



Perspectives

Quality measures in allergy, asthma, and immunology

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Introduction

The Hippocratic Oath, emphasizing sacred principles of caring for our patients with professionalism and compassion, is considered the moral compass guiding health care provision. More recently, however, the regulation of health care quality has become the prerogative of federal and other agencies rather than the individual health care professional. The US health care system is currently in transition from a volume-based (ie, fee for service) to a value-based system.¹ The shift to value-based health care is intended to incentivize high-quality care while reducing costs. The transition to value-based reimbursement is being advanced by the development and reporting of quality measures, which is the focus of this Perspective article.

Quality Measures

Quality measures assess the quality of care provided in relation to evidence-based standards.² In 1966, physician and researcher Avedis Donabedian first described the *structure-process-outcome* model, the foundation for modern health care quality measurement³: good *structure* of a health care facility leads to improved *processes*, which in turn lead to superior patient *outcomes*. To paraphrase Dr Donabedian, for patients with persistent asthma under your care, *outcomes* are what happens to each of them as a result of the care you provide. The proportion of your patients hospitalized for asthma is an *outcomes measure*. Because this clinical end point occurs infrequently, appropriateness of your care can be assessed more reliably by determining whether diagnostic and therapeutic interventions associated with desired outcomes were performed. These are *process measures*. For instance, favorable outcomes of asthma care have been linked with practice behaviors, such as performance of spirometry and prescription of a controller

medication. These process-outcomes links have been established based on best evidence—typically, a randomized, placebo-controlled trial evaluating a process of care, such as prescription of a controller medication, and its effect on rates of exacerbation during 1 year.⁴

Clinical quality measures can be categorized into 5 domains: measures of structure assess the capacity, whereas measures of process, access, outcome, and patient experience assess the quality of care provided by health care professionals and organizations¹ (Table 1).

Applications and Properties of Quality Measures

The identification of aims and intended uses is the first step in applying quality measures in practice. In general, the chief purposes of quality measures are (1) quality improvement, (2) accountability, and (3) research. Key conceptual attributes of quality improvement measures are importance, scientific soundness, and feasibility. The validity of a clinical quality measure and how well it captures the purpose chosen by the user may be addressed by the answers to the 6 key questions listed in Table 2.⁵

Improvement in health care outcomes is a sine qua non for the application of quality measures.¹ The quality improvement process is often iterative, warranting repetitive measurements over time. The first measurement can identify problems and establish a baseline. Subsequent measurements enable determination of the effect of quality improvement efforts and facilitate monitoring and sustaining improvement. These quality improvement efforts can be internal (within institutions or systems of care) or external (across institutions or systems of care).

Other Applications of Quality Measures

Quality measures are also used for accountability, including purchaser and consumer decision making, variation in payment in relation to the level of performance, and certification of professionals or organizations. The primary interest of those using accountability data is to guide selection of health care professionals, set financial rewards to health care professionals for

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Table 1
Clinical quality measures: glossary of terms^{2,5}

Term	Description
Structural measures	Pertain to features of health care organizations or clinicians related to the capacity to provide high-quality health care, such as improvement of health information technology by implementing computer systems and electronic medical record software to encourage lower rates of medication errors.
Process measures	Address proper delivery of health care–related activities that lead to improved outcomes, such as prescribing controller medication (eg, inhaled corticosteroids) for persistent asthma or tobacco cessation counseling. These measures are generally calculated using patients eligible for a particular service in the denominator and the patients who receive the recommended service in the numerator.
Access measures	Assess attainment of timely, affordable, and culturally appropriate health care. Optimal access implies needed care is obtained in a timely fashion and that care received reflects appropriate use of health care services.
Outcome measures	Evaluate the health state of patients resulting from the impact of one or more clinical interventions. There are other factors besides quality of care that may affect outcomes. For instance, rates of asthma hospitalization and emergency department visits vary according to socioeconomic status and race/ethnicity; for this reason, to be fair and accurate, a measure frequently includes provisions for risk adjustment.
Patient experience measures	Refer to a patient's satisfaction with the health care he/she received, such as the percentage of adults admitted for asthma reporting their physicians communicated well. The latter, although ostensibly appearing to be intuitive and a simple measure of performance, is frequently viewed as controversial in that patient satisfaction surveys may not accurately reflect quality of care.
Importance	The potential of the measure to lead to a desired health care outcome, its promise for high impact, and whether it is associated with a performance gap. The latter consideration is an evaluation of evidence demonstrating considerable variation or less than optimal performance in terms of quality of care.
Reliability and validity	When implemented, the proposed measure should generate reliable (consistent) and valid (credible) results, reflecting quality of care.
Feasibility	Any required data for the measure should be readily available or capable of being captured without undue burden (eg, data from a smart field in an electronic medical record).
Usability	The performance results are relevant for stakeholders (eg, consumers, payers, policymakers) and can be used for performance improvement, leading to more efficient and/or safe health care for individuals or populations.
Competing measures	The proposed measure is considered in the context of other measures with the same or similar measure focus and target population; measures are compared to achieve "harmonization" and selection of best measure(s).

