Fact sheet
Osteoarthritis

CPPE
CENTRE FOR PHARMACY POSTGRADUATE EDUCATION

Contents

NHS England

MANCHESTER 1824
The University of Manchester

Definition

Osteoarthritis is a long-term condition in which the cartilage in the joints deteriorates. The pathology of osteoarthritis involves the whole joint, and is categorised by cartilage degradation, bone remodelling, osteophyte formation and synovial inflammation, leading to loss of normal joint function. This results in bones rubbing together, creating stiffness, pain and difficult movement. Osteoarthritis mostly affects joints in the knees, hands, feet and spine, but can impact shoulder and hip joints. Similarly, it can cause damage to all areas of the joint, such as the:

- cartilage
- tendons
- ligaments
- synovium
- meniscus in the knee
- surrounding bone.[1]

There are some overlapping signs and symptoms between osteoarthritis and rheumatoid arthritis; however, osteoarthritis is clinically diagnosed in people who are 45 or over and have activity-related joint pain, and have either no morning joint-related stiffness or morning stiffness that lasts no longer than 30 minutes.[1]

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Prevalence and incidence

Osteoarthritis is the most prevalent joint disease associated with pain and disability, in addition to being the most common form of arthritis.[2] Up to 13 percent of adults over 60 have a degree of osteoarthritis, with higher prevalence among women than men. Osteoarthritis is becoming more common due to an increasingly aging population, in addition to an increasing prevalence of obesity.[2]

The United Nations estimates that by 2050, adults over 60 will account for up to 20 percent of the total population.[3] Of these adults over 60, 15 percent will have symptomatic osteoarthritis, with one third being severely disabled. By 2050, 130 million people will be living with osteoarthritis, 40 million of whom will be severely disabled by the condition.

Versus Arthritis provides local prevalence data in collaboration with Arthritis Research UK. Available datasets allow for a comparison between a local authority and the national average.

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Signs and symptoms

Osteoarthritis has a varying impact on activities of daily living (AODL). For some, its affect can be mild, minimally impacting AODL, while for others, it may cause significant pain and distress, limiting function. Damage to the joints occurs slowly over time, often years. However, joints can quickly deteriorate in some people.[4] Damage to joints results in chronic pain, aching, stiffness, decreased flexibility or joint stability, swelling in the joints and joint space narrowing, which worsens pain as bones rub or put too much pressure on each other.[5]

Another key distinction between osteoarthritis and rheumatoid arthritis is that inflamed joints tend to be cold to the touch in people living with osteoarthritis, whereas they tend to be hot to the touch in those living with rheumatoid arthritis.[6] Similarly, when feeling the joints, they tend to be sponge-like in rheumatoid arthritis due to the presence of fluid caused by inflammation,[7] whereas joints in osteoarthritis feel hard to the touch.[8]

As osteoarthritis progresses, bony enlargements can develop alongside shape changes in the finger joints of the hand. Similarly, gradual muscle and ligament weakness can cause the knees to buckle, due to joint instability. Grinding or scaping noises may occur when walking, as the bones of the knees rub together. Pain and stiffness can be felt in the neck or lower back, with spinal stenosis occurring in some people.[9]

In the Arthritis Ireland video ***Living with osteoarthritis – Ruth Mann's story***, we hear about the impact osteoarthritis on Ruth, a retired concert violist.[10]

Source: Arthritis Ireland, 2021[10]

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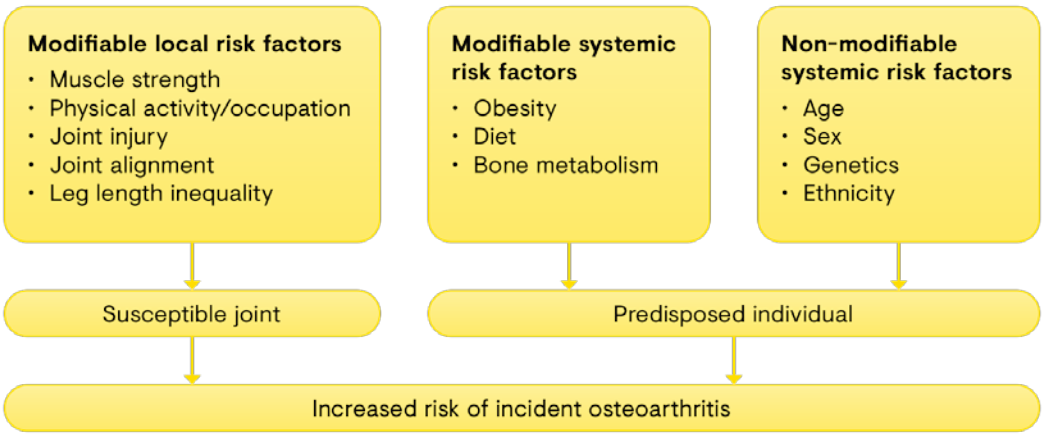
Causes/risk factors

