Help, my rating looks bad! Coding comorbidities in arthroplasty

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Abstract

In medicine today, there is a trend toward increasing transparency. Higher quality and better value are being sought, and one of the methods being used is publicly reported health care outcomes. However, there is a problem that comes from our loss of anonymity. Physicians who are being individually watched have to choose between doing what is best for the patient and doing what would look good when it is publicly reported. Often this might mean choosing not to treat a particularly sick patient who is unlikely to have a good outcome. Adjusting outcomes to account for risk factors should be a way to prevent this effect, but these methods need to be studied more. The current performance measures being released are based on administrative claims data, and to date, much of that information is not properly risk adjusted. To ensure that the increasing transparency reveals an accurate picture, it is critical that the complexity of care provided by surgeons be carefully documented. Therefore, we propose accurate coding of patients’ comorbidities during hospitalization for total knee arthroplasty and total hip arthroplasty, and we have included a chart detailing our recommendations of the specific diagnostic codes that are most important.

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Introduction

The purpose of publicly reporting health care outcomes is manifold. Proponents cite that it improves quality of care by encouraging adoption of best practice and by decreasing both waste and costs. The increase in public knowledge should also encourage adoption of best practice and by decreasing both waste and costs.

Public reporting in the United States began as broad government reports on hospital mortalities and has evolved in detail, specificity, and diversity. In the 1980s the Health Care Financing Administration began releasing mortality rates for hospitals across the nation [3]. Since then, information about hospital outcomes and complications has been available through the Hospital Compare website [4]. Public reporting has become subspecialty specific, such as the 2009 National Quality Forum report on hospital-level complication rates for total knee arthroplasty (TKA) and total hip arthroplasty (THA). They found a U.S. national range of 2.2%–8.9% which was attributed to variance in quality of care and has spurred investigation into the contributing factors [5]. Subsequently, Centers for Medicare and Medicaid Services (CMS) began issuing routine hospital-specific joint replacement quality reports [6]. Furthering this evolution, the Patient Protection and Affordable Care Act includes some of the largest steps toward transparent health care to date, including mandated government reporting of physician-specific quality and performance. In 2010, the CMS launched Physician Compare [1,3]. This is a level of transparency unprecedented in medicine.

In addition to the government, insurance agencies and other private enterprises are monitoring and reporting on specific health care quality metrics. For example, in the summer of 2015 the investigative reporting organization ProPublica, New York City, NY unveiled the “Surgeon Scorecard.” Purposed as a way for prospective patients to get objective information about surgeons’ skills, they chose to analyze 8 elective surgeries (including TKA and THA). ProPublica reports on individual surgeons’ numbers of procedures performed and also complication and mortality rates compared to local and national averages. They state, “[their goal is to] identify cases where a patient died in the hospital or had to be readmitted within 30 days for a problem related to one of these elective procedures [7].”

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Problem statement

One major problem with public reporting arises when looking at what is at stake. Hospital contracts, reimbursements, patient base, reputation, and collegial interaction (just to name a few) can all be heavily affected. Thus the problem, which critics have pointed out from the beginning, is in how physicians respond to those potential effects. One way to avoid a record of bad outcomes is to carefully choose to treat only those patients with a low risk of complication. Selection bias can easily make numbers on article look good by leaving out patients with many comorbidities.

There has been some work done in New York to evaluate this effect. Since 1991, the state has been publicly disclosing risk-adjusted mortality rates for cardiac surgeons and cardiologists performing coronary artery bypass grafting and percutaneous coronary intervention (PCI), respectively. After seeing a precipitous drop in mortality, there was suspicion that not all the improvement could be accounted for by lower scoring surgeons adopting best practice [8]. A 1999 study polling, practicing New York cardiothoracic surgeons found that, of the responders, 67% anonymously admitted to refusing to treat at least one high-risk coronary artery bypass grafting patient over the past year primarily due to fear of a negative review profile [9]. In 2006, the New York State Department of Health excluded cardiogenic shock patients from the risk-adjusted mortality rates due to concern that they were not being treated. Over the next 3 years, the number of shock patients treated with PCI increased 67% and the 30-day mortality rates after PCI increased 28% [8]. One explanation for the increase in mortality is that the highest risk patients were not receiving treatment before this change.

Numerous studies have shown the importance of adjusting for comorbidities when analyzing outcomes [10-12]. Theoretically, risk adjustment should prevent the occurrence of selective care; however, this is dependent on the methods used which are not yet studied well enough nor equipped to be used for generalizations. ProPublica attempted to do this for their “surgeon scorecard” using administrative claims data purchased from CMS. They used statistical analysis to control for hospital, patient age and sex, and a health score which was generated using a modified Elixhauser comorbidity index developed by van Walraven et al. [13].

