


## Special Communication

## Increasing Demands for Quality Measurement

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Measurement of health care quality and patient safety is rapidly evolving, in response to long-term needs and more recent efforts to reform the US health system around "value." Development and choice of quality measures is now guided by a national quality strategy and priorities, with a public-private partnership, the National Quality Forum, helping determine the most worthwhile measures for evaluating and rewarding quality and safety of patient care. Yet there remain a number of challenges, including diverse purposes for quality measurement, limited availability of true clinical measures leading to frequent reliance on claims data with its flaws in determining quality, fragmentation of measurement systems with redundancy and conflicting conclusions, few high-quality comprehensive measurement systems and registries, and rapid expansion of required measures with hundreds of measures straining resources. The proliferation of quality measures at the clinician, hospital, and insurer level has created challenges and logistical problems. Recommendations include raising the bar for quality measurements to achieve transformational rather than incremental change in the US quality measurement system, promoting a logical set of measures for the various levels of the health system, leaving room for internal organizational improvement, harmonizing the various national and local quality measurement systems, anchoring on National Quality Forum additions and subtractions of measures to be applied, reducing reliance on and retiring claims-based measures as quickly as possible, promoting comprehensive measurement such as through registries with deep understanding of patient risk factors and outcomes, reducing attention to proprietary report cards, prompt but careful transition to measures from electronic health records, and allocation of sufficient resources to accomplish the goals of an efficient, properly focused measurement system.

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Quality measurement is in rapid flux. Some of the change has been driven by the restructuring and refinancing of the health care system. Other change has been informed by research and a deeper understanding of the relationship among cost, quality, and quality.

In this article, the general term *quality measurement* will be used when addressing both measures of *quality of care*, defined as "care that results in desired health outcomes and is consistent with best professional practice,"<sup>1</sup> and *patient safety*, defined as "patients will be free from unintended injury while receiving medical care."<sup>2</sup>

Acknowledgment of quality-measurement innovators is important. For example, Codman proposed a century ago a focus on "end results"<sup>3</sup> consistent with the current emphasis on outcomes. Donabedian<sup>4</sup> developed the evaluation model of "structure, process, and outcomes" underlying much of the current view of quality—because outcomes may not fully develop until years after the structure of care that underlies quality and the process of care that leads to the ultimate outcomes can be observed. Ellwood emphasized the patient experience and more comprehensive outcomes such as functional status.<sup>5</sup>

Many more recent contributors have helped advance the thinking about an optimal quality measurement system. Berwick et al<sup>6</sup> conceptualized the links between measurement and continuous im-

provement. Pronovost et al<sup>7</sup> suggested national standards with a structure analogous to the Securities and Exchange Commission. Nelson et al<sup>8</sup> emphasized the need for measurement and improvement at the level of the "microsystem." Chassin et al<sup>9</sup> linked measurement to accountability. Glance et al<sup>10</sup> suggested quality measurement may be reaching the "tipping point" for a truly effective system. Pronovost and Lilford<sup>11</sup> described a road map for improving performance measures. Meyer et al<sup>12</sup> emphasized the need for a focus on "measures that matter." Berenson et al<sup>13</sup> made several recommendations to improve performance measures earlier this year.

This Special Communication focuses on recent changes in quality measurement rather than elaborate on the milestones that have informed current thinking. It includes a description of the recent development of a national quality strategy and its priorities. Also discussed are current major challenges to quality measurement, especially the limitations of claims data, the fragmentation of quality measurement, the lack of comprehensive quality measurement systems, and the rapid expansion of both the National Quality Forum (NQF)-endorsed and other measures. A set of recommendations are presented herein, in particular to raise the bar for quality measurement, harmonizing quality measures and reporting, anchoring on NQF directions, reducing reliance on claims-based measures, de-

veloping more comprehensive clinical deep registries, paying less attention to current proprietary report cards, transitioning to measures from electronic health records, and addressing the resources needed to make the quality measurement system effective.

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## Recent Evolution of Quality Measurement

More than a decade ago, the Institute of Medicine (IOM) report *Crossing the Quality Chasm*<sup>14</sup> identified 6 key aims for health care: it should be safe, effective, patient-centered, timely, efficient, and equitable.

More recently the National Quality Strategy<sup>15</sup> provided a version of the triple aim, originally articulated by Berwick and the Institute for Healthcare Improvement<sup>16</sup>: (1) better care: improve the overall quality of care, by making health care more patient-centered, reliable, accessible, and safe; (2) healthy people/healthy communities: improve the health of the US population by supporting proven interventions to address behavioral, social, and environmental determinants of health in addition to delivering higher-quality care; and (3) affordable care: reduce the cost of quality health care for individuals, families, employers, and government.

The National Quality Strategy<sup>15</sup> has 6 priorities: (1) making care safer by reducing harm caused in the delivery of care; (2) ensuring that each person and family are engaged as partners in their care; (3) promoting effective communication and coordination of care; (4) promoting the most effective prevention and treatment practices for the leading causes of mortality, starting with cardiovascular disease; (5) working with communities to promote wide use of best practices to enable healthy living; and (6) making quality care more affordable for individuals, families, employers, and governments by developing and spreading new health care delivery models.

