

+ Robotics-assisted partial knee replacement

A patient's guide

Smith+Nephew



+ Contents

Partial knee replacement	4
Partial knee replacement with traditional techniques	5
Partial knee replacement with Robotic assistance	6
Preparation for surgery	8
Preparation for after surgery	9
What to expect in surgery	10
Postoperative	11
Complications	14
Disclaimer	15
References	15



Please note: the information in this booklet is for educational purposes only and is not meant as medical advice. Every patient's case is unique. You should consult with your surgeon on the specific treatment plan designed for you. Remember to always follow your surgeon's instructions.

Your surgeon can help get you back in action with accurate and precise partial knee replacement.

Real Intelligence

There's nothing artificial about our intelligence

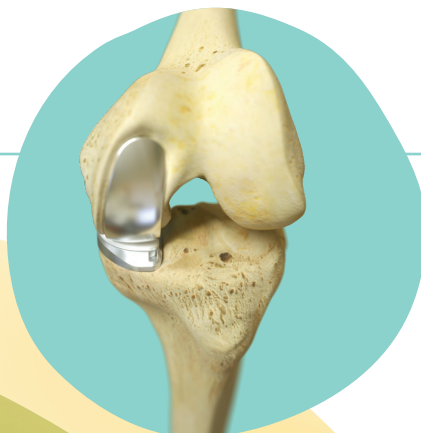


Partial knee replacement

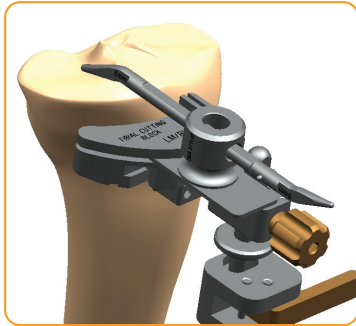
Partial knee replacement is a potential alternative to total knee replacement for patients with early to mid-stage osteoarthritis that is generally limited to one compartment of the knee.

The procedure removes and replaces the damaged portion of the knee with an implant, sparing the cruciate ligaments that are vital to knee stability, and preserving healthy bone and cartilage. In contrast to total knee replacement, partial knee replacement offers patients:

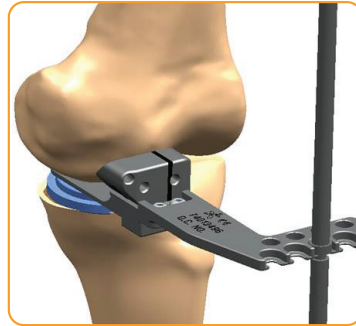
- **Less pain¹**
- **A more normal feeling knee¹**
- **Smaller incisions²**
- **Quicker rehabilitation¹**



Partial knee replacement with traditional techniques



Shin bone (tibia) guide



Thigh bone (femur) guide

Using traditional surgical methods, cutting blocks or guides are placed on the thigh bone (femur) and shin bone (tibia) to help direct a surgical saw in removing the diseased bone and cartilage. This method has been considered technically challenging, as accurately placing these block can be difficult.

In recent years, advanced surgical techniques using robotic assistance have been developed to provide a higher level of accuracy and precision.³

Robotics-assisted technique



Bone Removal

Partial knee replacement with robotic assistance

Your surgeon will size and position the partial knee implant with computer and robotic assistance.

The robotic system provides assistance through an advanced computer program that relays precise information about your knee to a robotics-assisted handpiece used by the surgeon during the procedure

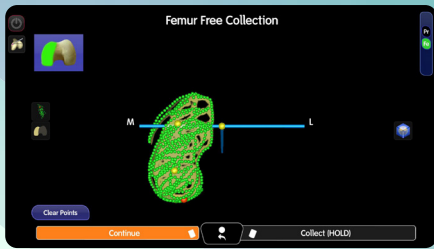
By collecting patient-specific information, the surgeon is able to establish spacial boundaries for the robotics-assisted handpiece to assist in removing the damaged surfaces of your knee, balance your joint, and position the implant with accuracy and precision.³



