

How does Mako SmartRobotics™ technology work?

Questions to ask your doctor:

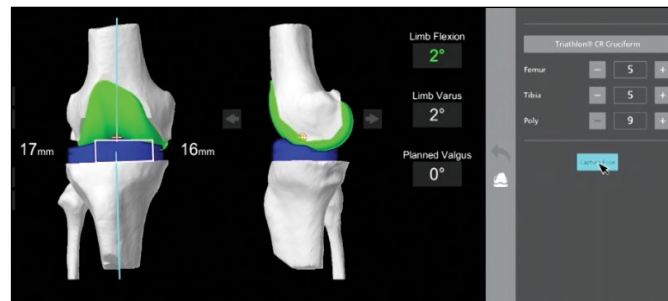
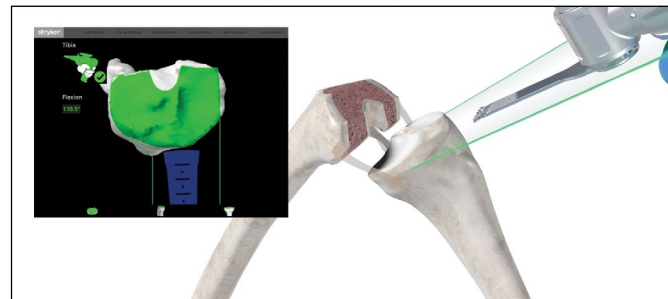
- How often do you perform surgeries using Mako SmartRobotics™?
- How long do knee implants usually last and what factors can impact their longevity?
- What to expect in weeks prior to surgery?
- Do I need a caregiver after the surgery and what do they need to know?



The AccuStop™ technology

With Mako SmartRobotics™, your surgeon can create a personalized surgical plan, and with the help of AccuStop™ technology, they are guided to accurately cut what's planned for you,¹ which for some patients can help preserve soft tissue and for others can help protect healthy bone.^{2,3}

How does Mako SmartRobotics™ and AccuStop™ technology work?



Personalized surgical plan

Before your surgery, your doctor will take a CT scan of your knee joint, which develops a 3D virtual model of your unique anatomy. This model helps your doctor see things they can't typically see with an X-ray alone. The information provided by Mako helps your surgeon determine the desired size, placement and positioning of your implant. Throughout the procedure, Mako SmartRobotics™ provides real-time data to the surgeon so they can continuously assess the movement and tension of your new joint and adjust your surgical plan if needed.

Arthritic bone removal

In the operating room, your surgeon guides Mako's robotic arm to remove arthritic bone and cartilage from the knee. AccuStop™ technology provides tactile resistance to help your surgeon stay within the boundaries defined in your surgical plan and accurately cut what's planned for you,² which could protect your healthy bone.^{2,3}

Implant placement and range-of-motion assessment

With the removal of the diseased bone, your implant is placed into the knee joint. Once your implant is successfully placed, it's off to the recovery room to begin the journey towards strengthening your new joint.

Frequently asked questions

These FAQs are not a substitute for medical advice from your own doctor.

Q: How long has Mako Technology been available?

A: The first Mako procedure was performed in 2006. Since that time, more than 615,000 Mako Total Knee, Mako Partial Knee and Mako Total Hip procedures have been performed worldwide.

Q: How long will I be in the hospital?

A: All patients are different. Clinical studies have shown that patients who had a Mako Total Knee procedure spent less time in the hospital compared to those who had a conventional knee replacement.⁴

Q: When can I get back to normal activities?

A: Most people who undergo knee replacement surgery and participate in a physical therapy regimen prescribed by their doctor return to their day-to-day activities, like driving, in four to six weeks,⁵ but everyone is different. Realistic activities following knee replacement may include walking, biking, swimming, golfing and other low impact activities. Your doctor will help determine a plan best suited for your recovery and your lifestyle.

Q: What activities will I be able to do after surgery?

A: In a few weeks, your doctor may allow you to pick back up with lower-impact activities like hiking, walking, cycling and golfing.⁶ Speak to your doctor about which activities are appropriate for you.

Q: Does the Mako Robotic-Arm actually perform the surgery?

A: No, surgery is performed by an orthopedic surgeon, who uses the surgeon-controlled robotic-arm system to pre-plan the surgery and to position the implant. The robotic-arm does not perform the surgery nor can it make decisions on its own or move in any way without the surgeon guiding it. The Mako System also allows your surgeon to make adjustments to your plan during surgery as needed.

your knee pain

Each patient is unique, and can experience knee pain for different reasons. One common cause of knee pain is osteoarthritis (OA). OA is sometimes called degenerative arthritis because it is a “wearing out” condition involving the breakdown of cartilage in the joints.

