PERSPECTIVE

Quantity Over Quality: How the Rise in Quality Measures is Not Producing Quality Results

Michele L. Esposito, MD, Harry P. Selker, MD, MSPH, and Deeb N. Salem, MD

Department of Medicine, Tufts Medical Center, Boston, MA, USA.

Over the past decade, quality measures (QMs) have been implemented nationally in order to establish standards aimed at improving the quality of care. With the expansion of their role in the Affordable Care Act and pay-for-performance, QMs have had an increasingly significant impact on clinical practice. However, adverse patient outcomes have resulted from adherence to some previously promulgated performance measures. Several of these QMs with unintended consequences, including the initiation of perioperative beta-blockers in noncardiac surgery and intensive insulin therapy for critically ill patients, were instituted as QMs years before large randomized trials ultimately refuted their use. The future of quality care should emphasize the importance of evidence-based, peer-reviewed measures.

KEY WORDS: quality improvement; performance measurement; medical errors; patient safety; Medicaid.

INTRODUCTION

Over the past decade, quality measures (QMs) have assumed a crucial role in the healthcare landscape. With the advent of pay-for-performance and public reporting of hospital and physician adherence to quality guidelines, the development of safe, practical QMs is more important than ever. The Affordable Care Act (ACA) now mandates that the Centers for Medicare and Medicaid Services (CMS) increase the scope of pay-for-performance nationally. As part of this new legislation, value-based purchasing expands the role of pay-for-performance in quality improvement. Hospitals will now be offered incentive payments derived from a list of 25 different QMs.1 Yet despite advances in healthcare quality improvement practices, not all QMs have proven to be of value. This is particularly the case when new data emerge that countermand the evidence on which the QM was originally based. There are multiple QMs that have fallen short of their intended objectives or that have even led to patient harm (see Table 1). Given the potential for adverse consequences, the conversion of guidelines into performance measures should not occur without adequate high-quality evidence. In this discussion, we examine two QMs that have had widespread effects on patient care, and that may have led to increased mortality: perioperative beta-blockers and glucose control in critically ill patients. We also explore the use of patient safety indicators and reduced 30-day readmission rates, which have an increasing role in the assessment of hospital quality and compensation.

PERIOPERATIVE BETA-BLOCKERS

Worldwide, 100 million patients undergo noncardiac surgery every year. It is estimated that 10-40% of these procedures are complicated by a major adverse cardiac event.22 First introduced into the literature in 1973, perioperative beta-blockers (PBB) were suggested as a preoperative maneuver to reduce the mortality of patients undergoing noncardiac surgery.23 However, it was not until publication of the Dutch Echocardiographic Cardiac Risk Evaluation Applying Stress Echo (DECREASE) trials that PBB became a commonly employed metric of quality.

The DECREASE I trial, published in 1999 by a team led by Dutch researcher Don Poldermans, was halted prior to completion due to a reported overwhelming survival benefit seen in the beta-blocker arm.24 After the results of DECREASE I were reported, the Agency for Healthcare Research and Quality (AHRQ) identified PBB as one of the “clear opportunities for safety improvement;” the National Quality Forum put PBB on its list of 30 Safe Practices for Better Healthcare; and the Physician Consortium and the Surgical Care Improvement Project designated PBB as a QM.25 Poldermans continued to publish new data as part of the DECREASE trials, notably DECREASE IV , which demonstrated an additional survival benefit with the use of PBB in intermediate-risk patients.26 In 2008, the results of POISE, the largest randomized controlled trial (RCT) to have been reported at that time, with over 8,000 participants, found a significant increase in mortality among patients randomized to beta-blockers versus placebo.2 Despite these new data, both the European Society of Cardiology (ESC) and the American College of Cardiology Foundation/American Heart Association (ACCF/AHA) joint guidelines continued to recommend PBB, with the ESC citing it as a class I recommendation.27

In September 2012, the Netherlands-based Erasmus Medical Center released the final report of an investigation of suspected research misconduct in the DECREASE trials.28
After thorough examination, the committee concluded that there were multiple instances of scientific misconduct represented in the collection, analysis, and representation of source data.

Subsequent to this announcement, a meta-analysis published in 2013 with consolidated outcomes of over 10,000 randomized participants showed that initiation of PBB before surgery caused a significant increase in mortality, whereas the DECREASE data had shown a non-significant reduction in mortality. It was only after additional RCTs had countered the results of DECREASE that, in 2014, the ESC guidelines recommended against the initiation of PBB for patients undergoing low- to intermediate-risk noncardiac surgery.