Robotic system

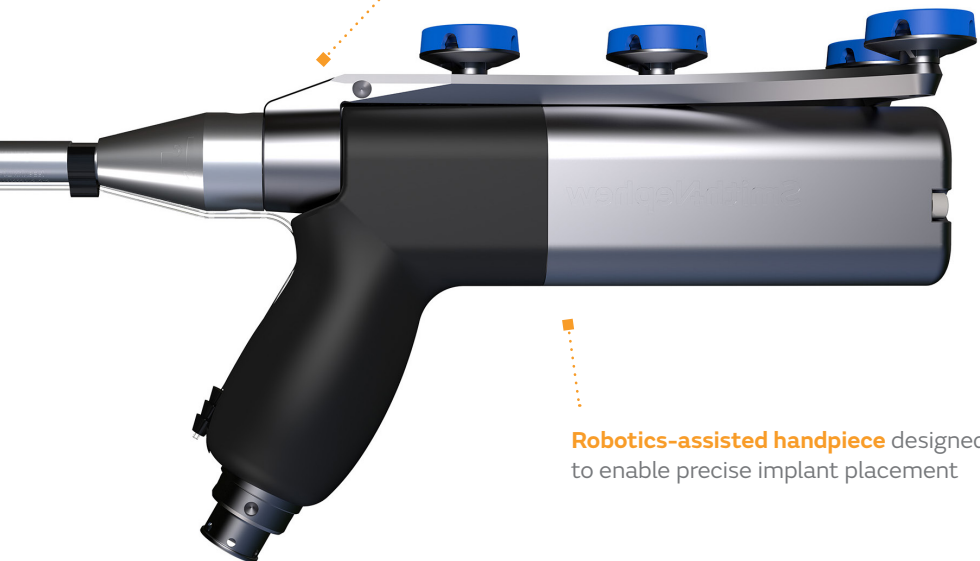


Precision milling
designed to ensure
consistent results



Advanced planning software allows the surgeon to tailor the procedure to each patient.

Advanced instrumentation designed to enforce the surgeon-defined plan



Robotics-assisted handpiece designed to enable precise implant placement

Preparation for surgery

There are several activities that you should plan for once you decide to have surgery:

Initial surgical consultation: Preoperative x-rays, complete past medical history, complete past surgical history, complete list of all medications and allergies (prescription, over-the-counter, vitamin supplements).

Complete physical examination: Your doctor may determine if you are in the best possible condition to undergo surgery.

Blood donation: A transfusion may be necessary after surgery, therefore you may wish to donate blood prior to surgery.

Physiotherapy: Instruction in an exercise program to begin prior to surgery and an overview of the rehabilitation process after surgery will better prepare you for post-operative care.

Preparation for the hospital: You may want to bring the following items:

- **Clothing:** underwear, socks, t-shirts, exercise shorts for rehabilitation.
- **Footwear:** walking or tennis shoes for rehab; slippers for hospital room.
- **Walking Aids:** walker, cane, wheelchair or crutches if used prior to surgery.
- **Insurance Information**

Preparation for after surgery:

- Follow your surgeon's instructions for preparation the evening before surgery.
- You may be advised not eat or drink after midnight.
- Shower (with five minute scrub to surgical area with special soap provided).
- Prepare your belongings and review partial knee booklet.

Preparation for after surgery:

- Move items and furniture in your home so they are easier to access while your mobility is limited.
- Remove clutter and obstacles that could be tripping hazards.
- Have a plan; preparing meals ahead of time and arranging visitors to help with everyday chores will make your recovery smoother.



What to expect in surgery

The surgeon will typically make a 10cm - 15cm incision along the front of your knee, just to the side of the knee cap, to access the damaged area and inspect the knee.

Special trackers are secured to both the thigh bone (femur) and shin bone (tibia) with four, 3.2mm pins that are placed through small incisions in the skin. These trackers are crucial to the precision of the system as they provide a constant reference point for the robot as the surgeon collects your anatomical data and prepares the joint surfaces.

The anatomical data collected is used to generate a 3-dimensional virtual model of your knee, which the surgeon uses to precisely plan your partial knee replacement.

With the robotic assistance system, proper implant placement and knee balance, important to a successful surgery, are first achieved virtually.

When the surgical plan is set, the robotics-assisted handpiece is used by the surgeon to accurately resurface the joint as he or she guides the instrument over the damaged femoral and tibial bone. After the damaged bone and cartilage have been removed and the implants are in place, the incision is thoroughly cleaned and closed to complete the procedure.



Incision made on knee



The implant is positioned virtually using advanced planning software

Real Intelligence

Postoperative

Immediately after surgery you will be transferred to the recovery room. In addition to the incision along your knee, there will be two small incisions on both your thigh and lower leg where the tracker pins were placed. Ice packs and analgesics may be used to reduce swelling and manage pain.

Each patient's postoperative care will vary, as severity of injury, surgical complexity and other factors can vary. Early movement of your operative knee with assistance is encouraged. Patients are typically allowed to walk with the assistance of a cane, crutches – or walker shortly after surgery. A physiotherapist will prescribe exercises to help restore knee strength and function, and increase range of motion. It is common for your knee to experience swelling, stiffness and tightness.



Rehabilitation following surgery

The success of your surgery will largely depend on how well you follow your surgeon's instructions the first few weeks following surgery. How quickly you recover depends on factors such as knee pain, flexibility, strength and balance. Follow up visits will likely be scheduled to check up on your condition and progress as you recover.

