

## OSTEOARTHRITIS

### What is osteoarthritis?

Osteoarthritis occurs when cartilage, the connective tissue that protects the ends of bones, wears away. This gradual breakdown can occur in any joint, but most often affects the parts of the body that bear weight and get used the most: the hands, spine, hips, and knees. As cartilage gets worn away, joints become stiff and painful, and bone rubbing against bone can cause deformity of the joints.

Doctors may use x-rays or MRIs to look for signs of osteoarthritis, which include:

- **Joint space narrowing:** A result of loss of cartilage
- **Osteophytes (bone spurs):** Bony growths that form in order to protect and stabilize the joint
- **Subchondral bone cysts:** Sacs filled with fluid that form inside joints
- **Subchondral sclerosis:** Thickening or hardening of the bone just below the cartilage surface

Symptoms of osteoarthritis include:

- Joint pain or achiness
- Joint stiffness, especially when waking up or after being inactive
- Swelling or tenderness in the joints
- Crunching or crackling sound or grating sensation in the joints when moving
- Loss of flexibility
- Bony outgrowths in fingers or toes
- Joint deformity

Since osteoarthritis is most often the result of gradual wear and tear, the number one risk factor is age. Rates of osteoarthritis rise significantly over age 50. Other risk factors include:

- **Repetitive use of joints** at work or in daily activities
- **Being overweight:** Excess weight puts pressure on joints and causes systemic inflammation, which increases joint pain
- **Female gender:** Women are diagnosed with osteoarthritis significantly more often than men
- **Joint injury:** A previously injured joint is more likely to develop osteoarthritis

- **Muscle weakness or joint laxity:** These factors can make joints unstable and misaligned, putting strain on joint tissues

## What causes osteoarthritis?

The gradual wearing away of cartilage is most often the result of how we use our body.

- **Chronically tight muscles compress joints,** putting pressure on cartilage and leading to gradual breakdown.
- **Muscular patterns that cause misalignment of joints** lead to joints having to move in ways that they aren't designed to; this puts unnatural strain on cartilage, leading to gradual breakdown.
- **Excess use of a particular joint,** as often occurs in sports training or repetitive physical work, can lead to gradual breakdown of cartilage.

When cartilage breaks down, cartilage cells are damaged. The immune system does not discriminate between physical trauma and infectious invaders. When either of these threats is perceived, the inflammatory response kicks in to remove harmful stimuli and begin the healing process.

Inflammation that occurs immediately after an injury, called acute inflammation, allows damaged cells to be removed from the area and initiates the healing process. But chronic, localized inflammation can occur when cartilage is constantly being damaged by overuse or misuse. It will continue as long as the source of the problem – the habitual movement pattern that damages the cartilage – is present.

Once joint protection is gone, bones try to protect and stabilize joints by becoming thicker and growing bone spurs and cysts. All of these changes typically cause pain, inflammation, and limited movement. Muscles surrounding the painful joints tighten reflexively, worsening the condition by limiting range of motion.

## The potential of cartilage to heal itself

Cartilage constantly grows and maintains itself throughout our lives. It was long believed that cartilage had a limited ability to repair itself because chondrocytes, the cells that produce and maintain cartilage, could not migrate out of their designated area. However, recent research has shown that chondrocytes actually can migrate, more or less depending on the specific situation and environment.

And in 2019, researchers from Duke University in North Carolina and Lund University in Sweden published a fascinating study in which they measured protein turnover in articular cartilage in human hips, knees, and ankles. They found that human cartilage has a greater innate ability to regenerate itself than previously thought. Their findings show a potential link to a capacity “for regeneration that might be exploited to enhance joint repair and establish a basis for human limb regeneration.”

There is still much to be learned about cartilage, but it's clear that it has greater ability to repair itself than we thought – we simply need to give it the chance.

There are two factors that get in the way of cartilage healing, one of which we can't change, and one that we can.

First is the fact that most cartilage does not have a blood supply of its own, so it relies on the pumping action from joint movement to diffuse blood and other nutrients through joint fluid. Too much compression and too little compression both spell trouble for cartilage; it needs a moderate amount of movement, involving regular loading and unloading of weight, to remain healthy.

Due to the indirect way in which cartilage receives nutrients, its healing process is fairly slow. And if cartilage repair can't keep up with the rate at which damage is done, cartilage will continue to get worn away until it's gone for good.

The second hindrance to cartilage healing is the fact that most people don't know exactly what to do in order to most effectively let their cartilage repair itself. Many people are willing to rest their joints in order to let them heal, but rest alone does not fix the underlying problem of habitual body use.

Remind your students to pay attention to warning signs of osteoarthritis, like crunching sounds and pain in the joints. Allowing cartilage to heal is much easier early on in the process than it is after significant damage has occurred.

### **Working with osteoarthritis**

If you have a student with osteoarthritis, you can educate them on the information above, and strongly recommend that they take the following five steps:

1. If a certain activity caused their joint damage or makes it worse, they should **stop or significantly reduce the activity while they heal**. Cartilage cannot heal itself if it keeps getting damaged.
2. **Practice Clinical Somatics exercises on a daily basis**. The exercises release the chronic muscle tension that compresses joints, and retrain imbalanced posture and movement patterns that put unnatural strain on joints.
3. When they're ready, they can **practice a gentle strengthening routine in which they repetitively load and unload their joints**, very gradually increasing weight over time. This should be done under the supervision of a qualified physical therapist.
4. **Lose weight, if necessary**. Research shows that obesity increases risk of osteoarthritis by putting pressure on joints and by increasing inflammation throughout the body.
5. **Explore dietary changes**. Research shows that eliminating inflammatory foods can significantly reduce symptoms of osteoarthritis.

If your student has a joint replacement or cartilage transplant, they should support their recovery by practicing Clinical Somatics exercises. The exercises will speed their recovery, release their chronic muscle tension, restore natural posture and movement patterns, and prevent future joint damage. When working with someone who has had a joint replacement, be aware of their limitations in range of motion; the student's doctor will have told them in which directions they should not move their joint.