Although age is a big factor, osteoarthritis is associated with modifiable and non-modifiable risk factors, including obesity, lack of exercise, genetic predisposition, bone density, occupational injury or excessive physical labour, trauma and sex.[11]

With increasing age, there is a higher likelihood of presenting with radiographic changes in one or more joints. Obesity increases the likelihood of earlier osteoarthritis diagnosis, in addition to more technical difficulties for total joint replacement surgery. This is due to the increased biomechanical loading of joints, in addition to systemic inflammation presented by increased adipokine release. Knee trauma or insult is a leading cause of osteoarthritis in younger adults, increasing the chances of diagnosis four-fold.[12]



Source: Change Pain, [No date][13]

Read the **National Institute for Health and Care Excellence (NICE) Clinical knowledge summary (CKS)** ***Osteoarthritis – Background information – Risk factors*** for more information about risk factors for osteoarthritis.

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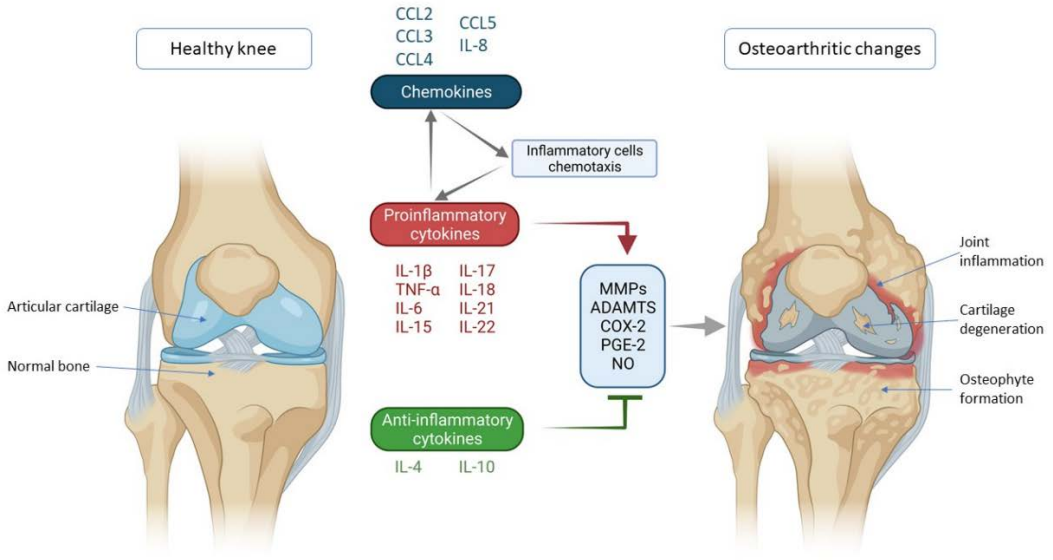
Pathophysiology (mechanism of disease)

The exact causes of osteoarthritis are not fully understood. The pathogenesis of osteoarthritis is complex and multifactorial, involving mechanical, inflammatory and metabolic processes that lead to structural destruction and failure of the synovial joint. Newer insights into the condition describe it as an imbalance between the repair and destruction of joint tissues, rather than a *'wear-and-tear disease'*.[14] Both the mechanical and metabolic processes trigger the secretion of inflammatory molecules, such as proinflammatory cytokines and chemokines begin the cascade of the osteoarthritis process, resulting in cartilage composition changes and loss of integrity. Interleukin-1β and tumour necrosis factor (TNF) are mainly implicated in the degeneration of articular cartilage matrix.[15] Although these inflammatory markers are implicated in both osteoarthritis and rheumatoid arthritis, anti-TNF drugs such as infliximab, etanercept and adalimumab are not routinely prescribed for osteoarthritis, and have not demonstrated any efficacy for people living with osteoarthritis.[16]

