Causes of Knee Pain:
When you injure your knee you may not be able to feel that exact structure causing the pain and instead may feel it in a different area of your leg. Knee pain can be felt over the front of the knee, but is also commonly felt deep in the back of the knee and may be felt only as a deep pressure or discomfort—especially if your knee has a lot of stiffness due to swelling. There is also considerable overlap between the pain referred to the inside aspect of your knee from structures within the knee and pain actually originating in your hip joint. This is known as Referred pain - our conscious brain doesn’t know where to localize pain from deep body sites so instead we feel pain in the part of our outer body which is supplied by the same nerves as the deep part that was injured - in this case the Obturator Nerve supplies part of the hip joint as well as the inner side of the knee. It is very common in young children as well as older adults to experience only knee pain (without any hip discomfort) even though the cause of the pain is only affecting their hip joint!
Other cause of referred pain due to nerve-pinching conditions include: Lumbar Spondylosis (arthritic bone spurs between the vertebrae) Herniated (bulging) Lumbar Discs or rarely, Lumbar Spinal Stenosis - where the nerve(s) in your lower back are pinched within a narrowed spinal canal. Some patients may have more than one cause for their knee pain at the same time! It is not uncommon for patients to start out with pain from one source (knee) which then is gradually replaced by secondary pain from their back or vice versa - adding to the diagnostic confusion.
Injuries to muscles, tendons, bursal sacs and other structures in your thigh & leg (although technically not a part of your knee joint) may also be confused with knee pain.

For this reason, part of your Orthopaedic care may be allocated to assessing and reassessing the contribution of painful conditions from your back, your hip and your leg as well as your knee.
**Articular Cartilage:**
Articular or Hyaline cartilage is the smooth, rubbery surface that covers both sides of the knee joint as well as the underside of your kneecap. (You have seen similar cartilage when cutting a fresh chicken through one of its joints. It is the smooth, shiny joint surface.) It is composed of a microscopic lattice of fibers embedded within a matrix of proteins & sugars called Glycosaminoglycan (GAG). This amazing bearing surface material is a live tissue but has no blood supply so it cannot effectively heal itself once damaged.

**Meniscus Cartilage:**
If we are preparing fresh chicken, the menisci are the rubbery structures we remove from the joint when preparing wings. There are two menisci in each knee - one inside (the Medial Meniscus) and one outside (the Lateral Meniscus). These circular, rubbery structures appear somewhat like cupped or finishing washers and are thin on the inner surface and thick around the edges of the knee joint. Their shape helps to stabilize the curved thigh bone (Femoral Condyles) against the flat surface of the leg bone (Tibial Plateau). Without the meniscus, there is only a very small contact area between the two bones. By filling the gaps between the curved surface on the femur and the flat surface of the tibia, the menisci help stabilize the joint and distribute the knee’s load over the entire joint rather than concentrating it in one small spot (which would otherwise wear out quickly). The meniscus is predominantly made of fibers -arranged circumferentially & radially - like the cords in a car tire. The meniscus has a blood supply only in its outer 1/3. This means that tears in the inner ½ will not usually heal whereas tears in the outer ½ retain the potential for healing.
Knee Ligaments:
Your Knee has 4 major ligaments each made of strong sinews which provide the stability for your knee. The collateral ligaments are on each side of your knee - The Medial collateral Ligament is on the inside and the lateral Collateral ligament stabilizes the outside of your knee. There are two cruciate ligaments - so named since they cross inside the knee. While it is simplest to think of these as stabilizing the knee’s forwards and backwards movement, in reality they are most important in providing rotational stability - allowing you to cut or turn quickly & safely.

Other Structures within the knee Joint:
There is also a variety of other tissue structures within the knee including small fibrous bands (plicas), fat pads and of course the important joint lining (called synovium). Usually, these have no structural function and you will not be aware of them. Occasionally, after an injury or with repetitive unusual activity, these may become thickened and begin to cause pain, or clicking or catching.

Routine X-Rays:
X-Rays are the best way to look for bone injury such as fractures, bone tumors, advanced arthritis and many minor abnormalities. X-rays are especially useful for assessing you knee cap (patella) for early wear, arthritis and abnormal positioning. These should done with your knee bent - allowing the kneecap to enter its groove on the end of the thighbone (patellofemoral joint) which is not possible with most MRI scans. Typically, hospital X-Ray series do not include these “Skyline Patella” views and you may be asked to have these taken on arrival at the Northwestern Orthopaedic Clinic.