The NQF,<sup>17</sup> a public-private organization, was created in 1999 in response to the recommendation of the Advisory Commission on Consumer Protection and Quality in the Health Care Industry.<sup>18</sup> Convened by the NQF more recently, the Measure Applications Partnership provides input to the US Department of Health and Human Services on the selection of performance measures for public reporting and performance-based payment programs, with more than 500 measures under review this year.

The National Quality Strategy explicitly describes what patients should rightfully expect from a high-performing health care system: improved quality and improved health of the population, all at an affordable cost. The 6 priorities focus improvement efforts that will meet patient expectations and generate value. These strategies and priorities in turn help guide the development and implementation of necessary quality measures through the NQF.

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## Methods

A search of PubMed from 2000 through March 2013 for terms such as *measurement of health care quality*, *patient safety*, *report cards*, *indicators*, *registries*, and *electronic health records* was conducted. Articles were also identified by a review of bibliographies from articles identified through the search. This was supplemented by re-

view of the descriptive and methodology components of public websites for various governmental, insurer, proprietary, and other public reporting systems. Challenges and recommendations were informed by the literature and the experiences among the authors' organizations, which include health systems with teaching and community hospitals, physician practices, and other components such as long-term and home care.

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## Quality Measurement—The Challenges

### Multiple Purposes

Despite the intense recent attention to its use in pay for performance, quality measurement will continue to have multiple roles, requiring at times different strategies and measures.

The NQF categorizes quality measurement as follows<sup>19</sup>: (1) measurement to inform consumers, including public reporting and public health or disease surveillance; (2) measurement to influence payment, including payment programs; (3) measurement to drive improvement, including regulatory and accreditation, professional certification, and quality improvement with external benchmarking to multiple organizations; and (4) quality improvement internal to the specific organization. In addition, important measures vary by the perspective of the user—especially from within an organization that delivers health care vs from an external perspective (consumer, employer, insurer, government) and whether the measurement is at a more local level or global level (eg, health plan, region, state, nation). Quality measurement is part of determining the numerator for value—understood as either quality to cost or outcomes achieved per dollars spent. Despite the importance of value, this article focuses on the quality aspect of the equation and does not elaborate on potential ways to measure the cost denominator.

### Limitations of Current Measures

Due to limited availability of meaningful clinical data, the focus of much measurement has been on areas for which data most easily exist (eg, administrative billing data submitted with claims for payment and a few select areas whereby clinical data are abstracted from records for national reporting systems), rather than what would be most meaningful (rich clinical data naturally created from the processes of care for many of the most important conditions). Use of claims data has been practical, but in part represents a manifestation of the streetlight effect—a type of bias consisting of observers only looking wherever it is easiest.

For most national clinical data abstraction, expensive manual processes are used, as with core measures.<sup>9</sup> The expense of the manual data extraction process would be prohibitive for a broad array of clinical conditions, resulting in overemphasis of the relatively few areas in which the infrastructure already exists. For example, the initial core measures for nonsurgical care in hospitals address myocardial infarction, heart failure, and pneumonia. Although these conditions are common, each only represents a small proportion of the care that occurs in most hospitals. These conditions have remained the focus of the Centers for Medicare & Medicaid Services (CMS) Hospital Compare nonsurgical process measures<sup>20</sup> for nearly a decade, in addition to being the focus of more recent CMS mortality and readmission reporting.

Table 1. Regulatory and Societal Performance Measures—2013

Database or Registry	No. of Measures	Database or Registry	No. of Measures	Database or Registry	No. of Measures
ORYX-The Joint Commission	8-55	Meaningful use		Society of Thoracic Surgery: CABG, valve, and thoracic surgery	36
Centers for Medicare & Medicaid Service quality reporting		Hospital clinical quality measures	15		
Hospital		Hospital objectives	24		
Inpatient	65	Professional clinical quality measures	6/38 <sup>a</sup>	American College of Cardiology: PCI, ICD, TAVR, CAS	120
Outpatient	22	Professional objectives	20/25	Society of Vascular Surgery: carotid procedures	4
Facility				Get with the Guidelines	
Inpatient psychiatric	6	Physician quality reporting	4/131	Stroke	19
Inpatient rehabilitation	2	National Database of Nursing Quality Indicators	15	Heart Failure	5
Ambulatory surgery	8	American College of Surgery: NSQIP, TQIP, Bariatric	150-200	Resuscitation	4

Abbreviations: CABG, coronary artery bypass graft; CAS, carotid artery stenting; CTS, cardiothoracic surgery; HAI, hospital-acquired infections; ICD, implantable cardioverter defibrillator; NSQIP, National Surgical Quality Improvement Program; PCI, percutaneous coronary intervention; TAVR, transcatheter aortic valve replacement; TQIP, Trauma Quality Improvement Program.

<sup>a</sup>In some cases, hospitals or physicians can choose a subset of measures to report on from a larger set. The number of measures a hospital or physician must report is shown over the total number of measures to be drawn from.

