

Chatbot Enrollment Correlates with Fewer Emergency Department Visits and Readmissions after Total Joint Arthroplasty

Joshua Rainey, Chance Landon McCutcheon, Courtney Marie Kenyon, Brenna Blackburn, Lucas Anderson¹, Christopher Earl Pelt², Kevin John Campbell³, Jeremy Gililland²

¹Univ of Utah Dept of Ortho, ²University of Utah, ³Orthopedic & Sports Institute

INTRODUCTION: Perioperative chatbots have the theoretical advantage of engaging patients as surgeon availability becomes more limited. The purpose of this study was to retrospectively assess how patient engagement with a chatbot influences outcomes after total joint arthroplasty (TJA). Emergency department (ED) visits and readmissions were also compared to a historical cohort without chatbot enrollment.

METHODS: We identified 1,338 TJA patients from a single, academic center who were enrolled in a short message service (SMS) chatbot from 2020-2022 with minimum of three months follow up. We identified a historical cohort of 1,703 patients not enrolled in the SMS chatbot. The total number of patient-generated text responses were recorded perioperatively. Independent t-tests and linear regressions were performed to measure the effect that conversational engagement had on ED visits, readmissions, and patient-reported outcomes (PROs). Adjusted logistic regressions were performed to determine odds ratios (OR) of ED visits and readmissions with chatbot enrollment.

RESULTS: For the patients enrolled in the chatbot, females (14.0 vs. 10.0, p-value < 0.0001), older patients ($\beta=0.077$, p=0.005), those without Medicaid (12.5 vs. 9.7, p=0.0309), and those undergoing TKA compared to THA (15.1 vs. 8.9, p < 0.0001) had increased engagement. Patients who were readmitted within 90 days had decreased conversational engagement compared to those not readmitted (3.9 vs. 12.7 texts, p < 0.0001). The overall changes in preoperative and postoperative PROs did not significantly differ with chatbot enrollment. In our adjusted logistic regression, chatbot enrollment significantly reduced ED visits (OR 0.45, p < 0.001), and readmissions (OR 0.60, p = 0.02) within 90 days.

DISCUSSION AND CONCLUSION:

Patients undergoing TJA who were readmitted after surgery had decreased conversational engagement with a SMS chatbot compared to those with higher engagement. Additionally, chatbot enrollment was associated with a significant reduction in ED visits and readmissions when compared to a historical cohort without chatbot enrollment.