

ROSA® Robotic Knee System

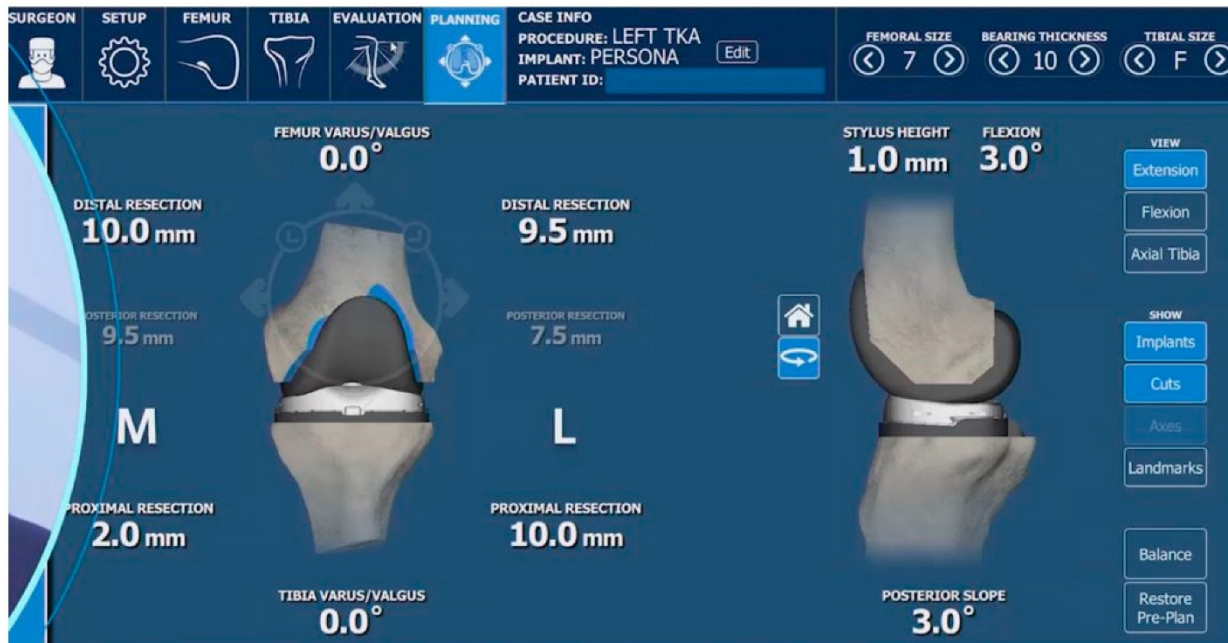
Knee replacement surgery has been available for well over 50 years. Although it is estimated that over 1 million knee replacements are performed in the U.S annually, there are still a disappointingly significant number of patients who are unsatisfied with their outcomes. Estimates as high as 20% of patients feel their replacements should function better than they do.^{1,2} Clearly there is room for improvement with this highly valued surgical procedure.

Robotics in the field of orthopedics has grown rapidly in the past decade as studies continue to show increased precision and accuracy of bone resections and correct placement of implants³. One of the most popular robotic platforms currently in use is the ROSA® created by the innovators at Zimmer Biomet, one of the largest implant manufacturers and a leader in the field of joint replacement surgery. This system was designed by surgeons to provide objective soft tissue feedback and extremely accurate



bone resections, aiming to restore a patient's natural knee function. ROSA® collects intra-operative metrics which better allow the surgeon to make data-driven decisions that ultimately create the best chance for an optimal outcome for the patient.

Comparing ROSA®-assisted knee replacement to traditional manual methods highlights differences, primarily in the surgical execution phase. In traditional surgery, the surgeon relies on manual instruments and their visual assessment to determine bone cuts and implant positioning. ROSA® introduces a digital planning component and real-time robotic guidance to assist these steps.



Both approaches aim for a successful knee replacement. The ROSA® system offers an additional layer of data and precision during the procedure. This technological aid can influence the surgeon's approach to alignment and balance, leading to differences in immediate post-operative outcomes like early stability. The decision between the two methods often involves a discussion with the surgeon, considering individual patient needs and the surgeon's preferred technique.

When compared to traditional manual total knee techniques, a ROSA®-assisted knee was associated with the same complication risk, but had less pain, better patient satisfaction and patient reported outcome measures (PROMs) at follow-up⁴. Research indicates better and reproducible implant positioning which is felt to result in a more natural feeling knee after surgery⁵.

Patients undergoing ROSA®-assisted knee replacement often report positive experiences regarding their post-operative journey. Initial pain levels are managed with medication, and many patients describe a gradual decrease in discomfort as they progress through recovery. Early mobility is encouraged, with physical therapy beginning shortly after the procedure to restore strength and range of motion.

Recovery timelines can vary, but many individuals report significant improvements in daily activities within several weeks to a few months. Patients commonly note enhanced mobility and a reduction in the chronic pain they experienced before surgery, allowing them to resume activities like walking, climbing stairs, and light exercise. Overall satisfaction often stems from the perceived restoration of function and the ability to engage more comfortably

in daily life. While challenges like temporary swelling or stiffness can occur, these are generally managed through consistent rehabilitation efforts.

The ROSA® system is associated with several advantages, primarily enhancing surgical precision. Its ability to provide real-time data and assist with accurate bone cuts contributes to improved implant alignment and a customized fit for each patient's anatomy. This precision can lead to better long-term function and implant longevity.

Patients considering ROSA®-assisted surgery should understand that the robot functions as a tool that augments the surgeon's skill. The surgeon's experience with the ROSA® system and their overall surgical expertise remain important for the procedure's success. While specific costs can vary widely based on insurance and healthcare providers, the robotic assistance might be factored into the overall expense of the procedure.

*****Most surgeons who utilize robotic assistance in joint replacement will have the patient pay out of pocket an added fee for the skill time and added resources required to provide this service that is NOT covered by Medicare or traditional commercial insurance. You can discuss this added charge with your surgeon!***

The ROSA® robotic system expects an advanced software upgrade in late 2025 that eliminates the need for additional X-rays or CT scans for pre-op planning. Rather, this new technology employs only the intra-operative measurements taken and stored in the robot's computer for analysis. In addition, it is designed to work exclusively with the PERSONA® total knee system, Zimmer Biomet's most comprehensive primary knee system, incorporating personalized implants, precise instrumentation and proven technology.

References

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4. Kenanidis E, Pappas G., et al. Comparative outcomes between a new robotically assisted and a manual technique for total knee arthroplasty in patients with osteoarthritis: a prospective matched comparative cohort study. Eur J Orthop Surg Traumatol (2022).
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