



Quality measurement:

Who is measuring outcomes and what are patients being told?

WALTER G. MAURER, MD, AND CHRISTOPHER J. HEBERT, MD

Numerous outcomes and quality indicators are being measured in today's health care marketplace. These measurements are being performed by a variety of government agencies, health care purchasers and payers, not-for-profit organizations, and even individual health care institutions.

This article will review quality outcome measurements that are being collected and posted on public Web sites by the government, health care accrediting bodies, business groups, and insurance companies. It also will discuss new quality measures that these groups are planning as well as newer developments and trends in the quality measurement field.

■ ORGANIZATIONS MEASURING AND REPORTING QUALITY OUTCOMES

Medicare

The Medicare program, administered by the federal Centers for Medicare and Medicaid Services (CMS), has been collecting data for several years for 10 standardized quality measures covering three clinical conditions: acute myocardial infarction (MI), community-acquired pneumonia, and heart failure (**Table 1**). Although submission of data is optional, hospitals would stand to lose 0.4% of the 2005 market basket update for Medicare payments if they chose not to participate. As of January 2005, hospitals' performance in providing recommended treatments for these three clinical conditions has been reported on a public Web site.¹

Challenges: The MI and vaccination examples. From a health care organization's standpoint, collect-

ing and reporting these Medicare quality measures is not without its challenges. For example, withholding an angiotensin-converting enzyme (ACE) inhibitor or beta-blocker may be justified in certain patients with acute MI, yet this decision runs counter to the quality indicator for the treatment of acute MI. Convincing physicians to then document their valid reason for not performing an act is another hurdle, yet it affects the reporting denominator and thus an organization's performance rate if patients who should not get these drugs are not excluded.

Documenting whether or not a patient has received a pneumococcal vaccination provides another example. If patients present having already received their pneumococcal vaccination, is a note made that they have had it before? If this information is not excluded from the denominator, the reporting organization's performance rate is adversely affected.

The lag effect. Medicare quality measures may lag the latest science. For instance, angiotensin II receptor blockers were being used for treating heart failure once they were discovered to be effective alternatives in ACE inhibitor-intolerant patients, but until very recently CMS would only recognize and give credit for ACE inhibitor use. It took the CMS 9 months to revise this measure.

Future CMS measures. CMS is already reporting nursing home and home health quality data on its public Web site. We expect that the next target will be an expansion into the surgical arena, specifically measuring presurgical antibiotic prophylaxis and surgical site infection rates. CMS is also pilot testing a pay-for-performance reimbursement scheme for certain quality measures in 200 hospitals.

Joint Commission on Accreditation of Healthcare Organizations

As an accreditation requirement, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requests the submission of data for

From the Departments of General Anesthesiology, Quality Management, and Environmental Health and Safety (W.G.M.) and the Department of General Internal Medicine (C.J.H.), Cleveland Clinic Foundation, Cleveland, OH.

Address: Walter G. Maurer, MD, Department of General Anesthesiology, Cleveland Clinic Foundation, 9500 Euclid Avenue, E31, Cleveland, OH 44195; maurerw@ccf.org.

Disclosure: Both authors reported that they have no financial relationships that pose a potential conflict of interest with this article.

TABLE 1
Medicare and JCAHO measures of quality

Acute myocardial infarction

- Aspirin given on arrival to emergency department
- Beta-blockers given on arrival to emergency department
- Aspirin prescribed at discharge
- Beta-blockers prescribed at discharge
- ACE inhibitors prescribed at discharge if heart failure is a secondary diagnosis
- Adult smoking cessation advice and counseling*
- Time to thrombolysis*
- Time to percutaneous coronary intervention*
- Inpatient mortality*

Community-acquired pneumonia

- Oxygen assessment on admission
- Screen for pneumococcal vaccination
- Appropriate antibiotic given within 4 hours of arrival to emergency department or hospital
- Blood cultures*
- Adult smoking cessation advice and counseling*
- Pediatric smoking cessation advice and counseling*

Heart failure

- Assessment of left ventricular function (echocardiogram)
- ACE inhibitor or ARB prescribed at discharge
- Discharge instructions specifically related to heart failure*
- Adult smoking cessation advice and counseling*