Table 2. Selected State Required Performance Measures—2013

State <sup>a</sup>	Mortality Measures	Complications or Hospital Acquired Infections	Maternal and Neonatal Measures
California	1	2	3
Colorado	9	5	0
Illinois	3	10	7
New Jersey	2	13	0
New York	4	2	16
Texas	12	4	2

<sup>a</sup> Metrics are posted online in addition to any CMS Hospital Compare Measures: California,<sup>31</sup> Colorado,<sup>32</sup> Illinois,<sup>33</sup> New Jersey,<sup>34</sup> New York,<sup>35</sup> and Texas.<sup>36</sup>

Despite discussion of the challenges of a rapidly expanding number of quality measures, much of health care remains poorly measured or unmeasured. Claims data (including demographic information, billing codes, encounter diagnoses, and procedures) have been used for quality measurement for years, because unlike most clinical data, claims data are easy and inexpensive to access. However, the flaws in claims data as a source for quality measurement have become more evident<sup>21</sup> as clinical data through targeted chart abstraction and electronic health records have become more available.

For example, in 1 study, 21% of those positive for the claims-based Patient Safety Indicator (PSI) "postoperative pulmonary embolus or deep venous thrombosis" were miscoded relative to carefully determined objective clinical findings.<sup>22</sup> These flaws are expected because claims data are primarily intended to communicate sufficient information for fair payment, not to accurately reflect the nuances of the clinical condition of the patient.

### Growing Mandates

Many constituencies and authorities are driving the addition of both mandatory and voluntary quality measures from diverse perspectives at the national level. This includes the increasing number sponsored by CMS—eg, pay for reporting<sup>20</sup>; pay for performance via value-based purchasing,<sup>23</sup> readmissions, and hospital-acquired conditions<sup>24</sup>; meaningful use<sup>25,26</sup>; and the physician quality report-

ing system,<sup>27</sup> which followed the initial CMS physician quality reporting initiative, as well as several other registries and quality measurement systems (Table 1).

Some measurement systems listed in Table 1 are technically voluntary whereas others affect payment and as such could be considered mandatory. For example, submitting a minimum number of measures to the Joint Commission ORYX<sup>28</sup> database is a prerequisite to maintenance of accreditation.<sup>29</sup> Similarly, submission of data to the various CMS databases is a requirement to receive both the "pay for reporting" incentive and qualify for the progressively increasing value-based purchasing pool. Reporting of meaningful-use measures with achievement of key thresholds is needed to receive federal electronic health record implementation incentives to both hospitals and physicians. Other measurement systems are also voluntary, but expected of centers of excellence—eg, National Database of Nursing Quality Indicators for those seeking Magnet Hospital status and Get with the Guidelines measures for those seeking recognition from the American Heart Association for Heart Failure, Stroke, or Resuscitation excellence.<sup>30</sup>

Hospitals and physicians in many states also face mandated quality measurement systems (Table 2). Many of these sites rely in part on quality metrics that appear on the CMS Hospital Compare website. However, a number of the state websites report mortality, complication, hospital-acquired infection, or maternal and neonatal data not presented by CMS, often adding to the number of measures for

Table 3. Centers for Medicare &amp; Medicaid Services Pay for Reporting Measures

Hospitals	No. of Reporting Measures									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Quality Reporting										
Hospital										
Inpatient	10	10	21	34	37	51	53	63	65	63
Outpatient	0	0	0	11	11	11	12	18	22	23
Facility										
Inpatient psychiatric	0	0	0	0	0	0	0	6	6	6
Inpatient rehabilitation	0	0	0	0	0	0	0	2	2	2
Ambulatory surgery	0	0	0	0	0	0	0	5	8	9
Meaningful use-eligible hospital objectives	0	0	0	0	0	0	24	24	24	19
Meaningful use-eligible hospital clinical quality measures <sup>a</sup>	0	0	0	0	0	0	15	15	15	16/29
Physicians										
Quality reporting system <sup>a</sup>	0	0	3/74	3/74	3/74	3/74	3/74	3/74	4/131	4/132
Meaningful use-eligible										
Professional objectives <sup>a</sup>	0	0	0	0	0	0	20/25	20/25	20/25	20/25
Professional clinical quality measures <sup>a</sup>	0	0	0	0	0	0	6/38	6/38	6/38	9/64

<sup>a</sup>In some cases, hospitals or physicians can choose a subset of measures to report on from a larger set. The number of measures a hospital or physician must report is shown over the total number of measures to be drawn from.

which hospitals must collect data and about which they must report. Among the states with additional mandated quality measures, the number and type of required measures vary substantially, with 20 or more in some states. Some of these transform voluntary measures into mandatory measures (eg, Centers for Disease Control and Prevention [CDC] National Health Safety Network infections).<sup>37</sup> Others involve unique additional data collection—eg, in New York State to determine cardiac surgery, percutaneous coronary intervention, and trauma risk-adjusted mortality.<sup>38,39</sup>

### Profusion of Proprietary Report Cards

Proprietary report cards (eg, *Consumer Reports* Hospital Safety Ratings, Healthgrades America's Best Hospitals, Truven Health Analytics 100 Top Hospitals, *US News & World Report*) may have a mix of measures derived from national reporting systems (eg, already available CMS Hospital Compare measures), nonstandard measures (eg, reputation in lieu of process measurement, risk-adjusted mortality calculations using their own risk models), or both. Some have unknown, absent, or unique specifications for risk adjustment.

