Increase in Healthcare Disparities
The Unintended Consequences of Value-Based Medicine, Lessons from the Total Joint Bundled Payments for Care Improvement

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The Centers for Medicare and Medicaid Services (CMS) is committed to moving healthcare reimbursement from the traditional fee for service (FFS) model to a value-based payment model. In 2015, the US Department of Health and Human Services announced a goal of providing 30% of Medicare payments through alternative payment models by the end of 2016 and 50% of such payments by the end of 2018. This goal was met by March 2016. Medicare payments through alternative payment models are likely to continue to increase. Alternative payment models include accountable care organizations (ACOs), bundled payment arrangements, advance primary care homes, and integrated care demonstrations for beneficiaries that are Medicare-Medicaid enrollees.

In value-based medicine (VBM), physicians are paid based on patient outcomes rather than the volume of services delivered. As a result, there is greater incentive to deliver cost-effective coordinated care that minimizes complications resulting in decreased costs and improved outcomes. It is crucial that orthopedic surgeons assume leadership in quality and patient safety in order to deliver the most cost-effective care. Strategies proven to improve outcomes include use of evidenced based clinical pathways and protocols, identification and modification of patient risk factors prior to surgery, utilizing high volume providers and centers of excellence, and proper patient selection (i.e., avoiding treating high risk patients). Although these are all sound strategies, they may have the unintended consequence of increasing healthcare disparities.

Value and Disparities
The exact meaning of the term “health disparities” is controversial. Disparities within the healthcare environment can range between groups including sex, race, ethnicity, and socioeconomic status. In the United States, discussion of disparities has focused primarily on socioeconomic, racial, and ethnic disparities. For example, African Americans are more likely to smoke and have obesity. Diabetes may be up to two times more prevalent in low income populations compared to wealthy populations.

Socioeconomic Status and Health
Patients of lower socioeconomic status are more likely to be tobacco users, consume alcohol, and have a lack of physical activity, all of which can put them at risk for poor health outcomes. For example, unhealthy habits such as smoking can have a significant impact on the surgical outcome of orthopedic patients. When total joint arthroplasty is considered, physicians should discuss with smokers how crucial it is to quit smoking or to cut down on the quantity of cigarettes before undergoing their surgical procedure. There is a significant inverse relationship between smoking prevalence and income across most geographical areas regardless of patient sex and age. Analysis on healthcare disparities found socioeconomic status accounts for more than 30% of healthcare disparities while race and culture each account for less than 30%.

Risk stratification is essential in predicting and improving outcomes of bundled payment patients. The process of separating patient populations into high and low risk is a key to the success of any population health management initiative. Medical clearance prior to surgery can assist risk stratifica-
tion of patients prior to undergoing surgery. When using risk stratification methodologies, physicians and hospitals may choose to refuse service to high-risk individuals resulting in disparities in patient care. However many risk stratifying techniques are flawed and do not adequately compensate for the negative financial impact of treating sicker patients.

With a greater emphasis on the quality of outcomes delivered by healthcare institutions, there is the potential for denial of care to high risk patients. Hospitals and physicians do not want to be penalized for poor patient outcomes. Patients with a larger number of comorbidities may be denied access to elective treatments as they are more likely to have worse clinical outcomes. Under the Hospital Readmissions Reduction Program (HRRP), The Centers for Medicare and Medicaid Services (CMS) reduced payments to hospitals with excess readmissions effective for discharges beginning on October 1, 2012. As a result, numerous hospitals now struggle to maintain quality standards without discriminating against high risk patients. Hospitals that disproportionately care for high-risk patients are more likely to be penalized as complications can be unavoidable in this population. These hospitals are more likely to be located in poorer areas and are utilized by patients of lower socioeconomic status. Increased financial burdens resulting from penalties further diminishes the ability of these hospitals to deliver adequate care to these predominately poorer patients. Additionally, high volume centers of excellence (HVCOEs) may be more likely to deny care to high risk poor individuals, as they are not financially viable for the institution. All of the above result in diminished access to care for patients of lower socioeconomic status.

**High Volume Centers of Excellence (HVCOEs)**

Learning theory predicts better outcomes and lower complication rates when care is provided at HVCOEs by high volume providers. Both institutions and individual providers have learning curves that require high volumes to achieve peak performance. Access to these high volume centers often requires travel over distances, which is not required when accessing local general hospitals. Poorer patients have increased difficulty accessing these HVCOEs as their access to transportation is limited when compared to patients who are more well off and can more easily afford to travel to HVCOEs. Cantazano et al. found that, in total joint arthroplasty, HVCOE volume is increasing and that these hospitals tend to have a more favorable payer mix than their lower volume counterparts. Additionally, they reported that this payer mix disparity is increasing over time. The difficulty in accessing HVCOEs by poorer patients serves to increase the healthcare disparity in this vulnerable population.