* JCAHO-measured indicators beyond those assessed for Medicare.
ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; JCAHO = Joint Commission on Accreditation of Healthcare Organizations

TABLE 2
JCAHO disease-specific certification areas

Acute coronary syndrome	Goucher disease
Allergic rhinitis	Hemophilia
Alzheimer disease	Hepatitis
Amyotrophic lateral sclerosis	High-risk pregnancy
Anticoagulation	HIV/AIDS
Arthritis	Hyperlipidemia
Asthma	Hypertension
Atrial fibrillation	Irritable bowel disease
Attention deficit disorder	Ischemic heart disease
Cancer	Lead exposure in childhood
Cellulitis	Low back pain
Chronic obstructive pulmonary disease	Lupus
Congestive heart failure	Migraine headache
Coronary artery disease	Multiple sclerosis
Cystic fibrosis	Obesity
Depression	Organ transplantation
Diabetes	Osteoporosis
Emphysema	Parkinson disease
End-stage renal disease	Sickle cell disease
Epilepsy	Sleep disorders
Gastroesophageal reflux disease	Smoking cessation
	Stroke
	Tuberculosis

JCAHO = Joint Commission on Accreditation of Healthcare Organizations

its quality “core measures,” the results of which have been posted publicly since July 2004.² These core measures are the same as the CMS measures with nine additions—four more indicators for acute MI, three more for community-acquired pneumonia, and two more for heart failure (Table 1).

In addition to these three clinical areas, JCAHO has also developed pregnancy-related condition core measures. These include the rates of vaginal births after cesarean section, neonatal mortality rates, and the rates of third- and fourth-degree laceration.

Beyond these core measures, JCAHO offers certification in other areas. In addition to the regular hospital certification, it now offers ambulatory certification, office-based certification, network certification, and disease-specific certification. Disease-specific certification standards support a continuum-based approach for chronic condition management (Table 2) and signify that the services provided have the critical elements necessary for long-term success in improving outcomes.

As part of disease-specific certification, for example, JCAHO can offer an institution certification as a primary stroke center. In some regions of the country, emergency medical service units are considering routing stroke patients only to JCAHO-certified stroke centers.

The downside to disease-specific certification is that once achieved, it requires ongoing maintenance. JCAHO recertifies its disease-specific programs every 3 years. Organizations that seek this certification need to consider the ongoing costs for every disease for which they seek certification.

Purchasers and payers

The government and health care accreditation organizations are not the only entities that are requiring the collection and reporting of quality measures.

Insurers. The health insurer Anthem has for many years required annual reporting of certain measures and can include an option to renegotiate contracts if compliance falls below 70%. Specific areas of interest to Anthem are quality processes, behavioral medicine, obstetrical care, cardiac care, the hospital credentialing process, the emergency department's role in asthma and pneumonia care, joint replacement, cancer care, congestive heart failure, acute MI, and

TABLE 3
National Quality Forum hospital safe practices

Create a health care culture of safety
Provide adequate staffing
Have methods in place to check for and prevent:
• Surgical site infections
• Pressure ulcers
• Deep venous thrombosis
• Tourniquet-based complications of ischemia and thrombosis
• Malnutrition
• "Wrong site, wrong surgery" errors
• Central line sepsis
• Contrast-induced renal failure
• Aspiration
Use anticoagulation services
Document patient do-not-resuscitate orders
Ensure health care workers use proper handwashing techniques
Vaccinate health care workers against influenza
Identify high-alert medications
Dispense medications in unit doses
Give perioperative beta-blockers to patients at risk for cardiac events
Read back verbal orders immediately
Ensure pharmacists are active in the medication use process
Use only standardized abbreviations and dose designations
Prevent mislabeling of radiographs
Refer patients to appropriate health care facilities for high-risk elective surgeries or other specified care
Staff general intensive care units with specialists in critical care medicine
Properly prepare patient care summaries (ie, do not recall notes from memory)
Transmit changes in patient care information in a timely fashion
Have patients restate their informed-consent discussion
Implement a computerized physician order-entry system
Keep medication workspace areas clean, orderly, and well lit
Standardize methods for medication labeling, packaging, and storage

patient safety. Beyond Anthem, other purchasers and payers are beginning to require the submission of data and are making compliance rates available to covered employers and employees.

