have been outlined as above. We don't have exact figures from India, but OA is more common in women and increases after an age of 50 years and plateaus at 70 years. Western literature shows increasing prevalence over time due to longer life expectancy, obesity and sedentary life style. It is estimated that 10% and 18% men and women are affected respectively.

#### **What are the symptoms associated with osteoarthritis?**

**Pain :** Pain is the most common symptom associated with osteoarthritis. When osteoarthritis starts, the pain can be intermittent and variable. It might be aggravated by certain activities. Often it is more common in late afternoon and evening. The patient can have good days without pain and bad days with pain.

For example : The first symptom of osteoarthritis in the knee is usually having some discomfort or pain while patient is climbing or coming down the stairs.

**Site of Pain:** Pain more commonly occurs around the joint line except in hip and shoulder when pain can occur away from the joint.

**Stiffness or gelling phenomenon :** The osteoarthritis patients can have stiffness which is usually aggravated when the patient takes rest in a certain position for more than few minutes. The patients are stiff in the morning but the morning stiffness is usually less than 30 minutes and not very intense like rheumatoid arthritis.



For example : When the patient sits too long with knee osteoarthritis, after getting up, initial few steps are painful. But after walking few steps patient is fine.

**Swelling** : Some patients with osteoarthritis can have mild to moderate swelling in the joint. This swelling might be soft and compressible due to collection of some fluid in the joint. This can also be hard swelling due to formation of bone spurs (extra new bony protrusions) in the osteoarthritic joint.

**Crepitus or crackling sound** : In osteoarthritic joint one can have some crackling noise for crackling sound when the joint moves. This is known as crepitus.

For example : Patient with knee joint osteoarthritis can feel crackling or crepitus from their joints, especially when they keep palms over their joint while movements.

In most young – middle aged patients, clicking sounds heard from joints without much pain is normal and one should not start fearing osteoarthritis due to same

### **How is osteoarthritis diagnosed ?**

There is no single test which can diagnose osteoarthritis on its own. Age, weight, family history and pattern of symptoms aid in diagnosis. Other types of inflammatory arthritis, though less common, needs to be ruled out.

Blood tests for osteoarthritis : There is no specific blood test to diagnose OA. Most blood tests done in patients with suspected OA are usually done to rule out other arthritis.

Imaging methods for OA: Sometimes X rays, ultrasound and MRI are helpful in confirming osteoarthritis, but they are not required in most patients. Also, X-ray can be normal in most patients with early OA. Clinical history is most important in early OA. Imaging methods are most useful to identify degree and severity of OA in a particular joint. And it is important to note that pain or clinical findings may not correlate with X-ray findings.

The diagnosis of osteoarthritis is usually made by expert like a Rheumatologist or Orthopedician doctor after collectively taking into account various factors.

### **How will osteoarthritis progress and affect my daily life ? Will I become permanently disabled ?**

Most people will have mild to moderate osteoarthritis with progressive age. In most cases it will lead to mild to moderate pain and usually this pain is intermittent. Most of the osteoarthritis patients can function with good quality of life without doing much interventions except for exercises, assistive devices or being physically active. However many patients will have moderate or progressive osteoarthritis, which can lead to pain and deformities in the future.



In some patients osteoarthritis will disability due to progression. However, there are many non-surgical and surgical treatment options available, even if one has advanced osteoarthritis with disability.

**What is treatment for Osteoarthritis ?**

**General principle of osteoarthritis treatment :**

Osteoarthritis is a chronic disease and there is a component of age-related wear and tear (degeneration) of the cartilage in the joint. Because age is a factor, osteoarthritis usually progresses with advancing age. The progress is gradual in most cases and it takes years for patients with early osteoarthritis to develop advanced osteoarthritis and disabilities.

There is no treatment for osteoarthritis which can slow down or stop the progression of osteoarthritis, except for possible weight control. Most treatment of osteoarthritis is to make the patient symptoms better and to give them a good quality of life.

Osteoarthritis treatment can include a range of options, which can include non-medication based treatment and medication based treatment and surgery. Please understand that every patient is different and every patient with osteoarthritis can have different issues and joints involved. Treatment depends on patient’s exact problems, daily activity demands and their desired expectations from treatment. (Figure 1)

