

REVIEW ARTICLE

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Defining Quality Markers for Cardiac Anesthesia: What, Why, How, Where to, and Who's on Board?

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BACKGROUND

The concept of measuring the quality of care is a good one if it can be linked to better patient outcomes, improved system performance, and increased value. Consideration for developing quality metrics specific to cardiac anesthesia care can be framed with a series of general quality-related questions: *What* is quality? *Why* should it be measured? *What* evidence-based metric should be used, and *How* should it be measured? *Where* is quality measurement headed and *Who's* on board and who's not? Moving forward as healthcare increasingly transitions to value-based care models, special consideration should be given to the concept of cardiac team-based quality metrics.

WHAT IS QUALITY?

What is quality as it relates to the delivery of healthcare? Avedis Donabedian noted, "The assessment of quality must rest on a conceptual and operationalized definition of what the quality of medical care means. Many problems are present at this fundamental level, for the quality of care is a remarkably difficult notion to define."¹

In 1966, Donabedian described a classic approach to evaluating quality of care delivered in the medical setting. His assessment provided a structured framework that is comprehensive, inclusive, and applicable to a contemporary assessment of quality of medical care delivered. Three dimensions of quality assessment include outcomes, processes, and structure, as shown in Table 1. Outcomes of medical care such as mortality, patient satisfaction, and health-related quality of life are dimensions of quality that are straightforward, easily measured, and, in general, valid. While patient satisfaction and health-related quality of life were described originally as more difficult to measure aspects of outcomes, today with validated instruments, these metrics have become a standard for quality outcome measurement.¹

Processes of care as they relate to the assessment of quality of care delivered refer to whether appropriate medical care is delivered at the point of care (ie, "Was medicine properly practiced?"). Compliance with core measures, application of evidence-based guidelines, and appropriate use of procedural or

surgical interventions are examples of processes of care that may be used to evaluate quality of medical care provided. The last approach to assessing quality is structure (ie, the specific setting where medical care is delivered). This quality assessment includes metrics such as certification status of a hospital, adequacy of facilities, and administrative processes that support the delivery of medical care.¹ Additional classifications for quality indicators include data type and usage (ie, benchmarking or risk assessment)² as well as classification according to aspects of care, dimensions of quality, and domains to which they apply.³ See Table 2.

WHY MEASURE QUALITY?

The purposes of measuring quality are to improve patient healthcare outcomes, to improve system performance, and, ultimately, to add value. Understanding the value of quality is important because the Centers for Medicare and Medicaid Services are increasingly linking Medicare fee-for-service payments to value of care delivered.⁴

Patients have access to consumer-oriented websites, such as Hospital Compare, to make informed healthcare decisions and hospitals have financial incentives to meet quality-of-care goals.⁵ Hospital-based physicians have become familiar with the performance-based metrics from the National Quality Forum, Joint Commission, and National Hospital Inpatient Quality Measures. Examples of core measure sets include use of aspirin on arrival and beta-blockers at discharge for patients who are admitted to the hospital with a diagnosis of acute myocardial infarction. The perioperative setting has the

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Table 1. Aspects of Quality of Medical Care Delivered¹

Aspect	Examples
Outcomes of medical care	Postoperative mortality
	Health-related quality of life
	Patient satisfaction
Processes of medical care	Appropriate medical care delivered
	Clinical evidence-based guidelines applied to patient care
	Contemporary core measures followed
Structure	Administrative and related processes that support care delivery
	Proper facilities and adequate equipment
	Physician qualifications/certifications and that of their organization

Surgical Care Improvement Project core measures set, which includes metrics such as the appropriate selection and timing of antibiotic administration, as well as antibiotic discontinuation postoperatively.⁶

Cardiac anesthesiologists are aware of the Society of Thoracic Surgery (STS) quality performance metrics for adult cardiac surgery, general thoracic surgery, and congenital heart surgery. The STS metrics follow the outcome, process, and structure framework as described by Donabedian. Examples of STS outcome measures include postoperative mortality, prolonged ventilatory support, and renal failure; process measures include factors such as whether an internal thoracic artery was used in the setting of coronary artery bypass grafting; and structure measures include whether the center participated in a database for cardiac surgery.⁷

While a goal for quality measurement is to improve outcomes, the direct linkage of processes and structure to outcomes of care may not always be straightforward and, at times, is difficult to consistently demonstrate.⁸ A recent study by Stefan and colleagues examined a series of hospital process-of-care performance core measure sets, such as whether aspirin was administered on admission for an acute myocardial infarction, Surgical Care Improvement Project measure compliance, and more, to the outcome of 30-day readmission rates. They were unable to link compliance with processes-of-care core sets to reductions in 30-day readmission rates.⁹

To address shortcomings associated with the evaluation of current quality metrics as well as those under development, Chassin and colleagues recommended quality metrics be focused primarily on maximizing health benefits to patients.

Table 2. Classification of Indicators of Quality³

Classification	Description
Aspects of care provision	Outcomes, process, structure
Dimensions of quality	Safety, effectiveness, efficiency, timeliness, patient-centered, care coordination, care equity
Domains of application	Hospital-wide, surgical or nonsurgical, service lines, departments

To this end, they proposed criteria to evaluate whether quality metrics maximized benefits to patients¹⁰:

1. Quality metrics should have a scientific basis to demonstrate the process is linked to improved outcomes.
2. Metrics should be able to demonstrate delivery of evidenced-based care.
3. The process should be closely linked to outcome.

WHAT SHOULD BE MEASURED?

Good quality indicators are valid, reliable, accurate, and have a solid evidence base. Availability of data should not drive the choice for a quality measurement, and the burden of obtaining data (ie, cost and feasibility of collecting data) should be taken into consideration. Furthermore, there should be some linkage between quality measurement and an opportunity to change practice, improve system performance, and/or improve patient outcome. Finally, results should be understood easily by end-users such as healthcare consumers and payers.^{8,10,11} See Table 3.

When considering a new metric, attention should be given to outcome, process, and framework. There are advantages and disadvantages associated with the use of process and outcome metrics to evaluate quality of care. Outcomes measures are important because they allow determination as to whether specific systems actually are achieving their specified outcomes. However, use of a quality outcome measure often is hampered by the need for large sample sizes, especially in cases in which the outcome events are rare or procedures are performed infrequently.^{8,12}

Consideration should be given to aligning quality metrics with the National Quality Strategy's 3 aims of "Better Care, Healthy People/Healthy Communities, and Affordable Care" and the 6 priorities to advance these aims: patient and family-centered care; safety; partnering with patients and their families; communication and care coordination; affordable care; health and well-being.¹³

While the adage "We cannot manage what we do not measure" is an important concept in quality improvement, measurement in and of itself is not sufficient to effect change. Berwick and colleagues noted that it is analogous to the simple act of measuring one's golf score, which does not make one a better golfer. The linkage between measurement and actual improvement is critical and necessitates the engagement and capability of organizational leadership as well as the knowledge and motivation of healthcare professionals to drive change.¹⁴

Table 3. Factors To Consider When Developing Quality Indicators¹¹

Factor	Definition
Importance	Relevant to large number of patients
	Involves high-risk conditions
	Offers an opportunity for improvement
Scientifically acceptable	Reliable and valid
Feasibility	Not burdensome to obtain
Usability	Results easy to understand by end-users (payers, consumers of healthcare)

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