Challenges in Outcome Reporting

Avery Tung, MD

KEYWORDS

• Outcome reporting • Risk adjustment • Quality improvement

KEY POINTS

- Challenges with outcome reporting include definition, measurement, and risk adjustment.
- Outcome reporting programs may have unintended consequences, including clinician reluctance to care for high-risk patients.
- Neither effective risk adjustment nor precise measurement is needed to improve care.

INTRODUCTION

Since the publication of the 1999 Institute of Medicine's report on medical error,[1] organized medicine has struggled to apply quality improvement principles from nonmedical domains to patient care. Among these principles are a belief that variability in the delivery of care must represent unwarranted deviation from optimal care, that physicians should change behavior to minimize such deviation, and that comparing physicians based on process or outcome ultimately results in better care.

Although such principles sound plausible, their real world performance is surprisingly uneven. Almost 30 years ago, Donabedian[2] first published his taxonomy of quality measurement,[2] categorizing medical quality as either structure, process, or outcome based. As examples, structural aspects of quality might include nurse/patient ratios, presence of rapid response teams, and/or specialized intensive care unit (ICU) staffing. Process-related quality involves technical aspects of clinical care: how often beta-blockers are given, whether glucose levels are kept within specific boundaries, or whether formal handoffs between providers are performed. Outcome-related quality involves measurement of the result of medical care and includes the incidence of end points, such as renal failure, reintubation, or surgical site infections.

Although remembered today as a strong advocate for medical quality improvement, Donabedian[2] expressed considerable skepticism in his landmark article regarding

Disclosures: This article was not supported by any external funding sources. Dr A. Tung receives a salary as executive editor for *Critical Care and Resuscitation*, *Anesthesia & Analgesia*.
Department of Anesthesia and Critical Care, University of Chicago, 5841 South Maryland Avenue MC 4028, Chicago, IL 60637, USA
E-mail address: atung@dacc.uchicago.edu

Anesthesiology Clin 36 (2018) 191–199
https://doi.org/10.1016/j.anclin.2018.01.004
anesthesiology.theclinics.com

how well his 3 categories of quality mapped to true quality of care. Donabedian[2] described the relationship between structural aspects of medical care and the process of care as "rather weak," observed that our knowledge regarding the relationship between technical care and outcome is of dubious quality and that assessments of the quality of technical care may vary, and doubted strongly that "direct assessment of the outcome of care can free us from imperfections of clinical science."[2]

The recently concluded 8-year experiment in surgical process measurement, the infamous Surgical Care Improvement Project (SCIP) program, suggests that although process measurement clearly improves adherence to the measured processes, outcomes may not improve. Despite targeted processes being evidence based, no perioperative SCIP measure has to date consistently improved its associated outcome. This finding is even true for interventions with extensive pre-SCIP literature support, such as subcutaneous heparin for deep venous thrombosis prophylaxis.[3] In light of such poor efficacy, and the quiet retirement of the SCIP program in January 2015, policymakers have worried that the forced measurement and reporting of process measures may not be the most effective use of limited quality resources.

The realization that process improvement may not lead to outcome improvement also suggests that an alternate strategy of measuring outcomes may be more effective. Conceptually, outcome measurement may improve quality by 2 mechanisms. The first is that outcome measurement forces physicians to examine their outcomes and in doing so helps them to identify potential quality issues. The second is that outcome measurement identifies physicians or practices with particularly good outcomes. By studying practices with good outcomes, physicians can then incrementally move toward better processes and (it is hoped) better outcomes.

Unfortunately, outcome reporting introduces its own set of challenges. Among these are difficulties in defining an outcome, identifying appropriate benchmarks, effective risk adjustment, gaming, the importance of definition, and unintended consequences, including care for high-risk, high-acuity patients. This article briefly describes these challenges and suggests strategies for effectively harnessing outcome reporting for improving anesthesia quality.

WHAT IS AN OUTCOME AND WHAT IS A GOOD OUTCOME?

Unlike process measures, which are easily described, outcomes can often be surprisingly difficult to define and measure. For example, 3 popular definitions of acute kidney injury (AKI) exist: the National Surgical Improvement Project (NSQIP), Acute Kidney Injury Network (AKIN), and Risk Injury and Failure and Loss and End stage kidney disease (RIFLE) criteria. The NSQIP definition is triggered when serum creatinine exceeds 2 mmol/dL or when dialysis is initiated, whereas the AKIN and RIFLE criteria are not based on dialysis, involve urine output metrics, and include relative increases in creatinine from baseline.[4] It is easy to see, and studies have demonstrated,[5] that the more rigorous NSQIP criteria underestimate the incidence of milder forms of AKI.

Other clinically relevant outcomes, such as stroke, are similarly troublesome. The Society for Neuroscience in Anesthesiology and Critical Care defines stroke as a brain infarction of ischemic or hemorrhagic cause that occurs during or within 30 days of surgery.[6] Although this definition is straightforward, if a focal deficit is clearly expressed and a corresponding brain lesion is visible on imaging, or if the computed tomography scan is negative, or the symptoms are not clearly focal, or patients recovers partial or full function within 2 or 3 weeks, then should the condition really be declared a stroke? Such judgments can require a disturbing level of subjectivity.