

Title: Repercussion of a national intervention on patient outcomes of primary knee arthroplasty to enhance the recovery pathway: 2008-2016 England trends

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Objective: We aimed to verify whether the Enhanced Recovery Programme (ERP) in knee arthroplasty has varied patient reported outcomes, complications, revisions and length of stay (LOS) for primary total or unicompartmental arthroplasty (TKA/UKA).

Material and Methods: We utilised the UK National Joint Registry, which contains data on knee arthroplasties. Primary operations were linked with Hospital Episode Statistics data which has records of all inpatient episodes undertaken in National Health Service (NHS) trusts in England, and Patient Reported Outcome Measures (PROMs). Primary elective TKA/UKA in people aged 18 years or over between April 2008 and December 2016 were identified. The intervention of interest was the period of time ERP was implemented (April 2009 to March 2011). The ERP promoted patient care: pre-operatively (ensuring people are in the best condition for surgery); peri-operatively (best handling during and after operation); post-operatively (best

rehabilitation following surgery). Outcomes assessed were: length of stay (LOS), change in Oxford knee score (OKS) 6-months after surgery, 5-year revision surgery rates, and 6-month complications rates. Monthly means, rates and proportions in outcomes described trend evolution before, during and after ERP implementation.

Results: 525,622 primary TKAs/UKAs were identified. 57% of patients were women, with an average age 70 years (SD \pm 9 years). Overall LOS decreased from 5.7 days in April 2008 to 3.6 in December 2016. Although older patients had a longer LOS, the trend in declining LOS was present across all age groups (e.g. 4.9 days to 3.1 days in those age < 60 and 7.7 days to 5.4 days in age \geq 85). The trend in reducing LOS was observed in people with and without pre-existing co-morbidity. During the study span there was a progress in OKS PROMs, the mean absolute change in OKS 6 months after surgery increased from 14.9 points in April 2008, to 17.1 points in December 2016. This trend was observed in patients with and without co-morbidities, and in all age groups. 5-Year revision rates changed marginally from a rate of 6.6 per 1000 implants years at risk in April 2008 to 6.1 in December 2012. Overall complication rates at 6-months lessened over the study span from a rate of 7.4 per 1000 implants months at risk in April 2008 to 3.0 in March 2016.

Conclusions: This study indicates that outcomes are superior for patients having TKA/UKA now than it was 10 years ago. LOS has dropped substantially over the study span, consistent across all age groups and in individuals with and without co-morbidity. Patient reported outcomes with regard of pain and function have increased, revision rates remain stable and complication rates are steady after declined before and during ERP.

KEYWORDS

Total knee arthroplasty, unicompartmental knee arthroplasty, Osteoarthritis, Enhanced Recovery, Epidemiology, Patient Outcomes.

Fig. Monthly trends after primary TKA/UKA in England, UK (2008 – 2016)