The Leapfrog Group. The Leapfrog Group is a consortium of large private and public health care purchasers that has entered the quality-measurement arena in recent years.³ This organization was launched in 2000 by the Business Roundtable, an association of Fortune 500 companies. Today, the Leapfrog Group consists of more than 150 public and private organizations that provide health care

benefits to more than 34 million Americans and account for more than \$62 billion in annual health care expenditures. The group encourages large employers to recognize and reward health plans and hospitals that make breakthrough improvements in patient safety and quality. It has identified a small subset of well-supported actions to improve quality and has adopted them as its quality measures. It is using preferential referral and other monetary market reinforcements to encourage compliance with its recommendations.

The three initial Leapfrog targets were:

- Computerized physician order entry. The Leapfrog Group believes that this development would eliminate 80% of preventable drug errors.

- Intensive care physician staffing. The belief is that ensuring the availability (either on site or by telemonitoring) of physicians who are subspecialty trained in critical care medicine would improve risk-adjusted outcomes, reducing mortality by as much as 29%.⁴

- Evidence-based hospital referral, with the expectation that outcomes would be improved and mortality reduced by greater than 30% if hospitals refined their practice methods and increased their volume for (and thus their experience in) seven complex surgeries.

The Leapfrog Group has moved beyond these three initial measures. In 2004, it added the remainder of the National Quality Forum's 30 "hospital safe practices."⁵ Under these measures, health care organizations can receive a maximum of 1,000 points, with full compliance with a particular "safe practice" awarded a predetermined number of points. For example, the first safe practice, having a "culture of safety," is worth 263 points. Examples of other National Quality Forum safe practices are shown in **Table 3**. Health care organizations have to attest that the measures are being addressed and supported from a fairly high leadership level in their organizations. The points that organizations achieve are then posted on the Leapfrog Group's Web site.

The Leapfrog Group has not formally announced its 2006 initiatives at the time this is being written. It has been discussing a move toward assessing clinical decision support in physician offices, an initiative that would be developed in coordination with the federal government's Agency for Healthcare Research and Quality and CMS. Such an initiative would encompass electronic prescribing, electronic lab results management, and electronic care reminders.

Institute for Healthcare Improvement

The Institute for Healthcare Improvement is a not-

TABLE 4

Institute for Healthcare Improvement interventions:
Six changes that save lives

Deploy rapid-response teams at the first sign of patient decline (these are similar to code teams except an attempt is made to reach the patient prior to code)

Deliver reliable, evidence-based care for acute myocardial infarction to prevent death from heart attack (eg, use of aspirin, beta-blockers, timely treatment)

Prevent adverse drug events by implementing medication reconciliation*

Prevent central line infections by implementing a series of interdependent, scientifically grounded steps called the "central line bundle"

Prevent surgical site infections by reliably delivering the correct perioperative care

Prevent ventilator-associated pneumonia by implementing a series of interdependent, scientifically grounded steps called the "ventilator bundle"

* Will also be a Joint Commission on Accreditation of Healthcare Organizations requirement.

for-profit group founded in 1991 that recently began an initiative called the "Save 100,000 Lives" campaign.⁶ Its goal is to enlist 1,600 hospitals to commit to at least one of six evidence-based interventions (Table 4) and agree to submit their mortality data, the main measure of the campaign's success. The desired result is that participating organizations will report a decline in death rates, thus realizing the Institute's goal of saving 100,000 lives. Participation is free and voluntary.

Self-reporting:

The Cleveland Clinic Outcomes Reporting Project
Rather than ceding control of outcomes reports by submitting data to the government, JCAHO, and various payers and purchasers, some health care organizations are reporting their own outcomes. The Cleveland Clinic has chosen this route, creating its own Web site devoted to quality measures that is updated continuously, and each clinical department also produces its own "outcomes booklet," a summary review of trends, approaches, and results.⁷ Quality indicators for an orthopedic surgery department, for example, could include the percentage of patients with surgery less than 30 days from their initial diagnosis, the percentage of patients receiving magnetic resonance imaging or computed tomography scans within 12 months of surgery, and the percentage of patients requiring redo procedures within 12 months.

NEWER QUALITY MEASUREMENT TRENDS AND DEVELOPMENTS

Not only are the numbers and types of players involved in measuring and reporting outcomes growing, so too are some of the purchaser-provider incentives and reporting tools. Some of these newer developments are described below.

