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The Effects of a Hospitalist Comanagement Model for Joint Arthroplasty Patients in a Teaching Facility

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ABSTRACT

Background: The goal of this study was to compare postoperative medical comanagement of total hip arthroplasty and total knee arthroplasty patients using a hospitalist (H) and nonhospitalist (NH) model at a single teaching institution to determine the clinical and economic impact of the hospitalist comanagement.

Methods: We retrospectively reviewed the records of 1656 patients who received hospitalist comanagement with 1319 patients who did not. The NH and H cohorts were compared at baseline via chi-square test for the American Society of Anesthesiologists classification, the *t* test for age, and the Wilcoxon test for the unadjusted Charlson Comorbidity Index score and the age-adjusted Charlson Comorbidity Index score. Chi-square test was used to compare the postoperative length of stay, readmission rate at 30 days after surgery, diagnoses present on admission, new diagnoses during admission, tests ordered postoperatively, total direct cost, and discharge location.

Results: The H cohort gained more new diagnoses ($P < .001$), had more studies ordered ($P < .001$), had a higher cost of hospitalization ($P = .002$), and were more likely to be discharged to a skilled nursing facility ($P < .001$). The H cohort also had a lower length of stay ($P < .001$), but we believe evolving techniques in both pain control and blood management likely influenced this. There was no significant difference in readmissions.

Conclusion: Any potential benefit of a hospitalist comanagement model for this patient population may be outweighed by increased cost.

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The hospitalist comanagement model aims to improve the quality of hospital care and reduce costs [1]. Hospitalists have assumed an evolving role in the care of orthopedic patients, and the literature provides evidence to suggest an improvement in outcomes for orthopedic surgery patients when a hospitalist comanagement model is adopted [2–7]. However, much of this literature is associated with patients undergoing hip fracture management in nonteaching hospitals without residents or fellows. Therefore, the full impact of the hospitalist comanagement model has not been

fully investigated in a multispecialty teaching facility in association with patients undergoing joint arthroplasty surgery.

According to the Nationwide Inpatient Sample survey, a total of 332,000 primary total hip arthroplasties (THAs) and 719,000 primary total knee arthroplasties (TKAs) were performed in the United States in 2010 [8]. American Joint Replacement Registry data from 2013 report a joint arthroplasty revision rate of 6.5% overall, with hip revisions accounting for 3.4% and knee revisions for 3.1% of the total [9]. Population projections by Kurtz et al [10] estimate that the demand for primary THAs will grow by 174%, from 208,600 procedures in 2005 to 572,000 procedures in 2030. They estimate that primary total TKAs will grow by 673%, from 450,000 procedures in 2005 to 3.48 million procedures in 2030. Total hip and knee revisions are expected to grow by 137% and 601%, respectively, by 2030 [10].

The perioperative management of patients undergoing joint arthroplasty continues to change as physicians improve their approach to the management of comorbidities encountered in this

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aging population. A hospitalist comanagement model has been adopted in many centers to allow full-time faculty hospitalists to help manage postoperative joint arthroplasty patients [2-5].

Our institution adopted a hospitalist comanagement model for all postoperative joint arthroplasty patients in late April 2012. Before this, a hospitalist was consulted on joint arthroplasty patients on an as-needed basis. Therefore, patients would often be admitted, undergo the operation, and be discharged without having hospitalist consultation.

Our study was performed at a teaching facility where students, residents, fellows, nurse practitioners, and physician assistants help coordinate care postoperatively in the hospitalist comanagement model. In this setting, the management of postoperative joint arthroplasty patients may depend on the caregiver’s assessment and particular level of training. This situation can be beneficial but may differ from a private practice model in which a more limited number of caregivers are involved in the care of postoperative patients.

This study aims to compare the currently used model of hospitalist comanagement with the pre-existing model of as-needed hospitalist consultation for postoperative joint arthroplasty patients.