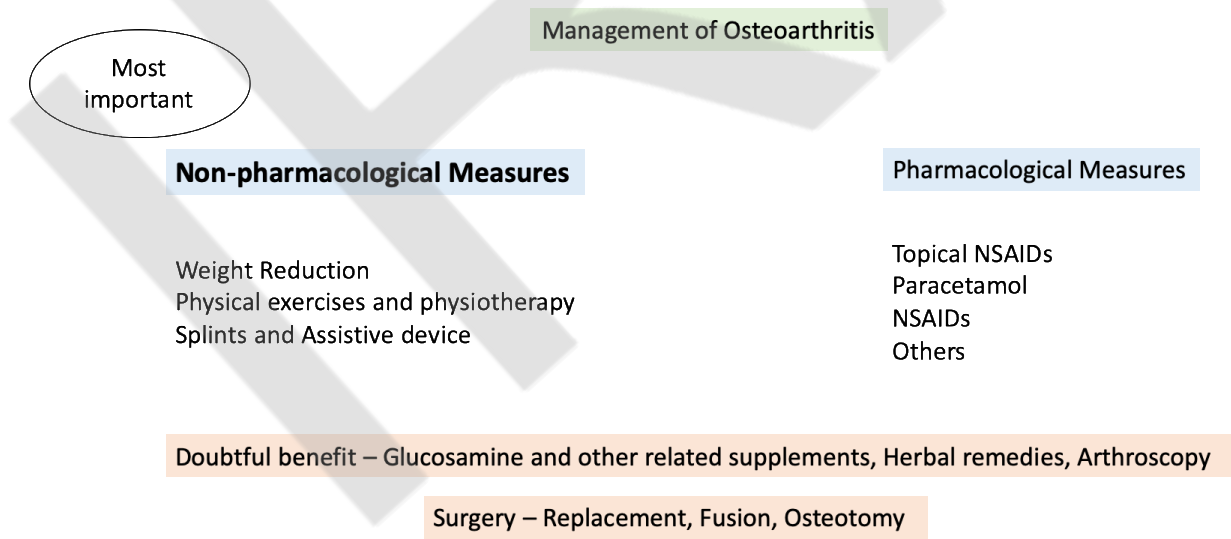


Figure 1: Overview of Management of Osteoarthritis. Non-pharmacological measures are the first line treatment in OA. NSAIDs, Non-steroidal Anti-Inflammatory Drugs.

**Treatment of osteoarthritis without medications (Non pharmacological treatment of OA)**

Treatment of osteoarthritis without medication is recommended as a first line of treatment. This line of treatment can be helpful to all patients without any side effects and should be a part of treatment of all OA patients.



*Controlling excessive weight or planning weight loss* : We have already mentioned that obesity or excessive weight can increase the risk of osteoarthritis. If the patient has already developed osteoarthritis in a particular joint, weight loss may help to slow down the progression. If Knee or hip joint OA patient loses weight by 10%, there is evidence to suggest that they can have 50% decrease in pain. If one is serious about weight loss, one should strongly consider showing a dietitian who can guide them accordingly with the weight loss program.

*Physical exercises and physiotherapy* : Exercises are very important part of management of osteoarthritis. They don't improve or stop the progression of the worn-out joint. However they keep to help the surrounding muscles strong and may decrease the pain. So a patient with osteoarthritis who continues to exercise, is more active compared to those who do not exercise. Consider starting exercise gradually and take advice from a trained physiotherapist. They can give specific exercises for affected joint.

Exercise may not give immediate relief and it may take some weeks for exercises to show its benefits. Also, exercises may increase the pain in initial few weeks before they show benefits. The general rule one should follow is any increase in pain after exercise should reach to pre-exercise levels within 24 hours. If that is not the case, one should be more gradual in building up to a desired exercise regimen or take help of a trained physiotherapist to modify the exercises.

Also any form of physical activity in these patients keeps their muscle strong and can be very helpful to help their comorbidities like diabetes, heart disease, hypertension, osteoporosis etc.

**Splints and assistive devices** : Some patients with osteoarthritis, especially osteoarthritis in the base of the hand can be helped by using hand splints. This splint does not prevent the progression of osteoarthritis in thumb base. However it is helpful in preventing excess deformity of the thumb base joint. It also helps decreasing the pain at thumb base while movements.

Patients with foot and ankle osteoarthritis may have some specific benefits with some specific insoles. This is generally true if patients have specific issues like flat feet or deviated ankles.

Usually knee braces or stockings are not advisable as they make the muscles surrounding the joints weak (patients muscles are not used and loading is taken by the supportive device). The weak muscles surrounding the joint can further increase the pain and may lead to instability in patient's movements. However, one might use the supportive devices for intermittent use to provide stability while walking, for short term use before surgery or in cases where surgery is not feasible. Always take advice of a clinical specialist (like a doctor, physiotherapist or occupational therapist).

In patients with advanced osteoarthritis, use of walkers, walking cane or sticks for support etc may be helpful and will prevent falls.



## **Getting educated and finding some support for patients with osteoarthritis**

If one is educated about various aspects of osteoarthritis, they can manage many aspects of their osteoarthritis. This empowers them to deal with this chronic disease more effectively on a daily basis.

