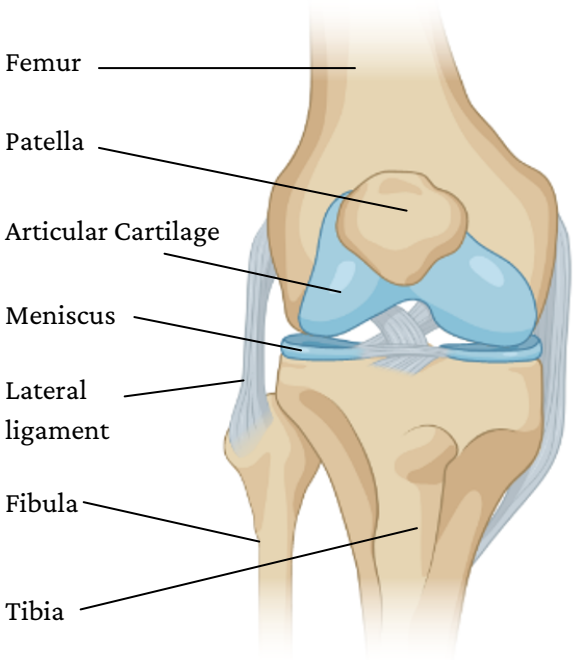
Understanding Arthritis



What is Arthritis?

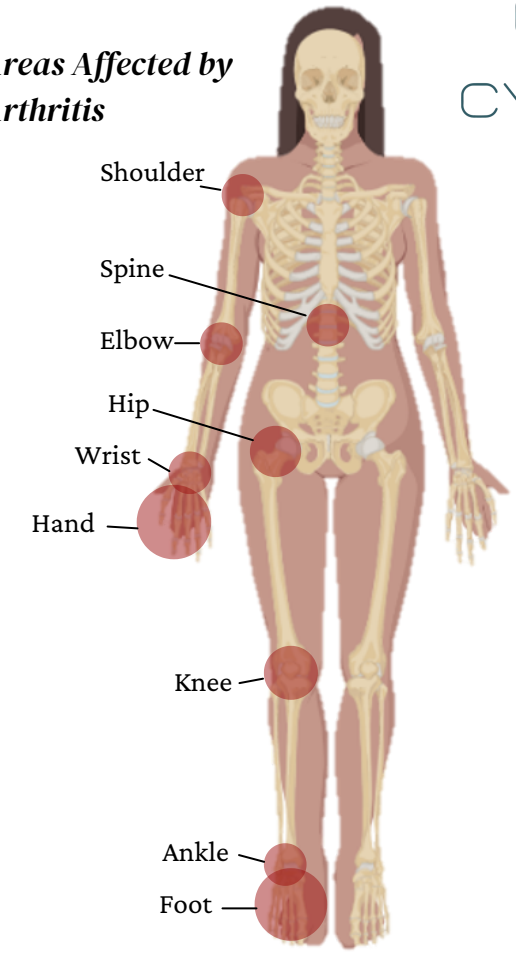
Arthritis means inflammation or swelling of one or more joints. There are more than 100 types of arthritis that affect the joints, tissues around the joint, and other connective tissues. The three most common types of arthritis are **rheumatoid arthritis**, **osteoarthritis**, and **gout**.

A Healthy Joint

A joint is where two or more bones are joined together. Joints can be rigid or movable. Many joints have cartilage on the ends of the bones where they come together. Healthy cartilage helps you move by allowing bones to glide over one another. It also protects bones by preventing them from rubbing against each other.