The profusion of report cards, even when they include performance on the same measures, requires additional work by senior leaders and quality managers—to respond to internal questions about the results and to respond to media inquiries about local or regional differences in performance. For high-quality report cards, this effort is worthwhile. However, for low-quality report cards, the effort can distract leaders, quality managers, and clinicians in various specialties from important work of delivering and improving the care they provide.

The proliferation of measurement (Table 1 and 2) as represented by insurers, state and federal authorities, licensing groups, consumer groups, business groups, both at the physician and hospital level is almost unsustainable.

### Comprehensive Registries Not Fully Deployed

A number of disease-, procedure-, or specialty-specific databases include patient registries with comprehensive clinical risk factors;

clinical processes; patient preferences; short-term, intermediate, and long-term outcomes including survival, symptoms such as pain; and functional status, both general, such as activities of daily living and disease specific, such as an arthritis score.

The registries with the most robust set of measures and risk adjustments depend on manual chart abstraction and follow-up due to the immaturity of electronic health records. Although easier methods for data extraction may become available in the future, most of these databases commonly used internally for perspective and improvement (eg, American College of Surgeons National Surgical Quality Improvement Program,<sup>40</sup> Society for Thoracic Surgery National Database, American Heart Association "Get with the Guidelines")<sup>30</sup> are not easily generated. Because of their value, participation in such registries is increasingly required by many payers or they are incorporated into their "center of excellence" designations.<sup>36</sup>

These more comprehensive and "deep" systems for measurement of patient risk factors and outcomes often require substantial staffing in the absence of reliable electronic health record sources of the necessary data. Even though unfunded and not a mandate, many hospitals find these voluntary systems sufficiently worthwhile to internally fund participant fees and staffing. For example, the voluntary National Surgical Quality Improvement Program has more than 400 participating hospitals.

## Quality Measurement Expansion

Quality measurement increased rapidly over the past decade, driven by need and supported by investments across the system, most notably at the Agency for Healthcare Research and Quality, the CMS, and the CDC. The scope of pay for reporting under both the CMS Hospital Inpatient Quality Reporting Program and Physician Quality Reporting System increased and then plateaued until recently (Table 3).

Table 3 illustrates the progressive expansion of both the types of pay for reporting under CMS and the numbers of measures in each of the reporting systems. In 2005 there was 1 CMS system (Hospi-

Table 4. Centers for Medicare &amp; Medicaid Services Pay for Reporting Measures—2013

Quality Reporting	No. of Measures			
	Chart Abstracted (Clinical)	Survey	Claims-Based	Structural (Affirmations)
Hospital				
Inpatient	29	9	24	3
Outpatient	13	0	8	3
Facility				
Psychiatric	4	0	0	2
Inpatient rehabilitation	2	0	0	0
Ambulatory surgery	6	0	0	3

tal Inpatient Quality Reporting) with 10 measures and in 2014 there will be 10 CMS systems with more than 350 potential measures (eTable see the Supplement).

As the increase in CMS-related hospital inpatient and physician measures leveled off, other CMS domains have added quality pay-for-reporting measures and have increased: hospital outpatient, inpatient psychiatric facility, inpatient rehabilitation facility, and ambulatory surgery facility. More recently the voluntary submission of meaningful-use measures for eligible hospitals and physicians seeking incentives for electronic health records implementation have added a number of overlapping and additional measures (Table 3).

Participation in the CMS pay-for-reporting program is technically voluntary, but is a prerequisite for both avoiding the penalty for nonreporting and being eligible for the new and increasing pay-for-performance CMS value-based purchasing program, which started affecting hospital inpatient payments in October 2012,<sup>41</sup> so hospitals have little choice but to participate.

Chart-abstracted measures require staff resources to collect most of the data (Table 4). Claims-based measures draw on staff resources as well, to ensure that the data accurately reflect the clinical picture. To some extent, both can at times divert resources from actually improving the care.

Expected reporting has increased in scope and magnitude from several other directions. Hospitals and physicians participate in many other measurement systems that are technically voluntary but are expected or required of quality organizations, eg, the National Database of Nursing Quality Indicators, which is a prerequisite for earning Magnet Hospital status. Many states mandate submission of chart-abstracted clinical measures, some unique to that state and others that make mandatory what is voluntary elsewhere (eg, submission of CDC National Health Safety Network Hospital Associated Infection data). Furthermore, for many specialties, participation in a registry or similar database, although also voluntary, is either expected, highly worthwhile, or both, eg, the National Surgical Quality Improvement Program.

Many private insurers (eg, WellPoint, United, Blue Cross entities) have attached quality report cards to their contracts with the intent of incentivizing quality. However, there is no standardization of these measurement systems. In some venues, the incentives involved may overshadow those currently available through CMS incentive programs.