In order for you to meet the goals of knee replacement surgery, you must take ownership of the rehab process and work diligently on your own as well as with your physiotherapist. The rehabilitation process can be quite painful at times. However, if you commit to following your program and overcome the challenges in rehab, you will succeed in meeting the goals you set when deciding on surgery.





Complications

As with any surgical procedure, there are risks involved with total knee replacement surgery. Every patient's case is unique. You should consult with your surgeon on the specific complications you may encounter. Complications may include, but are not limited to:

- **Blood clots.** Your surgeon may prescribe medication to help prevent blood clots.
- **Infection.** Antibiotics may be given before the surgery and continued afterward to help prevent infection.
- **Injury to nerves or vessels.** While rare, nerve and blood vessel damage may occur during the procedure.⁴
- **Other risks.** Individual patient risks should be discussed with your surgeon.

Disclaimer

Robotics-assisted surgery is not for everyone. Children, pregnant women, patients who have mental or neuromuscular disorders that do not allow control of the knee joint and morbidly obese patients should not undergo a procedure. Knee replacement surgery is intended to relieve knee pain and improve knee functions. However, implants may not produce the same feel or function as your original knee. There are potential risks with knee replacement surgery such as loosening, fracture, dislocation, wear and infection that may result in the need for additional surgery. Longevity of implants depends on many factors, such as types of activities and weight. This information, including postoperative care, is provided for educational purposes only. Smith+Nephew does not provide medical advice. In no event shall Smith+Nephew be liable for any damages whatsoever arising out of the use of or inability to use the expressed views. Consult your surgeon to determine if a robotics-assisted procedure is right for you.

Robotics-assisted surgery is intended to assist the surgeon in providing software-defined spatial boundaries for orientation and reference information to anatomical structures during orthopaedic procedures. Robotic assistance is indicated for use in surgical knee procedures, in which the use of stereotactic surgery may be appropriate, and where reference to rigid anatomical bony structures can be determined. These procedures include unicondylar knee replacement (UKR), patellofemoral arthroplasty (PFA), and total knee arthroplasty (TKA).

References **1.** Hall et al., “Unicompartmental Knee Arthroplasty (Alias Uni-Knee): An Overview With Nursing Implications,” *Orthopaedic Nursing*, 2004; 23(3): 163-171. **2.** Repicci, JA, et al., “Minimally invasive surgical technique for unicondylar knee arthroplasty,” *J South Orthopedic Association*, 1999 Spring; 8(1): 20-7. **3.** Lonner, et al. “High Degree of Accuracy of a Novel Image-free Handheld Robot for Unicondylar Knee Arthroplasty in a Cadaveric Study.” *Clinical Orthopaedics and Related Research*. Advanced online publication. DOI 10.1007/s11999-014-3764-x5 American Association of Orthopaedic Surgeons (2014). AAOS.org. **4.** American Association of Orthopaedic Surgeons (2014). AAOS.org



YOUR HEALTHCARE PROFESSIONAL WILL ADVISE YOU WHETHER THIS PRODUCT/PROCEDURE IS SUITABLE FOR YOU AND YOUR CONDITION.

Serious incident reporting notice:

For Australian patients, any serious incident/adverse event that occurs in relation to the device, should be reported to the manufacturer on customerfeedback.anz@smith-nephew.com and to the Therapeutic Goods Administration on: <https://www.tga.gov.au/reporting-problems>.

For New Zealand patients, any serious incident/adverse events that occurs in relation to the device should be reported on the manufacturer on customerfeedback.anz@smith-nephew.com and to the New Zealand Medicines and Medical Devices Safety Authority on:

<https://www.medsafe.govt.nz/safety/report-a-problem.asp>

Smith & Nephew Pty Ltd
Australia
T +61 2 9857 3999
F +61 2 9857 3900
smith-nephew.com/australia

Smith & Nephew Ltd
New Zealand
T +64 9 820 2840
F +64 9 820 2841
smith-nephew.com/new-zealand

®Trademark of Smith+Nephew
All Trademarks acknowledged
©Smith+Nephew, March 2021
06377-anz 0321

References 1.Total Knee Replacement, OrthoInfo. American Academy of Orthopaedic Surgeons (AAOS), online publication,<http://orthoinfo.aaos.org/topic.cfm?topic=A00389>, accessed 18 October, 2017. 2. Lonner, et al. "High Degree of Accuracy of a Novel Image-free Handheld Robot for Unicompartmental Knee Arthroplasty in a Cadaveric Study,"Clinical Orthopaedics and Related Research. Advanced online publication. DOI 10.1007/s11999-014-3764-x5 American Association of Orthopaedic Surgeons (2014). AAOS.org.