

LEGION^o Total Knee System: what does the evidence say for LEGION primary total knee arthroplasty (TKA)?

Summary

- LEGION TKA leads to improvements in knee function, similar to that of the contralateral knee¹ and with knee flexion characteristic of healthy knees,² compared to pre-TKA¹⁻⁸
- Improvements in patient satisfaction for LEGION cruciate retaining (CR) and posterior stabilised (PS) TKA compared to pre-TKA,⁸⁻¹⁰ with the majority of patients reporting being satisfied or very satisfied⁸
- Consistently high survivorship of LEGION TKA in international registries and clinical studies, with an excellent ODEP rating at 7 years^{4,5,8,11-14}

A systematic literature review, conducted in October 2020, identified 59 peer-reviewed publications containing LEGION CR, PS or revision-specific data, 16 of which were clinical studies relating to LEGION CR and PS TKA,¹⁵ in addition to an abstract presented at the European Knee Society (EKS) Arthroplasty Conference in 2019.⁵

Functional outcomes following LEGION TKA

Following TKA, over 50% of patients report some degree of limitation to their functional ability,¹⁶ hence knee function is an important measure of the success of TKA. In a study investigating functional improvement following LEGION CR TKA, over 80% of implants were reported to perform as well as or better than the contralateral knee in several functional activities, with knee function becoming more symmetrical over time.¹ In addition, there were significant increases in step length ($p=0.02$), speed ($p=0.01$) and knee range of motion (ROM) ($p=0.02$) compared to pre-TKA (Figure 1).¹