**Bundled Payments**

Bundled payments are a subset of VBM that set a fixed price for all related services during a single episode of care. They have been used extensively in orthopedic surgery and total joint replacement. In 2013, the Center for Medicare and Medicaid Innovation (CMMI) launched a voluntary bundled payment initiative, Bundled Payments for Care Improvement (BPCI). Bundled Payments for Care Improvement and more recently BPCI-A and Comprehensive Care for Joint Replacement models, are targeted for quality maintenance and care delivery at a lower cost. The most common condition that used BPCI was lower extremity joint arthroplasty since this type of procedure is easily identifiable from start to finish. The Centers for Medicare and Medicaid Services aimed to have 50% of traditional Medicare payments tied to alternative payment models, of which bundled payments became a part in 2018.

Bundled Payments for Care Improvement was initiated as a way to have a positive impact on the healthcare system. However, there is the potential for unforeseen disparities to occur. In a study by Jeong and Rosenquist, African American patients are less likely to undergo joint replacement surgery than Caucasian patients even though arthritis, work limitations, and severe pain disproportionately affect African American patients. Additional discrimination based on socioeconomic status can lead to the risk of higher costs. African American patients are more likely to live in neighborhoods with low quality skilled nursing or post-acute care, which can result in poor post-surgical outcomes.

Patients of lower socioeconomic status have poorer health outcomes that are similar to those of African American patients. The demographics of lower socioeconomic status overlaps with racial and ethnic disparities. Racial or ethnic background can be attributed to the socioeconomic differences not only in access to healthcare but also in the outcomes and rates of complications associated with surgical procedures. Patients who are among the lowest socioeconomic status have a higher probability of a longer length of stay and are more likely to be admitted to a rehabilitation facility postoperatively. These patients are more expensive and have a narrow or nonexistent margin for the treating physician. Therefore, there is potential for exclusion from care within BPCI. These patients are also more likely to return to the emergency department and be readmitted to the hospital within 90 days after surgery. Socioeconomic status has been shown to not only negatively affect surgical outcomes but is also associated with higher mortality rates in patients who end up in intensive care units post-surgery. An improvement toward access to care, such as incentivizing care for those of the lowest socioeconomic status, can help alleviate this disparity.

**Cherry Picking and Lemon Dropping**

New payment models have raised the concepts of “cherry picking” and “lemon dropping” where physicians will preferentially choose to care for the most profitable patients (cherry picking) and avoid the highest cost patients (lemon
dropping). The potential for cherry picking and lemon dropping must be considered by healthcare institutions as such practices are likely to worsen healthcare disparities. Those who are not among the educated and are of lower socioeconomic status will be less likely to receive care. When asked in a Medscape survey whether physicians would cherry pick or lemon drop patients “to avoid those with comorbid disease or those who would not follow treatment regimens,” 63% of physicians said no, 17% said yes, and another 20% said it would depend on the situation.19 The 17% and 20% of physicians who stated “yes” and “maybe” are the ones who must be targeted in order to decrease cherry picking. Cherry picking is unethical, but it is not illegal.19 This disparity can be remedied by implementing rewards for quality outcomes or creating policies within a hospital or by the government to prevent such actions from taking place. We would argue that one mechanism to such perpetuation of disparities would be to pay physicians less for the care of healthy patients and more for the care of sick patients to prevent this discrepancy from occurring.

Physician refusal to provide elective care to a patient based on their race, gender, sexual orientation, or religion is clearly unethical. However, physicians are not ethically obliged to provide the same care to every patient. A patient may require an elective knee replacement surgery, but if they are a smoker who is unable to quit or they are obese and unable to lose weight, a physician may choose to deny treatment. It may be unethical for physicians to have cut offs and deny treatment to specific patients, but it is likely ethical to support optimization preoperatively. Strict cutoffs for smoking or diabetic control will result in increased denial of care to African American and lower socioeconomic status patients perpetuating increased health disparities for these groups.

Conclusion

The shift from volume to value has had a positive impact on the healthcare environment in attempts to improve areas such as quality, cost, and patient safety. Yet disparities have occurred as a result and should be closely monitored. Even though new payment models were implemented to decrease cost and improve quality, it is evident that they may unknowingly lead to a worsening in healthcare disparities and greater ethical controversies. Changes in how value is perceived in relation to patient outcomes should occur so that patients of certain ethnicities or socioeconomic status are not discriminated against. A change in the design of financial incentives that favor the healthiest of patients will result in quality outcomes and should prevent patient discrimination. Without further research and investigation of healthcare disparities, patient discrimination will continue to occur.

Disclosure Statement

None of the authors have a financial or proprietary interest in the subject matter or materials discussed herein, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

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