

Pay-for-performance in orthopedics: how we got here and where we are going

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Abstract

Purpose of the review Recent health laws have shifted from the traditional fee-for-service model toward a pay-for-performance model. In this changing climate, it is imperative that a provider understands these changes and recognizes the importance of health services research on medicine.

Recent findings Increasing the value of care by improving quality and decreasing cost has been the focus of several projects. Preventing complications may be an effective way to increase value.

Summary Patient risk stratification is a modifiable variable that will allow for improved patient selection. This in turn may reduce adverse events, thereby lessening the economic burden of complications, increased length of stay, and hospital readmission. Providers must partner with their hospitals to align their goals and maximize quality and efficiency in order to decrease costs.

Keywords Pay-for-performance · MIPS · Risk stratification · Value-based reimbursements · Bundled care

Introduction

As the healthcare landscape changes, payment models to physicians are transitioning from a “fee-for-service” (FFS) model

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to a “pay-for-performance”(P4P) model that rewards value over volume. Value is defined as outcomes divided by costs [1]. Understanding both the limitations and framework of this model is essential for practitioners in order to effectively and efficiently treat their patients.

A PubMed search including articles from January 1, 2014 was completed on November 25, 2016 with the key terms “pay for performance” resulting in 1130 articles respectively. When “orthopedics” was added to the search string, 30 abstracts were available for review. After abstract review, three articles were eliminated. Further examination of each article eliminated two unrelated articles, leaving 28 articles to review.

With the 2001 publication of the Institute of Medicine’s “Crossing the Quality Chasm: A New Health System for the 21st Century” [2••], a transition from a FFS to a pay-for-performance model was hastened. Combined with the ever-rising cost to Medicare beneficiaries reliant on the sustainable growth rate formula, the IoM findings prompted policymakers to redesign the Medicare reimbursement model to be more focused on value of care rather than volume. Under the FFS model, overutilization of resources without regard to quality of care was rewarded financially [3]. Over the next several years, the Centers for Medicare and Medicaid Services (CMS) studied initiatives to bend the cost curve while promoting quality outcomes; this culminated with the passage of the Medicare Access and Children’s Health Insurance Program (CHIP) Reauthorization Act of 2015 (MACRA). This program created two reimbursement options for providers: merit-based incentive payment systems (MIPS) and alternative payment models (APM) [4•, 5].

MIPS is a pay-for-performance model rewarding quality and efficiency that combines previous CMS initiatives; these include value-based purchasing/resource utilization (VBP), physician quality reporting system (PQRS), electronic health records incentives program/meaningful use (EHR/MU), and

clinical practice improvement activities (CPI). APM include Bundled Payment for Care improvement (BPCI) which is being evaluated in the joint arthroplasty literature as well as Accountable Care Organizations (ACO) [4•, 5].

In this review, we examine the literature of the past 3 years (2013–2016) regarding how the pay for performance model is shaping orthopedics and present a brief synopsis of coming health care changes.

Value

Value can simply be defined as outcome quality over cost [1]. Defining and improving value in orthopedics has been deemed a critical issue of the American Orthopedic Association [3]. To succeed in an environment where competition itself is of value, providers must (1) understand the value of service, (2) create an infrastructure to measure and report outcomes relevant to patients, and (3) understand the actual cost of care while actively engaging to lower cost through aligned incentives [3, 6•, 7]. The safest, simplest, most efficient treatment resulting in good outcomes is the ultimate goal and may lead to less variation in the care provided [6•].

To advance quality of care in the USA, improved registries are needed [3]. The USA has lagged behind some other countries in this endeavor. P4P, via MIPS, should incentivize physicians to engage in patient-reported outcome data collection, thereby increasing participation and establishment in registries, and eventually leading to optimized quality of care [3]. However, there is concern this may limit the “art of medicine,” and create homogenized care [6•].

Figure 1 provides a simplified representation of the variables that greatly impact the value of care provided. As Hippocrates said, *Primum non nocere*; the majority of the modifiable factors are related to decreasing complications. By doing so, quality will increase, while the economically burdensome cost of complications will decrease, making healthcare less expensive and more valuable.

