Chapter 1
Health Care Organization and Its Impact on Care of Diseases of the Hip

Benedict U. Nwachukwu and Kevin J. Bozic

Introduction

Spending on healthcare delivery in the United States (U.S.) has long been a point of great concern [1–3]. The proportion of gross domestic product (GDP) used for healthcare expenditure is used as a benchmark against which nations are compared. According to World Health Organization (W.H.O.) statistics the U.S. spent 17.9 % of GDP on healthcare in 2011, the most of any nation, and based on historic trends healthcare expenditure is expected to rise to 20 % of GDP by 2017 [4]. Perhaps of even greater concern is that the large expenditures of the U.S. healthcare system are not producing superior health outcomes. The U.S. lags behind almost every other industrial nation in public health outcome parameters such as life expectancy and infant mortality [4]. Prior reports such as that in 2004 by the Institute of Medicine (IOM) have attributed lagging health outcomes to a lack of access to healthcare for many U.S. citizens. Specifically a prior report noted that the U.S. was one of the few industrialized nations that had not achieved universal healthcare or that guaranteed access to healthcare for its citizens [5].

B.U. Nwachukwu, MD, MBA
Academic Training, Hospital for Special Surgery, 535 East 70th Street, New York, NY 10021, USA
e-mail: nwachukwub@hss.edu

K.J. Bozic, MD, MBA (✉)
The University of Texas at Austin, Department of Surgery and Perioperative Care, Dell Medical School, 1912 Speedway, Austin, TX 78712, USA
e-mail: kevin.bozic@ucsf.edu

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Table 1.1 Definition of key terms

Term	Definition
Accountable care organization	A healthcare network consisting of various physicians from different specialties, hospitals and other non-physician healthcare providers that are contracted to provide coordinated care to a group of patients
Bundled payment/Episode of care payment	A payment model for the global reimbursement of healthcare providers (hospitals, physicians, and non-physician providers) according to a clinically defined episode of care
Fee for service payment	A payment model in which healthcare providers are reimbursed according to each service provided (e.g., office visit, diagnostic test)
Patient centered medical home	A healthcare delivery model centered around primary care with a goal of creating better access to healthcare services, coordinating care and implementing prevention programs.
Pay-for-performance	A model of reimbursement in which healthcare providers are incentivized to achieve better outcomes through incentives for meeting certain quality markers
Population Health Model	An aspect of healthcare redesign focused on implementing prevention programs and maintaining the health of the health plan population, thereby decreasing the eventual need for surgical intervention

To address these concerns, significant strides have been made in the U.S. to reorganize how healthcare is delivered in order to contain costs and improve quality and access. In 2010, President Barack Obama passed the Patient Protection and Affordable Care Act (PPACA). As part of the legislation, healthcare coverage was offered to all Americans through healthcare exchanges and an individual mandate was issued requiring Americans to sign up for health insurance. In addition to expanding access to care, PPACA also introduced measures to change the system of healthcare delivery. In this chapter the changes in healthcare delivery most pertinent to the orthopedic surgeon treating hip diseases are introduced: accountable care organizations (ACOs), bundled payments, and patient-centered medical homes (PCMHs). Novel ways derived as part of healthcare reform for incentivizing providers to improve quality and contain costs are also explored (Table 1.1).

Delivery Models & Reimbursement

Overview of Organized Delivery Models

In order to allow for cost savings through coordination of care, healthcare delivery is transitioning towards centrally planned modes of care delivery [6]. ACOs and PCMHs represent two novel delivery models implemented as part of PPACA that will likely impact the care of diseases of the hip.

The PCMH is primarily a healthcare delivery model centered around primary care with a goal of creating better access to healthcare services, coordinating care and implementing prevention programs. PCMHs are similar in concept to ACOs, the difference between the two is best conceptualized by thinking of ACOs as comprised of many "medical homes" or as ACOs have been dubbed by some: a "medical neighborhood" [7].