GLUCOSE CONTROL IN CRITICALLY ILL PATIENTS

Stress-induced hyperglycemia is a known complication among critically ill patients. Multiple studies have shown hyperglycemia to be linked to increased mortality in both diabetic and non-diabetic cohorts. An initial trial in the surgical intensive care unit showed a mortality benefit with intensive insulin therapy (IIT). Based on this RCT in surgical patients, strict glucose control was recommended as a QM in the Surgical Care Improvement Program. Citing grade A evidence, the American Association of Clinical Endocrinologists and the American Diabetes Association issued recommendations in 2007 and 2008, respectively, advising tight glucose control in the critically ill population. Thus, although originally recommended for surgical patients in intensive care, the QM also began to be used among patients in non-surgical intensive care units. In 2009, the NICE-SUGAR trial, which enrolled both surgical and non-surgical patients, showed increased rather than decreased mortality rates and more frequent hypoglycemic episodes with intensive glucose control at 90 days. A meta-analysis published in 2011 showed no clear mortality benefit with IIT; once again, IIT was associated with increased risk of hypoglycemia. That same year, the American College of Physicians released guidelines stating that IIT should not be used in critically ill patients, either with or without diabetes.

PATIENT SAFETY INDICATORS

Patient safety indicators (PSIs) were released by AHRQ in March 2003 to identify post-surgical or post-procedural complications of inpatient care using billing information as a screening mechanism. PSIs are playing a greater role in QMs, as U.S. News recently announced that patient safety will be a more heavily weighted score in its Best Hospitals ranking system. Of the 17 total PSIs, eight comprise 10% of the overall score in the new algorithm for this popular ranking system, double the 5% contribution to the score the previous year.

The current list of PSIs is extensive, including complications such as iatrogenic pneumothorax, postoperative sepsis, and postoperative hemorrhage or hematoma. However, a 2008 study by Isaac and Jha found largely poor or inverse correlations between several PSIs and other hospital quality standards. These PSIs were poorly correlated with other process metrics and in-hospital mortality. Multiple other studies have investigated various PSIs. One looked at the validity of 12 different PSIs and found moderate positive predictive values for most of the quality indicators in detecting true safety events, concluding that these indicators required revision before their use as pay-for-performance measures. Similar conclusions were formed in several other studies validating PSIs for postoperative pulmonary embolus and VTE, iatrogenic pneumothorax, accidental puncture and laceration, central venous catheter-related bloodstream infections, and postoperative respiratory failure. Despite the lack of meaningful correlation between these PSIs and other process-of-care metrics, at this writing, they continue to have a role in hospital compensation and public reporting.

THIRTY-DAY READMISSIONS

On October 1, 2012, CMS began penalizing hospitals for higher readmission rates for heart failure, acute myocardial infarction, and pneumonia as part of the Hospital Readmissions Reduction Program (HRRP). Of note, about 25% of all patients discharged after admission for heart failure are readmitted within this 30-day bracket. However, it is unclear...
whether the factors that influence hospital readmission rates are inherently beyond their control. A study by Joynt and Jha found that many of these factors were related to characteristics of the patient population and their community resources, such as poverty, mental illness, social support, and good access to care, yet no specific targets for improvement were found that would be successful in preventing future readmissions. In an Ontario study, investigators found that less than one-fifth of readmissions within 6 months were actually preventable. Based on the pattern of reimbursement cuts, one study has shown that large teaching hospitals and safety-net hospitals are most likely to be penalized, suggesting that higher readmission rates might be due to lower socioeconomic status and greater case complexity.

