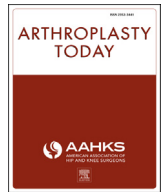




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Original research

Arthroplasty care redesign related to the Comprehensive Care for Joint Replacement model: results at a tertiary academic medical center

Chancellor F. Gray, MD^{*}, Hernan A. Prieto, MD, Andrew T. Duncan, MBA, PT, SCS, DPT, ATC, Hari K. Parvataneni, MD

Department of Orthopaedics and Rehabilitation, University of Florida, Gainesville, FL, USA

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ABSTRACT

Background: Total joint arthroplasty (TJA) remains the highest expenditure in the Centers for Medicare and Medicaid Services (CMS) budget. One model to control cost is the Comprehensive Care for Joint Replacement (CJR) model. There has been no published literature to date examining the efficacy of CJR on value-based outcomes. The purpose of this study was to determine the efficacy and sustainability of a multidisciplinary care redesign for total joint arthroplasty under the CJR paradigm at an academic tertiary care center.

Methods: We implemented a system-wide care redesign, affecting all patients who underwent a total hip or total knee arthroplasty at our academic medical center. The main study outcomes were cost (to CMS), discharge destination, complications and readmissions, and length of stay (LOS); these were measured using the 2017 initial CJR reconciliation report, as well as our institutional database.

Results: The study included 1536 patients (41% Medicare). Per-episode cost to CMS declined by 19.5% to 11% below the CMS-designated national target. Home discharge increased from 62% to 87%. CMS readmissions declined from 15% to 6%; major complications decreased from 2.3% to 1.9%; and LOS declined from 3.6 to 2.1 days.

Conclusions: A mandatory episode-based bundled-payment program can induce favorable changes to value-based metrics, improving quality and outcomes for health-care consumers. Quality and value were improved in this study, evidenced by lower 90-day episode cost, more home discharges, lower readmissions and complications, and shorter LOS. This approach has implications not just for CMS, but for private payers, corporate health programs, and fixed-budget health-care models.

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Introduction

Lower extremity joint replacement of the hip and knee remain among the most common and most cost-effective procedures performed in the United States, together representing the single highest line item in the Centers for Medicare and Medicaid Services (CMS) annual expenditure budget [1,2]. There has been interest in finding ways to control cost to CMS associated with total joint

arthroplasty (TJA), while maintaining access for beneficiaries to these life-changing interventions.

The CMS is in the midst of transitioning from being a volume-based buyer to a value-based buyer and is now emphasizing payment models that deviate from the traditional fee-for-service model, to control cost, reward favorable outcomes, and improve value in care [3]. The Medicare Access and CHIP Reauthorization Act of 2015 codified a new CMS payment plan: the Advanced Alternative Payment Model [4]. The first Advanced Alternative Payment Model to gain substantial traction in the orthopaedic community was the Bundled Payments for Care Improvement (BPCI), a voluntary participation model rewarding physicians with gainsharing for favorable outcomes and diminished costs [5]. Bundled-payment models attempt to unify disparate providers to better coordinate care, avoid unnecessary treatments, and improve outcomes by sharing a single episode “target price” for a specific episode of care.

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^{*} Corresponding author. 3450 Hull Road; Gainesville, FL 32607, USA. Tel.: +1 352 273 7001.

E-mail address: graycf@ortho.ufl.edu

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Recent literature has supported that BPCI programs for TJA lead to both lowered costs and improved value for CMS [5,6].

In April 2016, CMS implemented the Comprehensive Care for Joint Replacement (CJR) model, which brought the bundling initiative mandatorily (unlike BPCI, which remains voluntary) to a group of 67 metropolitan statistical areas [7]. Our health system was notified in July 2015 that we had been included in the initial phase of the CJR.

Preliminary data suggested that our health system's average 90-day episode cost would be 4.8% above the national target price. In light of this, we initiated a comprehensive effort, led primarily by the arthroplasty division, to examine the care pathway and determine opportunities for improvement. Our primary concern was to improve the value of our care delivery, by maintaining a high standard of patient safety and quality in outcomes while diminishing the cost of the episode of care, both to payers (CMS in particular) and the health system. Moreover, we questioned whether such a care redesign was sustainable, scalable, and applicable across a diverse payer mix.

The primary outcome measures we used to answer this question were 90-day cost to CMS, direct cost to the hospital, percent disposition to home vs a postacute care setting (skilled nursing facility [SNF] or inpatient rehab facility), complications (using the CJR final rule), all-cause readmissions, and length of stay (LOS).

Material and methods

Our institution is an 852-bed tertiary care academic medical center serving as the primary referral center for 18 counties and secondary major referral center to another 15; it is a level 1 trauma center that functions as a safety-net hospital, and as such caters to a diverse group of patients with both medical complexity and socioeconomic diversity. In addition, ours is a teaching hospital where resident and fellow education is an important commitment. Owing to the size of the institution, the number of diverse clinical programs, the wide geographic catchment area, and complexity of referred patients, wholesale or sustained change in clinical pathways is typically challenging.

