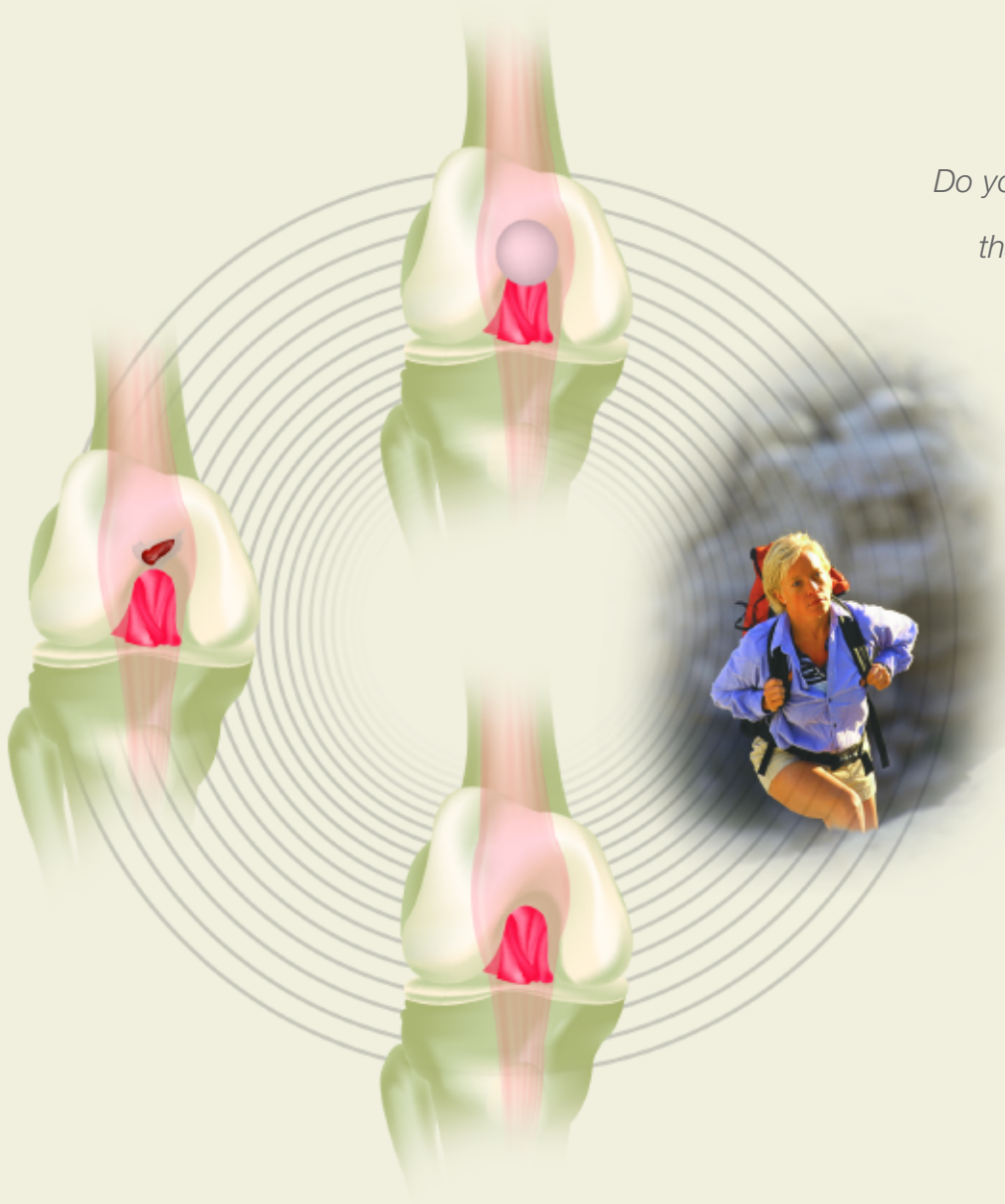


Patello-Femoral Resurfacing & Joint Preservation



Do you have pain around your kneecap that prevents you from doing the activities of daily life?

Has your doctor told you that you might need a partial kneecap replacement in the future?

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

Anatomy

Have you become frustrated because of the limitations due to pain around or behind your kneecap?

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

What is the patello-femoral joint?