Standing X-Rays:
An Orthoroentgenogram is a standing X-ray of both your legs (hips to your ankles) taken on a single film to measure the alignment of your knees. Ideally a straight line drawn from the center of your hip joint to the center of your ankle on this X-Ray should pass through the center of your knee also. If you are fortunate enough have this perfect alignment, your body weight is evenly shared between the inside and the outside compartments of your knee. Unfortunately, most of us have up to 3 degrees of bow leg (called varus) causing the weight bearing line to pass through the inner half of the knee joint which is why the inner or medial compartment of our knee tends to wear out first. Standing X-Rays of just your knees (taken with your knees fully straight) will also show advanced arthritic change as the joint will be significantly narrowed. Standing X-rays taken with your knees slightly bent are the best way to identify early knee joint arthritis - often before you develop significant symptoms. It is sometimes hard for our technicians to get perfect standing X-Rays, so we appreciate your patience should they need to repeat them.
MRI:
MRI shows other abnormalities of the knee joint especially the parts not well seen on regular X-Rays including: soft tissue (non-boney) tumors, subtle fractures, stress fractures, bone bruises, ganglion cysts, tears of the meniscus as well as ligament sprains & tears. Depending on the size of your leg, it may also be able to show loose bodies, as well as large defects in the articular cartilage. Because your knee must be held straight while in the MRI scanner, only limited information about your patellofemoral joint can be obtained. (The patella does not enter the groove until the knee is flexed about 30 degrees). Arthrography (injection of dye & Gadolinium into your knee joint) is rarely needed. If you are having a knee MRI for evaluation of a bone tumor, you will usually be given an injection of Gadolinium into an IV. Claustrophobia during knee MRI is rare since most your head is likely to completely outside the scanner throughout the study. Additionally the new scanners have a much wider bore and are not constricting like previous versions. If necessary a mild sedative can be prescribed prior to your MRI. If you require sedation you will need someone to drive you to and from the hospital for your imaging that day.

CT Scans:
These may be performed to evaluate fractures since they much better bone detail than MRI. CT scans also provide 3D images of the surface of your knee bones which are very useful in the planning of fracture repair surgery.

Knee Arthritis:
As we age past 40, the combination of factors such as leg alignment, inherited risk of premature arthritis and the cumulative effect of our childhood, adolescent and adult activities (especially injuries) leads to degeneration of our articular cartilage. The cartilage wears thin, frays and may begin to flake like old paint - eventually leaving the bone ends exposed and rubbing against each other. The loss of cushion as the cartilage thins does two things: 1) The joint narrows, causing the knee alignment to worsen which in turn loads the worn compartment still further. In turn, this causes micro damage to the bone supporting the joint surface - leading to aching pain with activity. 2) The loose flakes of cartilage debris irritate the lining of the joint causing Synovitis (inflammation of the synovium). The lining becomes red and produces excessive fluid causing joint swelling, stiffness and more pain. This is the basic process of Degenerative Joint Disease (also known as Wear & Tear Arthritis and Osteoarthritis). Post-Traumatic Arthritis has a similar mechanism - the major difference being the additional acute injury (such as a bone bruise, meniscus tear, fracture involving the joint surface or ligament injury with joint instability) which kick starts the accelerated joint wear. Since the Articular Cartilage has little capacity for regeneration or repair, our treatments are mainly directed towards preserving any remaining bearing surface, by removing or reducing any of the factors that are damaging the joint and aggravating the synovial inflammation.
Knee Pain - Diagnosis, Treatment & Surgery - J Hatch MD

What Happens During Arthroscopic Surgery?
Usually performed as an outpatient procedure, Arthroscopic Surgery of your knee is a safe, minimally invasive and therefore minimally painful procedure by which I can treat many “internal derangements” of your knee. It can be performed under either a short general anesthetic or with a short acting spinal anesthetic (a fine needle is used to place a small amount of local anesthetic in your spinal canal to numb all the nerves to your legs for an hour or so). Once you are completely comfortable, I use a series of (usually 3) small incisions each about 3/8" long to fill and distend your knee joint with sterile fluid to permit visualization of all the joint surfaces with a small videoarthroscope.

This allows me to both diagnose and treat a number of conditions within your knee. During the procedure I will usually be removing your torn meniscus (meniscectomy) and removing and smoothing damaged articular cartilage (chondroplasty). Unfortunately, only when there are very small articular cartilage defects, can we repair a damaged bearing surface. I can also repair certain types of meniscus tears, remove excessively inflamed joint lining (Synovectomy), remove loose debris (Debridement), reconstruct some damaged ligaments (ACL reconstruction), as well as removing loose bodies, realigning the tracking of the knee cap and in certain circumstances, I can arthroscopically reduce and fix fractures involving the knee joint.

The most important factor in recovery from arthroscopic knee surgery is the health of the articular cartilage or bearing surface of your knee. The severity and location of the articular cartilage damage found during your procedure may also influence the amount of pain & swelling you experience after surgery. While in younger patients, bearing surface damage is uncommon; patients over the age of 40 invariably have some articular cartilage damage found at arthroscopy.

We have all heard stories about athletes who have returned to compete in their sport within days or weeks of surgery but, you may also know of friends whose recovery has been much slower. This monograph will help you to explain the reasons behind these inconsistencies and help you to decide if Arthroscopic Knee Surgery is right for you.