Currently the scope of HRRP is increasing. For the next fiscal year, CMS has expanded its list of diagnoses that will incur a readmission penalty to include acute myocardial infarction, heart failure, pneumonia, chronic obstructive pulmonary disease, and total hip or knee arthroplasty; in addition, the maximum Medicare reimbursement reduction will increase from 2% to 3%. "In the future, the HRRP will be expanded to include all procedures performed in acute care hospitals, which is a major step forward," said Robert Smith, a senior health care economist at the University of Michigan. "This will provide a more comprehensive measure of hospital performance and help to identify areas for improvement."
12. Consumer Reports. Available at: http://www.consumerreports.org/health/doctors-hospitals/hospital-ratings.htm. Accessed February 20, 2015.
13. Joynt KE, Jha AK. Thirty-day readmissions: truth and consequences. N Engl J Med. 2012;366(15):1366-1369.
14. Van Walraven C, Jennings A, Taljaard M, et al. Incidence of potentially avoidable urgent readmissions and their relation to all-cause urgent readmissions. CMAJ. 2011;183:E1067-E1072.
15. Bilimoria KY, Chung J, Ju MH, et al. Evaluation of surveillance bias and the validity of the venous thromboembolism Quality Measure. JAMA. 2013;310(14):1482-1489.
16. Meddings JA, Reichert H, Hofer T, McMahon LF Jr. Hospital report cards for hospital-acquired pressure ulcers: how good are the grades? Ann Intern Med. 2013;159(8):505-513.
17. Isaac T, Jha AK. Are patient safety indicators related to widely used measures of hospital quality? J Gen Intern Med. 2008;23:1373-1378.
18. Rosen AK, Itani KM, Cevasco M, et al. Validating the patient safety indicators in the Veterans Health Administration: do they accurately identify true safety events? Med Care. 2012;50(1):74-85.
19. Kasfarani HM, Borsecki AM, Itani KM, et al. Validity of selected patient safety indicators: opportunities and concerns. J Am Coll Surg. 2011;212(8):924-934.
20. Cevasco M, Borsecki AM, O’Brien WJ, et al. Validity of the AHRQ Patient Safety Indicator “Central Venous Catheter-Related Bloodstream Infections.” J Am Coll Surg. 2011;212:984-990.
21. Borsecki AM, Kasfarani HM, Utter GH, et al. How valid is the AHRQ Patient Safety Indicator “Postoperative Respiratory Failure”? J Am Coll Surg. 2011;212:935-945.
22. Flynn BC, Wernick WJ, Ellis JE. Beta-blockade in the perioperative management of the patient with cardiac disease undergoing non-cardiac surgery. Br J Anaesth. 2011;107(1):3-145.
23. Prys-Roberts C, Foex P, Biro GP, Roberts JG. Studies of anesthesia in relation to hypertension v. adrenergic beta receptor blockade. Br J Anaesth. 1973;45:67-81.
24. Poldermans D, Boersma E, Bax JJ, et al. The effect of bisoprolol on perioperative mortality and myocardial infarction in high-risk patients undergoing vascular surgery. Dutch Echocardiographic Cardiac Risk Evaluation Applying Stress Echocardiography Study Group. N Engl J Med. 1999;341:1789-1794.
25. Lindenauer PK, Pekow P, Wang K, Mamidi DK, Gutierrez B, Benjamin EM. Perioperative Beta-Blocker Therapy and Mortality after Major Noncardiac Surgery. N Engl J Med. 2005;353:349-361.
26. Poldermans D, Schouten O, Bax J, Winkel TA. Reducing cardiac risk in non-cardiac surgery: evidence from the DECREASE studies. Eur Heart J Suppl. 2009;11:AS9-A14.
27. Sear JW, Foex P. Recommendations on perioperative beta-blockers: differing guidelines: so what should the clinician do? Br J Anaesth. 2010;104:273-278.
28. Erasmus Medical Center Follow-up Investigation Committee. Report on the 2012 follow-up investigation of possible breaches of academic integrity. Available at: http://www.erasmusmc.nl/3663/135857/3675250/3706796/integrity_report_2012-10.pdf?lang=en&lang=en. Accessed February 20, 2015.
29. Bouri S, Shun-Shin MJ, Cole GD, Mayet J, Francis DP. Meta-analysis of secure randomised controlled trials of beta-blockade to prevent perioperative death in non-cardiac surgery. Heart. 2013;1:9.
30. Kristensen SD, Knutsø J, Saraste A, et al. 2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management. Eur Heart J. 2014;35:2383-2431.
31. Van den Berghe G, Wouters P, Weekers F, et al. Intensive insulin therapy in critically ill patients. N Engl J Med. 2001;345:1359-1367.
32. The Joint Commission. Surgical care improvement project core measure set. Available at: http://www.jointcommission.org/assets/1/6/SurgicalCare%20Improvement%20Project.pdf. Accessed February 20, 2015.
33. American Diabetes Association. Standards of medical care in diabetes-2008. Diabetes Care. 2008;31(Suppl 1):S12-S54.
34. Rodbard HW, Blonde L, et al. American association of clinical endocrinologists medical guidelines for clinical practice for the management of diabetes mellitus. Endocr Pract. 2007;13(Suppl 1):1-68.
35. Quseem A, Humphrey LL, Chou R, Snow V, Shekelle P. Use of Intensive Insulin Therapy for the Management of Glycemic Control in Hospitalized Patients: A Clinical Practice Guideline From the American College of Physicians. Ann Intern Med. 2011;154(4):260-267.
36. Harder B. US News hospital rankings to double role of patient safety, cut back reputation. Available at: http://health.usnews.com/health-news/blogs/second-opinion/2014/01/11/us-news-hospital-rankings-to-boost-role-of-patient-safety-cut-back-reputation. Accessed February 20, 2015.
37. Vaduganathan M, et al. Thirty-day readmissions: the clock is ticking. JAMA. 2013;309(4):345-346.
38. Joynt KE, Jha AK. Characteristics of hospitals receiving penalties under the Hospital Readmissions Reduction Program. JAMA. 2013;309(4):342-343.
39. Centers for Medicare and Medicaid Services. Readmissions Reduction Program. Available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html. Accessed February 20, 2015.
40. Neuman MD, Goldstein JN, Cirillo MA, et al. Durability of class I American College of Cardiology/American Heart Association clinical practice guideline recommendations. JAMA. 2014;311(29):2992-2900.
41. Selker HP. Criteria for adoption in practice of medical practice guidelines. Am J Cardiol. 1993;71:339-341.
42. National Quality Forum. NQF Statement on Department of Justice Settlement. Available at: http://www.qualityforum.org/News_And_Resources/Press_Releases/2014/NQF_Statement_on_Department_of_Justice_Settlement.aspx. Accessed February 20, 2015.