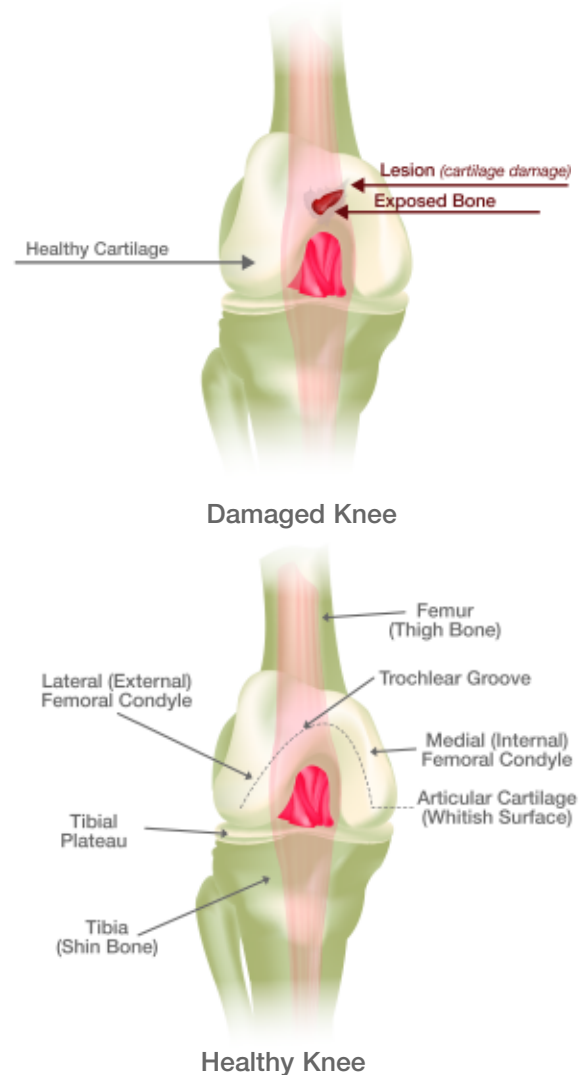
Joints are the locations in your body where bones meet. Movement of these bones at the joint permits our bodies to move. Cartilage is a specialized tissue in the joints which caps/covers our bones where they meet. Cartilage is a smooth, slippery tissue that allows the bones to slide against one another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

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The Patello-Femoral joint has 2 bones which work together: the kneecap and lower thigh bone (femur). Normally the kneecap or patella moves or tracks through the center of your femur as you bend and extend your leg. The groove that the patella tracks through is known as the trochlear groove. When the patella does not track normally in this groove or there is damage to the cartilage, problems can occur.

How does cartilage get injured?

A variety of events can damage cartilage, some include trauma (injury), infection, inflammation, and malalignment. A traumatic injury can cause an isolated defect just like a golfer creates a divot in the grass. Dashboard injuries from car accidents are a common way the patello-femoral (or PF) joint can be damaged. Malalignment can cause damage to the joint surface similar to the way the tires on a car lose their tread if the wheels are not properly aligned.



What if I have been diagnosed with malalignment?

Malalignment simply means your kneecap is no longer centered in the trochlear groove. The problem with malalignment is when the patella is shifted from its normal tracking it can cause an increase in the amount of pressure underneath it. This additional pressure can cause damage as the abnormal and higher forces may begin deteriorating the cartilage of your knee. This initially causes pain in the front of your knee but can lead to chondromalacia and eventually arthritis.

Chondromalacia = Softening of the Cartilage

Chondromalacia is noted by dull joint pain around or behind the kneecap

Can chondromalacia get worse?

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

What are treatment options for injured cartilage?

Depending on the degree of cartilage injury, age and activity level, patients may be candidates for either: physical therapy, soft tissue realignment, 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 are the most conservative treatments?

Most patello-femoral problems in the younger to middle-aged patient can be treated non-surgically using physical therapy and possibly a knee brace to correct the patella's alignment.

What is a lateral release?

Your surgeon may also opt to perform a soft tissue correction where he will surgically release or re-align the kneecap so it will track normally again. This is typically performed as an arthroscopic and outpatient procedure.

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.

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. This technique may provide short-term pain relief and is generally indicated for patients under 35 years old.

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 new congruent joint surfaces and may greatly reduce the pain.

