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STATE-OF-THE-ART PAPER

Public Reporting of Clinical Quality Data

An Update for Cardiovascular Specialists

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Public reporting of hospital and individual provider quality of care measures is not a new concept. In the United States, the first national public reports of hospital mortality data occurred in 1986, and detailed physician-level data for cardiac surgery are now reported in 4 states. The development of the "Hospital Compare," and more recently, the "Physician Compare" websites has further expanded public reporting for hospitals and providers. Several professional organizations, including the American Medical Association, Society of Thoracic Surgeons, and the American College of Cardiology, have published policy statements articulating key principles to guide the public reporting process. Despite the rapid proliferation of public reporting efforts, more research is needed to better define meaningful measures to report and fully understand the impact of public reporting on healthcare delivery. (J Am Coll Cardiol 2014;63:1239–45) © 2014 by the American College of Cardiology Foundation

"The very first requirement in a hospital is that it should do the sick no harm."

— Florence Nightingale, 1859 (1)

In the mid-19th century, Florence Nightingale published mortality rates at British military hospitals caring for war casualties in what is believed to be the earliest attempt at public reporting (1). About 50 years later, Dr. Ernest Codman, an advocate of hospital reform, endured the criticism of his colleagues after calling for the public release of surgical outcomes (2). Although his peers rejected Codman's vision, his efforts were central to the founding of the American College of Surgeons and The Joint Commission. Since that time, release of information into the public domain about the performance of healthcare systems and individual providers has grown. With the current national emphasis on quality improvement, accountability, and cost effectiveness in health care, stakeholders, such as government, purchaser, provider organizations, and consumers, are seeking information to inform decisions about healthcare facilities and providers (Table 1). Hospital-level public reporting exists in several formats and is now familiar to most clinicians. Although the methods are less developed, public reporting of individual provider data is rapidly progressing. The most compelling justification for public reporting is the public's right to know about the care that they are likely to receive from hospitals and physicians. Public reporting is fundamentally based on the belief that accessible, transparent quality information will affect decisions and behaviors of the various stakeholders, ultimately resulting in an improvement in healthcare delivery and outcomes.

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Historical Perspective

After Codman, little occurred to nurture transparency and accountability in health care until the late 1980s when the Health Care Financing Administration (HCFA), the predecessor of the Centers for Medicare and Medicaid Services (CMS), published risk-adjusted death rates in U.S. hospitals. Although originally not intended for public release, these reports became public and were widely criticized (3–6). Although the HCFA experience was fraught with challenges, it stimulated development of other quality improvement registries and statewide reporting systems, such

Abbreviations and Acronyms

ACA = Patient Protection and Affordable Care Act of 2010

ACC = American College of Cardiology

AHA = American Heart Association

CMS = Centers for Medicare and Medicaid Services

HCFA = Health Care Financing Administration

NCDR = National Cardiovascular Data Registry

NQF = National Quality Forum

PCI = percutaneous coronary intervention

STS = Society of Thoracic Surgeons

as the Northern New England Cardiovascular Study Group, the Society of Thoracic Surgeons (STS) National Adult Cardiac Surgery Database, and the reporting of cardiac surgery and percutaneous coronary intervention (PCI) outcomes in several states (7–13). With implementation of the "Hospital Compare" website in 2005, CMS re-established public reporting for Medicare beneficiaries aggregated at the hospital level, initially with process measures for common conditions (14). Public reporting initiatives include: 1) state initiatives, with some including price transparency; 2) reports from payers; 3) reports from business consumer groups; and 4) reports from independent organizations that display data in a simple format and provide proprietary analysis and ratings using methodology that is nontransparent (15–18). Some payer organizations have a greater focus on cost-profiling physicians; the accuracy of these methods has been questioned (15). There are also multiple internet-based forums where patients report their anecdotal experiences with physicians (19).

Beginning in September 2010, STS, in partnership with *Consumers Union*, started voluntary publishing information on the performance of coronary artery bypass graft procedures in *Consumer Reports* (20). Previously, STS data were used as benchmarks to stimulate local quality improvement, but were not available publically. This collaboration represented the first national public reporting effort led by a professional organization and was well received (21). Within 3 years of its inception, 50% of cardiovascular groups voluntarily reported their STS ratings.