Below is a diagram highlighting the inflammatory response resulting in the osteoarthritis process:



Key: IL – interleukin; CCL-CC – chemokine ligand; TNF-α – tumour necrosis factor α; MMPs – matrix metalloproteinases (MMPs); ADAMTS – a disintegrin-like and metalloproteinase with thrombospondin motif; COX-2 – cyclooxygenase-2; PGE-2 – prostaglandin E2; NO – nitric oxide.

Source: Molna, Matišić, Kodvanj, Bjelica, Jeleč, Hudetz et al, 2021[17]

For more information about the inflammatory pathogenesis of osteoarthritis, read the article ***Cytokines and chemokines involved in osteoarthritis pathogenesis*** (2021).

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Prognosis and complications

Osteoarthritis can impact different joints, leading to varying symptoms and functional impairment, which has an impact on different clinical outcomes. Joint replacement surgery may offer the best long-term outcome in some people.[18] Hand involvement generally has a good prognosis, unless the thumb basal joint (the first carpometacarpal) is affected. Hip involvement usually has a poorer prognosis, with a significant proportion of people requiring a hip replacement within five years of diagnosis. Osteoarthritis with knee involvement has a variable prognosis.

Obesity, increasing age, multiple joint involvement and varus deformity (knee buckling) are associated with rapid progression of disease. Those undergoing joint replacement surgery typically have a good prognosis, with success rates of over 80 percent. However, most prosthetic joints wear out by 15 years, and repeat surgery is required. Complications associated with joint replacement include neurovascular injury, prosthetic joint infection, peri-implant fractures, and issues related to wear and tear of the prosthesis.[19]

Complications may include:

- functional impairment and disability
- chronic pain syndrome, in addition to the psychosocial impact[20]
- joint deformity
- accelerated, complete breakdown of cartilage (chondrolysis)

- infection within the affected joint and rupture of the tendons and ligaments around the joint, leading to loss of stability[21]
- osteonecrosis
- stress fractures
- bleeding into the joint (hemarthrosis).

Complications of osteoarthritis of the spine can lead to bony outgrowths, which may put pressure on or pinch the nerves in the spinal canal. This may lead to lower back and leg pain that is worse on exertion.[22]

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Diagnosis/detection

NICE guideline [NG226]: *Osteoarthritis in over 16s: diagnosis and management* recommends clinical diagnosis of osteoarthritis without imaging in people who are over 45 years, have activity-related joint pain and atypical features that suggests an alternative or additional diagnosis.[23] Atypical features include any recent trauma, prolonged morning joint-related stiffness, rapid worsening of symptoms or deformity, the presence of a hot swollen joint, or concerns that may suggest infection or malignancy.[23] Although NICE recommends a clinical diagnosis without imaging, in practice clinicians may carry out some imaging on the joints to rule out differential diagnoses, such as rheumatoid arthritis.[23]

Typically, osteoarthritis is suspected once ***alternative conditions*** have been excluded.[24] The clinical features of osteoarthritis can vary depending on joint sites. There is usually a history of activity-related joint pain, with few joints affected at any one time, and pain developing over at least several months. There is no morning joint-related stiffness, or morning stiffness lasting longer than 30 minutes, which is more associated with rheumatoid arthritis. Finally, there is functional impairment, with symptoms affecting a person's ability to carry out their AODL to some extent.[25] Although rare, osteoarthritis and rheumatoid arthritis may coexist. This is often referred to as burnout rheumatoid arthritis, where osteoarthritis remains after the inflammation of the joint has improved through effective treatment with a biologic. Previous trauma or injury can lead to both diseases, with osteoarthritis more likely with increasing age. Likewise, people living with rheumatoid arthritis may develop osteoarthritis as they age. However, it is very rare to present with both at the same time. Read the **NICE CKS – *Diagnosis*** for more information.[25]