performance, or certify that health care professionals maintain required standards.

A number of public and private entities have implemented tools designed to assist health care purchasers and consumers to make informed decisions about where to seek care. For example, the Centers for Medicare & Medicaid Services (CMS) operate the Hospital Compare website.⁶ This consumer-oriented site compares performance measure information using voluntarily reported hospital data.

In recent years, many public and private payers have implemented programs that adjust payments to health care professionals or institutions based on the submission of performance data (pay for reporting) or on measured performance (pay for performance [P4P]).^{1,7,8} The P4P programs may award bonus payments to health

care professionals in addition to scheduled fees, if those health care professionals meet defined performance benchmarks. These benchmarks may be relative (eg, health care professionals ranked in the top third of performance) or absolute (eg, all health care professionals achieving an objective minimum standard). The Patient Protection and Affordable Care Act includes a value-based payment modifier that will be used in the future to assign differential payments to health care professionals based on quality and cost of care.⁹

Performance measures are increasingly being incorporated into certification programs across a variety of health care professions and organizations. For example, through Part IV of the American Board of Medical Specialties Maintenance of Certification Practice Performance Assessment, physicians are evaluated

Table 2
Assessment of validity of clinical quality measures⁵

Question	Explanation/Example
How strong is the scientific evidence supporting the validity of this measure?	A strong recommendation from one or more clinical guidelines based on high-quality evidence from systematic reviews, for instance, a measure to prescribe inhaled corticosteroids for patients with persistent asthma.
Are all individuals in the denominator equally eligible for inclusion in the numerator?	A valid measure of quality of care should exclude individuals ineligible to receive the indicated care or not at risk for a specified outcome, for instance, an "overuse" measure discouraging laboratory testing for C1-inhibitor level and C1-inhibitor functional assay in patients with chronic urticaria/angioedema would exclude individuals with chronic angioedema without urticaria.
Is the measure result under control of those whom the measure evaluates?	A measure that is not under control of those evaluated is termed a <i>related measure</i> . For instance, a measure of asthma prevalence within a health plan is not a measure of outcome but of user/enrollee health status.
How well do the measure specifications capture the event that is the subject of the measure?	For instance, to assess the rate of hospitalization and emergency department visits for asthma, health service utilization events occurring in other health care systems also need to be captured.
Does the measure provide for fair comparisons of the performance of health care professionals, facilities, health plans, or geographic distribution?	For instance, a health care professional who cares for a population of asthmatic patients with more severe disease, lower socioeconomic status, and multiple comorbidities cannot be expected to achieve rates of well-controlled asthma comparable to health care professionals managing populations of asthmatic patients with lower rates of these factors.
Does the measure allow for adjustment of the measure to exclude patients with rare performance-related characteristics when appropriate?	The measure should also allow exclusion of those who refuse evidence-based treatment; for instance, patients with asthma may decline influenza vaccination, despite a balanced discussion of the potential for benefit and the potential for harm/burden associated with the intervention.

Table 3Asthma medication ratio^a**Measure Description:**

The percentage of patients 5 to 64 years of age who were identified as having persistent asthma and had a ratio of controller medications to total asthma medications of 0.50 or greater during the measurement year.

Numerator Statement:

The number of patients who have a medication ratio of 0.5 or greater during the measurement year.

Denominator Statement:

Patients 5 to 64 years of age during the measurement year who were identified as having persistent asthma.

Exclusions:

1. Patients who had any diagnosis of emphysema, chronic bronchitis, cystic fibrosis, or acute respiratory failure any time during the patient's history through the end of the measurement year (eg, December 31).
2. Patients who have no asthma controller medications dispensed during the measurement year.