The total of the current and planned measures from different sources can be overwhelming, hence, the sense some organiza-

tions' leaders have of excessive and potentially overwhelming measurement and reporting requirements. Some organizations struggle to be adequately staffed to meet these requirements, at a time when financial pressures make adding resources difficult.

As the number and complexity of mandated and expected voluntarily reported measures increase, they may crowd out the resources that would otherwise be devoted to measuring processes and outcomes that have much more meaning to the institution's patients, staff, and leadership. For example, a hospital may internally detect problems with the safety of transitions in care and be unable to focus sufficient attention to this important patient safety issue due to the volume of other measures to which they must direct their attention.

Accordingly, it is critical that quality measures are carefully chosen for their value (quality given cost) and that expansion is synchronized with attention to sufficient resources and migration to electronic health records sources over time. Leaders need to balance the appropriate enthusiasm for more measures with their decisions to allocate the resources to collect such measures when we are still years away from being able to shift to less resource-intensive measurement through fully deployed and accurate electronic health records.

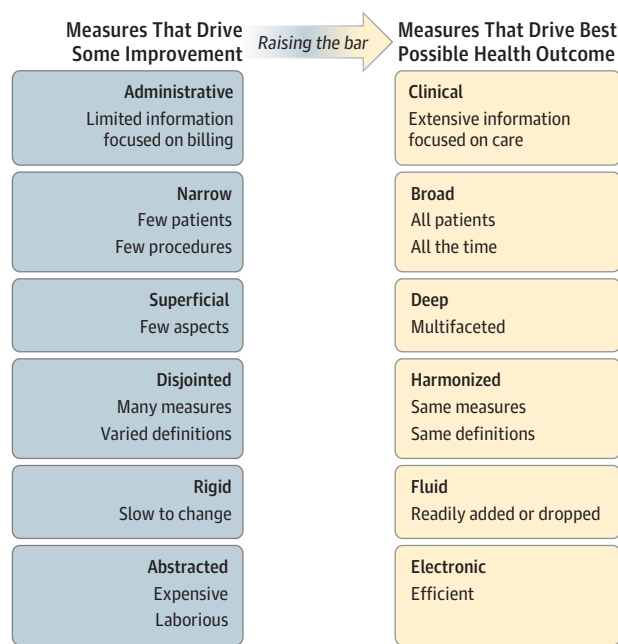
## NQF-Endorsed Measures

Approximately 85% of measures currently used in public programs are endorsed by NQF.<sup>17</sup> Recent statutes including the 2008 Medicare Improvements for Patients and Providers Act and the 2010 Affordable Care Act reinforce preferential use of NQF-endorsed measures on federal websites (eg, Hospital Compare), and linkage of endorsed measures to payment for clinicians, hospitals, nursing homes, health plans, and other entities. This approach has helped moderate the number of required quality measures.

The NQF refines the suite of approved metrics as technology and clinical knowledge evolves. For instance, within the past year, the NQF removed more than it added (>100 measures removed, with >90 measures added). The change is appropriate but increases the complexity and logistical difficulty of staying current, with more than 400 endorsed NQF measures.<sup>17</sup>

Some NQF endorsed measures have changed over time such that they have been dropped from NQF, CMS reporting or both. This includes some of the core measures, such as smoking cessation counseling for patients with acute myocardial infarction, heart failure, and



**Figure. Raising the Bar to Increase Positive Health Outcomes**

pneumonia for which success can be achieved through automatic computer-generated educational information at hospital discharge rather than more effective personal counseling as originally intended. Changes in documentation drive some measured performance rather than the actual quality process, such as for some core measures of whether important medications were given (eg, aspirin, angiotensin-converting enzyme inhibitors). In this case measured success can be improved by documentation, at times after a discovered failure, of a rationale for why the medication was not given.

Some still NQF-endorsed measures have begun to be superseded by better measures endorsed for the same area. For example, PSIs and hospital-acquired conditions rely on claims data to identify complications of care. They are quite dependent on documentation and coding practices, and when carefully compared with clinical information are flawed. For example, as noted previously, in 1 study, 21% of those positive for the PSI "postoperative pulmonary embolus or deep venous thrombosis" were miscoded.<sup>22</sup> When free software to analyze claims data for PSIs was first provided by the Agency for Healthcare Research and Quality, the agency's website cautioned against using PSIs for hospital comparisons because of the limitations of claims data and instead recommended that the greatest value of PSIs was for internal use to identify priorities for deeper investigation. These claims-based measures overlap with newer CMS pay-for-reporting requirements to submit chart-abstracted measures, eg, CDC National Health Safety Network infections including central-line associated blood stream infections and surgical site infections.

