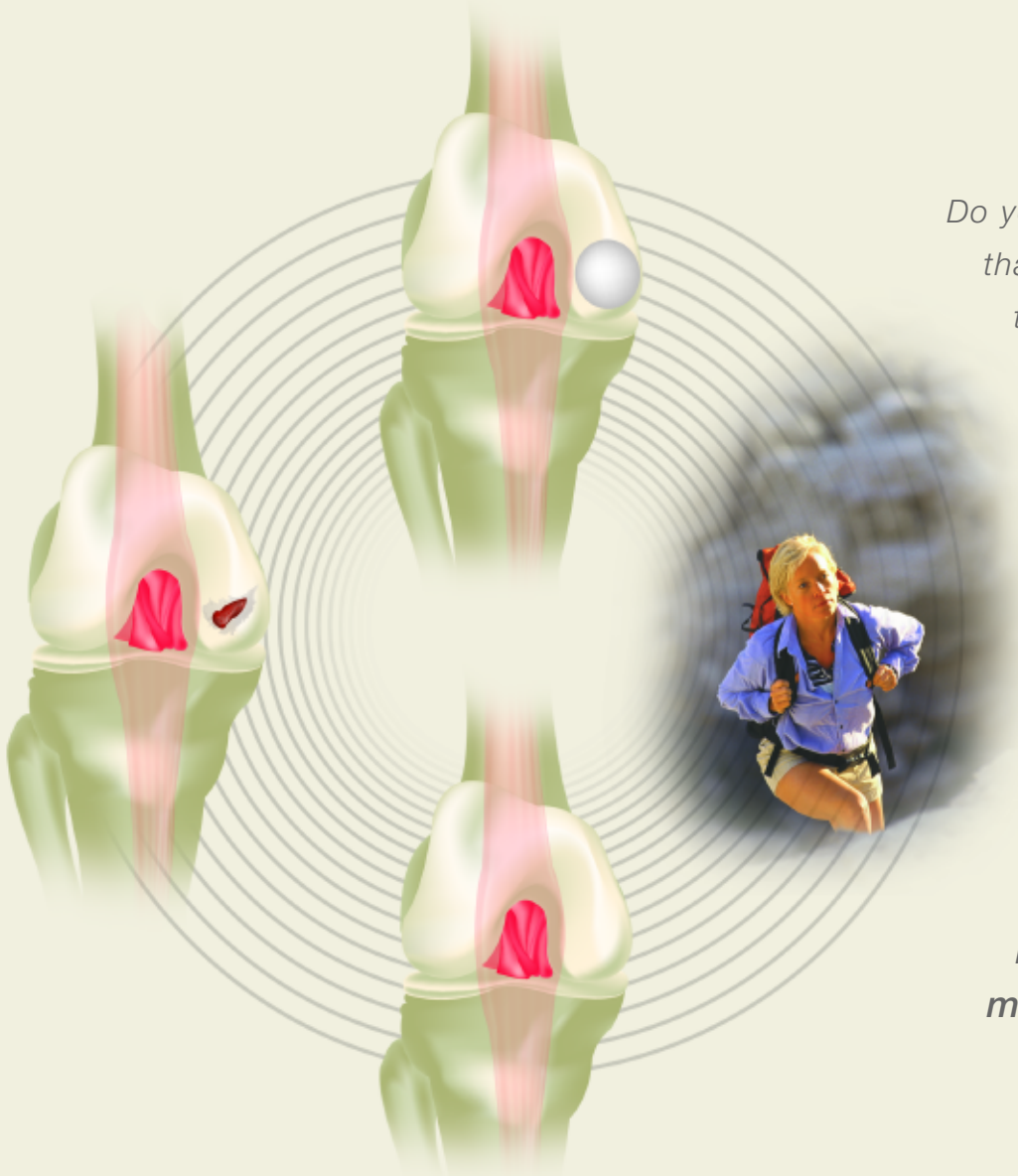


Knee Resurfacing & *Joint Preservation*



*Do you have pain in your knee
that prevents you from doing
the activities of daily life?*