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Non-pharmacological treatment

Information about a healthy lifestyle should be offered to people living with osteoarthritis. Recommendations Section 1.3, *Non-pharmacological management*, of NICE guideline [NG226]: ***Osteoarthritis in cover 16s: diagnosis and management*** covers the information that should be delivered, along with links to other relevant NICE guidance.[26] In summary, NICE recommends therapeutic exercise, weight management, manual therapy (such as manipulation, mobilisation or soft tissue techniques) for hip or knee osteoarthritis alongside therapeutic exercise, in addition to using devices such as walking aids.[26]

Versus Arthritis have produced a ***leaflet*** you can read through or distribute to people living with osteoarthritis during your consultations. In this leaflet we are introduced to Mel, who made some lifestyle changes to better control her symptoms.[27]

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Pharmacological treatment

There is no cure for osteoarthritis, and all the currently available treatments are directed towards controlling symptoms and supporting people to carry out AODL as best as they can.

NICE guidance

NICE guideline [NG226] – Section 1.3, *Non-pharmacological management* **–** outlines the NICE recommendations for pharmacological treatment in osteoarthritis.[26]

Therapeutic options

If pharmacological treatments are required, they should be prescribed at the lowest effective dose for the shortest possible time, and in conjunction with established non-pharmacological management strategies. Flare management should be promoted, rather than aiming for long-term use of analgesics.

Non-steroidal anti-inflammatory drug (NSAID)

NICE recommends that clinicians consider a topical NSAID be offered to manage knee osteoarthritis, although this could be considered for osteoarthritis in other joints.[28] However, an oral NSAID could be considered after a thorough risk assessment has been made if topical NSAIDs prove ineffective or inappropriate. The clinical need for gastroprotection with a proton pump inhibitor or H2-antagonist should be assessed on an individual basis and reviewed regularly. Cyclo-oxygenase-2 (COX-2) inhibitors, such as celecoxib, could be considered for people with a higher bleeding risk; however, this must be balanced with their risk of cardiovascular disease, as this risk is higher in COX-2 in comparison to COX-1 inhibition.[29]

Paracetamol and opioids

Opioids and paracetamol are less effective, having a smaller impact on physical function, in the management of knee or hip osteoarthritis in comparison to oral and topical NSAIDs. Furthermore, there is a greater risk associated with opioids and paracetamol when compared with oral or topical NSAIDs, which may outweigh any associated benefit.[30] NICE advises that paracetamol or opioids should not be routinely prescribed in the pharmacological management of osteoarthritis.[31] However, paracetamol and weak opioids may be considered for infrequent and short-term use if all other pharmacological treatments are not clinically suitable or have been ineffective.

Intra-articular injections

NICE advises against the use of intra-articular hyaluronan injections to manage osteoarthritis.[31] However, intra-articular corticosteroid injections could be considered when other pharmacological treatments are ineffective.

The American College of Rheumatology advises against herbal supplements in the treatment of arthritis, as there is no evidence of clinical benefit.[32]

The *British Medical Journal* article ***Supplements in the management of osteoarthritis of the hip or knee*** (2010) focuses on the effects of glucosamine and chondroitin on osteoarthritis of the hip or knee.

The *British National Formulary* (*BNF*) treatment summary: ***Osteoarthritis*** covers self-management strategies, pharmacological treatment options and intra-articular injections.

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Patient support

Versus Arthritis is a charity dedicated to supporting people living with arthritis, working with volunteers, healthcare professionals, researchers to develop treatments, raise awareness and advocate for people living with arthritis.

The **Arthritis and Musculoskeletal Alliance** is an umbrella body that brings together different organisations and professional bodies to represent and support people living with musculoskeletal conditions.

The NHS website has dedicated ***Treatment and support*** *and* ***Living with osteoarthritis*** *pages.*

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Further resources

CPPE's ***Musculoskeletal*** gateway page offers further learning on musculoskeletal topics, including osteoarthritis.

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External websites

CPPE is not responsible for the content of any non-CPPE websites mentioned on this page or for the accuracy of any information to be found there.

All web links were accessed in May 2023.

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Last review: May 2023
Next review due: May 2024

Credits

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