Total Knee Replacement MAKO

Every patient is unique, and one can experience joint pain for different reasons. It’s very important to talk to us about the reasons for your knee pain so you can understand the treatment options available to you and what best we can offer you. Arthritis is basically degeneration of the joint and may be attributed to trauma or rheumatoid arthritis or any other disease and can affect knees, hip or for that matter any joint of the body. Pain can be constant or can intensify or recede, occur due to movement or after a period of rest, or can be in one spot or many parts of the body. It is common for patients to try medication and other conservative treatments to treat their knee pain in particular. Therefore, it is particularly important to consult a specialist.

If you have not experienced adequate relief with those treatment options given by the doctor, you may be offered a **Total Knee Replacement – TKR,** which may provide you with relief from your knee pain.

The advent of total knee replacement (TKR) was an important milestone in the history of orthopaedic surgery. Total Knee Arthroplasty (TKA) was being practiced in early 1970s independently in United States and other countries.

Incredibly successful medical intervention, which absolutely changed lives worldwide. Total knee replacement (TKR) is one of the most preferred treatment for end-stage knee after failed non-surgical treatment. It relieves pain and improves the health-related quality of life. According to studies, an estimated increase in primary TKR by as much as 673% is predicted from 2005 to 2030 and everyday more than a milliontotal knee replacements are performed worldwide.

Unfortunately, TKA failure does happen in less than 2-3 %, it is multifactorial and early revisions result mostly from poor

surgical technique. Good surgical technique and accurate implantation of the components are likely to improve the longevity and function of TKA.

Here comes the role of technology and medical science. When this combination is synergicwe achieve accuracy, more safety, and an excellent outcome.

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“Leo II MAKO ROBOTIC ARM” is changing the way joint replacement surgeries are performed. It is the **best robotic knee replacement** procedure available among today’s progressive healthcare alternatives. **Robotic surgery in North India, Patna** is available at AIOR Anup Institute of Orthopaedics and

Rehabilitation.

Routine radiographs are obtained followed by a Computed Tomography (CT) scan for the patient. This CT scan is segmented and loaded into the system. Once in the system the surgeon can use a virtual 3D model, to personalize each patient’s surgical plan pre-operatively, thereby providing complete clarity on implant positioning before entering the operating room. When the surgery is in process, the surgeon can validate the entire plan or procedure and make the required adjustments. During the procedure, the robotic arm enables the surgeon to execute that plan with a high level of accuracy and predictability using haptic boundaries that restricts bone preparation to happen within the region of interest.

These combined features of the system have the potential for better outcomes and result in higher patient satisfaction. Accuracy and haptic boundaries ensure that only the required amount and planned part of bone is removed.

This helps in bone conservation and availability of more bone stock if a revision surgery is required. A lesser retraction of soft tissue is done enabling enhanced recovery.

It is important to understand that the surgery is performed by an orthopedic surgeon, who guides Leo II Mako’sthrough the surgery especially the robotic arm to properly place and position the implant in the knee joint. So, the surgeon should be well experienced in the **MAKOrobotic knee replacement surgery.**

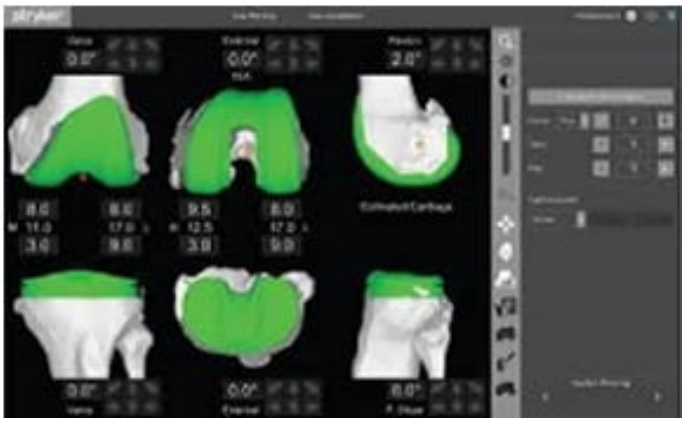
Leo II Mako Smart Robotic arm is not a surgeon and doesn’t perform the surgery. It doesn’t execute the surgery or make decisions on its own. Infact it will not move without the guidance of the surgeon. It also allows the surgeon to adjust the plan during surgery as needed. **Robotic knee surgery** is becoming popular due to its precision.