*Has your doctor
told you that you
might need a joint
replacement?*

*Now there is a less
invasive solution that
might be right for you.*

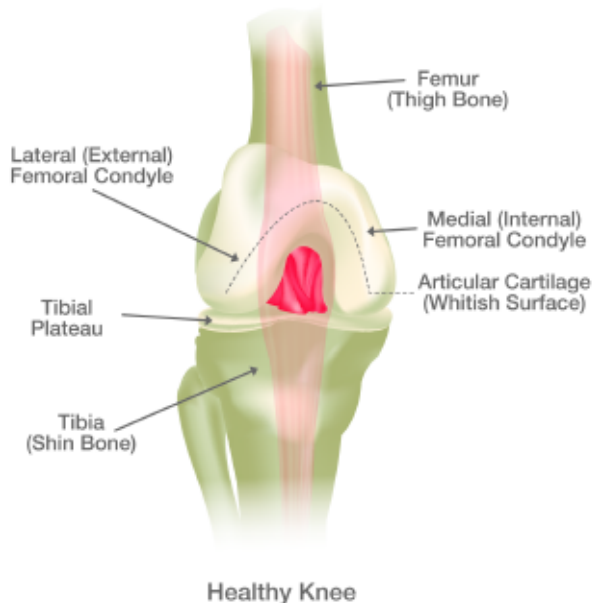
Anatomy

Have you become frustrated because of the limitations of a painful joint?

Before we begin to explain a possible solution, it is important to understand the problem.

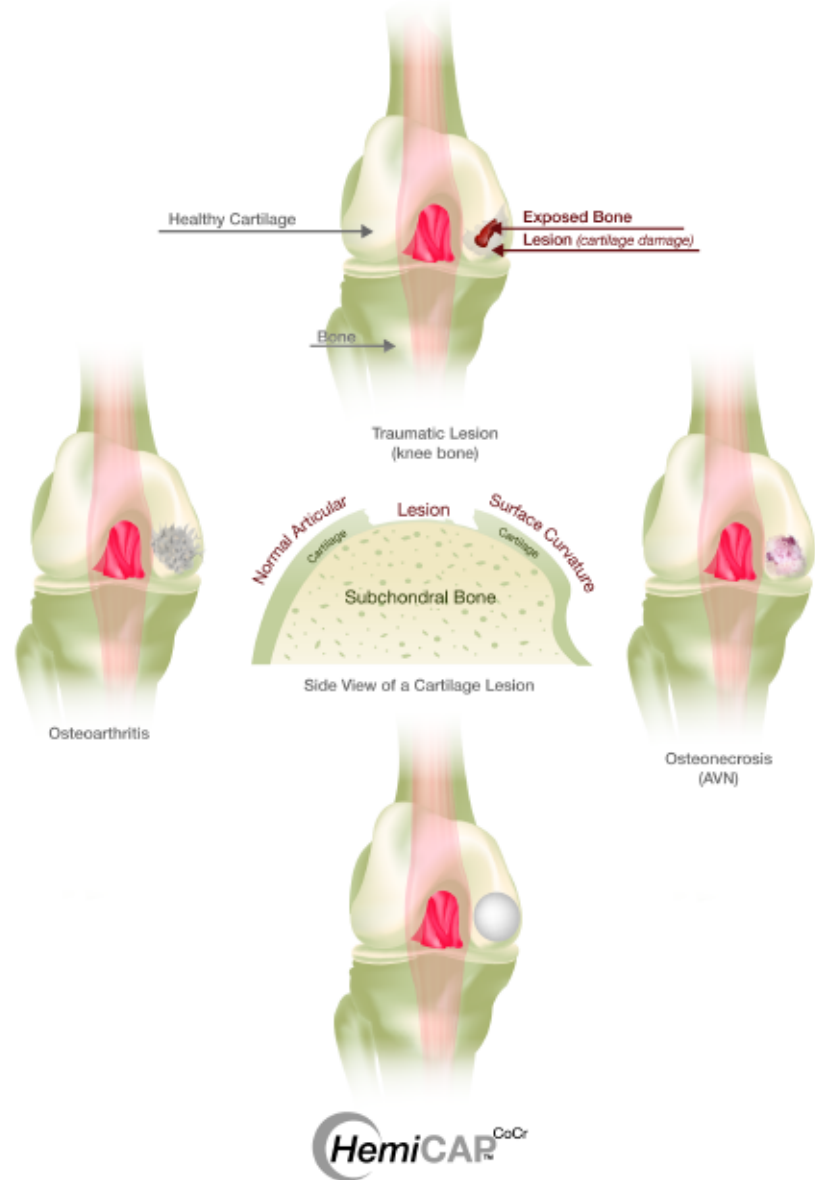
What is a joint?