Passage of the Patient Protection and Affordable Care Act of 2010 (ACA) created a new framework by mandating a national strategy for quality improvement, including public reporting of healthcare quality information. Two federal agencies, the Agency for Healthcare Research and Quality and CMS, share responsibility for these activities. By law, these agencies are required to engage all relevant stakeholders and develop detailed performance, quality, and cost measures to meet the needs of patients. The ACA also called for a multi-stakeholder group to: 1) identify the best available performance measures for use in specific applications; 2) provide input to the Department of Health and Human Services on measures for use in public reporting, performance-based payment, and other programs; and 3) encourage alignment of public and private sector efforts. The Secretary of the Department of Health and Human Services selected the National Quality Forum (NQF) to perform these functions, and subsequently, the NQF convened a public–private partnership to assist in the selection of performance measures (22,23). Public reporting will be used for insurance plans offered through new state-level health insurance exchanges and for participants in Medicare's "value-based purchasing" program. Some of these initiatives have already started, with implementation of the "Physician Compare" website by CMS (24). Beginning in 2014, Physician Compare will include quality of care ratings for group practices, with individual ratings added in the future.

Potential Benefits and Unintended Consequences of Public Reporting

Public reporting is intended to improve healthcare delivery and patient outcomes by making quality measures transparent and easily available. Literature on the impact of public reporting is limited, but positive examples are emerging. For example, a national survey from 2008 showed that patients with vascular disease were prescribed prophylactic aspirin by only 35% to 47% of physicians among different specialties (25). However, in Minnesota, which publically reports the use of aspirin prophylaxis, the rate is 95% (26). Likewise, recent data from the Wisconsin Collaborative for Healthcare Quality showed that large group practices will engage in quality improvement efforts and show improvement in response to public reporting, especially when comparative performance is displayed on a website (27,28). Survey data from administrators, physicians, and nurses indicate that public reporting: 1) leads to greater involvement of leadership in performance improvement; 2) creates a sense of accountability to internal and external customers; 3) contributes to a heightened awareness of performance measure data throughout the facility; 4) re-focuses organizational priorities; 5) raises concerns about data quality; and 6) leads to questions about consumer understanding of performance reports (29). However, reviews of public reporting confirm that a rigorous evaluation of many major public reporting systems is lacking, and there are minimal data about public reports of individual provider data and practices (30,31). These reviews cite evidence that publicly releasing performance data stimulates quality improvement activity at the hospital level, but conclude that the overall effect of public reporting on effectiveness, safety, and patient-centeredness remains uncertain.

Studies have also reported unintended consequences of public reporting. The majority of reports highlight the development of risk adverse behavior among physicians and facilities subject to public reporting. This was shown for coronary artery bypass graft surgery in both New York and Pennsylvania, and similar risk adverse behavior was reported for PCI (32–35). In several studies, patients with acute myocardial infarction and cardiogenic shock were less likely to receive PCI in states with public reporting (35–37).

Table 1 Stakeholders and Their Interest in Public Reporting

Stakeholder	Reasons for Interest
Consumers	Consumers of healthcare services are the most obvious audience for information on the costs and quality of care. Consumers could use the information in public reports at various points of interaction to make more informed decisions about choosing facilities and providers for a specific service.
Employers/purchasers	Employers act as intermediaries in selecting health insurance for most privately-insured Americans. Employers may want information to use in selecting from among various health plans or self-insured options, including the cost and outcomes of providers included in a given plan's network and the plan's record of performance in meeting service and quality standards.
Health plans	Health plans likely have their own claims data, but in certain markets may not have sufficient information to evaluate the price and quality of all physicians, hospitals, and other providers. Plans may also want to benchmark their performance on service and quality measures against their competitors.
Providers	Hospitals, physicians, nursing homes, and other healthcare providers could benefit from more transparent quality information for benchmarking their own performance and as a feedback loop for improved performance.
Policymakers	Federal and state officials' responsibility for oversight and monitoring of performance could benefit from accurate and timely information on providers, health plans, and facilities to monitor changes in the overall system, identify areas that warrant closer investigation, and encourage the reporting groups to monitor their own performance. Policymakers are seeking to promote healthcare "value," which necessitates the measurement of both cost and quality.

Adapted from Colmers JM. Public reporting and transparency. The Commonwealth Fund, 2007.

In Massachusetts, the risk profile of PCI patients at hospitals identified as having higher than expected mortality was significantly lower after public identification when compared with nonoutlier institutions (38,39). This was partially negated by the inclusion of a "compassionate use" variable into the mortality risk calculation (40). Nevertheless, there is concern that mortality alone is not a good metric to judge the quality of a PCI program (41–43).

In addition to concerns about unintended consequences, there are questions about the accuracy of some reported data. When HCFA data were used to generate hospital mortality reports, there was considerable concern about the potential inaccuracies of administrative (claims) data for this purpose, and these concerns still exist (5,6,44). For example, in comparative studies of cardiac surgery performance using administrative versus clinical data sources, considerable disparities were found, leading to the conclusion that report cards using administrative data were problematic (45–47). Clinical registry data have several advantages over administrative data that are currently the substance of many public reports (48,49) (Table 2).