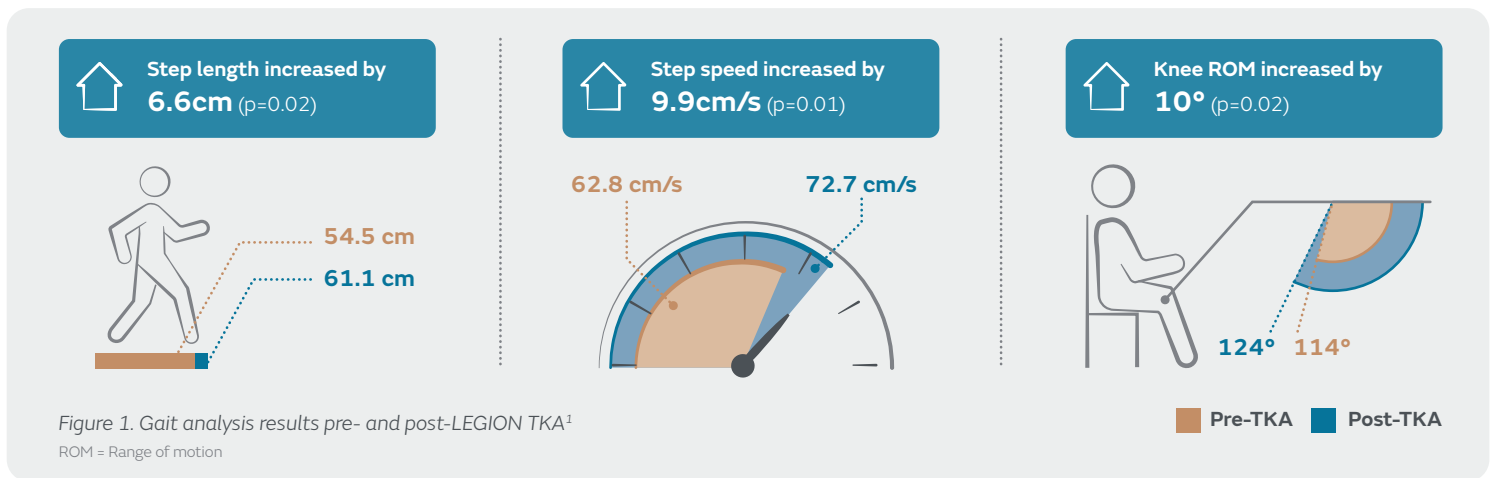


Figure 1. Gait analysis results pre- and post-LEGION TKA¹
ROM = Range of motion

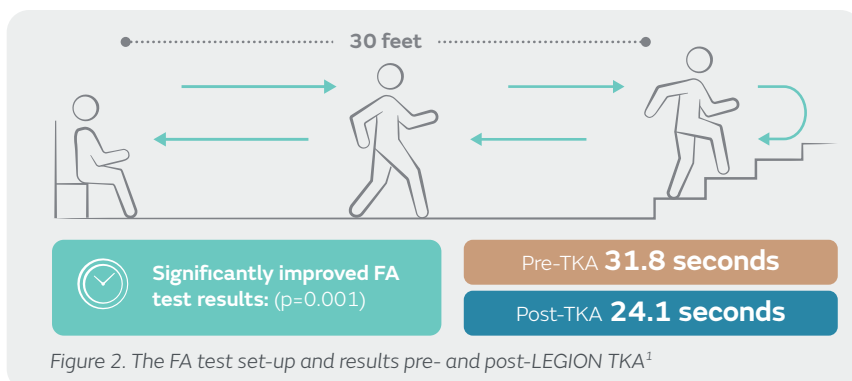


Figure 2. The FA test set-up and results pre- and post-LEGION TKA¹

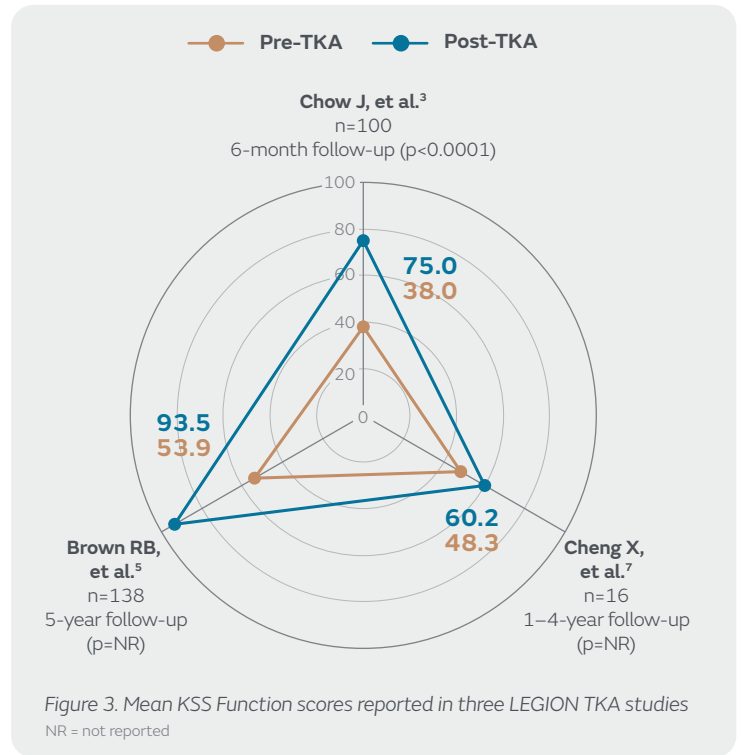
Parks NL, et al. also reported Functional Assessment (FA) test results for LEGION CR TKA patients.¹ In the FA test, which assesses movements that are challenging for these patients, the time it takes to rise from a chair, walk 30 feet, climb four stairs, turn around, descend four stairs, walk 30 feet back to the chair and sit down is recorded (Figure 2).¹ The study reported significant reductions in FA test time in patients 2 years post-LEGION CR TKA, compared to pre-TKA (8 second improvement; $p=0.001$; Figure 2).¹

+ Evidence in focus

Hyodo K, et al. analysed the gait of LEGION^o TKA patients 6 months post-operatively by investigating kinetics and muscle activation around the knee. Ten of twelve patients (83%) demonstrated physiological double knee flexion peaks during the gait cycle, characteristic of healthy knees and a normal gait.²

A number of patient-reported outcome measures (PROMS) have been used to assess pain levels and functional outcomes following LEGION TKA. In a study of 16 patients using a novel technique to tighten the medial collateral ligament, pain relief and improved knee function were reported by patients, comparing pre-TKA to after LEGION PS TKA (Visual Analogue Scale [VAS] ambulation score, 5.4 vs 1.5; Hospital for Special Surgery [HSS] score, 44.3 vs 87.1).⁷