We created a multidisciplinary task force that met monthly to examine the care process, through a patient- and family-centered care model as described by DiGioia et al. [8]. Our overall goal was to manage the entire episode of care, from the initial outpatient consultation, through the surgical encounter, to long-term function and outcomes. Table 1 summarizes the key areas that were redesigned with a patient-centered and outcome-based approach.

One major goal of the preoperative redesign was to improve patient selection and optimization and not to avoid care for riskier patients (a practice known as “cherry-picking or lemon-dropping,” a common concern with other bundled-payment initiatives) but to improve their modifiable risk factors through comanagement/consultation services. Education was another major goal: transforming the culture across the care continuum to expect early mobility and safe, early discharge to home. Prior to redesign, a clear postdischarge plan was often lacking, resulting in prolonged LOS and a determination for use of a SNF based on early function after surgery rather than baseline function.

During the acute care period, extensive attention was directed toward emphasizing regional anesthesia, early mobilization, early recovery, and safe discharge to home. All medical staff interacting with the patient were coordinated to emphasize the previously mentioned expectations. We conceded to accept modest increases in LOS to reach home rather than SNF discharge, if for instance a patient was felt to benefit from an additional day of inpatient stay to improve home safety.

Table 1
Redesign of the total joint replacement episode.

Task force constituents: orthopaedic surgery, anesthesiology, case management, rehabilitation services, home care companies, hospital administration, nursing leaders (orthopaedic unit, preoperative, operating room, and postoperative), and hospital quality and data personnel
Preoperative
Creation of a Patient Selection Tool: recognize and control known modifiable risk factors, that is, cigarette smoking, chronic narcotic use, morbid obesity, poorly controlled diabetes
Patient Medical Optimization: literature-guided three-tiered system (red-yellow-green) using systems-based classification, attempt to move patients to green across all categories; exercise caution when yellow (attempts made to modify, taken on case-by-case basis); red is a hard stop (do not proceed with surgery)
Use of Risk Assessment and Prediction Tool (RAPT) for predicting postacute placement: score >9, plan for home discharge; score 6-9, invest preop resources to optimize possibility of home discharge; score <6, plan for postacute care facility
Physical Optimization (“prehabilitation” for deconditioning)
Chlorhexidine (skin) and Mupirocin (nasal) decolonization
Narcotic Protocol, stratified by patient narcotic exposure (narcotic naive, standard, or chronic narcotic user)
Engagement of patients by Case Management before admission
Documentation of a firm postacute plan before admission (home is default)
High-Risk Anesthesia Pathway ^a : patients with 2 or more poorly controlled cardiopulmonary disease conditions referred to preoperative “high-risk” clinic to discuss risk and optimization with a high-risk anesthesia provider
Joint Replacement Education Program ^a
Acute Care
Acute Care pathway changed from 4 days to 2 days
Physical therapy started on the day of surgery and twice daily until discharge
Use of a physical therapy gym on the orthopaedic unit
Preoperative disposition plan is not changed without consulting surgeon
Predominant use of regional-only anesthesia (spinal anesthesia with preop regional block, ± home catheter when indicated)
Multimodal pain management: acetaminophen, celecoxib, tramadol ± neuromodulating agent
No routine Foley catheter use
Simplified wound dressings and no routine dressing changes
Case management engagement within 12 hours of surgery
Discharge teaching by nursing starting on postoperative day 1
Uniform messaging across all services for safe, early home discharge
Postacute Care
Improved patient engagement and tracking by orthopaedic team via a telephone
Preferred Skilled Nursing Facilities and Home care companies with regular communication
7 days per week access to Orthopaedic After Hours Clinic instead of emergency room
Nurse navigator ^a
Patient engagement and tracking electronic platform ^a

^a This component of the redesign was not active during the study period.

For the postacute period, enhanced patient engagement and tracking was implemented. Patients were called proactively at regular intervals and encouraged to call the orthopaedic practice readily with concerns, to reduce emergency room (ER) visits for routine issues. We leveraged our department's 7-day orthopaedic walk-in clinic to allow patients with concerns to be seen promptly by someone from our department, reserving the ER for medical emergencies only. Home care companies and postacute facilities were also contacted by our team and encouraged to call our practice first with any concerns.

We first implemented a 3-month pilot program with 2 of the surgeons (C.F.G. and H.K.P.) to see the scalability of our planned changes. The program was then implemented across the enterprise on February 1, 2016, to allow a 2-month run-in prior to the start date for the CJR. As such, we reviewed patient data from February 1, 2016 through January 31, 2017, a period of 1 year. This was compared to the 1 year leading up to the initiation of the pilot program, from November 1, 2014 to October 31, 2015.

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