Table 2 Advantages of Clinical (Registry) Data Over Claims Data in Public Reporting

More directly reflects clinical care, and is, therefore, closer to the science upon which measures are based and more reflective of actual performance than are data derived solely from claims.
Can provide periodic, timely, nationally benchmarked data to providers, which can be used to construct practice- and provider-level quality improvement activities, the results of which can be measured in subsequent data submissions. In contrast, administrative data frequently has a lag time of 2 years.
Data for submission to registries can be unobtrusively incorporated into provider workflow with software that queries virtually any commonly-used electronic health records system.
Data submission, quality, and analysis can be overseen by medical specialty societies that focus on education and clinical quality improvement.

How Should Public Reports Be Used by Patients and Purchasers?

Although the public has adopted the use of easily available product evaluations to guide decisions about major purchases, consumers have been slow to use comparative information to make healthcare choices. However, this is changing; data from the Pew Internet Research Project indicate that among those with Internet access, 55% have sought medical information from the Internet (50,51). In theory, the use of public reports should facilitate 3 key functions. First, these data should help consumers make informed and better choices about where to obtain health care for themselves and their family. Second, these data should stimulate quality improvement among provider groups as a way to protect or enhance their market share, especially in more competitive markets if they perceive that performance data may affect consumer choice. Finally, access to these data should encourage providers to improve their quality of care and encourage purchasers and health plans to use higher-quality providers in their networks (52,53).

To make public reporting helpful to consumers, it is important to understand that consumers and clinical experts may define quality differently. The top factors consumers identified as being most important in determining the quality of health care were affordability, the physician's qualifications, and access to care for everyone (54). This is clearly different from the concept of healthcare quality represented in most public performance reports, which often include technical measures of quality and patient experiences. Consumers can also misunderstand reported quality measures. For example, longer length of stay is intended to indicate poor performance, but some consumers may incorrectly believe this a favorable finding. Other measures may be incomprehensible to consumers, such as why certain medications are necessary for some conditions (55).

Research Is Needed to Improve Public Reporting

The effectiveness of public reporting, including both potential benefits and unintended consequences, has not been

convincingly proven, and thus, more research is needed (30,31). Presently, it appears that public reporting is more likely to have an impact on healthcare providers than on consumers. Some process measures of quality improve over time, but changes in outcomes like mortality have been more difficult to assess due to many confounders. The most consistent evidence supporting the impact of public reporting comes from the long-term care environment, where there have been more studies of improvements in quality measures due to Nursing Home Compare and Home Health Compare (56,57). Future research should focus on: 1) identifying which types of measures (process, outcome, safety, cost, access, or patient experience) are most meaningful to consumers, and thus, likely to have the greatest impact; 2) better defining the potential for harm to facilities and providers from public reporting; 3) determining the balance of benefits and harms of public reporting of individual physician performance, particularly when process measures are used to assess care and determining attribution of a failure to an individual may be difficult; 4) determining the best formats for presentation of healthcare information to consumers; and 5) assessing whether public reporting results in a change in consumer behavior, healthcare quality, and cost savings.

Why Should Professional Societies Engage in Public Reporting?

Public reporting of healthcare provider performance is here to stay and will continue to grow, including not only process measures, but also outcome measures. Physician engagement is essential and can be facilitated by professional organizations. Together, cardiovascular clinicians and professional societies should take a leadership role to: 1) continue the development of meaningful performance measures; 2) optimize the validity of publically reported information; 3) minimize unintended consequences; 4) promote the use of clinical data to improve public reporting; 5) ensure a link to quality improvement is maintained; and 6) develop ways to use public reporting in ongoing professional development (58).

Public Reporting and Professional Societies

In anticipation of the increase in public reporting, the American College of Cardiology (ACC) developed a health policy statement in 2008 defining 6 core principles of public reporting (59) (Table 3). With great attention to these core principles, the ACC, in partnership with the Society for Cardiovascular Angiography and Interventions and the Heart Rhythm Society, studied the feasibility of public reporting of certain cardiovascular performance measures using data from the National Cardiovascular Database Registry (NCDR). The main advantage is that these data derive from clinical sources rather than administrative data. Independent audits of NCDR data show an accuracy of approximately 90% in several registries compared with source documents (60). All publically-reported NCDR measures must be approved by the NQF, which is a lengthy and rigorous process (61). In addition, the ACC/American Heart Association (AHA) Task Forces on Practice Guidelines and Performance Measures provide guidance on the measures submitted to the NQF for consideration. All measures are evidence-based, predicated on the strongest guideline recommendations generated by the ACC/AHA Task Force on Practice Guidelines, and are developed according to standardized methodology promulgated by the ACC/AHA Task Force on Performance Measures.

