

MAKOplasty®

Partial Knee Resurfacing



U K N E E Q U E

Just Like Fingerprints,
No Two Knees Are The Same.

You Deserve A Knee Procedure
Customized Just For You.

Understanding Osteoarthritis

Osteoarthritis (OA) is the most common form of arthritis and a leading cause of disability worldwide, according to the American Academy of Orthopaedic Surgeons. It is estimated that nearly one in two people may develop symptomatic osteoarthritis of the knee in their lifetime.¹

This brochure has been designed to help you learn more about OA of the knee, and how MAKOplasty® may be the right treatment option for you. Be sure to discuss all treatment options with your physician.

What is OA?

OA is a form of arthritis and a degenerative joint disease characterized by the breakdown and eventual loss of joint cartilage. Cartilage is a connective tissue that serves as a cushion between the bones of a joint. With OA, the top layer of cartilage breaks down and wears away, allowing bones under the cartilage to rub together, causing pain and discomfort.

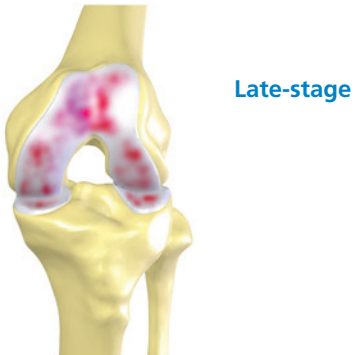
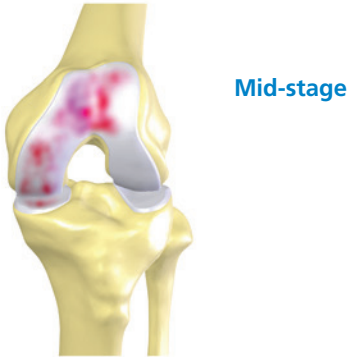
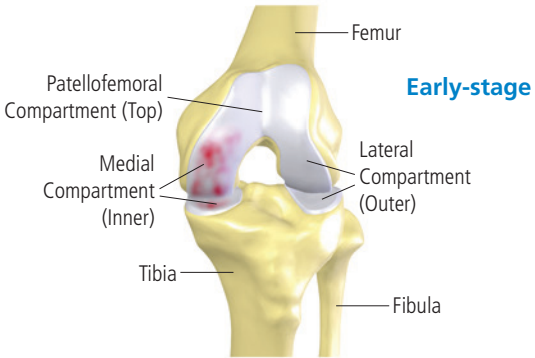
What causes knee OA?

Although the root cause of OA is unknown, the risk of developing symptomatic knee OA is influenced by multiple factors such as age, gender, and inherited traits that can affect the shape and stability of your joints. Other factors can include:

- Being overweight
- A previous knee injury
- Repetitive strain on the knee
- Improper joint alignment
- Exercise or sports-generated stress placed on the knee joint

Stages of OA

The knee is made up of three compartments: the medial (inner), lateral (outer), and patellofemoral (top).



What are the symptoms of knee OA?

Symptoms include:

- Pain while standing or walking short distances, climbing up or down stairs, or getting in and out of chairs
- Pain with activity
- Start-up pain or stiffness when activities are initiated from a sitting position
- Joint stiffness after getting out of bed
- Swelling in one or more areas of the knee
- A grating sensation or crunching feeling in the knee during use

How is OA treated?

Whether your OA is mild or severe, your physician will most likely recommend certain lifestyle changes to reduce stress on your knee joints. Additional treatment strategies may include: physical therapy, over-the-counter pain medications such as acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), topical pain-relieving creams, steroid injections, and viscosupplementation.

Please speak with your physician if your symptoms aren't responding to non-surgical solutions, or your pain can no longer be controlled by medication. You could be a candidate for surgery.

The most common surgical intervention for knee OA is a total knee replacement. During this procedure, the natural joint is removed and replaced with an artificial implant. This treatment option is usually offered to patients with late-stage osteoarthritis of the knee.

Since all three compartments of the knee are replaced in total knee replacement, it is not always optimal for patients with early to mid-stage osteoarthritis in just one or two compartments of the knee. For these patients, MAKOpasty® Partial Knee Resurfacing may be a more appropriate solution.

What makes MAKOplasty uKNEEque?

