



Specialising in Knee & Shoulder Surgery

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Robotic-Assisted Total Knee Replacement

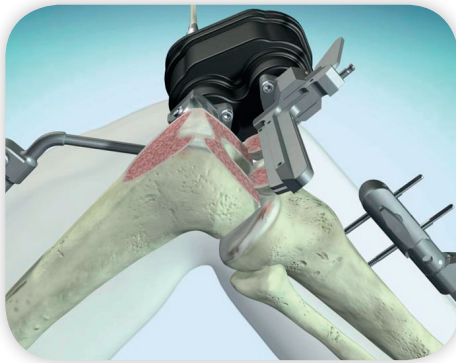
Patient Information Sheet

1. What Is Robotic Total Knee Replacement?

Evolving technologies in Total Knee Replacement surgery aim to achieve accurate component position, limb alignment and enable optimal ligament balancing. These include computer-navigation, patient-specific instrumentation and more recently robotics.

Introduction of new technologies in TKR over the past decade have not been shown to improve functional outcomes. But their use has led to decreased outliers and more accurate component positioning / limb alignment compared to conventional instrumentation techniques. The most recent of these technology is robotic assisted total knee replacement.

“Robot” is a mechanical device that is accurately controlled by a computer using intelligent software. Robots do not perform TKR surgery, but enable the Surgeon to implant the prosthesis accurately, reliably and reproducibly.



2. Will “Robot” Perform The Surgery?

Short answer is No.

Robotic systems can be active (No direct surgeon involvement) or semi-active (Surgeon performs procedure with assistance and feedback from robotic system).

All robotic TKR systems currently used are semi-active and require a pre-approved plan controlled by the surgeon. This plan could be from imaging like CT scan performed before surgery or from intra-operative registration to generate 3D-bone model of patient's knee.



3. What Are The Benefits Of Robotic-Assisted TKR To Patients?

There is no long term data available regarding results of robotic-assisted TKR and its benefits. The limited clinical data available for robotic systems in TKR however is promising. Like computer -navigation it has been shown to improve surgeon accuracy and precision. Capacity in robotic-assisted techniques to easily and reliably perform supplemental bone-cuts and ligament balancing is valuable.

Having used computer-navigation for over a decade, I believe the robotic system is a value-add to my capacity to provide accuracy and reproducibility in total knee replacement surgery. The system is a motorised cutting guide for femoral (thigh bone) cuts and is used in conjunction with a separate adjustable block for tibia (shin-bone) preparation.

4. Does Robotic-Assisted Surgery Have Any Additional Risks?

- The risks of robotic-assisted TKR include all the risks and complications of any joint replacement procedure.
- But specific risks could include pin-track related problems like fracture, loosening (rare complications).
- Lack of intra-operative versatility could be a limitation if the robotic system fails during surgery due to any reason. This would require reverting to conventional instrumentation.
- Some systems have high start-up costs and a long learning curve but the system I use does not have any additional costs to patients.

5. Will I Have A Smaller Scar Compared To A Conventional Knee Replacement?

No. Minimally invasive surgery is one of the proposed advantages of robotic-assisted TKR. But this is not the reason I use the technology. The surgery is performed through a standard incision at the front of the knee that is similarly sized to computer-navigated or conventional TKR.

Looking Forward To The Future

Future robotic systems in orthopaedic surgery would endeavour to deliver joint replacement surgery that is patient-specific and individual anatomy-specific. Incorporating ligament balancing and restoring normal knee kinematics is the key to achieving consistently excellent results in TKR surgery. But current technologies need further evolution and ongoing research to achieve this objective.

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