Quality/risk stratification

Patient satisfaction and good outcomes, while minimizing complications, are critical in order to become profitable in this new system. PQRS is 30% of the MIPS score, measuring quality aspects of care including 30-day readmissions, post-

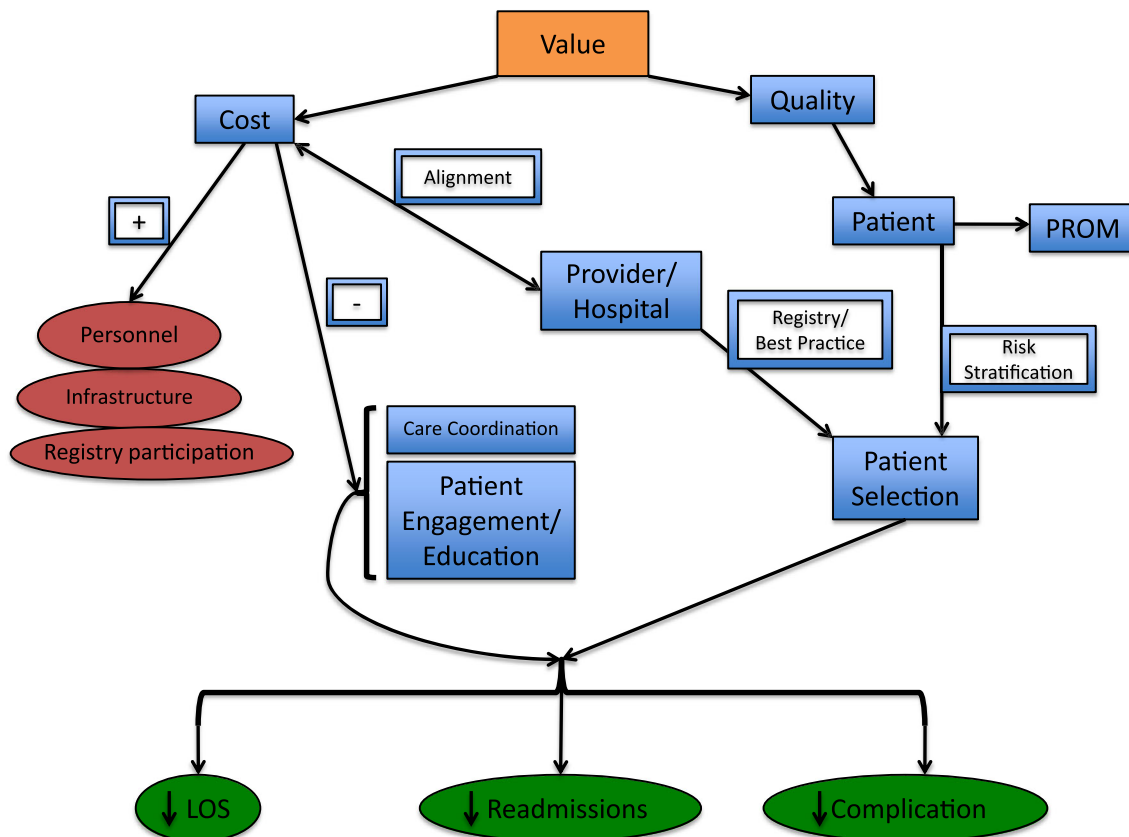


Fig. 1 This figure displays the complex relationships between different variables affecting value. Future research will focus around modifications/optimization of these variables in order to realize gains in value

operative complications, length of stay (LOS), and hospital-acquired conditions. Reducing the occurrences of these events will have a profound impact on cost containment moving forward [8, 9]. Understanding and predicting risk in order to stratify patients into risk categories will allow practitioners to predict and ideally mitigate potential complications [9]. A theme of risk avoidance has predominated in recent literature.

The CMS Hospital Readmission Reduction Program has a goal of reducing readmissions by 20% due to the significant financial strain it places on the system. While risk factors have been identified and risk calculators, including the NSQIP calculator, have been used to predict readmissions, a simplified equation was developed using the two most predictive risk factors for a general surgery population: American Society of Anesthesiologist (ASA) class and length of stay [9]. While it is unclear if this may be directly applied to orthopedic surgeries, they note the importance of profiling patients with high likelihood of readmission in order to create a safety net aimed at preventing readmission [9].

Total joint arthroplasty (TJA) can be extremely successful and valuable to a patient; given the significant economic and financial constraints of related complications, it has been an early target for value-based reimbursements, making risk assessment critical. CMS recommends the use of the ACS-NSQIP universal risk calculator for preoperative risk screening to receive financial incentives through PQRS, although any preoperative stratification tool may be used. A study evaluating the ACS-NSQIP surgical risk calculator in TJA patients found that the tool failed to accurately predict individual patient complications; in this regard, it was not useful as a tool for patient communication regarding preoperative risks. An arthroplasty-specific risk calculator is needed [10].