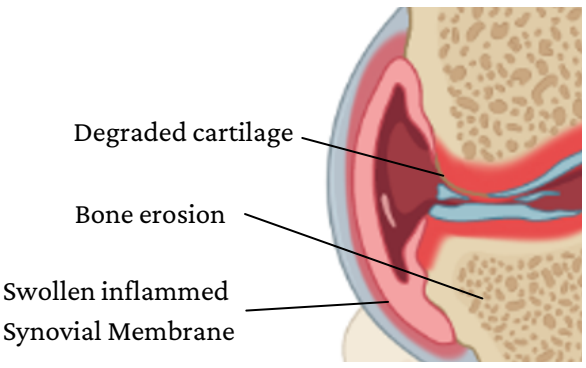
Articular cartilage: needs to maintain the joint's resilience and relative softness
Synovial membrane: provides nutrients and lubrication to the joint tissues
Chondrocytes (cells for cartilage formation): to maintain the extracellular matrix

Areas Affected by Arthritis



What is Rheumatoid Arthritis (RA)

Rheumatoid arthritis, or RA, is an autoimmune and inflammatory disease, which means that your immune system attacks healthy cells in your body by mistake, causing inflammation (painful swelling) in the affected parts of the body.

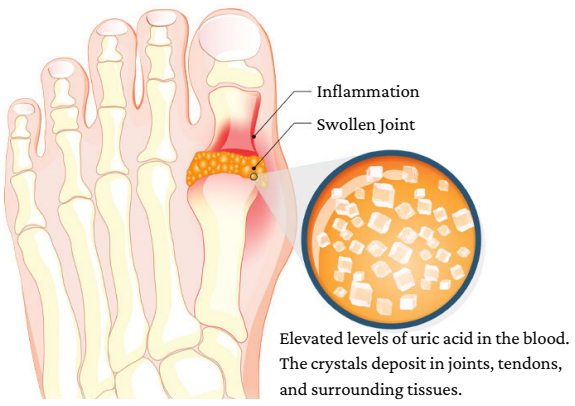


Rheumatoid Arthritis

1. Inflammed synovial membrane
2. Bone erosion
3. Cartilage exposed
4. Joint swelling and tenderness
5. Reduced joint space and bone fused when RA is worsening
6. Joint deformity

What is Gout?

Gout is a form of arthritis that is caused by a buildup of uric acid crystals in the joints, most commonly in the big toe. There are times when symptoms get worse, known as flares, and times when there are no symptoms, known as remission. Repeated bouts of gout can lead to gouty arthritis, a worsening form of arthritis.



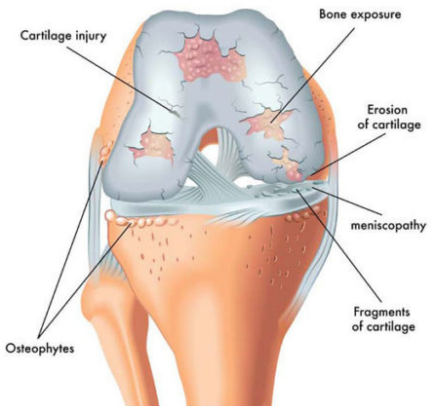
Elevated levels of uric acid in the blood. The crystals deposit in joints, tendons, and surrounding tissues.

Gout

1. Deposition of monosodium urate (MSU) crystals: **tophus**
2. Bone erosion
3. Cartilage erosion
4. Inflammed synovial membrane

What is Osteoarthritis (OA)?

Osteoarthritis (OA) is the most common form of arthritis, also known as degenerative joint disease or “wear and tear” arthritis. It occurs most frequently in the hands, hips, and knees. Inflammation occurs as cytokines and metalloproteinases are released into the joint. These agents are involved in the excessive matrix degradation that characterizes cartilage degradation in OA.



Osteoarthritis

1. Loss of joint space
2. Osteophytes
3. Subchondral cysts: formation of fluid-filled sacs inside the joints
4. Subchondral sclerosis: a thickening of bone that happening in joint
5. Inactivity stiffness: occurs when the patient gets up and bears weight after prolonged immobility
6. Joint deformity in the knees
7. Feel for crepitus (abnormal popping or crackling sound) throughout the range of movement

Warning Signs of Arthritis

Arthritis is the most common movement disorder that affects people's daily life. According to *the Lancet* report in 2020, Osteoarthritis affects 7% of the global population, more than 500 million people worldwide. Certain joint symptoms you should be aware of, not to tell you have arthritis, but give you a warning sign that should prompt you to talk to a health care provider.