Several issues arise from this methodology. The Elixhauser system was not an index, so to develop one, weight or value had to be assigned to each comorbidity based on the statistical risk it conferred to the patient group. Elixhauser et al. [14] found that some comorbidities impacted certain patient cohorts more than others, meaning the system could predict outcomes within a sub-specialty but could not generalize across sub-specialties. The index used in ProPublica’s “health score” was developed using pooled sub-specialty data, and thus, variables known to be pertinent to arthroplasty complication rates, such as morbid obesity and uncontrolled diabetes, received either zero or negative points [15]. Ironically, this means that those patients should have as good or better of an outcome. More importantly, the use of administrative data as the input variables makes the model dependent on coding practices of physicians, which are far from standardized. For example, Elixhauser et al. found that some comorbidities (hypertension, valvular disease, hypothyroidism, obesity, and depression) appeared to decrease mortality. They hypothesized that some of the less threatening diagnoses were unlikely to be coded in a patient who had multiple serious comorbidities but were more likely to be coded in a relatively healthy patient. Thus, these variables acted as a surrogate marker for health [14]. Of note, this effect was also reflected in the results of the van Walraven study [15]. In support of this theory, we note that the Health Care Financing Administration form 1500 only allowed the use of 4 diagnoses until it was altered in February 2012. Thus, it eliminated the “less threatening” diagnoses due to lack of space. The new form, designed for the implementation of International Classification of Diseases, Tenth Revision (ICD 10) allows up to 12 diagnoses which will allow for more accurate documentation, although it is again dependent on coding practices.

Additional issues have been found with the statistical methods used by ProPublica such as control of hospital-to-hospital performance variance and measurement reliability [16]. So while the aim of publicly reported surgical outcomes may have merits, the current methodology and practical implications are problematic and biased at best. In light of these practical problems, the ultimate problem of selective care remains. That which is in the best interest of the patient is pitted against the surgeon’s need to maintain “good” public numbers.

Proposed solution

Improving the current models being used requires a strong effort on the part of physicians, and multiple avenues need to be pursued. In order for public reporting to be fair and representative, it is critical that the appropriate risk factors be incorporated into the risk adjustment algorithms. If administrative data are to be used as part of the metric, then we need to improve documentation practices. More thorough and accurate coding will improve outcomes reported through the current risk adjustment models. An algorithm cannot adjust for risk factors if the appropriate ICD 10 codes are not entered as secondary diagnoses, and more specifically, they cannot be entered by coders unless they are specifically mentioned in the note. This will lay the groundwork for building a better overall model. Unfortunately unless we are careful, more coding or “upcoding” can become a double edged sword. It is not enough to simply add more secondary diagnostic codes; we must be accurate and consistent. For example, a perusal of data from the Healthgrades Mortality and Complications Outcomes 2015 article reveals that “dehydration” portends a worse outcome than “end-stage renal disease” [17]. We theorize that the root cause of this may have been postoperative episodes of acute renal failure being less accurately coded as “dehydration”. In another example, “acute posthemorrhagic anemia” could often be applied to arthroplasty patients which may, initially, boost hospital reimbursements. However, after data review, patients may eventually be diverted away from the hospital and surgeon who always has “acute posthemorrhagic anemia” after arthroplasty. Therefore, we must be stringent in how we choose to code, and a strong argument stands for physician involvement in hospital coding to fuel future efforts to change the index variables.

In addition to more accurate coding, we need to incorporate more data into the model than is provided through diagnostic codes. One important lesson to be learned from the New York state cardiac outcomes reporting is that the addition of clinical data from collection registries statistically improves the accuracy and reliability of risk adjustment models [18]. Registries provide a means of incorporating more quantitative and objective information (such as severity of arthritis in operative and nonoperative joints and pre-operative physical function score) than is possible using administrative data. The American Association of Hip and Knee Surgeons (AAHKS) Risk Adjustment Task Force has been working with CMS and the Yale-New Haven Health Services Corporation Center for Outcomes Research and Evaluation group to use the Functional and Outcomes Research for Comparative Effectiveness in Total Joint Replacement registry to improve current risk adjustment models. Combining information from registries such as this and The American Joint Replacement Registry with administrative data will create a more complete and accurate picture of risk and outcomes [19].
Future directions and long-term focus

Once there is a stronger foundation of information, individual risk factors need to be tested to determine which ones affect the risk adjustment model. Although, in the example of ProPublica, only some of the variables known to carry risk in arthroplasty are included, it is critical to code a patient’s comorbidities as accurately and completely as possible to allow for future efforts to improve it. For example, the AAHKS has already tested smoking and obesity, and these significantly improved the model [19].