As risk calculators are developed, there is concern that complex cases may be avoided due to their increased risk for complications and readmissions. Readmission penalties may lead to decreased revenue resulting in such cases being shifted to tertiary centers [11]. This was clearly the case in one study that urged practitioners to perform evidence-based medicine rather than medicine based on finances. They encouraged providers to explore other savings in order to minimize these transfers [12]. Another study demonstrated an increased number of referrals during the transition to a pay-for-performance system [13]. Likewise, it was demonstrated that it was still financially advantageous to accept these transfers. With that being said, knee periprosthetic joint infections (PJIs) proved to be more financially beneficial than hip PJIs [13].

An evaluation of all Medicare beneficiaries undergoing total knee arthroplasty in 2011 revealed a complication rate of 11.82% with only hemorrhage and acute renal failure being over 2% incidence. With a mortality rate of 0.09% and an average extended length of stay of 0.9 days per complication, national benchmarks can be surmised for this population [14]. Furthermore, there were significant financial effects of

complications. Resource consumption exceeded \$5000 for each complication. Hemorrhage requiring transfusion (the most common complication) added an additional 67.5 million dollars nationwide, demonstrating a significant opportunity for savings [14].

Similar to TJA, hip fracture care is an early target for value-based care. Unlike TJA, hip fractures are not elective procedures. If reimbursements are directly linked to outcomes in non-optimized patients, a practitioner needs to understand the risks associated with complications and be compensated appropriately.

The UK has successfully improved outcomes for hip fractures through the Best Practice Tariff, introduced in April 2010, providing reimbursements on best practices [15]. This includes surgery within 36 h of admission. A recent study evaluated strategies to decrease postoperative MRSA infections by the use of perioperative Teicoplanin for antibiotic prophylaxis. Results of MRSA screening were not always available in the narrow window prior to the operating room, and standardized protocols yielded higher compliance than patient selection for MRSA coverage (i.e., institutionalized patients). In their hospital, they could prevent three infections a year with potential savings of \$52,000 per year [16]. This paper demonstrates two key principles for future research: first, the utilization of protocols to maximize compliance and limit complications; next, changes to the protocols should be focused to treat patients epidemiologically as opposed to individually, in order to create cost savings. With regards to extended antibiotic prophylaxis for MRSA treatment, it is unclear how this will affect drug resistance going forward and what impact that may have [16].

Hip fractures are well known to have high morbidity and mortality in the presence of end-stage renal disease [17]. Other fractures in this high-risk patient population had a complication rate of 14.7% and average length of stay of 15.9 days compared with a control group of 3% and 6.4 days [18]. Diabetes mellitus (DM) is increasing its prevalence and is well known to have increased risk with the use of implants [19]. In a large cohort study, 12.8% of 58,748 patients undergoing open reduction and internal fixation had DM. Nearly 15% of these individuals were further stratified into a group with complicated diabetes mellitus (CDM), as defined by having complications related to DM (based on ICD-9 codes). Patients with CDM had 2.4 days longer length of stay, nearly 7000 dollars more in expenditures, and higher mortality than simple DM [20]. More work is needed to stratify patients undergoing non-elective orthopedic surgery not only with regards to specific diagnoses but also within the given diagnoses in order to fully understand the economic impacts they impart.

Further work has been done in other subspecialties as well. With regard to spinal fusion in a Medicare population, 17.7% of beneficiaries sustained complications with an average increase in incremental cost of \$8911 and longer length of stay

(5.7 days); the most significant complication was infection [14]. One study produced two models predicting medical complications and surgical site infections for spine surgery patients. They evaluated risk factors that could be used to estimate absolute risk in order to appropriately counsel patients and stratify them into risk categories for a pay-for-performance model [21, 22].

Patient satisfaction

Increasing pressures in the pay-for-performance rubric have led to a culture reliant on patient satisfaction. In spine patients, younger age, less education, smoking, and workmen's compensation are associated with poorer satisfaction ratings. Conversely, marital status, working status, mental history, travel distance, pain characteristics, previous treatments, and narcotics use did not affect patient satisfaction [23]. Early strategies to improve satisfaction have also been successful. A simple method to improve patient satisfaction in orthopedic trauma is to provide physician biosketch cards to inpatients: the "excellent quality of doctor care" was improved from 52 to 74% when attending biosketch cards including backgrounds and interest of the attending surgeon was provided to the patient. Interestingly enough, length of stay, injury, education, age, race, gender, and insurance status had no impact on perceived quality by the patient [24]. This leads to the question of whether the quality of the surgery performed or the physician's nontechnical expertise is more important in obtaining high patient satisfaction and patient-reported outcomes. Moreover, interactions and experiences outside the physician's control (i.e., nursing care, quality of food, hospital noise level, hospital cleanliness) may shape the patients' perceived quality of care [8].