Pay-for-performance programs

The next wave in quality measurement is likely to be pay-for-performance schemes (see sidebar on next page), whereby a positive financial incentive for quality and/or efficiency is introduced. For example, copays may be waived if employees use hospitals or doctors with good quality scores. On the provider side, organizations may share in savings achieved by initiatives that increase quality and lower costs.

In one Midwestern city, a pay-for-performance program has recently been contemplated involving three entities: a large employer, the local hospitals, and a third-party payer. The employer asked the third-party payer to identify quality measures and monetarily incentivize the employees to seek out providers who scored well on those measures. The result was that payers were able to create a pay-for-performance scheme.

A few major pay-for-performance initiatives have already reported results. Here are their experiences:

- **Bridges to Excellence** involved several large employers, health plans, and provider groups in Boston, New York City, Cincinnati, and Louisville.⁸ Five hundred physicians split \$1 million in 2004 for initiatives that increased quality and lowered the cost of ambulatory care.

- **The Integrated Healthcare Association of California** involved six health plans, covering about 7 million enrollees.⁹ Some 24,000 primary care physicians split \$50 million in 2003. Some of their quality improvements included getting 35,000 more women to receive mammograms and immunizing 10,000 more children than the previous year.

- **The CMS/Premier Hospital Quality Incentive Demonstration** included 270 hospitals.¹⁰ Hospitals deemed high performers on core measures shared \$7 million per year, and the worst-performing hospitals bore financial penalties. A 7.5% median improvement occurred in the single composite quality score, and a 12% improvement was observed in a composite quality score for heart failure.

Health plan proposals vs insurer proposals.
Health care organizations can be scored and reim-

Pay-for-performance: Commonly used terms

Because the development of more pay-for-performance proposals is likely, it's important to have an understanding of the terminology commonly used.

Value is simply quality divided by costs. To increase value, either increase quality or decrease costs.

Efficiency equates to costs. When payers or purchasers request increased efficiency, they are essentially asking for lower costs.

Provider refers to either the individual clinician or the hospital or health care organization.

Pay-for-performance proposals allow providers to earn bonuses for high scores on quality indicators.

Pay-for-value proposals allow providers to earn bonuses for high scores on quality and efficiency indicators.

Gain sharing allows providers to share in the cost savings they helped to achieve.

bursed using several methods. Health plan proposals for pay-for-performance schemes might focus on diseases and wellness, whereas an insurance company may look at a much wider range of practices to measure and presumably pay for. While an insurer's quality-measurement model is typically more comprehensive, it's also more complex.

A health plan's proposal might measure the following outcomes in several common clinical areas:

- In diabetes, the percentage of patients with office blood pressures less than 140/90 mm Hg, low-density lipoprotein (LDL) cholesterol levels less than 100 mg/dL, and hemoglobin A_{1c} levels between 7.0% and 9.0%
- In heart disease, the percentage of patients with office blood pressures less than 140/90 mm Hg and LDL cholesterol levels less than 100 mg/dL
- In hypertension, the percentage of patients with office blood pressures less than 140/90 mm Hg
- In the prevention arena, the percentage of women aged 52 to 69 years who have had screening mammograms, women aged 21 to 64 years who receive Papanicolaou smears, and patients aged 50 to 80 years who are screened for colorectal cancer.

In contrast, one insurance company is considering 16 measures in four categories. The types of measures being considered include efficiencies (cost vs expected cost), six process measures related to wellness (testing for hemoglobin A_{1c}, microalbumin, and lipids; diabetic eye examination; influenza immuniza-

tions; mammograms), and value-added offerings (eg, convenient office hours, patient satisfaction factors).

Many questions remain unanswered when considering these two types of proposals. Is performance and reward going to be based on an intermediate outcome (such as reducing LDL cholesterol below a certain level) or on the process (simply getting the lipid blood test ordered)? Should high-leverage wellness-type measures be rolled out after the plan has been initiated, or should the measures be worked into a more comprehensive plan from the start?

Patient incentives. One of the biggest questions is how to incentivize patients to participate in pay-for-performance schemes, such that they will comply with the indicated tests and medication regimens so that the health care organization can realize performance scores and receive reimbursement. Also, patients who choose not to comply may find it difficult to find a doctor under a pay-for-performance scheme, which could raise difficult social and public health issues.