Also, some NQF-endorsed measures may be an accurate measure of an outcome, but less clearly relate to true quality of care. For example, mortality has limitations as a true quality measure.<sup>42</sup> Patients enter hospitals for end-of-life care as well as for a chance of cure or improvement. Mortality rates are affected by important factors such as disease care, preventing complications, detecting de-

terioration promptly, and rescuing patients in trouble through interventions such as rapid response teams or timely treatment of severe sepsis. However, mortality rates are also affected by factors that are only in part related to quality of care and may be potentially manipulated in the interest of improving apparent mortality metrics: documentation, coding, classification of patients as having palliative care or hospice care, choice of patients for transfer out or in, or choice of patients for elective admission or surgery. Furthermore, the methods of risk adjustment for calculating risk-adjusted mortality rates are improving but still limited, as they have been for many years.<sup>43</sup>

## Recommendations

### Raise the Bar for Quality

Improvement in the US health care system should be driven with the view that each element of the "triple aim" will be achieved at a benchmark level—informed by the best performance within the United States and in other countries. Many who look at our current flawed, fee-for-service-dominated system expect an important shift to a value-driven system but do not envision dramatic improvements in performance. Raising the bar for quality measurement could make possible a more inspiring vision that health system improvements could advance at as rapid a pace as the electronic devices we now routinely rely on and achieve the same high levels of safety as our own commercial aviation industry. (Figure).

Too often thinking is anchored on modest changes from the current state, as reflected by a RAND study,<sup>44</sup> published a decade ago, finding that best practices were delivered about 55% of the time. Among the 439 measures evaluated in more than 6700 patients in all types of health care settings, performance ranged from a high of 79% for measures of senile cataract care to a low of 11% for measures of care of alcohol dependence.

Setting higher expectations is appropriate for the US health system and its measurement, given that it invests more resources in health care than any other country in the world. Instead of just reducing the mediocrity of the current fee-for-service-driven system, we should embark on transformational redesign to a health system that is waste-free, harm-free, and highly reliable.

### Promote Balance in Quality Measurement

The broadening of measures to more of the important clinical domains and more populations is a positive development, but there must be room for local improvement and ad hoc activities, together to promote quality and safety at multiple levels: system-wide improvement on a national scale to address common aims and priorities, regional and local improvement to address community-level needs, organizational, practice group, and individual physician improvement, and facilitation and support of innovation that is vital to inform transformational change.

As Meyer et al<sup>12</sup> suggested, it will be important to "measure what matters" and achieve both balance and parsimony in quality measurement. Addressing these multiple levels of performance may require efforts to develop measures that reflect the broader organizational abilities needed to achieve reliability, rather than specific disease performance, such as culture change, communication, teamwork, or accountability.

To achieve transformational change, the need for finding the right metrics to drive improvement is crucial. There needs to be room for new methods, such as pursuing analysis of *big data* to sift through large amounts of data in search of hidden patterns that could guide creative improvements.

An additional purpose of measurement is to help inform the public about quality, safety, and cost in their choice of physicians and health care institutions. However, the complexities involved make the measures currently available difficult for the public to interpret and less likely to influence patient choice than many would hope.

### Harmonize Measures and Reporting

The National Quality Strategy<sup>15</sup> and its priorities should guide the focus of measurement, especially as the health care system evolves away from a system focused on production toward a system focused on value. As priorities change over time, measures receiving emphasis should evolve.

This is occurring increasingly at the national level but should also occur more locally. At the community level, health departments, purchasers, and insurers should harmonize their quality measurements. Health care systems should harmonize their measures across their components (hospitals, procedure centers, nursing homes, outpatient clinics, community practices, home health services). Within each of those entities, measures should be harmonized across clinical service lines and departments.

When a key change occurs at the national level, an ideal system would spread that change rapidly across the national level and cascade down to the other relevant levels. For example, the CDC National Health Safety Network's<sup>45</sup> central-line associated blood stream infection<sup>46</sup> measure gathered from clinical records is endorsed by the NQF and is now a required source for CMS inpatient quality reporting and value-based purchasing.<sup>47</sup> This type of cooperation among different groups is essential to improve measurement efforts. However, less meaningful claims data remain the source for the closely related vascular catheter-associated hospital-acquired conditions<sup>24</sup> reporting still used in CMS and many other quality reports.

With harmonization, the quality-measurement system viewed from any perspective should make sense, both in the logical relationships of measures to the part of the system being measured and in the totality of measures from different entities.

### Strongly Anchor on NQF Directions

Requiring NQF endorsement is critical to achieving an efficient and properly focused external quality-measurement system. The current US health system can ill afford the waste and rework that result from the lack of coordinated oversight of the full array of measures to which an individual physician, group, hospital, or health system must respond.