A Patient's Story

"Five years ago, I had an accident at work. A large 20lb rock fell right on my kneecap and since then my life has been miserable. My first surgery was right after my accident. The surgeon took out some damaged tissue and cleaned up the inside of my joint. It helped a bit but then the pain got worse. I went from playing softball, working 80 hours a week and being very active, to being so debilitated that I couldn't walk up and down stairs without a lot of pain. Finally, I went to see another doctor and he performed a different surgery. This time they realigned my knee and put some bone grafts into the injured area under my kneecap. Unfortunately, that didn't work either. At that point I had been out of work for two years. I was starting to lose hope of ever going back to work since nothing had worked, the pain was constant, and the only other option was getting a joint replacement.

Just when I thought there was no other choice, my doctor called me to tell me about a new technology from Arthrosurface®. He had already used it in the knee and shoulder with great results. Now they had something for kneecap so I went to find out what it was. I was surprised at how simple it was. The idea was to replace the damaged area with contoured implants. What made the implants special was that they were designed to fit the anatomy of the patient.

It's now been about one and a half years after surgery and for the first time in 5 years I have no more pain. Walking, biking, going up and down stairs are all things that I can do again, now without pain. I went from taking pain meds everyday to taking none. Now, I even sleep through the night. When I went back to work, I started with a desk job. Things kept going well and at the end of my rehab program, I got my old job back. That was fantastic.

If my doctor had told me that only 2 months after my surgery I would be pain-free and working again I would have said it was impossible. Today it's a reality. The Arthrosurface® technology has given me back my life. I couldn't be happier."

– D.C., Boston, MA

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 complex curvatures of the PF joint surfaces. 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.

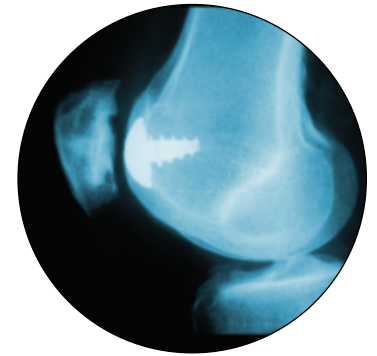
What about Joint Replacement?

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. In addition it may be “more surgery than you need” if your damage is limited to your PF joint only.

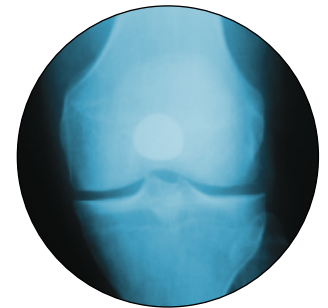
What about the ArthroSurface HemiCAP® implant?

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 painful and damaged knee joints resulting from post-traumatic degenerative disease or focal defects.

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) **superior to inferior** 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 that 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 curvatures are available to provide a proper fit for each patient.



HemiCAP® Implant
(side view)



HemiCAP® Implant
(view from front to back)





Existing devices



HemiCAP® Implant



Patello-Femoral
Joint Replacement



Total Knee Replacement

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 meant to relieve the pain during the bending and extending of your knee. 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 converted to a larger 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.

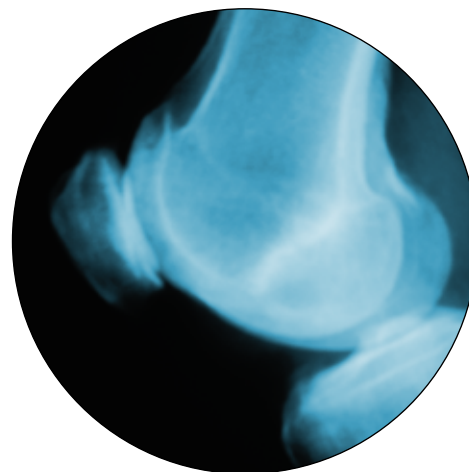
How long will I be off of work?

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.

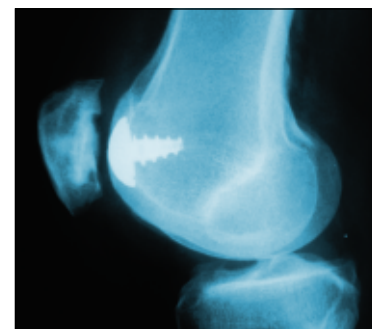
Due to its general applicability, do not rely on information in this brochure to assess any particular patient condition. Seek professional medical advice for specific personal care. Do not delay seeking professional medical advice or disregard professional medical advice because of something you have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



X-ray of damaged Patello-Femoral joint



HemiCAP® Implant



HemiCAP® Implant
(Side view)



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