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Improved Perioperative Care of Elective Joint Replacement Patients: The Impact of an Orthopedic Perioperative Hospitalist

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ABSTRACT

Background: We developed an orthopedic hospitalist fellowship program for our total joint replacement program at a large urban academic medical center. The goal of the program was to improve patient outcomes, quality, and healthcare value through collaborative perioperative care and improved care coordination. This study evaluates the implementation and impact of our modified Hospitalist-Orthopaedic Team Co-management model on quality and performance metrics.

Methods: We reviewed our Quality Institute data using 3 databases for the 16 months before (PreOH) and 18 months after (PostOH) implementation. Procedural volume was identical during period 1 (1100 cases) vs period 2 (1119 cases). Metrics included mean LOS (length of stay), % patients discharged home, mean observed and expected LOS and LOS index, LOS variance, % ICU (intensive care unit) admissions, mean ICU days, % cases with complications, % mortality, 30-day readmission rate, and Hospital Consumer Assessment of Healthcare Providers and Systems scores. Statistical analysis was performed using the software imbedded in the database software.

Results: Statistically significant improvements occurred in multiple performance and quality metrics including mean hospital LOS for total knee replacement, percentage of total knee replacement patients discharged home, and percentage of patients discharged home for primary total hip arthroplasty, complication rate, and 30-day readmission rate. Reductions in % ICU admission and ICU LOS were seen but not statistically significant. HCAPHS scores improved in 6 of 8 categories, and was statistically significant in 3 of 8.

Conclusion: The results of this study demonstrate that the modified Hospitalist-Orthopaedic Team Co-management model described above improves quality, cost effectiveness, and value for elective total joint replacement patients in comparison to the traditional consultation only model.

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The hospitalist model has been shown to result in decreased acute care costs and length of stay (LOS) in many medical and surgical populations [1–7]. Perioperative care of surgical patients by hospitalists can be provided in several ways. When hospitalist care is provided under a “consultation” arrangement, medical evaluation and treatment is provided based on an “as needed” basis in response to a change or concern about the patient’s medical

condition. This is a reactive strategy to manage potential complications that develop in the perioperative period. The disadvantage of this approach to patient care is that this strategy frequently misses the opportunity to prevent complications, which is especially important in today’s value-based healthcare environment.

Hospitalist care can also be provided under a “surgical or hospitalist co-management” arrangement. In this situation, the hospitalist is typically involved in medical management of all surgical patients on a surgical service. This is a more proactive strategy that provides considerably more opportunity for prevention of complications, improved “rescue” of patients who have developed complications [5], improved understanding about the needs of the surgical patient, and increased collaboration between surgeon and hospitalist. In a value-based healthcare environment, this may be a more effective way to manage LOS, reduce waste, avoid unnecessary testing, and control costs and unnecessary resource utilization over the episode of care.

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Patients undergoing joint replacement surgery are unique, and in many ways unlike other surgical patients. Because TJRs are elective procedures, patients undergoing these procedures should be in optimal medical condition prior to surgery. Total joint replacement (TJR) patients are also generally healthy but because they are frequently elderly they may have multiple medical comorbidities that affect their risk of perioperative complications. Joint replacement patients are also at high risk of venous thromboembolic complications post-operatively. Due to the considerable bleeding risks associated with the use of potent anticoagulants post-operatively, it is essential that hospitalists providing medical care for elective TJR patients understand that the bleeding risks and thromboembolic concerns need to be managed in a balanced manner to provide our patients with a safe surgical outcome. Perioperative care of the joint replacement patient would be expected to be enhanced and outcomes improved by a more thorough understanding of the specific needs of these patients by all providers caring for them around the time of surgery.

In an attempt to provide our TJR patients with improved perioperative medical care, we developed an orthopedic/surgical hospitalist fellowship program for our TJR program at a large urban academic medical center. This program provided a hospitalist with in-depth training in TJR surgery, anesthesia, pain management, surgical critical care, and perioperative medicine. The goal of the program was to improve patient outcomes, quality, and healthcare value through better understanding of patient needs, collaborative perioperative care, and improved overall care coordination.

