

## **Conversion Total Knee Arthroplasty Requires Increased Energy Expenditure Compared to Primary Knee Arthroplasty**

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**INTRODUCTION:** Conversion total knee arthroplasty (TKA) requires increased preoperative planning, surgical time and perioperative resources, yet there is currently no separate procedural code for conversion TKA like there is for conversion total hip arthroplasty (THA). The purpose of this study was to compare energy expenditure for the surgeon when performing primary TKA/THA, conversion TKA/THA, and revision TKA/THA.

**METHODS:** 179 Arthroplasty patients were prospectively enrolled and various demographic and surgical variables were collected. There were 77 primary TKA, 10 conversion TKA, 18 revision TKA, 58 primary THA, 4 conversion THA and 12 Revision THA patients. Energy expenditure of five arthroplasty surgeons at a single institution were recorded via a smart garment. Demographic variables and energy expenditure were compared between TKA and THA cohorts using ANOVA tests

**RESULTS:** TKA patients were similar in age, ASA, sex and laterality. Body mass index (BMI) varied amongst TKA groups, with conversion TKA ( $28.2 \pm 6.4$ ) and primary TKA ( $31.1 \pm 5.9$ ) being lower than revision TKA ( $35.2 \pm 9.3$ ;  $p=0.018$ ). THA patients were similar in BMI and sex. Conversion THA cohort ( $42.5 \pm 15.9$ ) was younger than primary THA ( $63.3 \pm 13.1$ ) and revision THA ( $61.5 \pm 14.5$ ;  $p=0.015$ ). Conversion TKA ( $467.2 \pm 219.4$  cal) required 152% higher energy expenditure than primary TKA ( $308.0 \pm 109.2$  cal) but not as much as revision TKA ( $703.8 \pm 368.0$  cal;  $p<0.001$ ). Conversion THA ( $523.8 \pm 117.9$  cal) required 143% higher energy expenditure than primary THA ( $365.2 \pm 112.5$  cal) but less than revision THA ( $846.2 \pm 435$ ;  $p<0.001$ )

### **DISCUSSION AND CONCLUSION:**

Conversion total knee arthroplasty is associated with significantly more physiologic stress for a surgeon. The increased energy expenditure seen in conversion TKA relative to primary TKA mimics a similar increase seen in conversion THA, which does have a conversion procedural code. This study highlights the need for payment reform to reflect the actual work done by arthroplasty surgeons.