Joints are the locations in your body where two bones meet. Movement of these bones at the joint permits our bodies to move. Cartilage is a specialized tissue in the joints which caps/covers our bones where they meet. Cartilage is a smooth, slippery tissue that allows the bones to slide against one another with minimal friction.



How does cartilage get injured?

A variety of events can damage cartilage, some include trauma (injury), infection, inflammation, osteonecrosis (dead bone) and malalignment. A traumatic injury can cause an isolated defect just like a golfer creates a divot in the grass. Malalignment can cause widespread damage to the joint surface similar to the way the tires on a car lose their tread if the wheels are not properly aligned. In many instances, physicians elect only to replace the side of the joint with the damaged surface rather than replacing the entire joint.



What is Osteoarthritis?

Osteoarthritis is a disease process causing the deterioration of the articular cartilage usually occurring in the major joints.

Arthritis = Deterioration of Cartilage

Osteoarthritis is noted by joint pain and stiffness usually after activity

Can arthritis get worse?

Any event that injures the cartilage may cause joint damage or arthritis. A small cartilage injury with time, may become larger and lead to widespread cartilage loss or degenerative joint disease.

What is Osteonecrosis?

This condition literally means bone death (osteo=bone, necrosis=death). Also known as avascular necrosis (AVN), this condition is caused by lack of blood supply to the bone. It is triggered by a variety of factors including trauma, alcohol abuse, blood abnormalities, pregnancy, corticosteroids used in medical treatments (e.g., cancer treatments, lupus and organ transplantation), but in approximately 25% of the patients, the cause is unknown.

Osteonecrosis = Bone Death

Osteonecrosis is noted by aching joint pain

What are treatment options for injured cartilage?

Depending on the degree of cartilage injury, age and activity level, patients may be candidates for either: abrasion arthroplasty, microfracture, allograft, a traditional total joint replacement or now with the advent of resurfacing technologies, a less invasive procedure such as the ArthroSurface HemiCAP™ system.

What is Abrasion Arthroplasty?

In abrasion arthroplasty, a high-speed rotary burr or shaving device is used to remove about 1mm of bone from the surface of the lesion. This creates an exposed bone bed that will bleed and this will initiate a fibro-cartilage healing response. The fibro-cartilage then grows into and fills the hole or lesion creating a new but inferior surface. This response is similar to a “scab” or scar tissue that grows over a cut. This technique may provide short-term pain relief and is generally indicated for patients under 35 years old.

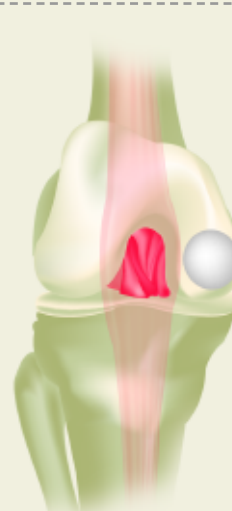
What about microfracture?

This technique is very similar to abrasion arthroplasty except that the bleeding is initiated by impacting awls, picks or drilling directly into the bone within the lesion.

Cartilage defects of a large enough size may be problematic. They typically cause pain, may increase in size and risk spreading damage to surrounding areas of normal, undamaged cartilage.



Damaged articular cartilage can be very painful and may inhibit activity levels as a result.



Joint resurfacing with a HemiCAP™ implant creates a new congruent joint surface and may greatly reduce the pain.

