Smith+Nephew

Improved efficiencies and outcomes: the health economic value of robotics in UKA

Healthcare systems globally are challenged with providing more patients better outcomes and at a lower cost. Patients are more engaged in their episode of care and expect better outcomes than previously. Patients want a quick recovery, with good functional outcomes and a durable implant. Administrators want the same, but they also need it to be done efficiently. UKA is a surgical procedure that treats osteoarthritis in a single compartment of the knee, for patients suffering from single compartment osteoarthritis UKA is a suitable alternative to TKA, which is more invasive and requires a longer recovery time.[1]

Patient satisfaction and TKA

TKA is a successful intervention for the treatment of end-stage arthritis, resulting in reductions in pain and improvements in function, whilst demonstrating long-term survivorship. **However, following TKA:**

Over 50% of patients report some degree of limitation to their functional ability at least 1-year post-operatively, including activities of daily living and sports activities[2]

Up to 20% of patients are not satisfied with their knee replacement[3]

Patient selection criteria and utilization

Up to **47%** **of all TKA patients are candidates for UKA[4]**

Although 25–47% of patients undergoing TKA are eligible for UKA,[4] only 8–15% of all knee arthroplasties are accounted for by UKA.[5] Low utilization of UKA is partly accounted for by surgical complexity,[6,7] reduced threshold for revision,[8] and limited patient selection criteria.[8] With low usage, the revision risk is high, and this drives surgeons to perform UKA in a narrow group of patients leading to further reduced use.[8]

Robotically-assisted UKA (rUKA) and outcomes

When performed robotically, UKA provides patients with improved surgical outcomes,[9] irrespective of individual surgeon experience.[*10] Pre- and intra-operative surgical planning capabilities enable a personalized approach whilst alleviating surgical complexity.[11]

Up to **58%** reduced risk of revision[†12,13]

Compared with conventional techniques, robotic-assisted surgery has been shown to:

Improve accuracy of implant placement

- Robotic-assisted surgery improves implant placement when compared to a conventional technique[10,14,15]
- Robotic-assisted UKA allows surgeons of all experience levels to achieve improved accuracy[10]

Increase UKA implant survivorship[‡]

- Aseptic loosening is a common cause of UKA revision in national joint registries[16]
- Accurate positioning of arthroplasty implants with robotic-assisted technology may reduce the impact of aseptic loosening, resulting in improved survivorship[16]
- Reduced revision rate (12 fewer revisions per 100 cases for rUKA)[17]

Improve functional outcomes

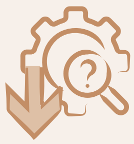
rUKA patients have demonstrated significant improvements in functional outcomes including Knee Society Score[§] (KSS) and Oxford Knee Score (OKS) over conventional unicompartmental knee arthroplasty (cUKA; $p \leq 0.037$)[18,19]

Decrease post-operative pain and opioid usage[¶20]

rUKA and episode of care cost

rUKA allows surgeons to accurately and reproducibly perform UKA versus cUKA, which improves upon the extensive clinical benefits of cUKA.[14,18,21–26]

When comparing conventional methods, UKA offers patients multiple clinical benefits versus TKA that have been shown to reduce the total episode of care cost:



Reduction in short term complications

Including:

- Reduced post-operative infection risk[27]
- Blood transfusion[28,29]
- Deep vein thrombosis and pulmonary embolism[28,29]

More economical[29]

Shorter length of stay:

1.53 (UKA) versus 2.47 (TKA) days

Lower overall cost:

$55,976 (UKA) versus $61,513 (TKA)

Quicker recovery

Less disruption of soft tissue,[30] potentially helping patients regain knee function sooner[31]

Quicker return to sports and work[32,33]

JOURNEY◊ II UK and CORI◊ Surgical System: optimized for the ASC

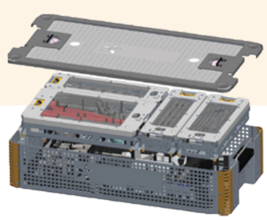
When performed robotically, JOURNEY II UK implanted using RI.KNEE on CORI Surgical System may increase operating efficiencies resulting in cost benefits.

Small footprint & portability

Featuring simple calibration and a small footprint, CORI Surgical System can easily be moved between operating rooms to support demand

Reduced tray requirement (from 2–3, to 1)

JOURNEY II UK, when implanted using CORI Surgical System may only require a single tray to perform the surgery[34]



With or without pre-operative imaging

CORI Surgical System allows for image-agnostic registration functionality, including image-based and image-free offerings

High survivorship

JOURNEY II UK has shown excellent early survivorship[‖35,36] and when used with Smith+Nephew handheld robotics demonstrated 100% survivorship in the UK NJR[**37]

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*On dry bone models. †Compared with cUKA. ‡Compared to TKA. §Patient expectations component of KSS. ¶Demonstrated in robotic-assisted TKA versus conventional TKA. ‖At 2 years. **At 1 year, n=122; Acknowledgments: We thank the patients and staff of all the hospitals in England, Wales and Northern Ireland who have contributed data to the National Joint Registry. We are grateful to the Healthcare Quality Improvement Partnership (HQIP), the NJR Steering Committee and staff at the NJR Centre for facilitating this work. The views expressed represent those of the authors and do not necessarily reflect those of the National Joint Registry Steering Committee or the Health Quality Improvement Partnership (HQIP) who do not vouch for how the information is presented.

