



The American Orthopaedic  
Society for Sports Medicine

## SPORTS TIP

# Articular Cartilage Injuries

**EXPERT CONSULTANTS:** Daniel Romanelli, MD, John Uribe, MD,  
Diane S. Watanabe, ATC, Bert R. Mandelbaum, MD

## What is articular cartilage?

Articular cartilage can sometimes be confusing, because there are three different types of cartilage found in the body: articular or hyaline cartilage (covers joint surfaces), fibrocartilage (knee meniscus, vertebral disk), and elastic cartilage (outer ear). These different cartilages are distinguished by their structure, elasticity, and strength.

Articular cartilage is a complex, living tissue that lines the bony surface of joints. Its function is to provide a low friction surface enabling the joint to withstand weight bearing through the range of motion needed to perform activities of daily living as well as athletic endeavors. In other words, articular cartilage is a very thin shock absorber. It is organized into five distinct layers, with each layer having structural and biochemical differences.

## What causes an articular cartilage injury?

Articular cartilage injuries can occur as a result of either traumatic or progressive degeneration (wear and tear). With mechanical destruction, a direct blow or other trauma can injure the articular cartilage. Depending on the extent of the damage and the location of the injury, it is sometimes possible for the articular cartilage cells to heal. Articular cartilage has no direct blood supply, thus it has little or no capacity to repair itself. If the injury penetrates the bone beneath the cartilage, the underlying bone provides some blood to the area, improving the chance of healing.

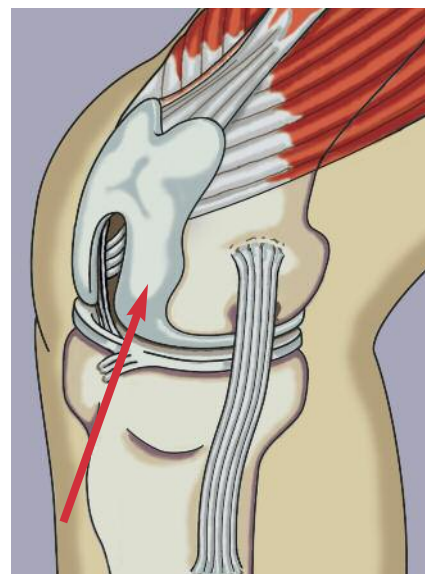
Mechanical degeneration (wear and tear) of articular cartilage occurs with the progressive loss of the normal cartilage structure and function. This initial loss begins with cartilage softening then progresses to fragmentation. As the loss of the articular cartilage lining continues, the underlying bone has no protection from the normal wear and tear of daily living and begins to break down, leading to osteoarthritis.

## How often does an articular cartilage injury occur?

In many cases, a patient will experience knee swelling and vague pain. At this point continued activity may not be possible. If a loose body is present, words such as “locking” or “catching” might be used to describe the problem. With wear and tear, the patient often experiences stiffness, decreased range of motion, joint pain, and/or swelling.

## How is an articular cartilage defect (injury) diagnosed?

The physician examines the knee, looking for decreased range of motion, pain along the joint line, swelling, fluid on the knee, abnormal alignment of the bones making up the joint, and ligament or meniscal injury. Injuries to the articular cartilage are difficult to diagnose, and evaluation with MRI (magnetic resonance imaging) or arthroscopy may be necessary. Plain X-rays are not usually good in diagnosing articular cartilage problems but are usually taken to rule out other abnormalities.



## How is an injury treated?

Injuries to the cartilage that do not extend to the bone will generally not heal on their own. Injuries that penetrate to the bone may heal, but the type of cartilage that is laid down is structurally unorganized and does not function as well as the original articular cartilage. Defects smaller than 2 cm have the best prognosis and treatment options. Those options include arthroscopic surgery using techniques to remove damaged cartilage and increase blood flow from the underlying bone (e.g. drilling, pick procedure, or microfracture). For smaller articular cartilage defects which are asymptomatic, surgery may not be required. For larger defects, it may be necessary to transplant cartilage from other areas of the knee (joint). Consult your specialist for further information on the decision to have surgery.



## Articular Cartilage Injuries

For patients with osteoarthritis, non-surgical treatment consists of physical therapy, lifestyle modification (e.g., reducing activity), bracing, supportive devices, oral and injection drugs (i.e., non-steroidal anti-inflammatory drugs, cartilage protective drugs), and medical management. Surgical options are very specific to osteoarthritis severity and can provide a reduction in symptoms that are generally only short lived. Total joint replacement can provide relief for the symptom of advanced osteoarthritis, but generally requires a change in a patient's lifestyle and/or activity level.