" One day in the spring of 2004, I was playing tennis which I do several times a week. During the game my knee started to hurt. It was a little bit strange because I didn't fall or remember doing anything traumatic, it just started to hurt. After the game it got worse and that night my knee swelled up. When I went to see my surgeon he decided it was more than just a minor injury so he scheduled me for an arthroscopic surgery so they could look inside my knee to see what was wrong. That's when he found that I had damage to my articular cartilage and that I would need surgery to correct the problem. At first, my surgeon suggested I get a microfracture. My surgeon told me that with microfracture the rehab was going to be fairly long. This was an issue for me as I am very active and wanted to continue to play tennis. After discussing several options my surgeon suggested I might be a good candidate for the HemiCAP™ implant from Arthrosurface. The implant is custom fit to cover the damaged area and since it is metal I could put my weight on it much earlier. Being able to move around early was very appealing to me so I decided to have surgery the next month. After surgery I went home to start my rehabilitation. I still had pain at first but each day it got better and by the end of the first week the worst pain was gone. Even though the whole rehab program took only about 8 weeks, by 6 weeks almost all my pain was gone. Of course, I started to play tennis as soon as my doctor said it was O.K. which was about 8 weeks after surgery. Recently I went on a one week bike tour in Germany. This was the first time that I was going to exercise my knee everyday for several hours so I was a little concerned. It was great! No pain, my legs felt strong and the best thing was that no one could tell I even had surgery only a year before. When I first had the pain in my knee I was very concerned. I thought I might not be able to exercise and be as active as I liked. With the HemiCAP™ implant I have everything I wished for. The rehab was short, it didn't really affect my work, I can play tennis, hike and ride my bike, all with no pain. The HemiCAP™ implant sounded like a good idea when I first heard of it but now I know it is. I couldn't be happier with how it turned out."

P.R., Germany

Many patients treated with the HemiCAP™ device experience relief from pain and symptoms, however individual patient results will vary. Consult your physician to see whether this treatment is right for you.

What about Allografts?

Allografts are human donor tissues. This can be a difficult surgery because it is very hard to reconstruct the existing joint surface curvatures. There are also risks of disease transmission and a lengthy waiting list for grafts and surgery.

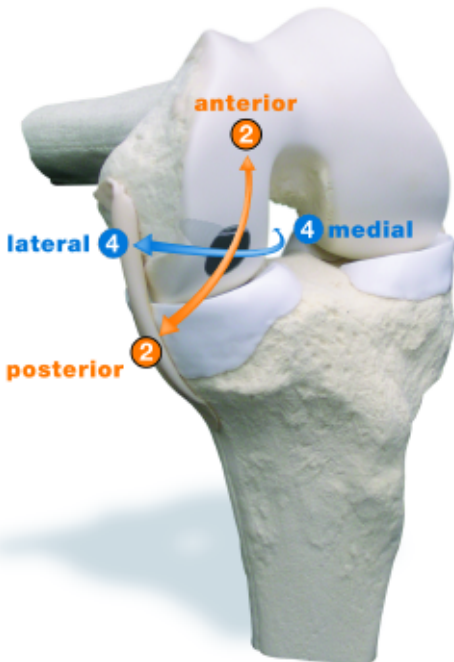
I've heard of injecting cartilage cells to regrow normal cartilage.

Does that work?

It has been tried in certain patients but is expensive, requires two surgeries and has long and difficult rehabilitation.

What about Joint Replacement?

This is major surgery designed to relieve the pain of widespread arthritis. It removes all of the cartilage in the knee and a significant amount of bone from the joint. Joint replacement was originally indicated for patients aged 70 years and older. Total joint replacements have a lifespan of approximately 10-12 years in younger patients.



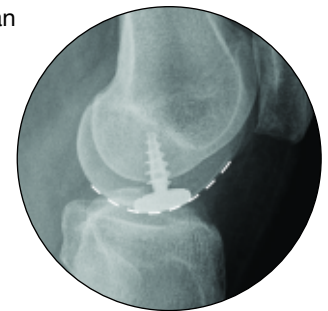
What about the Arthrosurface HemiCAP™ implant?

The HemiCAP™ implant is a technologically advanced system designed to match the shape and contour of the individual patient's cartilage surface. It is a "patch" for an area of damaged cartilage designed to protect the remaining, normal cartilage in an attempt to prevent further damage. The HemiCAP™ system is for disabled knee joints resulting from post-traumatic degenerative disease or avascular necrosis.

