

**Orthopaedic and Spine Institute  
21 Spurs Lane, Suite 245, San Antonio, TX 78240**

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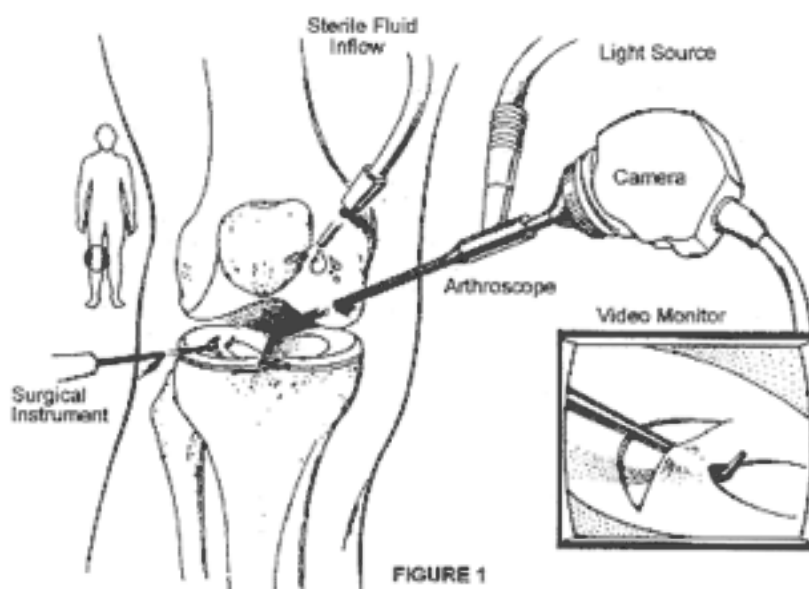
**Tel# 210-487-7463**

**Joel B. Nilsson, M.D., P.A.**

**PATIENT GUIDE TO KNEE ARTHROSCOPY  
CARTILAGE / MENISCAL INJURIES**

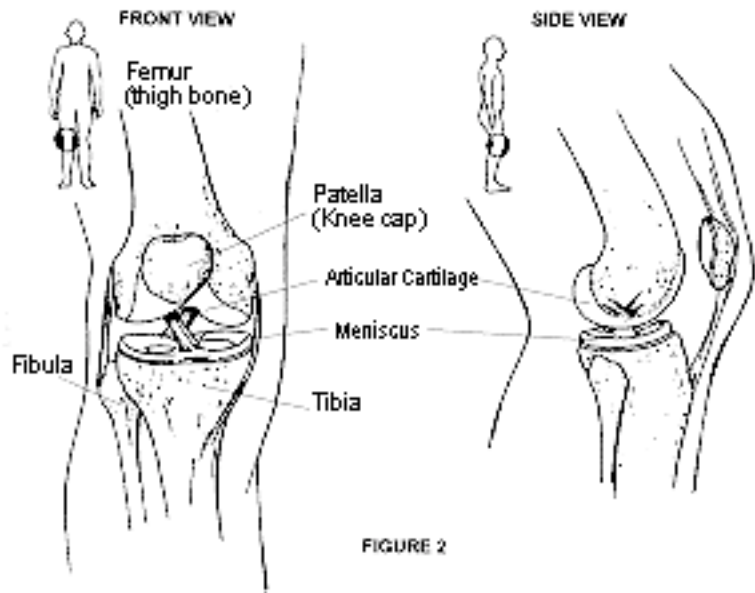
***WHAT IS ARTHROSCOPIC SURGERY?***

Arthroscopic surgery is a procedure in which the inside of the joint can be evaluated and treated using surgical instruments placed into the joint through small incisions (portals) measuring one centimeter or less (less than half an inch). The arthroscopic equipment consists of the scope (camera) and small surgical instruments which allow the surgeon to probe, cut, or shave tissues inside the knee. The scope itself is a small tube 4-5 millimeters in diameter (smaller than a pencil) which has a fiberoptic light source and a magnifying lens. Attached to this is a camera and cable which projects the image from inside the knee onto a television screen or monitor. The knee joint is filled with sterile fluid and the scope is moved around the inside of the knee joint by the surgeon so that various areas and structures can be seen and evaluated on the monitor. The small surgical instruments (*bite*s, *shavers*, *probes*, *scissors*, *etc.*), also measuring 2 to 5 millimeters, are placed into the joint through separate incisions to remove torn cartilage, trim torn structures, or do other procedures [Figure 1]. Two to four small incisions are usually needed for knee arthroscopy.