Abbreviations: ASC = ambulatory surgical center; cUKA = conventional unicompartmental knee arthroplasty; KSS = Knee Society Score; OKS = Oxford Knee Score; rUKA = robotically assisted unicompartmental knee arthroplasty; TKA = total knee arthroplasty; UKA = unicompartmental knee arthroplasty; UK NJR = National Joint Registry of England, Wales, Northern Ireland, the Isle of Man and the States of Guernsey.

References: **1.** Lyons MC, et al. *Clin Orthop Relat Res*. 2011;470(1):84–90. **2.** Noble PC, et al. *Clin Orthop Relat Res*. 2005;431:157–165. **3.** Scott CE, et al. *J Bone Joint Surg Br.* 2010;92-B(9):1253–1258. **4.** Wilson HA, et al. *BMJ*. 2019;364:l352. **5.** Wills-Owen CA, et al. *Knee*. 2009;16(6):473–478. **6.** Batailler C, et al. *Knee Surg Sports Traumatol Arthrosc*. 2019;27:1232–1240. **7.** Keene G, et al. *J Bone Joint Surg Br.* 2006;88:44–48. **8.** Murray DW, et al. *Bone Joint J.* 2018;100-b(4):432–435. **9.** Chen K, et al. In: Lonner JH, editor. *Robotics in Knee and Hip Arthroplasty*: Springer; 2019. **10.** Karia M, et al. *Adv Orthop.* 2013;2013:481039. **11.** Jacofsky DJ, et al. *J Arthroplasty*. 2016;31:2353–2363. **12.** Sun Y, et al. *BMJ Open*. 2021;11(8):e044778. **13.** Bensa A, et al. *Bone Jt Open.* 2024;5(5):374–384. **14.** Herry Y, et al. *Int Orthop*. 2017;41:2265–2271. **15.** Bollars P, et al. *Eur J Orthop Surg Traumatol*. 2020;30:723–729. **16.** Smith+Nephew 2019. Internal Report EO/RECON/NAVIO/002/v1. **17.** Yeroushalmi D, et al. *J Knee Surg.* 2022;35(1):39–46. **18.** Crizer MP, et al. *Adv Orthop*. 2021;1–8. **19.** Ghazal AH, et al. *Cureus*. 2023;15(10):e46681. **20.** Bhimani SJ, et al. *Bone Jt Open*. 2020;1(2):8–12. **21.** Ashok Kumar PS, et al. *J Robot Surg.* 2024;18(1):49. **22.** Negrin R, et al. *Knee Surg Relat Res*. 2021;33(1):5. **23.** Negrin R, et al. *J Exp Orthop*. 2020;7(1):94. **24.** Shearman AD, et al. *Arch Orthop Trauma Surg.* 2021;141(12):21472153. **24.** Canetti R, et al. *Arch Orthop Trauma Surg*. 2018;138:1765–1771. **26.** Mergenthaler G, et al. *Knee Surg Sports Traumatol Arthrosc*. 2021;29:931–938. **27.** Lee CS, et al. *Arthroplast Today*. Published online July 20, 2021. doi: 10.1016/j.artd.2021.06.006. **28.** O'Neill CN, et al. *J Arthroplasty*. 2022;37(10):2014–2019. **29.** Maman D, et al. *J Clin Med*. 2024;13(13):3888. **30.** Hiranaka T, et al. *J Knee Surg*. 2020;33(7):655–658. **31.** Pongcharoen B, et al. *J Bone Joint Surg Am*. 2023;105(3):191–201. **32.** Lester D, et al. *Bone Jt Open.* 2022;3(3):245–251. **33.** Kievit AJ, et al. *Knee Surg Sports Traumatol Arthrosc.* 2019;28(9):2905–2916. **34.** Smith+Nephew 2019. Internal Report DD0066. **35.** D'Amario F, et al. *J Clin Med.* 2025;14(5):1748. **36.** Fricka KB, et al. *Cureus*. 2024;16(11):e74596. **37.** National Joint Registry for England, Wales and Northern Ireland: JOURNEY II UK Unicondylar (Robotics) bespoke implant summary report. 09 April 2025. Copy available upon request.

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