This dedicated orthopedic hospitalist at our institution works closely in collaboration with our Center for Perioperative Medicine which is an anesthesia directed pre-op evaluation process focused on risk assessment, health optimization, risk mitigation, and identification of patients “at risk” for adverse outcomes. Proactive co-management of “at risk” patients by the orthopedic hospitalist is expected to prevent complications, readmissions, excess days, and improve value for our patients.

Our current program which is perhaps best described as a modified Hospitalist-Orthopaedic Team Co-management model closely resembles the Hospitalist-Orthopaedic Team Co-management model described by Huddleston et al [8] and the Surgical Co-management model described by Rohatgi et al [9].

In our program, acute post-operative care by our hospitalist is provided in collaboration with the orthopedic team (attending surgeon and resident staff) and our Center for Perioperative Medicine. Patients identified to be “at risk” during their pre-operative assessment are closely followed and co-managed by our orthopedic hospitalist, while other minimal risk patients are managed by our hospitalist on an “as needed” basis under a more traditional consultation arrangement. We feel that this approach best directs resources where they are most effective and needed and minimizes waste and unnecessary care.

The objectives of this study are to assess the impact of a dedicated Perioperative Orthopaedic Hospitalist on value and quality-related outcomes after elective TJR.

Materials and Methods

We performed a review of our Quality Institute data for all elective TKRs and total hip arthroplasties (THAs) at a large urban academic medical center for the 16 months before (PreOH) and 16 months after (PostOH) addition of our dedicated orthopedic hospitalist to our TJR program in August 2012. Perioperative care in the PreOH group was provided under a typical consultation model with a hospitalist service at our institution and perioperative care in the PostOH group was provided by our dedicated orthopedic hospitalist under the modified Hospitalist-Orthopaedic Team Co-management model described above. The period of study was selected to provide sufficient study size and a realistic estimate of the impact of this specific change in perioperative care management on our program's performance metrics. The study period was also selected to coincide with an interval during which no other major changes in patient care occurred.

Data analyzed came from 3 separate databases maintained by our Quality Institute during the study period. Patients undergoing primary TJR typically have more predictable surgical episodes than the more diverse group of revision TJRs, and as a result we looked at this group separately from a larger group of all TJRs. One of these databases (Vizient) contained risk-adjusted data for all patients undergoing the following International Classification of Diseases, Ninth Revision procedural codes at our institution during the study period: 81.51 (primary total hip), 81.52 (partial hip), and 81.54 (primary total knee). Another database (Midas STATit) contained data about all patients admitted with the following diagnosis-related groups: Medicare Severity Diagnosis Related Groups (MS-DRG) 469 and 470 (primary TJR with and without major complication or comorbidity). The third database contained Press-Ganey Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient satisfaction data for all patients with MS-DRG 469 and 470 during the study period. Analysis yielded 1100 patients in the PreOH group and 1119 patients in the PostOH group. There was no statistically significant difference between the 2 groups with respect to mean or median age, gender, percentage of patients with and without major comorbidities and complications, or Case Mix Index (CMI) (Table 1). This study was Institutional Review Board approved.

The following quality and performance metrics were determined for each group:

1. Mean LOS for primary THA and total knee replacement (TKR)
2. Percentage of primary THA and TKR patients discharged to home
3. Mean observed and expected LOS (risk adjusted) and LOS index for DRG 81.51, 81.52, and 81.54.
4. LOS variance in days
5. % ICU (intensive care unit) admissions for DRG 81.51, 81.52, and 81.54

Table 1
Comparison of Patient Populations.

	Pre-Hospitalist Period	Post-Hospitalist Period	P-Value Comments
CMI	2.11	2.13	Not significant at $P > .05$
% Male	36.09%	39.92%	Not significant at $P > .05$
% Female	63.91%	60.08%	Not significant at $P > .05$
% With MCC	1.41%	1.94%	Not significant at $P > .05$
% Without MCC	98.59%	98.06%	Not significant at $P > .05$
Mean age (y)	66.46	67.19	Not significant at $P > .05$
Median age (y)	67.00	67.50	Not significant at $P > .05$
% Age over 80	14.01%	14.44%	Not significant at $P > .05$
% Age over 65	59.07%	61.82%	Not significant at $P > .05$

CMI, Case Mix Index; MCC, major complication or comorbidity.

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