Significant improvements in Oxford Knee Score (OKS) were reported in three studies, at 2 years ($p < 0.001$)^{1,4} and 4.6 years follow-up ($p < 0.001$).⁸ Improvements in Knee Society Scores (KSS), compared to pre-TKA, were observed in three studies for LEGION TKA at 1 year,⁶ 2 years ($p < 0.001$),¹ and 5 years⁵ post-TKA. In addition, three studies reported numerical improvements in KSS Function scores with LEGION TKA, compared to pre-TKA (Figure 3),^{3,5,7} with one study demonstrating a significant mean improvement of 36 points at 6 months post-TKA ($p < 0.0001$).³



88% of patients reported being **satisfied or very satisfied** post-LEGION TKA⁸



Figure 4. Percentage of LEGION TKA patients (n=133) who reported being satisfied or very satisfied at a mean follow-up of 4.6 months⁸

Patient satisfaction following LEGION TKA

Up to one in five patients report feeling unsatisfied with their TKA procedure.¹⁷ Improving patient satisfaction is not only important for quality of care but also for payers and healthcare providers.^{18,19}

A consecutive cohort study investigating OKS and patient satisfaction found that 88% of LEGION TKA patients (n=133) reported feeling satisfied or very satisfied after a mean follow-up of 4.6 years (Figure 4).⁸

It is recognised that Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores directly correlate to patient satisfaction, with scores of > 70 signifying excellent patient satisfaction.²⁰ Two clinical studies reported improvements in WOMAC scores with LEGION PS TKA.^{9,10} Anwar R, et al. investigated the use of patient-specific guides with LEGION PS TKA in obese patients ($BMI > 30 \text{ kg/m}^2$),¹⁰ a challenging demographic often associated with poor TKA outcomes.^{10,21} The authors reported an improvement in WOMAC scores from 38.4 to 78.6 at 1 year post-LEGION PS TKA in this high-risk group (Figure 5).¹⁰ This was in addition to improvements in Knee Injury and Osteoarthritis Outcome Score (KOOS; from 36.6 to 76.2).¹⁰ Significant improvements in WOMAC scores, KOOS categories scores and Kujala scores were also observed by Gharaibeh MA, et al. in a study of 100 LEGION PS TKA patients ($p < 0.01$).⁹

