

# Change in Oxford Shoulder Score (OSS) is associated with patient satisfaction one-year following primary total shoulder arthroplasty

**Authors:** Perry Liu, Irrum Afzal, Nick Clement, Vipin Asopa, Vipul Patel

*The Academic Surgical Unit (ASU) at the South West London Elective Orthopaedic Centre.*

Correspondence to: perry.liu@nhs.net

## Background

Patient-Reported Outcome Measures (PROMs) are commonly used in orthopaedic research to ascertain information from the patient's perspective. These have been shown to be reliable, valid and sensitive to clinical change<sup>1</sup>. One such measure is the Oxford Shoulder Score (OSS), a 12-question PROM tool which focusses on shoulder pain and function<sup>2</sup>. The OSS is popular given its simplicity, reliability and high internal consistency<sup>2</sup>, but is sparsely reported in the literature for shoulder arthroplasty<sup>3</sup>. Furthermore, it is not clear how the change in score relates to patient satisfaction or whether this can be used to define the Minimal Clinically Important Difference (MCID).



## Aims

- 1) To assess the relationship between the change in OSS and patient satisfaction with their outcome (using a visual analogue scale- VAS) following primary total shoulder arthroplasty (TSA).
- 2) To calculate the MCID using a distribution-based method.

## Methods

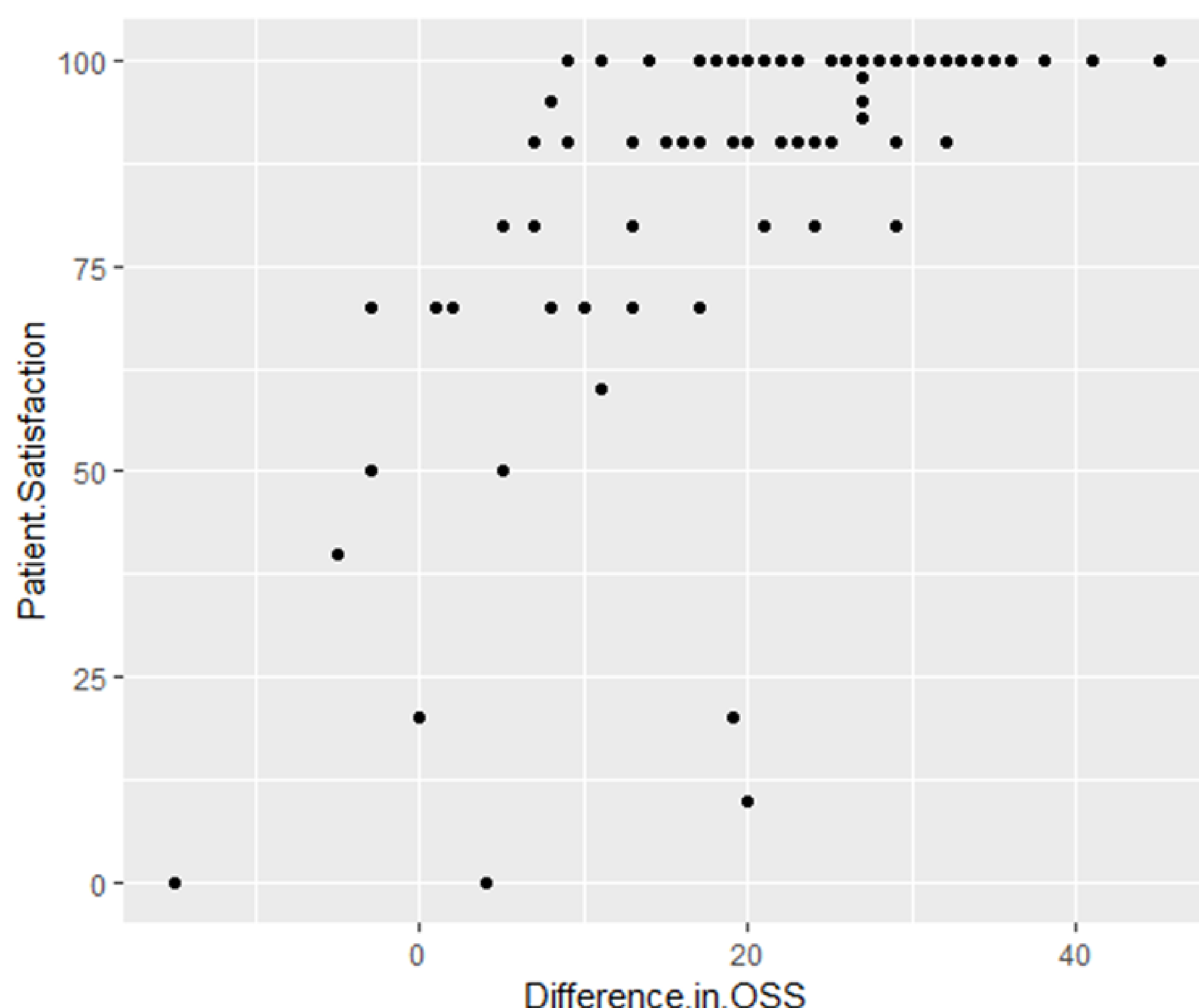
- A retrospective analysis of patients who had TSA at a high-volume elective centre between January 2016 and December 2020.
- 109 consecutive patients with information on their pre-operative OSS, post-operative OSS (at one-year) and outcome satisfaction score (at one-year using a VAS from 0-poorly satisfied to 100-extremely satisfied) were included.
- 27 patients who underwent resurfacing, hemiarthroplasty or revision surgery were excluded.
- Kendall's rank correlation coefficient was used to compare the variables for statistical significance.
- The MCID was derived from a distribution-based method as follows:

