



Arnold & Cox Knee and Shoulder Center

## **MICROFRACTURE INFORMATION**

Dr. Christopher Arnold

Articular cartilage is the smooth, white tissue that covers the ends of bones where they come together to form joints. Healthy cartilage in our joints makes it easier to move. It allows the bones to glide over each other with very little friction.

Articular cartilage can be damaged by injury or normal wear and tear. Because cartilage does not heal itself well, doctors have developed surgical techniques to stimulate the growth of new cartilage. Restoring articular cartilage can relieve pain and allow better function. Most importantly, it can delay or prevent the onset of arthritis.

Surgical techniques to repair damaged cartilage are still evolving. It is hoped that as more is learned about cartilage and the healing response, surgeons will be better able to restore an injured joint.

### **Cartilage Damage**

#### ***Hyaline Cartilage***

The main component of the joint surface is a special tissue called hyaline cartilage. When it is damaged, the joint surface may no longer be smooth. Moving bones along a tough, damaged joint surface is difficult and causes pain. Damaged cartilage can also lead to arthritis in the joint.

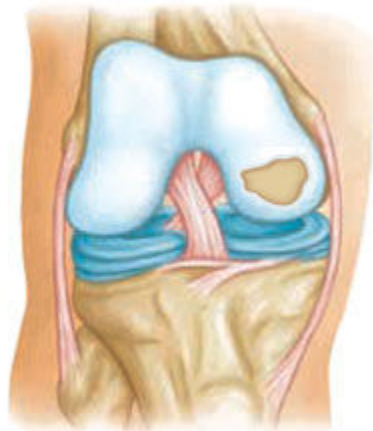
The goal of cartilage restoration procedures is to stimulate new hyaline cartilage growth.

#### ***Identifying Cartilage Damage***

In many cases, patients who have joint injuries, such as meniscal or ligament tears, will also have cartilage damage. This damage may be hard to diagnose because hyaline cartilage does not contain calcium and cannot be seen on an X-ray.

If other injuries exist with cartilage damage, doctors will address all problems during surgery.

### **Patient Eligibility**



Articular cartilage in the knee damaged in a single, or focal, location.



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Most candidates for articular cartilage restoration are young adults with a single injury, or lesion. Older patients, or those with many lesions in one joint, are less likely to benefit from the surgery.

The knee is the most common area for cartilage restoration. Ankle and shoulder problems may also be treated.

### **Surgical Procedures**

Many procedures to restore articular cartilage are done arthroscopically. During arthroscopy, Dr. Arnold makes three small, puncture incisions around your joint using an arthroscope.

Some procedures require Dr. Arnold to have more direct access to the affected area. Longer, open incisions are required. Sometimes it is necessary to address other problems in the joint, such as meniscal or ligament tears, when cartilage surgery is done.

In general, recovery from an arthroscopic procedure is quicker and less painful than a traditional, open surgery. Your doctor will discuss the options with you to determine what kind of procedure is right for you.

The most common procedures for cartilage restoration are:

- Microfracture
- Drilling
- Abrasion Arthroplasty
- Osteochondral Autograft Transplantation
- Osteochondral Allograft Transplantation

### **Microfracture**

The goal of microfracture is to stimulate the growth of new articular cartilage by creating a new blood supply. A sharp tool called an awl is used to make multiple holes in the joint surface. The holes are made in the bone beneath the cartilage, called subchondral bone. This action creates a healing response. New blood supply can reach the joint surface, bringing with it new cells that will form the new cartilage.

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Microfracture can be done with an arthroscope. The best candidates are young patients with single lesions and healthy subchondral bone.



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Normal healthy articular cartilage in the knee (left). A large cartilage defect in the knee joint surface (center). During microfracture, an awl is used to penetrate the defect (right).

### **Drilling**

Drilling, like microfracture, stimulates the production of healthy cartilage. Multiple holes are made through the injured area in the bone with a surgical drill or wire. The bone is penetrated to create a healing response.

Drilling can be done with an arthroscope. It is less precise than microfracture and the heat of the drill may cause injury to some of the tissues.

### **Abrasion Arthroplasty**

Abrasion arthroplasty is similar to drilling. Instead of drills or wires, high speed burrs are used to remove the damaged cartilage and reach the subchondral bone.

Abrasion arthroplasty can be done with an arthroscope.

### **Rehabilitation**

After surgery, the joint surface must be protected while the cartilage heals. If the procedure was done on the weight bearing surface of your knee you will not be able to put weight on the affected leg. You will need to use crutches to move around for the first four weeks after surgery. If the procedure was performed on the undersurface of your kneecap, then you will be given a brace to limit the motion that your knee can flex to. Although you may put as much weight as you feel comfortable on the leg, you should always have your brace on when you are up and around.

During the first weeks after surgery, you will begin continuous passive motion therapy. A continuous passive motion machine constantly moves the joint through a controlled range of motion. You will be sent home with a motion machine to promote blood flow to the site. You should use this machine a minimum of 6 hours per day.

You will need to undergo physical therapy. This will help restore mobility to the affected joint.

As healing progresses, your therapy will focus on strengthening the joint and the muscles that support it. Typically, the cartilage take 3-6 months to heal in, therefore, the recovery is typically a longer process than that of a “routine” knee scope. It may be several months before you can safely return to sports activity.