

Robotic Assisted Total Knee Replacement Update

Introduction

Total knee replacement (TKR) is a common surgical intervention for patients with severe knee osteoarthritis or joint degeneration. In recent years, robotic assisted techniques have gained traction in Australia, offering new possibilities for precision and patient outcomes. Joint registry data from Australia and internationally has begun to show promising trends, suggesting improved implant survivorship and decreased revision rates when robotic assisted techniques are utilised compared to conventional methods.

What is Robotic Assisted Total Knee Replacement?

Robotic assisted total knee replacement integrates computer-assisted planning and robotic arm technology to enhance the accuracy of bone cuts and implant positioning during surgery. Surgeons use pre-operative imaging (such as CT or MRI scans) and/or intra-operative mapping to develop a personalised surgical plan, which is then executed with the guidance of a robotic system. The technology does not replace the surgeon but acts as a tool to improve precision. Recent analyses of Australian and international joint registries indicate that these technological advancements are associated with a trend towards better early- to mid-term outcomes, further supporting the adoption of robotic assistance in TKR.

Recent Advances

- **Improved Accuracy:** Robotic systems allow for more precise alignment and placement of knee components, which may reduce the risk of implant malposition and early failure. Registry data supports that this increased precision correlates with improved implant longevity.
- **Personalised Planning:** Preoperative imaging enables tailored surgical plans based on individual anatomy.
- **Minimally Invasive Techniques:** Some robotic systems support less invasive approaches, potentially leading to smaller incisions and reduced tissue trauma.
- **Enhanced Data Collection:** Robotic platforms can collect intraoperative data, supporting ongoing research and quality improvement.

Potential Benefits

- Potential for reduced post-operative pain and faster rehabilitation.
- Lower rates of complications related to implant malalignment.
- Improved function and satisfaction reported by some patients.
- Possible reduction in revision surgery rates over the long term (though long-term data are still emerging).

Considerations and Limitations

- Robotic assisted TKR is not suitable for all patients; careful selection is required.
- Long-term evidence on clinical outcomes and cost-effectiveness is still being established.

Robotic assisted total knee replacement represents an exciting advance in orthopaedic surgery, with promising early results in precision and patient outcomes. While not universally available or suitable for every patient, it is a valuable option to discuss with those considering knee replacement.



Dr David Cossetto

MBBS (Syd), FRACS, FAOrthA, DipModLang.

Orthopaedic Surgery

70 Bridge Road
Nowra NSW 2541

P: 02 4423 6377

F: 02 4423 6387

Interests:

- Direct Anterior Approach Total Hip Replacement
- Computer Navigated and Patient Specific Instrumented Total Knee Replacement
- Revision Total Hip and Knee Replacement
- Arthroscopic Knee and Shoulder Surgery
- Arthroscopic ACL Reconstruction
- Total Shoulder Replacements

Dr Cossetto has a focus on arthroscopic and joint replacement surgery of the knee, hip and shoulder. He has expertise in ACL knee reconstruction, computer navigated total knee replacement and direct anterior approach total hip replacement surgery.

Dr Cossetto obtained his MBBS from the University of Sydney in 1986, followed by an FRACS in 1996. He was made a fellow of the Australian Orthopaedic Association in 1998. He has American fellowship training in primary and revision total joint replacement surgery, and currently regularly convenes training workshops for direct anterior total hip arthroplasty.

Dr Cossetto has a particular interest in patient-specific technology and robotic solutions.

Having over 20 years experience, Dr Cossetto has performed over 5000 total hip and knee replacements. His passion and commitment to providing a high level of care enables him to help his patients achieve the best possible outcomes.