Osteoarthritis pain might have a functional component and many people with the same degree of osteoarthritis can have more pain if they don't have a good social support. It is best if such patients can be given some kind of mental or physical support to help with activities at home. It is also helpful if somebody positively encourages them to do the exercises on a regular basis. It is also very helpful if such patients can join group sessions of people with osteoarthritis. Such groups help them to identify people with similar problems, they can encourage each other to do exercises, provide a listening ear, emotional support etc.

## **Osteoarthritis treatment with medications / Pharmacological treatment of osteoarthritis**

Most patients with osteoarthritis can be managed with non-pharmacological measures of weight loss, exercise, splints etc. These things should be a part of patient's management even if any medications are given to them.

Some patients do require medications for management of osteoarthritis. Please understand that there is no medication conclusively proven to halt or slow down the progression of osteoarthritis. Whatever medications we have available right now, are to manage the symptoms of osteoarthritis, so that the patients have better quality of life with less pain and more mobility.

We again re-emphasize that it is very important for the patient to concentrate on exercise and weight loss in most cases, without which the pharmacological interventions may not have much benefit.

**Topical NSAID lotion / gels / therapies for osteoarthritis joints** - Topical anti-inflammatory gels / lotions contain drugs called as nonsteroidal anti-inflammatory drugs (NSAIDs). These drugs when applied to the skin over the joint can help in relieving the pain of osteoarthritis. This is especially true in the hands, knee and other superficial joints. They cannot be used in relieving pain of hip osteoarthritis as it is a deep joint. Usually topical gels contain very low quantity of NSAID drugs with very low absorption and hence they usually do not have any major side effects. However, in patients with blood pressure, kidney or heart issues one should discuss safety issues with their doctors.

**Nonsteroidal anti-inflammatory drugs (NSAIDs)** - Nonsteroidal anti-inflammatory drugs (e.g.: ibuprofen, diclofenac, Naprosyn, indomethacin etc) are commonly known as pain killers by general Indian public. They not only help relieve pain but can also help to decrease inflammation (redness, swelling etc). They are very effective drugs in relieving the pain and inflammation associated with osteoarthritis. However, one should always discuss their use with doctor as their consumption in patients with acidity (heartburn), heart, kidney, blood pressure issues etc can be harmful.



Experts might use NSAIDS in short or intermittent courses to help the patients. They will be used in the lowest possible doses for the shortest possible duration to avoid side effects. They should not be taken without an expert advice. Some patients might be given low dose of these drugs for prolonged periods. In such cases patients should be educated about side effects and their kidney, liver and other parameters should be regularly checked.

NSAIDS gels (discussed in topical therapies above) have very low doses of these drugs and are absorbed in very little quantities when applied over joints. They are generally much safer to use than NSAID tablets.

**Paracetamol** - Paracetamol is generally very safe in elderly population of osteoarthritis. The maximum total daily dose of paracetamol is 3 to 4 gram per day. Paracetamol is not as effective as NSAID drugs (discussed above) as it does not have an anti-inflammatory and dramatic pain-relieving effect. However, it is much safer if given for prolonged periods also and can give decent relief to OA patients. In recommended doses it doesn't tend to affect heart or kidneys.

Paracetamol is commonly used in dose of 500 milligram (mg) for fever 3-4 times per day. However, 500 mg is not usually effective for pain. One should use doses of 650mg-1gm two to three times a day for pain relief in OA. One should be careful with paracetamol doses and should not exceed a dose of 3gram – 4 gram of paracetamol in a day (see table below).

Paracetamol tablet strength	Maximum tablets which can be safely taken in a day (24hrs) – (do not exceed 4gram in 24 hrs) *
500 mg	8 tablets
650mg	6 tablets
1 gram	4 tablets

\*Confirm with your doctor

One should always talk to their doctor before trying to find their maximum possible dose of paracetamol which can be taken safely, and one should take it with regular checking up of liver parameters.

**Non NSAID pain relieving drugs:** Opioid drugs like tramadol (or tapentadol) tablets or capsules, buprenorphine patches etc are used quite frequently in Indian context. However, there is quite strong evidence that these drugs may cause dependence, can cause a variety of issues including constipation, giddiness, nausea etc. They are generally considered to be unsafe in elderly people and should only be use very sparingly. They are generally not recommended to relieve OA pain routinely.

**Neuromodulators for relieving pain:** Pain in osteoarthritis and any other disease can be multifactorial. There is some evidence that some patients with OA have over sensitisation of their nerves and this may lead to increase pain. Some experts recommend a trial of low dose neuromodulator drugs like duloxetine, pregabalin, gabapentin etc to give symptomatic relief in OA patients. They might be especially useful in patients with osteoarthritis of spine,



especially if there is some compression of nerves. Technically these are not pain relievers, but they possibly work by modulating the pain carried in nerves. Again, these drugs should always be taken under expert guidance.