An ACO is a healthcare network consisting of various physicians from different specialties, hospitals, and other non-physician healthcare providers that are contracted to provide coordinated care to a group of patients. The ACO is then typically accountable to a third party payer for the cost and quality of care provided to a population of patients. The Centers for Medicare & Medicaid Services (CMS) represent the largest ACO third party payer and are in the process of testing several ACO models. Medicare ACO programs include Medicare Shared Savings Program, Pioneer ACO model, and Advance Payment ACO model. The common goal in all ACOs is to find ways to improve quality and decrease overall costs. For example, as part of the CMS Shared Savings Program, Medicare fee-for-service programs are converted into ACOs that seek to lower their growth in health care costs while meeting performance standards on quality of care. These ACOs then share costs savings resulting from changes in practice with CMS.

In addition to implementing a financial reorganization, ACOs have also introduced a redistribution of healthcare delivery. Because there is increased provider accountability, ACOs incentivize a shift toward provider-led organizations and an orientation toward primary care, management and prevention of medical illness across the entire continuum of the care cycle. Thus, the fiscal responsibility in the management of hip osteoarthritis (OA), for example, may include aspects of the care cycle for which the orthopedic surgeon typically pays less attention such as pre-arthritic hip pain and prevention of progression to end stage hip OA. Similarly, for conditions like avascular necrosis of the hip that progress through a variety of degenerative stages prior to requiring orthopedic intervention, the orthopedic surgeon may begin to play more of an active (in concert with primary care physicians) in prevention of disease progression and disease management.

Incentives in Healthcare Reorganization

Central to the reorganization of how healthcare is delivered is a reorganization of how healthcare providers are reimbursed for their care of patients with certain disorders. Provider payment reform has long been considered a viable method for driving attention to the escalating costs of the U.S. healthcare system [8]. In this section, we outline payment methods resulting from healthcare delivery reorganization.

Traditionally, payment for orthopedic services has been based on a fee-for-service model. Such payment models created an orientation toward increasing the volume and intensity of service provided without necessarily rewarding the value of healthcare delivered. Thus pay for performance (P4P) incentive schemes evolved from

fee-for-service models. These P4P models adopted fee-for-service models and created quality of care related bonuses based on standardized metrics for different aspects of care.

As ACOs have become more widespread, there is now a shift toward "bundled payments" or episode of care payments. Under this payment structure, a single payer provides payment to all providers for all care related to the treatment of a condition, e.g. hip osteoarthritis requiring a total hip arthroplasty (THA). In this example, for a patient presenting with hip OA requiring a THA, providers may receive a fixed payment for an "episode of care," including pre-operative screening, in-patient admission, and the surgery itself as well as early post-operative (e.g., 30 days post-operatively) care, rehabilitation, and management of complications. The onus therefore is on the providers involved in these phases of care to maintain appropriate margins by providing care that is necessary and avoiding non-value-added interventions.

Early evidence for quality improvements and cost savings based on bundled payments has been promising. One of the earliest demonstrations for the impact of bundled payment on hip disease came from the Geisinger Health System (GHS) [9]. GHS physicians developed a program for implementing bundled payment for THA. GHS offered payers a guarantee that procedural and post-procedural costs (including costs related to re-admission) would be inculcated into a global payment scheme. After the introduction of their Provencare program, Geisinger reported a 3.6 % reduction in hospital length of stay, a 58 % reduction in 30-day re-admission, a 49 % reduction in deep venous thrombosis (DVT), and 67 % reduction in pulmonary embolism (PE) rate [8].

Changes in the Care of Hip Diseases

Increased Access to Care

PPACA is largely credited with addressing the large number of uninsured people in the U.S. As such, moving forward there will be a larger number of patients with health insurance seeking appropriate care and obtaining necessary orthopedic services. There is theoretical evidence to suggest that universal access to healthcare coverage leads to increased utilization of orthopedic services. For example, trend data for hip arthroplasty utilization suggests that THA utilization spikes at the point of healthcare eligibility—i.e., at age 65 upon reaching the age of Medicare eligibility [10]. However there is also a theoretical concern that in the new universal healthcare model, the provision of health insurance alone will not achieve the goal of optimizing the musculoskeletal health of the population. Specifically, the vulnerable and under-represented population segments may not benefit equally from expanded healthcare coverage. Disparities in the provision of healthcare services have been well documented [11–13], and there are myriad reasons why vulnerable population segments may not seek medical care even when the access is available [14]. Furthermore, there are other