Another common cause of knee pain is rheumatoid arthritis (RA). RA produces chemical changes in the lining of the joints, or synovium, that causes it to become thickened and inflamed. In turn, the synovial fluid destroys cartilage.

When cartilage wears away, the bones rub against each other, causing pain and stiffness, limiting your ability to move and work.

Total knee replacement is a surgical procedure where a diseased or damaged joint is replaced with an artificial joint called an implant. Made of metal alloys and high-grade plastics, the implant is designed to mimic a normal, healthy knee.

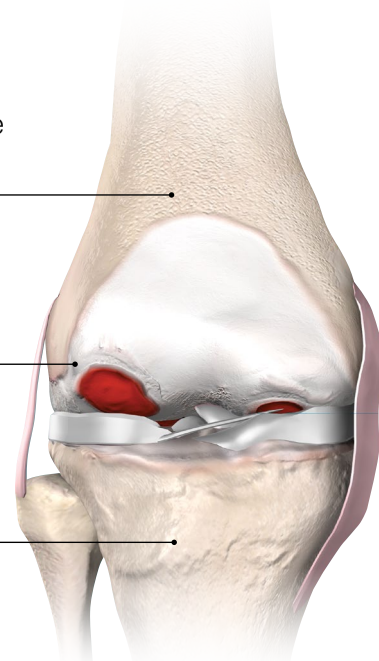
Mako SmartRobotics™ transforms how total knee replacement procedures are done by integrating 3D CT-based planning software and AccuStop™ haptic technology.

An arthritic knee

Femur (thighbone)

Diseased cartilage

Tibia (shinbone)



References

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Important information

Knee replacement: Knee replacement is intended for use in individuals with joint disease resulting from degenerative, rheumatoid and post-traumatic arthritis, and for moderate deformity of the knee. Knee replacement surgery is not appropriate for patients with certain types of infections, any mental or neuromuscular disorder which would create an unacceptable risk of prosthesis instability, prosthesis fixation failure or complications in postoperative care, compromised bone stock, skeletal immaturity, severe instability of the joint, or excessive body weight.

As with any surgery, knee replacement surgery has serious risks which include, but are not limited to, pain, infection, bone fracture, peripheral neuropathies (nerve damage), circulatory compromise (including deep vein thrombosis (blood clots in the legs)), genitourinary disorders (including kidney failure), gastrointestinal disorders (including paralytic ileus (loss of intestinal digestive movement)), vascular disorders (including thrombus (blood clots), blood loss, or changes in blood pressure or heart rhythm), bronchopulmonary disorders (including emboli, stroke or pneumonia), heart attack, and death.

Implant related risks which may lead to a revision include dislocation, loosening, fracture, nerve damage, heterotopic bone formation (abnormal bone growth in tissue), wear of the implant, metal and/or foreign body sensitivity, soft tissue imbalance, osteolysis (localized progressive bone loss), and reaction to particle debris. Knee implants may not provide the same feel or performance characteristics experienced with a normal healthy joint.

This information is solely intended for patients who have been booked for a Mako robotic-arm assisted surgery by their surgeon. The information presented is for educational purposes only. Stryker is not dispensing medical advice. Speak to your doctor to decide which treatment is appropriate for you. Individual results vary and not all patients will return to the same activity level. The lifetime of any joint replacement is limited and varies with each individual. Your doctor will counsel you about how to best maintain your activities in order to potentially prolong the lifetime of the device. Such strategies include not engaging in high-impact activities, such as running, as well as maintaining a healthy weight. It is important to closely follow your doctor's instructions regarding post-surgery activity, treatment and follow-up care.

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Mako SmartRobotics™ total knee replacement

A patient's guide



Time to take on

What is a total knee replacement

The knee is the largest joint in the body and is central to nearly every routine activity. Three bones come together to form the knee joint:

- the lower end of the thighbone (the femur),
- the upper end of the shinbone (the tibia),
- and the kneecap (the patella) right above where the long bones meet.

Tough bands called ligaments help keep everything in place and stable.

A smooth, plastic like lining called cartilage covers the ends of the bones. Cartilage provides cushioning, keeps bones from rubbing together, and absorbs the shock of walking, running and jumping. Your body also produces a natural lubricating fluid called synovium that minimizes friction in the joint.

A healthy knee

Femur (thighbone)

Healthy cartilage

Tibia (shinbone)