The HemiCAP™ system matches not only the diameter of the damaged area but also the precise radius of both curvatures of the patient's joint surface (top to bottom) **anterior** to **posterior** and (inside to outside) **medial** to **lateral**. The technology for mapping the joint curvatures comes from eye surgery where it was used to make products to protect the corneal surface. The mapping is done in the operating room by the surgeon. Once the mapping points are defined, an appropriately sized implant is chosen and then implanted into the patient. Different diameters & curvatures are available to provide a proper fit for each patient.



Total Knee Replacement



HemiCAP™ Implant
(side view)



HemiCAP™ Implant
(view from front to back)

* The white dotted line represents the patients' cartilage surface as cartilage is not apparent on x-ray. X-rays show bony structures only.



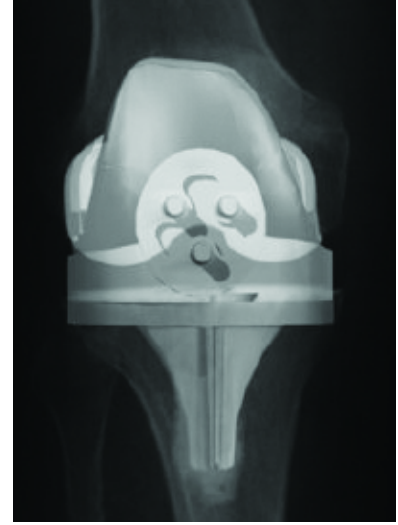
Existing devices



HemiCAP™ Implant



Unicompartmental Knee



Total Knee Replacement

* The white dotted line represents the patients' cartilage surface as cartilage is not apparent on x-ray. X-rays show bony structures only.

Is this different than a joint replacement?

The HemiCAP™ implant is matched and fit to a patient's joint size and shape. It removes a much smaller amount of cartilage and bone than traditional joint implants. It is placed "into" the surface leaving the joint less surgically altered. Simply put "This is not your grandparent's joint replacement."

How long will the HemiCAP™ implant last?

Your surgeon expects the devices to last as long as existing devices but it will depend on your general health, activity level, and adherence to your doctor's orders following surgery.

What happens if it fails?

If it ever fails, it may be replaced with another HemiCAP™ device or, if necessary, it may be converted to a joint replacement.

Does it “burn any bridges?”

Compared to existing joint replacements there is minimal bone loss with the HemiCAP™ implant. With a joint replacement, the entire bony surface, sometimes even both sides of the joint, are surgically removed to facilitate the implant being placed. This means there is far less of the natural bone to work with if future surgery is required. The HemiCAP™ system leaves more bone intact therefore leaving more options should future surgery be required.

Will I feel it?

No. The implant is surgically placed so there are no protruding edges. The bone and the implant become a smooth surface you will not feel.

Will it set off airport security alarms?

It should not. However after receiving the HemiCAP™ implant you can ask your surgeon to give you an implant identification card (similar to your driver's license) that can be shown to anyone should there be any question.

How long will I be off of work?

This will be dependent on your muscle strength, range of motion and the type of work you do. Many patients have experienced a rapid return to daily activities. However, as with all medical treatments, your results may vary.

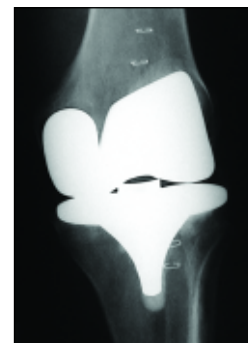
What type of physical therapy will I need to do?

Your doctor and therapist will design a rehabilitation protocol to return strength to your muscles so that you can return to your original lifestyle.

Due to its general applicability, do not rely on information in this brochure to assess any particular patient condition. Seek professional medical advice for specific personal care. Do not delay seeking professional medical advice or disregard professional medical advice because of something you have read in this brochure.



HemiCAP™ Implant (enlarged view)
white dotted line defines original articular cartilage



Knee total arthroplasty



Knee “uni” arthroplasty



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