^aEndorsed by the National Quality Forum (last updated: January 6, 2014).¹¹

on their use of specialty-specific measures of patient care in their clinical practice. Physicians are required to demonstrate their ability to assess the quality of care they provide, compared with peers and national benchmarks, and then apply best evidence or consensus recommendations to improve that care using follow-up measurements.

National Quality Forum

The National Quality Forum (NQF) was formed in 1999 to set national standards for health care quality and is dedicated to continuous quality improvement of the American health care system; its mission is to lead "... national collaboration to improve health and healthcare quality *through measurement*." The NQF-endorsed measures are intended to encourage safety in patient care, achieve optimal health care outcomes, and reduce increasing health care costs. Performance measures certified by the NQF provide recognized standards for assessing quality of health care. As these measures are shared with the public, consumers can access these data to make more informed health care decisions. The NQF endorsement process entails a rigorous assessment of proposed measures based on the following 5 criteria: importance, reliability and validity, feasibility, usability, and competing measures (Table 1).¹⁰

Table 4Allergen immunotherapy measure^a

Allergy Immunotherapy Treatment: Allergen Specific IgE Sensitivity Assessed and Documented Before Treatment

Description:

Percentage of patients 5 years and older who were assessed for IgE sensitivity to allergens before initiating allergy immunotherapy AND results documented in the medical record.

NQS Domain:

Patient Safety

Denominator:

All patients 5 years and older who initiated allergy immunotherapy

Denominator Criteria (Eligible Cases):

Patients 5 years and older on the date of the encounter. Reported encounter is for the initial allergy immunotherapy treatment AND Allergy Immunotherapy (CPT): 95115, 95117, 95125, 95144, 95120, 95165 OR Venom (stinging) Immunotherapy (CPT): 95130, 95131, 95132, 95133, 95134, 95145, 95146, 95147, 95148, 95149, 95170, 95180.

Denominator Exclusions:

None

Numerator:

Patients who have documentation of IgE sensitivity to allergens in the medical record

Numerator Instructions:

This measure requires documentation of IgE sensitivity to allergens in the medical record. Written documentation of assessment within the medical record OR documentation of serum specific IgE laboratory testing (CPT 82785, 86003) OR skin prick testing (CPT 95004, 95017 95018) OR intradermal testing (CPT 95024, 95027, 95028) will meet the numerator requirement for this component of the measure.

Data Source:

CPT codes, electronic medical record data and patient demographics

Measure Type:

Process

Clinical Recommendations, Treatment Goals:

Summary Statement 7: Allergen immunotherapy should be considered for patients who have demonstrable evidence of specific IgE antibodies to clinically relevant allergens. The decision to begin allergen immunotherapy might depend on a number of factors, including but not limited to patient's preference, acceptability, adherence, medication requirements, response to avoidance measures, and the adverse effects of medications.¹²

Abbreviation: CPT, Current Procedural Terminology.

^aEndorsed by the American College of Allergy, Asthma and Immunology and the American Academy of Allergy, Asthma and Immunology.

A process of measure maintenance has also been established at the NQF, such that endorsed measures are reassessed and appraised on a 3-year cycle according to the above criteria along with newly proposed, but not yet endorsed, measures. This process facilitates evolution of the NQF portfolio of measures over time. Table 3 details one of the measures for asthma endorsed by NQF.¹¹

Quality and Performance Measures Task Force

Measures for allergy, asthma, and immunology have been developed for allergic rhinitis, asthma, atopic dermatitis, sinusitis, urticaria, food allergy, allergen immunotherapy, and drug allergy. Initially established to address Healthcare Effectiveness Data and Information Set measures, the Quality and Performance Measures (QPM) Task Force, which includes members representing the American College of Allergy, Asthma and Immunology (ACAAI) and the American Academy of Allergy, Asthma and Immunology (AAAAI), has been engaged more recently in developing a library of measures for our specialty. Workgroups are convened under the aegis of the QPM Task Force to develop measures that pertain to a specific condition. These measures are directly based on summary statements, usually with strong recommendations, from published practice parameters. The proposed measures undergo a review process in which input is requested from ACAAI and AAAAI.

members, frequently leading to revisions; measures are then presented for review and endorsement by the leadership of the AAAAI and ACAAI.