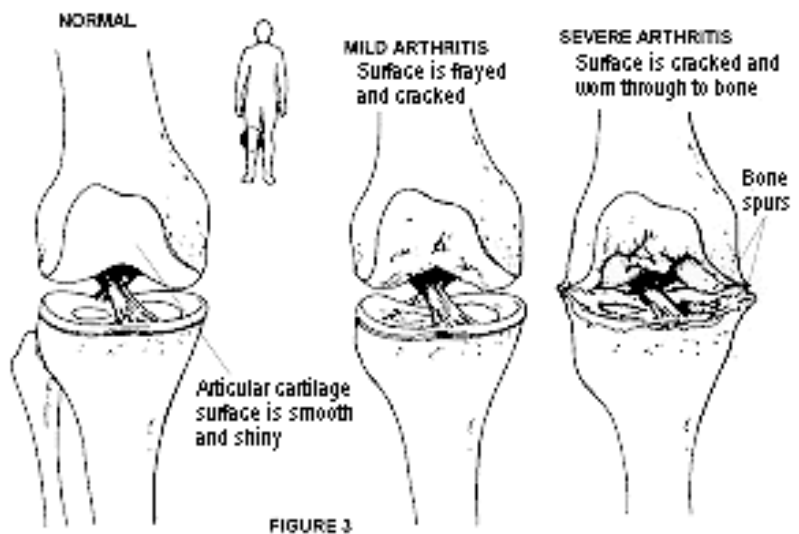
## WHAT CAN BE SEEN IN THE KNEE WITH THE ATHROSCOPE?

The arthroscope allows the surgeon see many structures inside the knee. The knee is basically a hinge formed by the ends of the thigh bone (*femur*) and the leg bone (*tibia*). The knee cap (*patella*) in the front of the knee makes contact with the femur as the knee as bent [Figure 2]. The surfaces on the femur, tibia, and patella are covered with smooth cartilage (called the *articular cartilage*) which allows them to glide over each other as the knee bends and straightens during activity. This cartilage is white and smooth, and is about 3 to 4 millimeters thick.



When that cartilage begins to wear away and break down, this is known as *arthritis* [Figure 3]. Articular cartilage breakdown can be caused by injury, infection, aging (*osteoarthritis*), or rheumatoid conditions. Pain and swelling commonly develop when the cartilage starts to wear away and arthritis develops. Unfortunately, this cartilage cannot regenerate or repair itself, so once it is worn away or damaged, it does not come back.

There is also a second type of cartilage in the knee called the *meniscus*. This is a tougher or more fibrous type of cartilage that sits between the ends of the tibia and femur, and is attached to the lining of the joint. The menisci primarily serve as shock-absorbers between the ends of the bones to protect the surface articular cartilage. There are two separate meniscal cartilages in the knee, each somewhat C-shaped: one on the inner half of the knee (the medial meniscus), and one on the outer half (the lateral meniscus) [Figure 2].



Years ago the meniscus was believed to be unnecessary, just like the appendix. If it was torn, the whole meniscus was routinely removed in surgery. However, research has shown that complete removal of the meniscus leads to an increased risk of arthritis over 10 to 15 years.

Without the shock-absorbing meniscus, the articular cartilage on the ends of the bones is exposed to increased pressure and "wears" away. Currently, as much of the meniscus as possible is saved or preserved by surgeons to hopefully decrease the chance of future arthritis. Removing only a small portion of the meniscus (i.e. the front, center, or back) is called *partial meniscectomy*. Usually, only a part of the inner rim is trimmed out, leaving a stable rim peripherally.

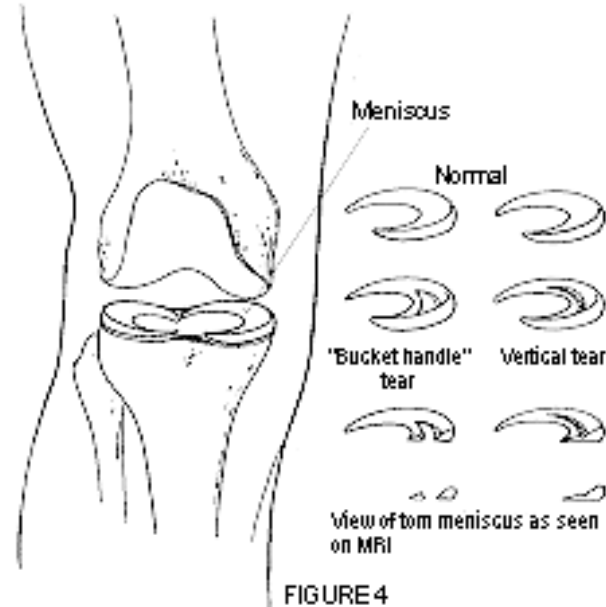
The arthroscope can also visualize the ligaments within the knee, particularly the large anterior and posterior *cruciate ligaments*. If torn or damaged, surgical reconstruction can be done in selected patients by arthroscope-assisted techniques.