possible reasons suggesting that even when these population segments seek care they may not receive the care that would otherwise be indicated for them. We briefly discuss some of the disparities in healthcare access for hip disease in order to outline how healthcare reorganization can help address some of these inequalities. Specifically, we use access to THA as a case example. Hip OA is a leading cause of disability in the U.S. and THA is an effective and safe procedure for alleviating pain and restoring physical function. Given the established efficacy, differential access based on race and/or socioeconomics represents a concerning disparity.

There is a well-established evidence base suggesting that there is an underutilization of THA for ethnic minorities and the socioeconomically disadvantaged [15]. Mahommed et al. used a Medicare database to analyze 61,568 patients who had had a primary THA and 13,483 who had a revision THA during a 1-year period. The authors found rates for primary THA were higher for whites than African Americans, and for those with a higher income [16]. Studies such as these suggest that beyond a lack of healthcare access, patient and provider specific reasons may represent potential reasons for consistently lower utilization of THA among vulnerable segments of the population. Patient specific reasons are thought to include lack of recognition of symptoms, a higher threshold for seeking care, ineffective communication of symptoms to providers, unfamiliarity with procedures and lower expectations of post-operative outcome. Some studies have suggested that many of these reasons for underutilization are related to a lack of access to a primary care physician who can play a role in initial referral and can facilitate trust by educating and communicating with patients in a culturally competent manner [15]. As such it is plausible that as healthcare reorganizes around a primary care model, disparities in underutilization of elective procedures may become addressed. However there is a significant onus placed on the primary care physicians, case managers, and care coordinators in this model to work with these populations in order to overcome aforementioned barriers to seeking care and understanding the disease process. Further, in light of the responsibility placed on these providers in the new healthcare models, it is crucially important that providers, payors, and healthcare deliver organizers understand that provider related biases affect patient utilization and access to healthcare services. One study found that both primary care physicians and orthopedic surgeons were less likely to offer joint arthroplasty to women when faced with standardized male and female actors [17]. Another study not directly related to orthopedics found that physicians were less likely to recommend cardiac catheterization to racial minorities who had the same medical history and symptoms as white counterparts [18]. Thus, as access to orthopedic care is expanded to a broader population, it is important to understand that ensuring equal access to care goes beyond enrollment in a health plan.

In addition to issues of underutilization, increased access to health insurance may raise the possibility of *overutilization* of elective procedures. Specific to the management of hip OA, this is an area of potential concern. With the introduction of more durable implants, there has been a recent trend toward increased utilization of hip arthroplasty among younger patients (age < 65 years) [19]. As such, with healthcare

reorganization there will be increased pressure for utilization management in order to judiciously indicate patients for procedures. Musculoskeletal conditions such as hip OA will require orthopedically driven metrics for the management of various stages of disease, e.g. appropriate use of diagnostic and therapeutic interventions, and well-defined criteria for referral to a surgical specialist (more on this in subsequent sections).

Supply Side Crisis

Studies published prior to the introduction of universal healthcare coverage suggested that based on population senescence trends alone that there could be a supply side crisis for joint arthroplasty, i.e. there would not be enough arthroplasty surgeons to respond to the demand for joint replacement [20]. There has yet to be a revised projection incorporating demand based on universal healthcare coverage. As part of any revised projection however the previously projected supply side crisis is likely to become more pronounced. Supply side issues may become even more evident in other non-arthroplasty fields of orthopedic surgery. For example, in conditions like femoroacetabular impingement, which is being increasingly recognized, hip arthroscopy has been utilized to treat this condition at increased rates. Plausibly there may be a future supply side crisis for hip arthroscopists.

The manifestation of supply side crises for hip conditions will likely be increased wait times for surgeon availability. The experience of some European nations may serve as an example, i.e. where significant wait times for specialty care is the norm. In these countries, patients become accustomed to living with chronic conditions until a specialist is available [21]. Further, the affluent population segments seek care out of the insurance system by paying out of pocket in order to gain more immediate access to care. This phenomenon may eventually lead to a socioeconomic tiering of specialty care.