Materials and Methods

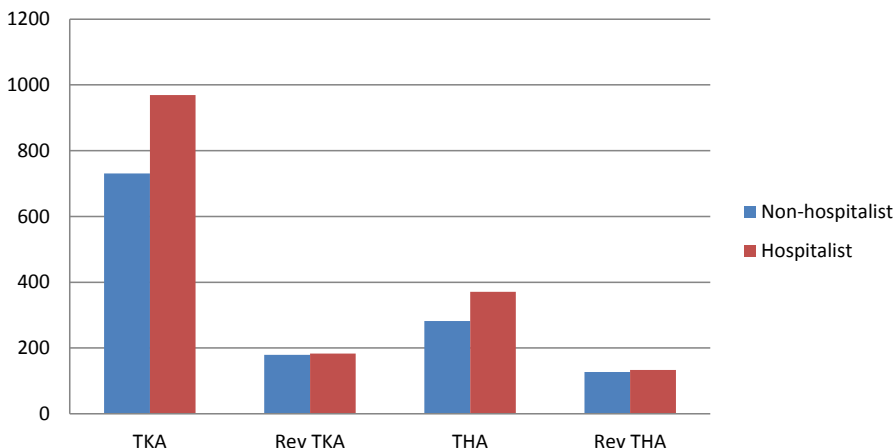
We retrospectively evaluated 2975 patients who underwent THA or TKA between May 2010 and January 2014 at one teaching facility. Nonelective trauma patients were excluded. Institutional review board approval was obtained for the study. All surgeries were performed by 3 surgeons specializing in joint arthroplasty. The approach, technique, and implant systems used by the 3 surgeons throughout the study period remained constant without significant alterations. All THAs were performed through a standard posterior approach. All TKAs were performed through a standard medial parapatellar arthrotomy. Patients received dose-adjusted venothromboembolism prophylaxis with warfarin. All

patients were evaluated before surgery by our anesthesia-directed preoperative clearance center, which includes evaluation by internal medicine physicians who risk stratify the patients providing recommendations for preoperative optimization and postoperative management of comorbidities. Patients who needed further evaluation by a subspecialty, such as cardiology, nephrology, pulmonology, or rheumatology, were referred to the respective specialist before surgery so the specialist could follow the patient postoperatively if needed. An anesthesia-directed preoperative clearance center has been shown to help decrease postoperative length of stay (LOS) and cost [11].

For the analysis, patients were separated into a nonhospitalist (NH) cohort of 1319 patients who did not receive automatic hospitalist comanagement postoperatively, and a hospitalist (H) cohort of 1656 patients who received automatic hospitalist comanagement postoperatively. Figure 1 lists the arthroplasty procedures performed in each group: TKA, revision TKA (Rev TKA), THA, and revision THA (Rev THA). Postoperatively, the patients were admitted to the orthopedic service and managed primarily by the orthopedic team. For the patients in the NH cohort, the hospitalist service was only consulted if needed for assistance with acute medical issues or poorly controlled chronic medical illness, which occurred in 13.8% of the surgeries. For the patients in the H cohort, the hospitalist service was automatically consulted immediately after the surgery on all cases, even if the patient had no acute issues and did not experience chronic medical illness.

The NH and H cohorts were compared at baseline via chi-square test for the American Society of Anesthesiologists (ASA) classification, the *t* test for age, and the Wilcoxon test for the unadjusted Charlson Comorbidity Index score and the age-adjusted Charlson Comorbidity Index score. Chi-square test was used to compare the postoperative LOS, readmission rate at 30 days after surgery, diagnoses present on admission (POA), new diagnoses during admission, tests ordered postoperatively, total direct cost (TDC), and discharge location. The data were gathered through queries of our institution’s billing department. *International Classification of*

Operative totals



Operative Totals		
	Non-hospitalist Cohort	Hospitalist Cohort
TKA	731	969
Revision TKA	179	183
THA	282	371
Revision THA	127	133

Fig. 1. Operative totals by cohort. THA, total hip arthroplasty; TKA, total knee arthroplasty.

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