Pain

Pain from arthritis can be constant or it may come and go. It may occur when at rest or while moving. Pain may be in one part of the body or in many different parts.

Stiffness

This is a classic arthritis symptom, especially when waking up in the morning or after sitting at a desk or riding in a car for a long time. Morning stiffness that lasts longer than an hour is good reason to suspect arthritis.

Swelling

Some types of arthritis cause the skin over the affected joint to become red and swollen, feeling warm to the touch. Swelling that lasts for three days or longer or occurs more than three times a month should be careful.

Difficulty moving a joint

It shouldn’t be that hard or painful to get up from your favorite chair.

REFERENCES

1.Hunter, D. J., & Bierma-Zeinstra, S. (2019). Osteoarthritis. The Lancet, 393(10182), 1745-1759. 2. Centers for Disease Control and Prevention. (2019). Arthritis types. Retrieved on 10th September, 2021, from https://www.cdc.gov/arthritis/basics/types.html. 3. Arthritis Foundation. (n.d.). Recognizing the symptoms of arthritis. Retrieved on 10th September, 2021, from https://www.arthritis.org/health-wellness/about-arthritis/understanding-arthritis/recognizing-the-symptoms-of-arthritis

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Understanding Osteoarthritis (OA)

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More than **500 million** people worldwide suffer from osteoarthritis

2 in 3 people with osteoarthritis are **female**

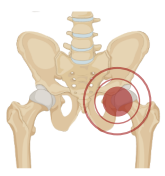
Osteoarthritis is the **leading cause of pain and disability** among the elderly

Excess Weight Gain is the most important modifiable risk factor

UP TO 70% osteoarthritis is preventable

WHAT IS OSTEOARTHRITIS?

Osteoarthritis is the most common form of arthritis, occurring most frequently in the hands, hips, and knees. The cartilage within the joint begins to break down, and the underlying bone begins to change. These changes typically develop slowly, worsen over time, and cause pain, stiffness, and swelling.