Pressure for Cost Containment

Inherent in shared savings programs is a pressure to identify areas for cost containment, primarily through the elimination of non-value-added services. As such, the processes of healthcare delivery for musculoskeletal hip conditions will evolve to become more cost conscious. There is already a trend toward decreased length of stay (LOS) for many in-patient procedures. In order to decrease LOS for elective procedures requiring inpatient admission, multidisciplinary teams are involved in discharge planning even prior to patient admission. Further, because bundled payments incorporate payments for care provided after discharge, the cost and appropriateness of discharge destinations will become an increased focus of attention. For example, when a patient may appropriately receive post-discharge care at home with visiting services, this option is now more often exercised as opposed to discharging the patient to in-patient rehabilitation.

Beyond just decreasing LOS, some centers have moved toward avoiding an in-patient stay altogether in the management of certain hip conditions. Traditionally, surgeries of the hip have required in-patient hospitalization. However there are now reports of protocols and pathways for outpatient THA in selected patients. Berger et al. originally reported on a protocol for outpatient THA [22–24]. Berger developed and implemented a comprehensive perioperative management protocol that included pre-operative teaching, the use of regional anesthesia for improved pain control, and preemptive oral analgesia and anti-emetics. In addition, a dedicated nurse clinician was on staff to manage patients and respond to clinical issues such as nausea, hypotension, and oversedation that could potentially delay discharge. With the Berger protocol, patients are evaluated post-operatively according to strict criteria which patients are required to meet prior to discharge. Criteria mandate that patients are able to independently transfer into and out of bed to a standing position; patients are also required to rise from a chair to a standing position, walk 100 ft and ascend/descend a flight of stairs. In addition to these physical tasks, patients are required to have stable vital signs, tolerate a regular diet, and have adequate pain relief with oral analgesics alone.

Currently, outpatient THA is not the standard of care in the United States; however as bundled payments continue to spread and hospital systems look for areas of cost saving, there could be increased impetus for same day or brief-stay THA. Before adopting these practices, however, more work needs to be done to investigate the clinical safety and outcomes for these expedited pathways. One prior study by Parvizi and colleagues found that most of the fatal and near fatal complications associated with lower extremity arthroplasty occur during the typical three-day in-patient stay [25]. As such the authors cautioned against early discharge. More work needs to be done to understand the subset of THA patients that can be safely discharged on the day of surgery. Further, formal cost analyses may be warranted to investigate the cost efficacy of these pathways. As Berger concedes in discussion of the same day THA pathways, cost savings from decreased hospital stay may be transferred to personnel costs for intensive pre-operative and perioperative management [23].

Another potential target area for cost containment is an emphasis on the location in which surgical care is delivered. There has been a surge in the utilization of ambulatory surgery centers (ASCs). Procedures performed in ASCs are associated with less cost than those performed in the hospital due to lower overhead, operating expenses, and personnel requirement within ASCs [26, 27]. Thus, when appropriate there will be a pressure to perform hip procedures in ASCs.

Population Health Model

Inherent in the design of ACOs and PCMHs is an orientation toward a Population Health Model (PHM). Healthcare reorganization will introduce a PHM for orthopedic surgery. In theory PHM would work by developing prevention strategies

to maintain patient health and prevent the eventual need for a surgical intervention. We briefly use hip fractures and orthopedic intervention for hip fractures as an example of PHM. In a PCMH or ACO model, the goal would be to decrease the incidence of hip fractures among a group of enrollees. Thus, as part of this program, elderly patients and those deemed to be at high risk would undergo fall risk and bone-density screenings. Orthopedic surgeons, PCPs, and payors would create screening guidelines which would then be implemented by PCPs. Multidisciplinary care pathways to prevent falls and optimize bone density among high risk patients would be developed and implemented with the goal of reducing the incidence of hip fracture and the costs associated with hip fracture surgeries.

