

# ARTICULAR CARTILAGE INJURIES



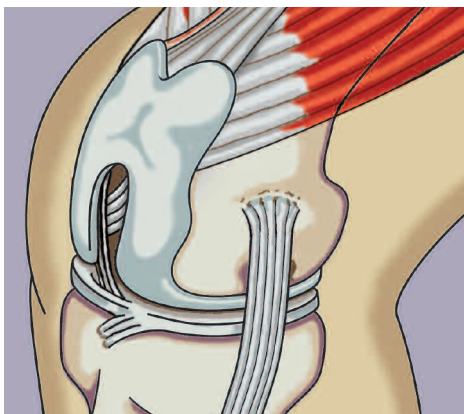
## AOSSM SPORTS TIPS

### 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.

In some joints, such as the knee, both articular cartilage and fibrocartilage are found functioning side-by-side as distinctly different structures with different functions. When the meniscus is injured, it is sometimes referred to as “torn cartilage” or “torn meniscus.” This is different than joint surface articular cartilage problems discussed here.

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. Those daily activities include walking, stair climbing and work-related activities. 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.

### HOW IS ARTICULAR CARTILAGE INJURED?

Articular cartilage injuries can occur as a result of either traumatic mechanical destruction, or progressive mechanical 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.

Occasionally an articular cartilage fragment completely breaks loose from the underlying bone. This chip, called a loose body, may float in the joint interfering with normal joint motion.

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.

Also known as degenerative joint disease, osteoarthritis is characterized by three processes:

1. a progressive loss of cartilage
2. the body's attempt to repair the cartilage
3. destruction of the bone underneath the articular cartilage

The cause of osteoarthritis is poorly understood, but lifelong moderate use of normal joints does not increase the risk. Factors such as high impact twisting injuries, abnormal joint anatomy, joint instability, inadequate muscle strength or endurance and medical or genetic factors can contribute to osteoarthritis.

### WHAT ARE THE SIGNS OF AN ARTICULAR CARTILAGE DEFECT (INJURY)?

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 mechanical degeneration (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. Plane X-rays are not usually good in diagnosing articular cartilage problems but are usually taken to rule out other abnormalities.

## WHEN IS SURGERY NECESSARY?

When a joint is injured, the body releases enzymes that may further break down the already damaged articular cartilage. 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). 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.

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. Tibial or femoral osteotomies (cutting the bone to rebalance joint wear) may reduce symptoms, help to maintain an active lifestyle and delay the need for total joint replacement. 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.

### Expert Consultants:

**Daniel Romanelli, MD**

**Diane S. Watanabe, ATC**

**Bert R. Mandelbaum, MD**

Sports Tips are brought to you by the American Orthopaedic Society for Sports Medicine. They provide general information only and are not a substitute for your own good judgement or consultation with a physician. To order multiple copies of this fact sheet or learn more about other orthopaedic sports medicine topics, please visit [www.sportsmed.org](http://www.sportsmed.org).

A world leader in sports medicine education, research, communication and fellowship.



Copyright © 2008. American Orthopaedic Society for Sports Medicine. All rights reserved. Multiple copy reproduction prohibited.

**Terence Delaney, MD**  
**14911 National Ave, Ste. 3**  
**Los Gatos, CA 95032**  
**Phone: (408) 402-5742**  
**Fax: (408) 358-2089**