The additional safeguard offered by the Affordable Care Act with the posting of new measures on the Hospital Compare website for 1 year before they may be included in CMS value-based purchasing also helps to ensure that measures do not advance into the pay-for-performance system prematurely. With increasing emphasis on its endorsement, NQF needs to continue to be as aggressive in retiring less valuable or superseded measures as in adding new measures. As the NQF has learned, some initially endorsed measures need to be discontinued due to unintended consequences. For ex-

ample, the original core measure for evaluating care of patients being treated for pneumonia, relating to how often patients receive antibiotics within 4 hours of arrival (later changed to 6 hours), led to many patients who did not have pneumonia receiving antibiotics inappropriately. As a result, this core measure was eventually discontinued.<sup>48</sup>

### Reduce Reliance on Claims-Based Measures

In the absence of widely available clinical measures, the use of broad claims-based measures (eg, mortality, readmissions, and hospital-acquired conditions) have had a positive effect of drawing attention to larger systems issues. Yet the ready availability of claims data must be balanced against the increasing availability of measures that reflect true clinical differences, rather than differences in documentation and coding or the inaccuracies inherent when data gathered for payment is used to evaluate quality.<sup>21</sup>

Claims-based measures such as PSIs have been useful surrogates for assessing the occurrence of complications but should return to use for their original purpose, screening within organizations for interesting differences, to be investigated with real clinical data. Eventually these measures should be retired as is functionally happening with CDC National Health Safety Network central-line associated bloodstream infections from clinical data replacing the hospital-acquired condition vascular-catheter-associated infection from claims data.<sup>24</sup>

Improved documentation that leads to improved coding is a worthy goal for the accuracy of resulting databases and for billing reasons. However, when aggressive documentation campaigns become a dominant element in the approach to improving quality, it accomplishes precisely what must be avoided: diversion of resources away from true improvement efforts, the illusion of having achieved augmented quality without having changed clinical care at all, and skepticism among clinicians about what improving quality performance measures and safety performance is really about.

### Develop and Expand "Deep Registries"

Given the investment needed, comprehensive and data-rich registries that are encouraged should be well coordinated, focused on clearly defined populations, and gather information as an expected part of normal clinical operations. Although society and payers may demand certain categories of measurement, the institutional focus, especially for the resource-intensive deep registries, should be in key domains—the high-volume, high-visibility, high-risk, high-cost clinical areas that are critical components in realizing the triple aim.

Some of these registries focus on broad areas of care, such as the National Surgical Quality Improvement Program, which includes chart-abstracted detailed clinical information on risk factors and outcomes for multiple surgical specialties, for both adults and children. In contrast, other registries are more focused on a single condition or procedure. As an example, the 2010 Functions and Outcomes Research for Comparative Effectiveness in Total Joint Replacement is a nationwide, comprehensive database of total joint replacement surgical and patient-reported outcomes. This registry will collect data from more than 30 000 patients, develop tools to record the patients' assessment of their surgery, and conduct research to guide both clinical care and health care policy.<sup>49</sup>

Improvement occurs at the local level. The right registry informs local teams on their performance and allows appropriate comparison with external top performers. A long-standing example of the value of such work is the Northern New England Cardiovascular Disease Study Group.<sup>50</sup>

### Pay Less Attention to Proprietary Report Cards

The numerous national and regional report cards, many by for-profit companies, that developed over the past 2 decades initially filled a gap in describing hospital and physician performance. Today online report cards from insurers, states, and the federal government, such as CMS's Hospital Compare, provide rich performance data. Typically proprietary report cards have a combination of claims-based and clinical measures, often representing data already shown on Hospital Compare, supplemented by measures unique to the company producing the report card.<sup>51</sup>

Inconsistent ratings often occur with proprietary report cards<sup>52</sup> that assign an overall score, rating of excellence, or other combination of the various elements.<sup>53</sup> These include proprietary report cards and ratings, such as those issued by *Consumer Reports*, Healthgrades, Truven Health Analytics, *US News & World Report*, and others.

The Hospital Association of New York State "Report Card on Hospital Report Cards" of 2013<sup>54</sup> updated from 2008,<sup>55</sup> again found that governmental report cards achieve the highest grades and the proprietary report cards the lowest grades on adherence to key principles for public reports of quality. These grades were based on assessment of each report card on 9 criteria: transparent methodology, evidence-based measures, measure alignment, data sources, most current data, risk-adjusted data, data quality, consistent data, and hospital preview.

Although many such organizations suggest that their report cards continue to add value by distinguishing good from poor performers for the public, at times the profusion of proprietary report cards and their frequent releases of various ratings seems more a result of the evident current business models for such organizations: eg, increasing readership, issuing "excellence" ratings that require a license fee for a recipient to publicly post their recognition, or issuing ratings of poor performance for which the proprietary company offers consulting services.<sup>56</sup>

Numerous proprietary report cards can have the undesired effect of leading organizations seeking respect and higher patient volumes to chase higher ratings in the key report cards rather than develop the reliable systems that result in high-quality care and high performance across a range of current and future measures. Also, the time needed to respond to media coverage of report cards that repeat various combinations of already published data can distract clinical leaders from working on actual improvement of primary performance measures.

Quality leaders should understand these report cards and be prepared to help their organization respond appropriately and mobilize attention when there appears to be a new, valid signal of an opportunity to improve. They should also work to help internal leaders (eg, board members, senior executives) and external leaders (eg, media, government) understand when such report cards are providing redundant or misleading information, so that clinicians and managers are not diverted from important clinical or improvement work.

Properly managed, some organizations may find value in pursuing higher rankings on these ratings and report cards and, despite their flaws, use the pursuit of high rankings to unify staff in working on meaningful improvement. It is also possible that those who produce proprietary report cards could be more successful in the future in efforts to improve their methods while better synchronizing with standard national measurement systems.