Table 3 American College of Cardiology Foundation's Principles of Public Reporting

Number	Principle
1	The driving force behind physician performance measurement and reporting systems should be to promote quality improvement.
2	Public reporting programs should be based on performance measures with scientific validity.
3	Public reporting programs should be developed in partnership with physicians.
4	Every effort should be made to use standardized data elements to assess and report performance and to make the submission process uniform across all public reporting programs.
5	Performance reporting should occur at the appropriate level of accountability.
6	Public reporting programs should include a formal process for evaluating the impact of the program on the quality and cost of health care, including an assessment of unintended consequences.

Adapted with permission from Drozda et al. (59).

The initial measures reported consist of 3 process measures and 4 outcome measures derived from the NCDR's CathPCI and Implantable Cardioverter Defibrillator Registries (62,63) (Table 4). These measures will be displayed on the Hospital Compare website and will also be posted on other sources, including CardioSource or CardioSmart, when the measures appear in the public domain. A pilot project using 30-day readmission following PCI has already started, with approximately 300 facilities voluntarily reporting their results.

The Future of Public Reporting

The future of public reporting is evident in CMS's plans for the Physician Compare website (24). The ACA stipulates public reporting of performance measures for physicians, nurse practitioners, physician assistants, and 19 other types of healthcare providers who provide service to Medicare beneficiaries. As this law is phased in, CMS is also charged with developing a plan to provide larger payments to physicians who provide "high-quality care" compared with cost. In addition to measures already collected as part of the Physician Quality Reporting System, metrics reflecting the continuity and coordination of

Table 4 American College of Cardiology Measures to Be Publicly Reported

Measure Descriptions to Be Included in Composites	Registry Source	External Data Required	NQF Endorsed
Hospital risk-standardized complication rate following implantation of an ICD	ICD	Yes—CMS	Yes
Beta-blocker at discharge for ICD implant patients with a previous MI	ICD	No	Yes
Beta-blocker at discharge for ICD implant patients with LVSD	ICD	No	Yes
ACE/ARB therapy at discharge for ICD implant patients with LVSD	ICD	No	Yes
Patients with an ICD implant who receive prescriptions for all medications (ACE/ARB and beta-blockers) for which they are eligible for at discharge	ICD	No	Yes
PCI mortality (risk-adjusted)	CathPCI	No	Yes
30-day all-cause risk-standardized mortality rate following PCI for patients with STEMI or cardiogenic shock	CathPCI	Yes—for vital status (e.g., CDC)	Yes
30-day all-cause risk-standardized mortality rate following PCI for patients without STEMI and without cardiogenic shock	CathPCI	Yes—for vital status (e.g., CDC)	Yes
Hospital 30-day risk-standardized readmission rates following PCI	CathPCI	Yes—CMS	Yes
Therapy with aspirin, $P2Y_{12}$ inhibitor, and statin at discharge	CathPCI	No	Yes

ACE/ARB = angiotensin-converting enzyme inhibitor/angiotensin receptor blocker; CathPCI = Cardiac Catheterization/Percutaneous Coronary Intervention; CDC = Centers for Disease Control and Prevention; CMS = Centers for Medicare & Medicaid Services; ICD = implantable cardioverter-defibrillator; LVSD = left ventricular systolic dysfunction; MI = myocardial infarction; NQF = National Quality Forum; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

care, patient experience, appropriateness, and timeliness of care are being considered. These categories are based on the Institute of Medicine's 6 domains of quality (care that is safe, effective, patient-centered, timely, efficient, and equitable) and have been used to measure the quality of health plans and community clinical services (64). Other issues under consideration by CMS are: 1) developing additional measures that are statistically valid, reliable, and risk-adjusted; 2) allowing providers the ability to review results before they are published; and 3) including data reflecting care rendered to all patients, not just Medicare beneficiaries, if that provides a more accurate picture of physician performance.

In the future, U.S. consumers will likely be paying more of their personal healthcare costs, and that will drive patients to seek greater value. Just as consumers search the Internet for the lowest price of an appliance, patients in the future will search for quality and value in health care based upon transparent and reliable data. The challenge moving forward is to ensure public reporting occurs in a fair, accurate, and meaningful way that benefits patients and minimizes the possibilities of unintended negative consequences. Greater involvement of professional societies and employing clinical data in reporting are 2 desirable ways to improve public reporting and guide it to the right place as healthcare delivery evolves. By following clinical practice guidelines, knowing their personal and their institution's adherence to performance measures, and giving proper attention to appropriate use criteria, cardiovascular specialists will help ensure that they are prepared for the future. Attention to these areas in daily practice can safeguard a clinician from being identified as an outlier.

Health care is changing dramatically in the United States, and cardiovascular professionals face a future likely to be quite different from the past. With valid data, meaningful measures, and a commitment to continuous improvement, cardiovascular specialists and the care teams that assist them should be prepared to succeed in an era of public reporting and to be leaders in the transparent and accountable healthcare system ahead.

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