MAKOplasty Partial Knee Resurfacing is a minimally invasive procedure for those suffering with painful early to mid-stage osteoarthritis of the knee. It is performed using the proven robotic arm technology of the RIO® Robotic Arm Interactive Orthopedic System.



**RIO Robotic Arm
Interactive
Orthopedic System**

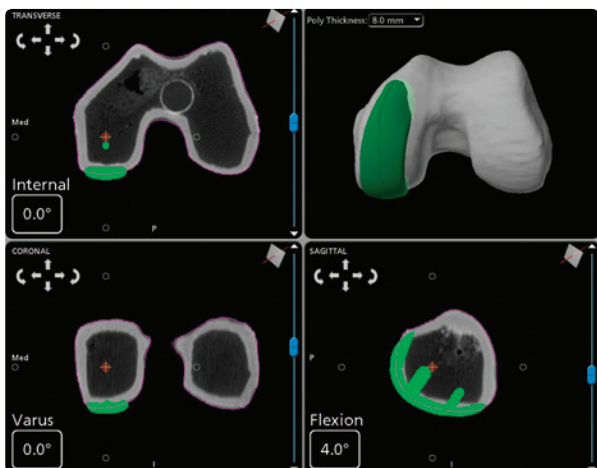
MAKOplasty enables surgeons to accurately resurface only the diseased portion of the knee, saving as much of the original knee as possible—including healthy bone and ligaments. This minimally invasive approach, combined with a patient-specific surgical plan and more accurate implant placement, results in a more natural feeling knee compared with total knee replacement.

MAKOplasty can be performed on any one of the three knee compartments: the inside (medial), behind the kneecap (patellofemoral), or outside (lateral) compartments as a unicompartmental procedure, or it can be performed on both the medial and patellofemoral portions of the knee together, which is known as a bicompartamental procedure.

The MAKOpasty® Advantage

How does MAKOpasty work?

Because no two knees are the same, MAKOpasty customizes the procedure for your unique anatomy. Before surgery, a computed tomography (CT) scan is taken of your knee, and the RIO® System creates a 3-D anatomical model. This allows the surgeon to plan the placement and alignment of your knee implants prior to surgery, and helps to accurately execute the plan.



RIO Implant Planning Screen

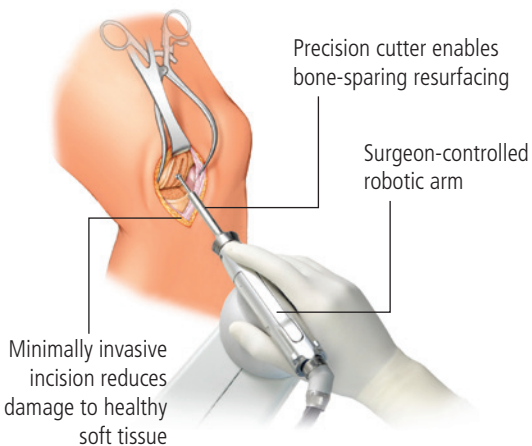


RESTORIS® MCK
Family of Implants

To ensure your implants are optimally positioned and that the soft tissues of your knee are balanced for natural movement, your surgeon can test and fine-tune the plan during surgery by moving the leg through different ranges of motion. The RIO® provides measurements and visualization of your unique anatomy, enabling the surgeon to adjust and customize the plan as needed.

Once the surgical plan is finalized, it is programmed into the RIO, which creates a safety zone for bone removal. During surgery, the surgeon guides the robotic arm while preparing the bone for the implant. The RIO assists by ensuring that bone removal stays within the safety zone of the surgical plan, providing auditory, visual, and tactile feedback, stopping the robotic arm if necessary before bone can be removed outside the planned area. Once the bone preparation is complete, the implants are placed in the knee.

MAKOplasty® Procedure



The MAKOplasty® Advantage

What's the clinical data?