In addition to the prevention of illness, a component of PHM inherent in healthcare organization is utilization management. As part of PHM for orthopedics, surgeons and PCPs would collaborate with payors to better understand the source of claims and major cost drivers within a group of enrollees. Together, these parties would then identify claims that can be prevented through more coordinated care. Further, orthopedic surgeons will be called on to create evidence-based clinical practice guidelines and direct the management of musculoskeletal diseases at the primary care level. Orthopedic surgeons will play a greater role in defining appropriate use criteria for diagnostic and therapeutic interventions in musculoskeletal conditions. By developing these criteria, costs can be minimized by eliminating non-value-added diagnostic and therapeutic interventions.

Early Lessons from Real World Examples of Healthcare Reorganization

Several healthcare organizations and hospital systems have redesigned their clinical care pathways in anticipation of healthcare reorganization and changes in financial incentives. Hospital systems have sought to respond to pressures for reorganization through diversification of healthcare services and/or specialization. In this section we describe the healthcare reorganization for two hospitals in California; one focusing on specialization and the other on diversification. Both models of healthcare delivery are viable in the new healthcare environment. Specialization allows hospitals to focus on a few specialized services thereby maximizing efficiency and high quality. PPACA specifically encourages specialization through bundled and episode of care payments for specific service lines. On the other hand, diversification allows for integration and a coordinated approach whereby hospitals and medical groups are able to provide the services for all aspects of a patient's health.

The Hoag Orthopedic Institute (HOI) is a specialty hospital in California that is considered a regional center of excellence. HOI provides specialized care to patients who are already seeking a joint replacement. As such the health system deals less with the pre-arthritic and progressive OA patient population that would be seen in a PHM. This focus is in part because due to the organizational capabilities

of HOI, there is no reward for engaging in chronic disease management. As such healthcare reorganization at HOI focused on improving operational efficiency to maximize the number as well as the quality of procedures done by each surgeon. The secondary goal being to minimize wait time in order to allow for a growth in referral volume. HOI was able to achieve these goals however as noted by Robinson, specialization alone may be insufficient in the current healthcare environment and may require partnership in order to respond to the pressures of inherent in healthcare reorganization [28]. Hoag has now merged with a large multi-hospital system, thereby suggesting that care coordination is integral for the reorganization of healthcare.

In contrast to a specialized healthcare system, The Kaiser Permanente organization has over seven million enrollees in California and represents a highly diversified approach to healthcare delivery. In 2011 Kaiser Irvine was faced with increased wait times for elective surgery and as a result the orthopedics department developed the "Osteoarthritis care pathway" [28]. The pathway focused on patients with intermediate severity of osteoarthritis who were not yet candidates for surgery but who needed pain management, functional assistance, and prevention of disease progression (e.g., weight loss). These functions were considered primarily non-surgical in nature and thus out of the direct domain of the orthopedic surgeon. Kaiser's reorganized diversified clinical pathway thus emphasized the role of nurse practitioners, nurses, physical therapists, and wellness coaches. The overall goal from the health system perspective being to limit the need for surgery in non-end stage arthritics by delaying disease progression, managing symptoms, and limiting the involvement of surgeons in non-surgical processes. The impact of the program was highly positive and it helped to decrease wait times, improve surgeon efficiency, and establish a standardized flow of patients through the care cycle.

These early examples suggest that there are multiple ways in which to respond to the need for healthcare reorganization for the management of hip disease. Going forward, reorganization efforts will need to be institution/health system specific with continuous collaboration and interaction of allied healthcare providers.

Conclusion

ACOs, bundled payments, and PCMHs represent a reorganization of healthcare delivery and payment in the U.S. aimed at improving quality of care and decreasing costs. Orthopedic surgeons will play an integral role in the redesign of healthcare. Specific to conditions of the hip, orthopedic surgeons will be accountable for ensuring increased access, defining appropriateness criteria for both diagnostic and therapeutic interventions, and management of hip disease across an entire spectrum of disease. More than ever before, orthopedic surgeons will be called on to collaborate with primary care physicians, payors, and allied healthcare providers to optimize the value of care we provide to our patients.

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