APR-DRGs: severity-of-illness adjustment

APR-DRG stands for "All Patients Refined Diagnosis Related Group," an expansion of the long-standing DRG patient classification system. The adjustment is an attempt to enhance the accurate coding of comorbid conditions so that outcomes, as displayed on public report cards, can be compared fairly. APR-DRGs, developed by 3M Health Information Systems, are applied to all payers, not just Medicare. 3M identified four levels of severity of illness (minor, moderate, major, and extreme) for each DRG. This disease-severity index is used to develop a "risk of mortality" score. The Medicare Payment Advisory Commission supports adoption of this type of severity-of-illness scale, stating that such a system would help yield substantial improvements in payment accuracy.

Among the notable organizations using the APR-DRG severity-of-illness methodology are:

- **The Agency for Healthcare Research and Quality.** This federal agency selected the 3M index as the severity risk and adjustment method for use in its Inpatient Quality Indicators.

- **HealthGrades.** This health care rating and advisory Web site has announced that it will begin using APR-DRGs in addition to its own methodology. HealthGrades, together with 3M, will deliver a combined service for quality improvement.

- **Premier.** This alliance of not-for-profit hospitals and health systems will use APR-DRGs in its

prospective online benchmarking software.

- **US News & World Report.** This magazine uses APR-DRGs to rank America's best hospitals.

- **State agencies.** Some 33 state agencies are using APR-DRGs in their state performance reporting systems.

- **Pay-for-performance demonstration projects.** New Jersey is using APR-DRGs in its Gainsharing Initiative, a pay-for-performance demonstration project; CMS and Premier are using it in their Hospital Quality Incentive Demonstration; and other third-party vendors have purchased APR-DRG software to build their own pay-for-performance model.

- **The Cleveland Clinic** is using the APR-DRG tool for reporting outcomes data. This tool allows data to be analyzed at the level of the individual physician. Organizational leadership can then examine, on a physician-by-physician basis, such information as the number of patient cases, average length of stay, discharge rates, and severity of illness.

■ REFERENCES

1. Hospital Compare page. United States Department of Health and Human Services. Available at: www.HospitalCompare.HHS.gov/hospital/home2.asp. Accessed August 2005.
2. Quality Check page. Joint Commission on Accreditation of Healthcare Organizations. Available at: www.jcaho.org/quality+check/index.htm. Accessed August 2005.
3. The Leapfrog Group home page. Available at: www.leapfrog-group.org/. Accessed August 2005.
4. Pronovost PJ, Angus DC, Dorman T, et al. Physician staffing patterns and clinical outcomes in critically ill patients: A systematic review. *JAMA* 2002;288:2151–2162.

■ SUMMARY

Change is inevitable, but participation is optional. An array of quality measures is being used by various government entities, health care purchasers and payers, and other groups. Many of the quality-measurement initiatives have not only gained the attention of large employers, but are also beginning to pique the public's interest. Novel approaches to measuring and rewarding quality are also emerging, such as pay-for-performance schemes and the use of APR-DRGs. Health care organizations that participate in the quality-measurement process and provide input will benefit by the type of measures that are ultimately created. It is much better to be part of the development process than to have insurer- or employer-designed quality measures imposed on your institution. At the very least, health care organizations would be wise to serve as watchdogs to ensure that currently proposed quality measures truly measure high-quality care.

5. Safe Practices for Better Healthcare. Washington, DC: National Quality Forum; 2003. Available at: www.qualityforum.org/publications.html. Accessed August 2005.
6. Institute for Healthcare Improvement home page. Available at: www.ihl.org/ihl. Accessed August 2005.
7. The Cleveland Clinic Quality Measures home page. Available at: www.clevelandclinic.org/quality/. Accessed August 2005.
8. Bridges to Excellence home page. Available at: www.bridgestoexcellence.org/bte/. Accessed August 2005.
9. Integrated Healthcare Association home page. Available at: www.iha.org/. Accessed August 2005.
10. CMS/Premier Hospital Quality Incentive Demonstration home page. Available at: www.premierinc.com/all/quality/hqi/. Accessed August 2005.