Process and Outcomes Measures

Assessment of care quality often entails a consideration of both process and outcomes measures. Table 4 details a measure endorsed for allergen immunotherapy.¹² Assessment and documentation of the pattern of IgE sensitivity (by skin or in vitro testing) in association with prescribing allergen immunotherapy is an important process measure. If patients do not receive allergens in their therapeutic extracts to which clinically relevant IgE-mediated responses are present, the potential for improved outcomes with allergen immunotherapy is compromised. If nonrelevant allergens are administered via subcutaneous allergen immunotherapy, there is a potential for harm. Another approved measure (not shown) calls for an assessment of outcomes of this treatment: the numerator is the proportion of patients 5 years and older who were evaluated for clinical improvement and efficacy within 1 year after initiating allergen immunotherapy and had this assessment documented in the medical record.

The Future of the Measures Process

It is likely we will see composite measures in the future that are more complicated but will capture a more complete representation of appropriateness of care and will more precisely define health care behaviors associated with improved outcomes. For instance, the asthma measure detailed in Table 3 describes a medication *ratio*. An earlier measure (approved by the NQF in 2009) identified the percentage of patients with moderate-severe asthma between the ages of 5 and 64 years “who were appropriately prescribed medication during the membership year.”¹³ The numerator was defined as the proportion in the denominator (in quotes above) “who were dispensed at least one prescription for a preferred therapy during the membership year.” Preferred asthma therapies included inhaled corticosteroid, inhaled corticosteroid combined with the long-acting β -agonist, omalizumab, leukotriene modifier, mast cell stabilizer (cromolyn or nedocromil), or methylxanthine. The advance reflected in using the asthma medication *ratio* measure is readily apparent: evidence has revealed that in patients with moderate-severe asthma and a ratio less than 0.5, whose pattern of dispensed asthma medications entails an overreliance on “reliever” medications (inhaled short-acting β -agonists), are at increased risk for untoward asthma care outcomes.^{14,15}

Implications for the Practicing Allergist

The transition to value-based care is happening. This process initially affected hospitals and large health care systems but now will also affect individual health care professionals. Reporting measures is becoming part of clinical practice and reimbursement. With the implementation of the Patient Protection and Affordable Care Act,⁹ more changes in how quality is measured and reported and compensation for services based on quality are expected. We are entering an era in which we will see greater public reporting, increased transparency, and expanded use of quality measures.

As a practicing allergist, you may decide that it is time to initiate participation in a Physician Quality Reporting System (PQRS). The PQRS program was introduced in 2006 by the CMS to enable eligible health care professionals to report data on quality measures for services furnished to Medicare beneficiaries.¹⁶ The PQRS began with incentive payments, but over time negative adjustments have been introduced. There will be a reimbursement penalty of 1.5% in 2015 for nonparticipation or poor performance in 2013; this penalty is scheduled to increase in the future. Although your practice may have only a few Medicare patients, it is likely that other payers

will follow along and also levy penalties. Moreover, the penalties may also be reputational. These data will be publicly reported and consumers will be able to view information rating physicians on the quality of care they provide to aid in selecting high-quality health care professionals. It is also conceivable that in the near future, to be included as a health plan provider, certain quality criteria, including participation in a PQRS, will be required.

The AAAAI has developed a Qualified Clinical Data Registry (QCDR) in collaboration with CE City.¹⁷ This QCDR was recently approved by the CMS and qualifies as a reporting tool for the PQRS. Participation in the QCDR may also fulfill requirements in the future for Part IV of the Maintenance of Certification process. The QCDR includes 16 quality measures, 2 of which are outcomes measures. Six measures pertain to allergen immunotherapy; the other 10 are asthma measures developed by the Physician Consortium for Performance Improvement, Bridges to Excellence, or Minnesota Community Measurement.

Other specialty societies have also created quality measures and introduced qualified registries for reporting to the CMS. Our specialty has moved forward to put quality measures into action, rather than waiting for other agencies (eg, payers or government organizations) to define components of the value equation for us. The QCDR is therefore an important development for practicing allergists. This is a process in evolution. What is essential now is that all practicing allergists use the QCDR to demonstrate that our quality measures, which have inherent face validity and reflect allergy/immunology care based on best evidence, are associated with meaningful improvements in outcomes. Broad participation of allergists in the QCDR is imperative for our specialty to validate our current quality measures.

Conclusion

In association with the transition of our health care system from volume-based to value-based reimbursement, quality measures have been developed and are being implemented in the specialty of allergy/immunology. These measures are essential for assessing quality of care. Measures that focus on areas of greatest impact in our field have been developed, but additional quality measures are needed for patients with other allergic and immunologic disorders. There is a need to not only validate our current measures but also expand this process to include patient-centered measures for care satisfaction and cost-effectiveness.

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