### ***WHAT IS A CARTILAGE TEAR?***

Most of the time a cartilage tear refers to a tear in the meniscus. The meniscus is a specialized structure that is thicker where it attaches to the lining of the joint and thinner toward the middle of the joint. If you made a cut across it, the meniscus would be triangular or pie shaped.

The meniscus can tear in a number of ways. Tears can result from a sudden twisting-type injury or can occur gradually with age. The tear can be through either the outer thick part or inner thin part. Some tears involve only a small portion of the meniscus, while in others nearly the entire meniscus can be involved.

[Figure 4]



Meniscus tears can cause symptoms from portions of the torn fragments getting stuck or pulled on between the bones as the knee moves. This can cause snapping or popping, locking, pain, and swelling. Not all meniscus tears cause problems, but when they do the arthroscope can be used to trim out the piece which is torn. Only the portion which is torn is removed.

### ***CAN THE MENISCUS BE FIXED?***

The ability of a meniscus tear to heal depends primarily on its blood supply. The outer or thicker part of the meniscus receives a fairly good blood supply from the lining of the joint, whereas the inner or thin part has a poor blood supply. Thus, tears at the outer margin of the meniscus are more amenable to successful repair, which can be done by placing sutures or small tacks across the tear by arthroscopic techniques. If the tear is in the thin part, the cartilage will not heal and

the torn fragment is typically excised. Old or chronic tears also tend to have a poorer success rate with repair and are typically trimmed out as well.

### ***WHAT IF THERE IS ARTHRITIS?***

Arthroscopic surgery is very successful in relieving the pain and swelling from a torn meniscal cartilage. However, the results of arthroscopic surgery for arthritis alone are somewhat unpredictable. While it is relatively easy to excise or repair a torn meniscus, not much can be done if the articular cartilage is significantly frayed or worn from the ends of the bones (arthritis). Current technology does not allow surgical repair or regeneration of the surface cartilage. In some select cases where only a small area (around one centimeter) of cartilage is missing from the ends of the bones, the bone can be drilled to stimulate a scar to form on the end of the bone. This procedure is called a *micro fracture* and the scar tissue that forms may reduce the pain, but it is not as good as normal cartilage. Overall, while the results are somewhat unpredictable, arthroscopic surgery often does improve the pain of arthritis, sometimes for years. It is an acceptable treatment option for patients in whom alternative treatments such as medication and injections have failed to provide significant relief.

### ***WHAT IS THE RECOVERY TIME FROM ARTHROSCOPIC SURGERY?***

The recovery time depends upon many factors, namely how extensive the arthritis was in the knee and what was done at surgery. Most patients go home the same day after surgery. Crutches are used for 3 to 7 days, but weight can usually be placed on the operated leg as tolerated. Rest, ice packs, and elevating the limb are also recommended. Physical therapy is not required for all patients, but is prescribed on an individual basis.

It usually takes at least a week before patients can drive depending upon which leg had surgery and the car's transmission. Most people can go back to a sitting job at one week after surgery, but patients who lift or walk a lot at their job may take longer. Activities are progressed according to the amount of pain and swelling present in the knee. It typically takes about three weeks to recover fully for routine daily activities, but it may be two to three months before one can comfortably return to sports. Generally, the more arthritis there is in the knee, the longer it takes to recover.

If a micro fracture procedure is performed, the recovery is quite a bit longer. Patients will be required to restrict weight-bearing on the injured leg for at least 6 weeks using crutches. This is to reduce the risk of further injury to the bone that was just drilled. In addition, a continuous passive motion machine is often used in the early post-operative period (2-6 weeks) to decrease stiffness and facilitate healing. With a micro fracture it can take up to 4-6 months before return to activity, and depending on the patient, return to certain sports may be restricted permanently.

### ***WHAT IS THE PROGNOSIS AFTER SURGERY?***

The prognosis depends entirely upon what was found and what was done at the time of surgery. If there is a lot of arthritis the doctor may recommend modification of activities such as avoiding running or jogging. If a torn meniscus cartilage was found and removed, then the patient usually can return to previous athletic activity. However, they are usually warned that heavily stressing the knee with part of the meniscus gone may lead to arthritis after many years.