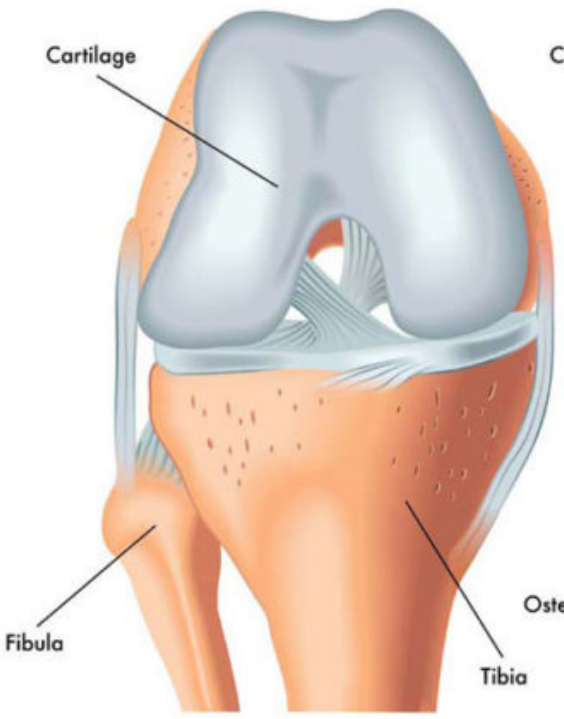
Hip OA

Hand OA

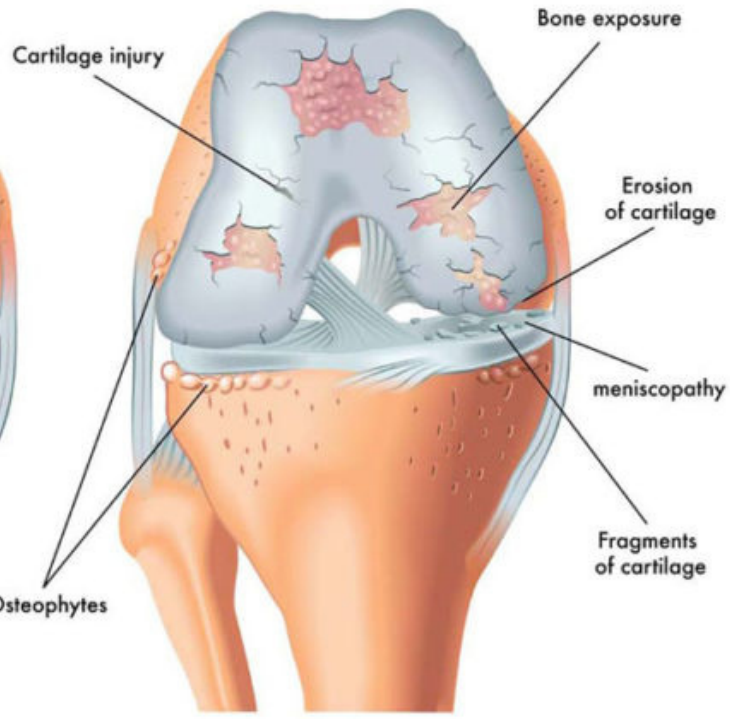
Knee OA

Although OA was previously classified as a non-inflammatory condition caused largely by excessive wear and tear. Increasing evidence has shown that inflammation occurs as cytokines and metalloproteinases are released into the joint. These agents are involved in the excessive matrix degradation that characterizes cartilage degradation in OA.

NORMAL KNEE



OSTEOARTHRITIS



SIGNS AND SYMPTOMS OF OA

Pain & Tenderness

Stiffness (joint stiffness often worse in the morning or after a period of inactivity)

Loss of flexibility, limitation of motion

Joint swelling (with or without associated warmth and loss of function)

RISK FACTORS

i) MODIFIABLE

Behaviors and exposures that can raise a person's risk.

- **Extra weight**, which puts more stress on joints, particularly weight-bearing joints, such as the hips and knees, may also have metabolic effects that increase the risk of OA.

- **Joint injury or overuse**, such as knee bending and repetitive stress on a joint.

- **Occupations** that require repetitive knee bending and squatting.

ii) NON-MODIFIABLE

Risk factors that cannot be changed.

- **Gender**

- **Age**

- **Genetics**

- **Race**

IMAGING

- **Joint space narrowing**
- **Osteophyte** (bone spur)
- **Subchondral sclerosis** (the hardening of the bone just below the cartilage surface)

(Adapted from Kellgren, J. H., & Lawrence, J. (1957). Radiological assessment of osteo-arthrosis. Annals of the rheumatic diseases, 16(4), 494.

Grade I	**Grade II**	**Grade III**	**Grade IV**
Doubtful	Mild	Moderate	Severe

REFERENCES

1) Centers for Diseases Control and Prevention. (2020). Osteoarthritis (OA). Retrieved from https://www.cdc.gov/arthritis/basics/osteoarthritis.htm, on 18th September 2021. 2)Hunter, D. J., March, L., & Chew, M. (2020). Osteoarthritis in 2020 and beyond: a Lancet Commission. The Lancet, 396(10264), 1711-1712. 3)Kellgren, J. H., & Lawrence, J. (1957). Radiological assessment of osteo-arthrosis. Annals of the rheumatic diseases, 16(4), 494. 4) Chow, Y. Y., & Chin, K. Y. (2020). The role of inflammation in the pathogenesis of osteoarthritis. Mediators of inflammation, 2020.

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