Does Arthroscopic Partial Meniscus Removal Worsen Arthritis?
The correct answer is that we don’t really know. Good studies showed years ago that total meniscectomy (which we rarely do anymore) leads to premature arthritis in the compartment from which the meniscus was removed. Clearly this is a mechanical consequence of reducing the “contact patch” of the bearing surface thus concentrating all our weight on a very small area of the joint. There are no good studies showing whether partial meniscectomy hastens the subsequent development of arthritis. (This is mainly because no one with sufficient symptoms to warrant the procedure wants to undergo arthroscopic surgery without removal of the painful, torn part of the meniscus!) Some authors feel that it is the initial injury causing immediate damage to the bearing surface and supporting bone (rather than the meniscus tear) that determines the subsequent risk of arthritis. This is certainly true for ACL injury but unproven for isolated meniscus injuries.

Will Arthroscopic Surgery Work For Me?
My challenge as your Orthopaedic Surgeon is to try to predict for you how much articular cartilage damage is present in your knee before recommending arthroscopic surgery. Preoperatively, a careful examination and routine X-rays of your knee (taken while you are lying down) will help me to identify severe articular cartilage damage or arthritis. Some patients have MRI scans, which are very good at revealing meniscus and ligament tears, but often poor at diagnosing articular cartilage damage! I will also take standing X-rays to see if your knees are properly aligned and sharing the load equally between the medial (inside) and lateral (outside) compartments of each knee. If there is narrowing of the joint space your knee has already developed significant arthritis & I may not recommend arthroscopic surgery (since taking away more damaged articular cartilage may make it worse). In these cases I may recommend a variety of treatments including realignment bracing, joint injections, osteotomy (correcting the malalignment), partial knee replacement or full knee replacement. Recent studies of patients with known arthritic knees who underwent surgery suggest that physical exercise, medications, bracing or injections are more effective than arthroscopic surgery. These studies also show a role for arthroscopic surgery in the arthritic knee where there is also a known meniscus tear causing mechanical symptoms such as: clicking, locking or jamming since these respond well to removal of the torn meniscus fragment (although the arthritis is not altered).
Will Arthroscopic Surgery Make My Knee Worse?
Not usually. By now you can understand that many young patients are excellent candidates for arthroscopic surgery and that some young and many older patients have clear reasons why they should not have it. You may be part of a third group of patients who have evidence of a meniscus tear, some bearing surface damage, but no major arthritis in their knee. It is medically difficult to distinguish pain due to damaged articular cartilage from meniscus cartilage pain since the two structures touch each other and, in many cases, the pain is coming from both!
Articular cartilage damage can occasionally be much more extensive than predicted by our pre-operative tests and X-rays so that extensive articular cartilage damage (indicating rapidly progressing arthritis) may be found for the first time during your arthroscopic surgery (in addition to the expected meniscus tear). Usually Arthroscopic treatment of even moderate or severe articular cartilage damage results in significant improvement in your pain. A few unlucky patients feel worse after the arthroscopic surgery if the pain and swelling due to the arthritis escalates rapidly. This creates the illusion that “the surgery caused the arthritis” (even though the damage was present prior to surgery and its progression to arthritis was therefore inevitable). I believe it is important to inform you prior to surgery that this occasionally happens and that there is a small risk of requiring further treatment (including additional surgical procedures) should your arthritis progress rapidly after Arthroscopic Knee Surgery.

What about after Surgery?
Most patients may walk on their operated leg the day of surgery and may shower the day after. Most patients need take only Aleve or Advil after uncomplicated Arthroscopic Menisectomy or Chondroplasty. Expect some swelling, tightness & stiffness for at least 3 weeks after surgery. Patients with sedentary jobs usually return to work within a few days of arthroscopic knee surgery while those who have had more complex procedures, do heavy lifting in their job, or climb, crouch or squat may need 4-6 weeks to return to work.

Do I Have To Undergo Arthroscopic Surgery?
Recent, traumatic, meniscus tears that occur near the periphery of the meniscus may have the ability to heal as they often maintain an excellent blood supply from the structures around the knee joint. I recommend arthroscopy to try to repair these as soon as possible to improve the chances of healing the tear. Most degenerative meniscus tears do not truly heal (because they frequently occur at the inner half of the meniscus where there is very little blood supply to provide a healing response) yet they can be safely treated without surgery if they are causing few symptoms and you do not feel that something shifts or locks in your knee when you twist or crouch. If your knee doesn’t improve to the point where you can participate in your daily activities without significant discomfort, arthroscopic surgery gives excellent results in the vast majority of my patients despite the concerns raised earlier.
Please feel free to contact me or my staff to discuss your concerns about these issues or to schedule an appointment. If you wish to schedule arthroscopic treatment of your knee, please notify my receptionist when you call as we can often start the scheduling process over the telephone.