### Transition Carefully to "eMeasures"

Although quality measures derived from electronic health records (eMeasures) are what ultimately must be used, currently available measures coming from electronic health records are generally a mix of accurate and inaccurate data. Often, key elements are not available in an analyzable format. This is further aggravated by the immaturity of the current electronic health records. As data entry structure is added to enhance the analyzability of the data, often the readability of clinical notes declines and the burden of entry increases, potentially impeding care delivered to the patient.

The only way for such eMeasures to improve is for data capture to be seamlessly integrated with the process of care, with clear specifications, standard implementation by electronic health records software vendors, routine use, and sufficient auditing to drive accuracy.

Measures lacking an audit of real performance should be viewed with caution. Since the activity or task being reported and the act of documentation are not always linked, many eMeasure systems allow the reporting of a completed task via a check box (eg, medication reconciliation, a cognitive task) without full knowledge of whether the task was completed. Although the presence of a medication list can be audited, there is no practical way to audit the most important step—reconciliation—which involves the clinician carefully considering how best to shift the patient's home medication regimen to the one they need in the hospital and then repeat that careful consideration at subsequent transitions such as after procedures, on transfer to new care settings, and on return home.

Long-term, electronic data sources are necessary for a feasible, comprehensive measurement system. Experience with the deep registry systems demonstrate that the type of information needed to fuel a meaningful risk adjustment and outcome measurement system does mostly exist in the electronic health record. The time course for this transition will, in part, be determined by the ability of both electronic health record vendors and those who provide health care to recognize the need and act so that capturing accurate clinical data becomes a routine part of patient management.

### Allocate Adequate Resources

Until measures efficiently and accurately flow from electronic health records, policy makers must balance the need to broaden measurement with the available resources to capture the data. Furthermore, expansion of measurement into many nonhospital settings without resources for gathering such information has resulted in staffing strains in those settings or in the heavily loaded hospital apparatus assuming the additional burden.

The life and death nature of health care, the need for continuous improvement, and the need for transformational redesign require effective quality measurement. Measurement cannot be minimized or arbitrarily reduced when finances are tight and difficult changes are under way. In those situations, measurement is espe-



cially critical. Quality measurement, like the system of care, will require a mix of investments and process improvements to create an effective, efficient, waste-free, and error-free measurement system that delivers value.

## Challenges Ahead

The ultimate purpose of measurement is for learning and improvement. Migration toward payment for value rather than payment for volume aligns financial incentives with clinical needs. Further alignment is associated with the potential embarrassment or legal implications of transparency. However, until measurement truly reflects clinical reality and data acquisition no longer distracts from the process of care nor requires extra effort, barriers will remain resulting in compromised quality, safety, and accountability.

Even though medical science is built on research in the laboratory and at the bedside, the medical profession has not clamored for measurement of its own clinical performance. It is critical that current and future generations of physicians, from the time they are medical students forward, understand the principles of performance measurement and performance improvement. These physicians need to advocate for their patients by demanding measurement and continuous improvement as necessary to delivering high-quality, safe, and affordable care. As an important step in this direction, the Accreditation Council for Graduate Medical Education recently revised resident and fellow training requirements to emphasize quality and patient safety.<sup>57</sup> The Association of American Medical Colleges has convened several annual integrating quality conferences showcasing progressively meaningful and integrated quality improvement education and work involving interprofessional students, residents, and fellows.<sup>58</sup>

Most medical care is practiced in the ambulatory environment and an increasing percentage of medical malpractice claims arise from that setting. Yet this environment is the least measured and

least resourced, even though the emphasis of the Physician Quality Reporting System, currently voluntary pay for reporting, is heavily on outpatient quality measures. Although many have placed their hope for improvement in the office practice on the electronic health records, ultimately it is the process of care, not the technology, that keeps patients safe and health care reliable.

## Conclusions

Measurement and transparency are necessary requirements in the delivery of highly reliable, effective, and safe care. Although the current state of health care measurement is, on occasion, disorganized, inefficient, confusing, and misleading, it is better now than prior to the IOM reports *To Err Is Human* and *Crossing the Quality Chasm*, when many incorrectly assumed that patients were uniformly safe and care delivery was always effective and reliable.

Today, even though measures remain imperfect and perhaps seemingly excessive, it is possible to target areas in which the safety of care and quality of care are not as intended. The challenge is to move from measurement that is better than no measurement to measurement that unambiguously delivers all of the necessary information to improve care while not interfering with the delivery of that care.

As the major challenges described in this perspective are overcome and the quality measurement system matures, health care will be poised to achieve the levels of high reliability and safety seen in other successful sectors. The challenging work and persistence in measurement development will provide a necessary foundation for the key improvements that must be realized in health care such as access to care, transition to value-based payment models, and full deployment of high-quality electronic health records. Failure to achieve an optimal quality measurement system will impede progress to the health care delivery system expected and, more importantly, deserved by patients.

### ARTICLE INFORMATION

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