Patient satisfaction through patient-reported outcomes is also dependent on the population a provider is treating. Outcomes that are important to the patient and will not marginalize the true effect of an intervention are needed [6]. Applying outcome measures to appropriate populations negates the possibility of the "ceiling effect" [25]. For example, a low-demand patient is greatly different than a highly competitive athlete. In a study of upper extremity outcome measures for athletes, the Kerlan Jobe Orthopedic Clinic overhead athlete shoulder elbow score was recommended for use in this population [25]. An example of a broader outcome measure is the Disability of Arm, Shoulder and Hand DASH score; this may be more appropriate for other upper extremity pathologies, but it is clearly not a catch-all [25]. Other comorbidities (i.e., depression) and poor coping skills need to be evaluated as risk factors for low morbid procedures [6]. Furthermore, the consideration of social, economic, and demographic factors would help providers treating more disadvantaged patients avoid penalty [26]. As patients are stratified into groups,

appropriate outcome measures for individuals will need to be considered or created to evaluate the true value of the treatment. This is a large, untapped area for future research.

Cost

As regulatory pressures mount, there is an ever-increasing need for physicians and hospitals to work together toward common goals; this will be critical to success moving forward in a value-based payment model [7, 8, 27]. Through successful cooperation between a hospital and its providers, value can be increased with improving quality and efficiency of care. In a successful system, there are seven key facets to productive alignment: working toward a common financial interest, respecting clinical authority of the practitioner, administrative participation by physicians, transparency, patient advocacy, mutual necessity, and accountability [27]. For example, following a total knee arthroplasty, buy-in from nursing, anesthesia providers, therapists, discharge coordinators, and others, will greatly impact the success of care and the system [4]. All participants involved in care must have a thorough understanding of how the landscape is changing. Little work has been done to date specifically on cost-saving measures besides decreasing complications. Understanding the cost to the patient (i.e., missed income from work, stress on family) for undergoing treatment has yet to be evaluated in any depth [6]. To date, most work discussing strategies for cost containment have stemmed from bundled care research.

Bundled care

The Patient Protection and Affordable Care Act funded the initiation of the Bundled Payment Care Improvement Initiative. It is an alternative payment model that sets value to a procedure and places the responsibility of decreasing cost and increasing quality on the providers. This is converse to the MIPS system which rewards individual improvements in quality and cost in different categories. This government-sponsored program is a voluntary pilot program to test bundled payment models. In this value-based purchasing program, quality metrics, including 30-day readmissions, rates of antibiotic administration, patient mortality, and avoidable complications, have been used to adjust payments. Under the bundled care model, providers and health systems shoulder significant financial risk for PJI, emphasizing the need for preoperative optimization and patient selection [11]. With some hospitals operating as safety net facilities, providing care to indigent and disadvantaged patients, rates of Medicare payments have decreased for these hospitals. The hospitals with the fewest low-income patients have received bonuses,

leading to significant concerns of patient “cherry picking” to avoid financial loss [11].

With early experience in bundled care, several lessons have been learned [28••]. It is clear that cultural shift must be accepted by providers; accepted risk, performance metrics, and cost containment are critical. In order to improve a practitioner’s value, one must not be stagnant, but have the insight to engage as a leader and continue eliminating non-value-added inefficiencies [28••].

Outcomes on P4P

Recent outcomes evaluating pay for performance have been limited. Trends over several years for patients discharged following coronary artery bypass grafting, hip replacement, or knee replacement at participating and non-participating pay-for-performance hospitals showed lower risk-adjusted mortality and complications rates in participating hospitals. However, when taking into account changes over time in non-participating hospitals, they found no difference. They concluded that the pay-for-performance structure may not be as successful as proposed to improve outcomes in the studied procedures [29]. The long-term impact of replacing volume with value is unclear to date. After full adoption of the system, retrospective review will provide insight on these issues.

Conclusions

Pay for performance incentivizes providers to meet quality performance measures while controlling costs. It rewards outcomes, efficiency, and quality while penalizing for poor outcomes errors and increased cost. As goals shift toward financially incentivizing value, a research wave toward optimized protocols and appropriate risk stratification is forthcoming. Additional attention will be required to determine how to best deal with “high-risk” populations of patients in a fair and equitable manner.

Compliance with ethical standards

Conflict of interest Ashton H. Goldman declares that he has no conflict of interest.

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Human and animal rights and informed consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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