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WORSE OFF AFTER KNEE REPLACEMENTS: HOW LIKELY IS IT AND WHAT ROLE DOES THE PRE-OPERATIVE OXFORD KNEE SCORE PLAY? EVIDENCE FROM THE ENGLISH NHS

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Abstract:

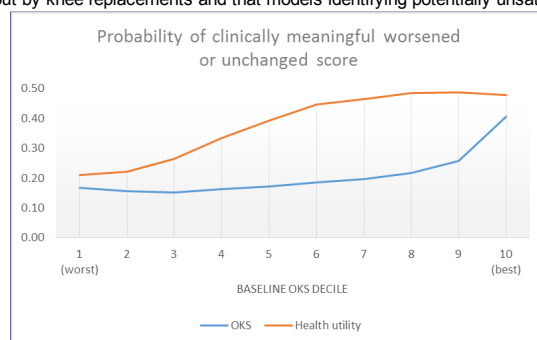
Purpose: Knee replacements are extremely effective surgical interventions associated with significant improvements in pain, function and quality of life. Although significant improvements have been reported in outcomes measures when comparing pre- and post-operative scores, little is known about how this improvement varies for different groups depending on the starting pain and function level. We aim to describe the changes in the Oxford Knee Score (OKS) and health-related quality of life (HRQL), and in particular to estimate the probability of a worse outcome, by decile of baseline OKS for patients in the English NHS.

Methods: We used patient-level data collected by the English NHS PROMs initiative between 2008 and 2012. All records with completed pre- and post-operative OKS and EuroQol EQ-5D-3L measures were included in the sample and significance of differences with the full sample assessed by the Wilcoxon-Mann-Whitney non-parametric test. Changes in OKS and health utility based on the UK social value tariff (as a measure of HRQL) were calculated and the sample divided into deciles according to their baseline total OKS. We report changes in each of the outcome measures by decile as well as the proportion of patients who improved compared to those who reported no change or a decrease in their post-operative score. A further analysis including clinically meaningful changes in both OKS (7 points) and health utility (0.121) was performed to create categories of 'worsened', 'unchanged', and 'improved'.

Results: Of the 215,335 knee replacement records available, 117,844 completed both the OKS and EQ-5D-3L at baseline and at 6 months post-op and were included in the analysis. Of these, 55% were women and 74% had one or no reported comorbidities. Mean change in OKS was 15 points (SD=10.0) improving from 19 to 34 (out of a maximum total of 48), and 0.30 (SD=0.33) in health utility as it increased from 0.41 to 0.70 (where 1 is considered perfect health). No statistically significant differences in pre- or post-op scores for either outcome measure were found by applying the Wilcoxon-Mann-Whitney non-parametric test. The age of patients at operation was not available.

A diminishing mean improvement was observed with decreased severity. Whilst the first decile (worst severity), with a baseline OKS between 0 and 9, improved by a mean of 19 points in their OKS (0.48 in health utility), the (10th) decile with the best pre-operative OKS score at 30 or above saw their score increase by only 7 points (0.14 in health utility). The probability of reporting no change or a drop in the OKS was also lower for patients with greater baseline severity: this figure increased progressively from 5% to 12% between the worst decile up to the 9th, whereas for the decile coming into surgery with the highest OKS scores the chances of not improving was 17%. For HRQL, this figure also increased progressively but between 15% for the worst decile and 27% for the best. When introducing clinically meaningful changes, the combined probabilities of an 'unchanged' or 'worse' score follow the same pattern above. The likelihood of not reporting a meaningful improvement in OKS was found to be largely stable between 15% and 17% within deciles 1 and 5, thereafter increasing to 41% for the 10th decile. For HRQL, this probability increased rapidly between deciles 1 and 6 from 21% to 45%, reaching 48% to 49% for deciles 8 through 10.

Conclusions: In average, knee replacement patients in England experience a significant improvement in their pain and function and their overall health-related quality of life as measured by the OKS and the EQ-5D-3L, respectively. The size of the improvement is greatest for patients arriving at surgery with most problems and lowest for those in better health. The probability of reporting no improvement is also lowest for those with the highest severity and it increases as baseline severity drops, but values are two to three times higher for HRQL than for OKS, suggesting that many patients improving in their pain and function are not better off in their overall health-related quality of life. When considering clinically meaningful changes, between 1 in 5 for those worse-off at baseline and 1 in 2 for those with the least pain and function problems fail to achieve a clear improvement. These findings show that further work is required to better understand the improvements brought about by knee replacements and that models identifying potentially unsatisfactory outcomes can better spread



improvement to patients and improve efficiency for the health care system.

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