Steps of how the Leo II Mako System improves Total Knee Replacement for someone with Arthritis Painwith 100% precision:

STEP 1 : INVESTIGATIONS AND SEGMENTATION:

The X rays and CT scan of the patient's knee is segmented and fed into the robot to obtain a three-dimensional model of the knee joint – the femur, the tibia, and the surfaces that have been damaged by arthritis.

Figure 1 – Pre-Planning and Segmentation of the CT SCAN image



The surgeon with his or her own preferences can then preoperatively plan the best location for the femoral component and tibia component over the model bone, based on factors including patient size, angle of legs, location of articulating surface, and how the femur moves on top of the tibia.

STEP 2 : PATIENT SPECIFIC PERSONALIZED PRE-OPERATIVE PLANNIG PRIOR TO SURGERY

Figure 2 – Patient Specific Personalized Pre-Operative Planning prior to Surgery

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The health care provider or the doctor’s team loads the plan onto the robot. The surgeon who is performing the operation compares the plan to the motion of the patient – bending the knee, flexing, straightening it out, all while looking at how the motion is replicated on the robot’s screen. After analyzing and observing the ligament’s laxity or tension, the surgeon might slightly change or tweak the component positioning by a just a fraction of millimeters before deciding on the final plan.

Now the role of the robot is to lock the plan of its saw blade into a place that is relative to the spot of the final three-dimensional plan. The robot assists the surgeon to perform the cuts. When the surgeon pushes the saw the robot restrict where the saw can go in that space.

It is important to understand that the surgery is performed by an orthopedic surgeon, who guides the Leo II Mako’s robotic arm during the surgery to position the implant in the knee joint. Leo II Mako Smart Robotic arm will not conduct the surgery. It won’t independently make decisions or move without the surgeon’s guidance. The surgeon can adjust the plan during the surgery as required.

STEP 3 : EXECUTION OF PLAN WITHIN PRE DEFINED LIMITS OF HAPTIC BOUNDARY ENABLING MORE THAN 99% ACCURACY

Figure 3 : Plan is executed with predefined limits of Haptic boundary. Thus, soft tissue and Neurovascular damage is not

possible. The accurate positions can be seen on the screen during the operation.

There is no doubt that the surgeon performs the surgery but now with utmost precision and accuracy according to a particular plan, meant specifically for the patient. This was not possible earlier through conventional and manual instruments.

The robot's haptic boundary prevents soft-tissue trauma. There are several peer-reviewed publications on the benefits, including reduction in post-operative pain, increased patient satisfaction, increased flexion, less opioid drug use; reduction in length of stay, and fewer readmissions due to complications from the procedure has been published.

Benefits of Robotic – Assisted Total Knee Replacement Positive outcomes

Robotic surgery is getting popular because it is adopted to have a best surgical plan, with utmost precision in execution with positive clinical outcome leading to patient satisfaction.

Robotic surgery has been increasingly chosen as an option to address human errors that could potentially result in misalignment and decreased longevity of the prosthesis.

Robotic assisted surgery is precise and allows for more accurate implant positioning. This renders a more natural feeling post-surgery for the patient, with better safety and

reduced risk of injury to adjacent tissues as there is lesser retraction, value &safety provided by the Pre-Op CT, small incisions, which can mean a quicker recovery, a shorter hospitalization, and less pain and a potential for better long-term function.

In a nutshell The Robotic Technology helps in –

- More accurate implant positioning, which can result in a more natural feeling after surgery.
- Improved safety and reduced risk of injury to adjacent tissues as there is lesser retraction.
- Value & Safety Provided by the Pre-Op CT.
- Small incisions, which can mean a quicker recovery, a shorter hospitalization, and less pain.
- Minimal blood Loss.
- Precision in Mapping of the Joins.
- Early mobilization and Early Discharge from the Hospitals(less Hospital Stay).
- A Happy Patient.

***AIOR – Anup Institute of Orthopedics and Rehabilitation https://www.aior.co.in/best-orthopedic-hospital.php offers* Mako surgery in Patna, India performed with outmost precision.**

In September 2020 *AIOR – Anup Institute of Orthopaedics and Rehabilitation https://www.aior.co.in/best-orthopedic-hospital.php became the first hospital in East and North India to have world's best Mako Robotic system for orthopedic joint replacement surgery.* We offer the best **total knee replacement surgery in Patna, Bihar.**

Visit our website *https://www.aior.co.in/index.php and book an appointment*

https://www.drashishsingh.com/bookappointment/appointment.php to get expert advice and treatment.