$$MCID = 0.5 \cdot \frac{SD(\text{baseline}) + SD(\text{followup}) + SD(\text{difference})}{3}$$

## Results

- 82 patients (mean age 74, 62 female) had a primary TSA (46 anatomic, 36 reverse-polarity) during the study period.
- The mean outcome satisfaction score was 87/100 (SD 23.9).
- There was a statistically significant correlation between the change in OSS and patient-reported outcome satisfaction ( $p < 0.01$ , correlation coefficient = 0.505).
- Satisfaction was not influenced by age and gender ( $p > 0.05$ ).
- The MCID for OSS was calculated as 5.

### Kendall's rank correlation coefficient



$z = 6.4976$ ,  $p\text{-value} = 8.16e-11$ ,  $\tau = 0.5058422$

## Conclusion/ Findings

The change in OSS correlates closely with patient-reported outcome satisfaction. This can be used to help manage patient expectations for those with higher pre-operative scores.

Our estimate of MCID for the OSS (for TSA) is 5, which is higher than previously recognised<sup>4</sup>. This will have repercussions on powering of studies and defining a clinically meaningful improvement.

However, calculating MCIDs by distribution methodology holds no clinical relevance as it is a solely statistical phenomenon. Using anchor-based questioning is better for this purpose, as it compares the change in a scoring measure in patients who have perceived to have had post-operative clinical improvement, relative to those who have not<sup>5</sup>.

## References

- 1) Fitzpatrick R, Fletcher A, Gore S, Jones D, Spiegelhalter D, Cox D. Quality of life measures in health care. I: Applications and issues in assessment. *BMJ*. 1992;305(6861):1074-1077. doi:10.1136/bmj.305.6861.1074
- 2) Dawson J, Fitzpatrick R, Carr A. Questionnaire on the perceptions of patients about shoulder surgery. *J Bone Joint Surg Br*. 1996;78(4):593-600.
- 3) Padua R, de Girolamo L, Grassi A, Cucchi D. Choosing patient-reported outcome measures for shoulder pathology. *EFORT Open Rev*. 2021;6(9):779-787. doi:10.1302/2058-5241.6.200109
- 4) Nyiring MRK, Olsen BS, Amundsen A, Rasmussen JV. Minimal Clinically Important Differences (MCID) for the Western Ontario Osteoarthritis of the Shoulder Index (WOOS) and the Oxford Shoulder Score (OSS). *Patient Relat Outcome Meas*. 2021;Volume 12:299-306. doi:10.2147/PROM.S316920
- 5) McGlothlin AE, Lewis RJ. Minimal Clinically Important Difference: Defining What Really Matters to Patients. *JAMA*. 2014;312(13):1342. doi:10.1001/jama.2014.13128