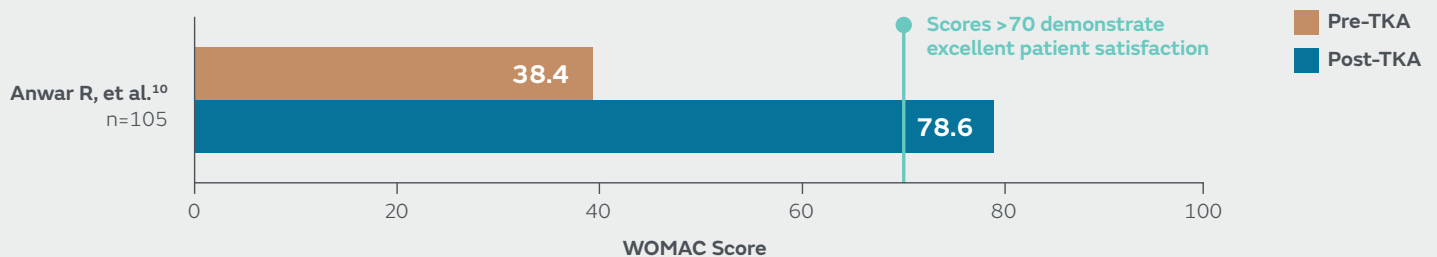


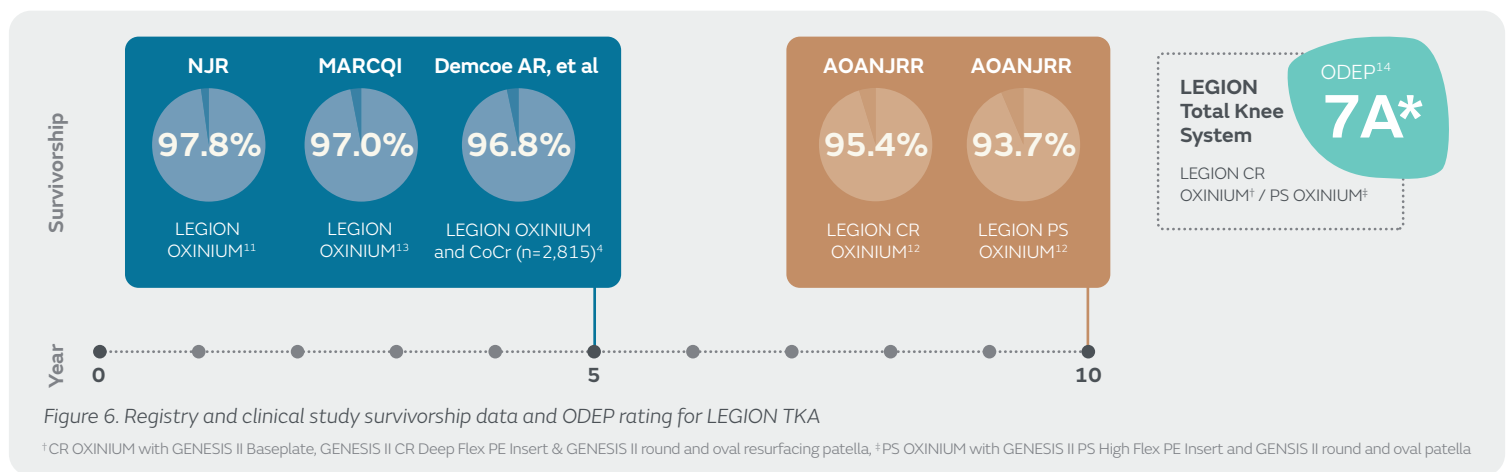
Figure 5. Mean WOMAC scores at 1 year post-LEGION PS TKA in high-risk, obese patients

+ Evidence in focus

Registry and clinical study survivorship of LEGION^o TKA

National joint registries provide insights into the real-time performance of specific implants.²² LEGION CR and PS TKA demonstrate consistently high survivorship in international registries, including the National Joint Registry of England, Wales, Northern Ireland, the Isle of Man and the States of Guernsey (NJR),* Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR) and Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI; Figure 6).^{11–13} These registry data are supported by an excellent ODEP rating for LEGION OXINIUM^o (Figure 6).¹⁴

The registry survivorship rates for LEGION TKA are also reflected in clinical studies. A multi-centre study of 138 TKAs demonstrated 98.5% survivorship for LEGION OXINIUM TKA at 5 years.⁵ Only two minor revisions requiring the exchange of the tibial insert or patella component were performed in this study. Similar survivorship was reported by Stockwell KN, et al. in a single-centre database analysis comprising 136 TKAs, which found 98.1% survivorship for LEGION PS TKA at 5 years.⁸ Further confirmation of excellent mid-term survivorship has been demonstrated by a retrospective study of 2,815 LEGION TKAs (OXINIUM and cobalt chrome).⁴ Demcoe AR, et al. reported LEGION TKA survivorship rates of 98.2% at 2 years and 96.8% at 5 years (Figure 6).⁴ Given the shared design features of GENESIS^o II and LEGION TKA, and the consistently high mid-term performance of the latter, LEGION TKA may demonstrate a similar long-term survivorship to its predecessor of more than 96% at 10 years.²³



Conclusion

LEGION TKA has evolved from the GENESIS II system, which has more than 20 years of clinical data demonstrating its safety and efficacy plus a high survivorship rate.²³ Consistent with its predecessor, LEGION CR and PS TKA demonstrate consistently high survivorship in international registries and clinical studies.^{4,5,8,11–13} LEGION TKA has also been shown to result in improved patient satisfaction^{8–10} and knee function^{1–8} compared to pre-TKA.

*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.

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