MAKOplasty offers less post-operative pain and improved accuracy over manual procedures

MAKOplasty resulted in more accurately placed implants and less pain for the first eight weeks after surgery, when compared with patients receiving manually placed Oxford* implants, based on initial results of an ongoing study. Additionally, it found MAKOplasty patients had increased post-operative functionality compared with those who underwent the manual procedure, based on American Knee Society Scores at three months.²

This study is a randomized controlled trial (RCT) that compares outcomes of 100 partial knee patients (50 robotic arm assisted MAKOplasty and 50 manual Oxford patients).²

Knee Functionality[†]

MAKOplasty®

57%

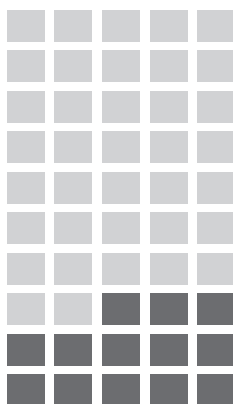
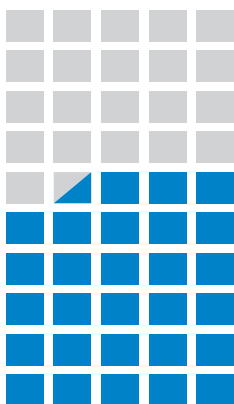
Excellent[†]

vs.

Manual Oxford®

26%

Excellent[†]



[†] American Knee Society Scores, three months post-op.

*Oxford® is a registered trademark of Biomet, Inc.

MAKOplasty® has a very low failure rate at two years

MAKOplasty demonstrated very low failure rates in a study conducted by four surgeons, evaluating 201 MAKOplasty patients (224 knees) who had partial knee resurfacing with RESTORIS® MCK medial only implants. MAKOplasty failure rate was only 0.4% at two years,³ **which is nine times lower than that of manual surgery.**

MAKOplasty Two-Year Failure Rate vs. Manual



MAKOplasty Partial Knee Resurfacing offers improved function compared with total knee replacement

MAKOplasty Partial Knee Resurfacing demonstrated improved function, better post-operative range of motion, and better quadriceps strength in a study⁴ comparing it with total knee arthroplasty.



If I undergo MAKOplasty, what can I expect?

MAKOplasty can be performed as either an inpatient procedure or on an outpatient basis depending on what your orthopedic surgeon determines is right for you. Hospital stays average anywhere from one to three days; outpatients return home the same day.

In many cases, patients are permitted to walk soon after surgery, drive a car in the first few weeks, and return to normal daily activities shortly thereafter.

What is the lifespan of a MAKOplasty implant?

All implants have a life expectancy that depends on several factors including the patient's weight, activity level, quality of bone stock, and compliance with their physician's orders.

Proper implant alignment and accurate positioning during surgery are also very important factors that can improve the life expectancy of an implant. Through the use of RIO® robotic arm technology, implants can be optimally aligned and positioned to optimize surgical outcomes. RESTORIS® MCK implants enable the treatment of one or two compartments with OA disease. Because very little bone is actually removed during a MAKOplasty procedure, the implants can be replaced with another procedure such as a total knee replacement, if necessary.

1. Murphy L, Schwartz TA, Helmick CG, Renner JB, Tudor G, Koch G, Dragomir A, Kalsbeek WD, Luta G, Jordan JM. Lifetime risk of symptomatic knee osteoarthritis. *Arthritis Rheum*. 2008;59(9):1207-13. doi: 10.1002/art.24021.
2. Blyth MJ, Smith J, Jones B, MacLean III AD, Anthony I, Rowe P. Does robotic surgical assistance improve the accuracy of implant placement in unicompartmental knee arthroplasty? AAOS 2013 Annual Meeting, March 19-23, 2013, Chicago, IL.
3. Roche MW, Coon T, Pearle AD, Douchis J. Two year survivorship of robotically guided medial MCK onlay. 25th Annual Congress of ISTA, October 3-6, 2012, Sydney, Australia.
4. Kreuzer S, Conditt M, Jones J, Dalal S, Pourmoghaddam A. Functional recovery after bicompartamental arthroplasty, navigated TKA, and traditional TKA. 25th Annual Congress of ISTA, October 3-6, 2012, Sydney, Australia.

Am I a Good Candidate

for the MAKOplasty® procedure?

MAKOplasty candidates have osteoarthritis in one or two parts of the knees. Typical MAKOplasty patients share the following characteristics:

- Knee pain with activity, usually on the inner knee and/or under the kneecap
- Start-up knee pain or stiffness when activities are initiated from a sitting position
- Failure to respond to non-surgical treatments or nonsteroidal anti-inflammatory medication

If you have one or more of the above symptoms, talk to your doctor about MAKOplasty or visit makoplasty.com