**Joint injections** - Glucocorticoid or steroid injections can be useful in certain patients with osteoarthritis. They are especially useful in those with some amount of inflammation in the form of swelling and warmth. They are generally considered to be safe. However, some evidence says that repeated steroid injections in the knee may lead to slightly faster progression of the osteoarthritis. Hence, usually doctors don't give more than three to four injections in a year for a given osteoarthritic joint.

### **Therapies of uncertain benefits in osteoarthritis**

**Gel injections in joints:** Injection of a certain types of gel in the knee called hyaluronic acid gels are also available (example brand name Hylan, Synvisc, Durolane etc.). Their benefits are uncertain, don't last very long and they can be very expensive.

**Platelet rich plasma injections in the knee:** In this procedure, patients own blood is collected and platelets are separated and injected in the affected joint (mostly knee). It is uncertain if it has any significant benefits. Many patients claim relief but again its uncertain whether they would have got relief anyways from conventional therapies.

**Stem cell injections in the OA joints:** Off late many centres in India have been propagating use of patients own stem cells to be injected into the OA joint. These are expensive, there is no conclusive benefit, there is no clear-cut guideline or regulatory authority for such kind of procedures. One should at this moment refrain from using these kinds of injections. In most cases utilising the expenses meant these kinds of procedure on replacement surgery is far more beneficial. This is especially true in cases of advanced knee and hip OA.

**Glucosamine and other similar supplements:** Various tablets / supplements containing glucosamine and chondroitin sulphate are routinely prescribed to or used by patients with osteoarthritis. Many practitioners also prescribe diacerein for patients with osteoarthritis. However, there is no conclusive evidence that any of the above supplements work in relieving the pain of osteoarthritis. There are some good trials which have shown benefit and some good trials which have not shown benefit. There is generally no major harm in using them, but again one should consult their doctor.

**Herbal remedies and natural substance supplements for OA:** A lot of herbal / natural therapies are there in the market which are claimed to give miraculous relief in osteoarthritis patients. Some patients also claim a lot of relief with these therapies. The list includes many supplements. For example: Turmeric tablets, curcumin tablets, fenugreek tablets, chinese herbal therapies, herbal topical agents, boswellia extract, rose hip extract, Ayurveda therapy tablets or oils etc. These therapies are usually expensive and there is no proven conclusive benefit. However, since they are generally safe the doctors generally do not aggressively discourage the patients from taking these supplements.





One should always be careful of herbal therapies which have the potential to damage liver or kidneys. Many of them claim to have no side effects which can be untrue. Patients should always discuss / disclose their herbal therapies they with their respective expert doctors.

Multiple other examples: There are multiple other fancy therapies in unregulated Indian healthcare sector propagated widely to be very effective for osteoarthritis pain. For example: naturopathies, electric stimulation, magnetic therapy, ceragem massages, blood chelation, joint manoeuvring, prolotherapy, cupping etc. They are often expensive, have no proven benefit, might give some placebo effect and may do more harm at times. One should refrain from such therapies or talk to a well-qualified doctor before trying same.

### **Osteoarthritis surgery**

Surgery is usually used as a last resort in osteoarthritis patients specially who have advanced osteoarthritis and are not benefited by conservative management. The patients with advanced osteoarthritis have severely worn out cartilage, deformities of the joint and the pain is much more severe.

*The various type of surgeries available:*

**Replacement surgeries:** The most common surgery done is knee and hip replacement surgery which can be a partial replacement of a complete replacement.

Replacement is usually done after 55 to 60 years of age as usually replaced joints last for an average of 15 years. Patient's usually requires a repeat replacement after that. Generally speaking, repeat replacement surgeries are more difficult. As the average Indian age lifespan is around 70-75 years of age, doctors recommend surgery to osteoarthritis patient at around 60 years of age or later. This is so that they are less likely to require another surgery on the same joint in their lifetime.

In patients who have osteoarthritis of only one part of the joint and are relatively young, experts can do realignment surgery or partial joint replacements. This provides better mobility and they also have a joint which is more like a natural joint. They might not require a complete joint replacement in future. Even if required, one can always undergo a complete joint replacement surgery easily in the future. It's much easier to do a complete replacement surgery on partially replaced joint rather than doing a re-replacement surgery in a previously fully replaced joint. Hence, in carefully selected young patients' realignments and partial replacements can be very useful.

**Fusion surgery:** Fusion surgery (medically known as arthrodesis) is recommended in very severe osteoarthritic joint where there is no possibility of a replacement and there is lot of pain. Fusion surgeries are usually done in ankle joint OA where. In fusion surgeries joint margins are fused so that this leads to restriction of joint movement and much lesser pain. However, the movements are obviously restricted after fusion surgery. Such surgeries are more for pain relief at the cost of flexibility of the joint. They can be very helpful in properly selected patients.