It is also important to discuss how quality of care is measured in elective procedures. CMS and ProPublica have both chosen to report on complication and mortality. However, for arthroplasty there may be as much or more benefit to report something related to physical function. For example, a patient with an optimal outcome after knee arthroplasty who was readmitted to the hospital 4 weeks after surgery with a bladder infection would give the surgeon a poor mark. Thus, the measures for quality in orthopaedic surgery are often not well defined. However, in a recent summit, convened by the AAHKS, several groups met to discuss and delineate what performance measures and patient-reported outcomes measures are most suitable [20].

Recommendations

Based on all of this, the most immediate step that we are recommending is the consistent use of specific diagnostic codes for secondary diagnoses during hospitalization for THA and TKA. We understand that meticulously documenting and coding patients’ comorbidities adds another layer of burden to the preoperative history and physical, but it is critical in order for orthopaedists to be judged fairly and maintain access for patients. Based on the work of the AAHKS and Yale group, we are requesting that you pay particular attention to 11 specific clinical risk factors. Some of these will affect the algorithm now and immediately be reflected in the public numbers, and some of them are for future testing and incorporation into a new model. We have chosen the specific ICD 10 Clinical Modification codes which we believe are most appropriate for these risk factors. When appropriate, we request mentioning these comorbidity codes/secondary diagnoses in your notes (office and hospital) and entering them on your CMS-1500 form.

A 2008 report showed that 14% of Americans surveyed used publicly reported health care data [21]. Regardless of the merits or detriments of public outcomes reporting, it is here to stay for the foreseeable future. With the advent of ICD 10 Clinical Modification, the whole health care system is in a state of adjustment which makes now the opportune time to act. If medicine is moving in the direction of a transparent consumer model, it is critical that physicians take up an active role in refining that model.

Eleven comorbidities are currently known to most impact total hip and total knee arthroplasty outcomes. Based on the work of the AAHKS and the Yale-New Haven Health Services Corporation Center for Outcomes Research and Evaluation group, we recommend that, when applicable, each comorbidity is documented as a secondary diagnosis during joint replacement hospitalization (Table 1).

| Clinical risk factor | Preferred ICD 10 CM | Laterality | Descriptor | Alternatives |
|----------------------|---------------------|-----------|------------|--------------|
| Morbid obesity BMI >40 (body mass index) | E66.01 | Right hip | Morbid (severe) obesity due to excess calories | E66.09, Z68.43 |
| Smoking | Z72.0 | Right hip | Tobacco use | E66.9, Z68.44 |
| Chronic anticoagulant use | Z79.01 | Right hip | Long-term (current) drug therapy: use of anticoagulants | Z68.41, Z68.45 |
| Chronic narcotic use | Z79.891 | Right hip | Long-term (current) drug therapy: use of opiate analgesics | Z68.42, F17.210 |
| Workmen’s compensation case | Z95.9 | Right hip | Problems related to employment: unspecified | 256.89 |
| Previous intra-articular infection | M12.851 | Right hip | Other specific arthroplathies, not elsewhere classified, hip | |
| | M12.852 | Right knee | Other specific arthroplathies, not elsewhere classified, knee | |
| | M12.861 | Left hip | Sequelae of unspecified infectious and parasitic disease | B94.8 |
| | M12.862 | Left knee | Unilateral osteoarthrosis resulting from hip dysplasia | |
| Congenital hip deformity | B94.9 | Right hip | Sequelae of unspecified infectious and parasitic disease | B94.8 |
| | M16.31 | Right hip | Other specified acquired deformities of lower leg | M21.061, M21.162 |
| | M21.861 | Right knee | Other specified acquired deformities of lower leg | M21.062, M21.261 |
| Angular knee deformity >15 degrees | M16.32 | Right knee | Other specified acquired deformities of lower leg | M21.161, M21.262 |
| Previous ORIF hip (Open reduction, internal fixation) | M16.51 | Right hip | Osteoarthrosis: unilateral post-traumatic osteoarthrosis of hip | |
| | M16.52 | Right hip | Osteoarthrosis: unilateral post-traumatic osteoarthrosis of knee | |
| Previous ORIF knee (Open reduction, internal fixation) | M17.31 | Left hip | Osteoarthrosis: unilateral post-traumatic osteoarthrosis of knee | |
| Depression/psychiatric disease | M17.32 | Left knee | Nonpsychotic mental disorders, unspecified | F39, F41f |
| | F48.9 | Right knee | Nonpsychotic mental disorders, unspecified | F31f, F43.1f |
| | | Right knee | Psychotic mental disorders, unspecified | F33f, F41f |
| | | Right knee | Opioid use, consumption, or dependence | F34f, F48.8 |
| | | Right knee | Opioid use, consumption, or dependence | F34f, F41.9 |
| | | Right knee | Opioid use, consumption, or dependence | F40f |

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