

## **Total Joint Arthroplasty Patients with Preoperative Sleep Impairment Experience Rapid Improvement in Postoperative Sleep Quality**

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### **INTRODUCTION:**

Patients with symptomatic knee or hip osteoarthritis (OA) are at increased risk of experiencing disturbances in their sleep. Total joint arthroplasty (TJA) improves patients' sleep quality > 6 months after surgery; however, the impact of TJA on sleep in patients with or without preoperative sleep impairment in the near-term postoperative period is not well understood. This study sought to 1) examine the impact of TJA on sleep up to 3 months postoperatively, and 2) compare postoperative sleep patterns for patients with or without preoperative sleep impairment.

### **METHODS:**

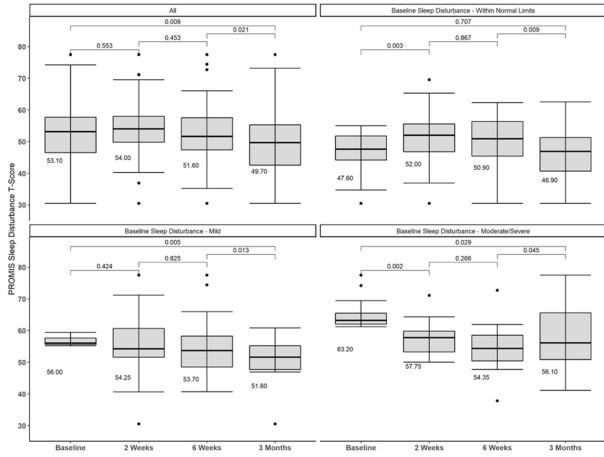
This prospective observational study included adult patients undergoing an elective hip or knee TJA at an urban teaching hospital. The PROMIS Sleep Disturbance Short Form 8a questionnaire (PROMIS-SD) evaluated patients' sleep quality preoperatively and at 2 weeks, 6 weeks, and 3 months postoperatively. T-scores were utilized to categorize patients' sleep as within normal limits (WNL;  $\leq 55$ ), mild impairment ( $>55-60$ ), or moderate/severe impairment ( $>60$ ). Significant differences in median PROMIS-SD T-scores from baseline to 2 weeks, 2 weeks to 6 weeks, 6 weeks to 3 months, and baseline to 3 months were identified using Wilcoxon signed-rank tests for the total sample, and in a stratified analysis for those with baseline sleep WNL, mild impairment, and moderate/severe impairment.

### **RESULTS:**

Among 105 patients, the percentage of patients reporting sleep WNL was 55.2%, 58.5%, 62.9%, and 71.2% at baseline, 2-weeks, 6-weeks, and 3-months, respectively. The percentage of patients reporting mild or moderate/severe sleep impairment declined from 25.7% and 19.1% preoperatively to 15.3% and 12.5% 3 months after surgery, respectively. Patients with baseline sleep WNL (median: 47.6) experienced a transient worsening in sleep disturbance at 2-weeks postoperatively (median: 52.0,  $p=0.003$ ), which resolved between 6-weeks (median: 50.9) and 3-months (median: 46.9,  $p=0.009$ ); Figure 1. Patients with moderate/severe baseline sleep impairment (median: 63.2) experienced a significant improvement in their sleep 2-weeks after surgery (median: 57.8,  $p=0.002$ ) which was sustained through the 3-month milestone (median: 56.1,  $p=0.029$ ). Patients with mild sleep impairment at baseline (median: 56.0) had non-significant improvements at 2-weeks and from 2-weeks to 6-weeks; however, they experienced an overall significant 4.4-point improvement from baseline to 3-months (median: 51.6,  $p=0.005$ ).

### **DISCUSSION AND CONCLUSION:**

Patients experience differing patterns in postoperative sleep changes based on the level of preoperative sleep disturbance. Those with moderate/severe baseline sleep impairment experience improvements in their 2-week sleep quality, while patients with baseline sleep WNL observe a transient decline in sleep quality but return to baseline levels within 3-months. Considering that 19.1% of patients in this study experienced moderate/severe preoperative sleep impairment, the prospect of improved sleep quality only 2 weeks after surgery represents a substantial potential near-term benefit. While there is a modest risk for transiently worsened sleep disturbance in patients with preoperative sleep WNL, the median scores in this group remained WNL based on general population cutoffs throughout the recovery period.



**Figure 1:** Graphs displaying the level of sleep disturbance over the study period stratified by patients' preoperative sleep quality. Median T-scores are reported.