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# The Unintended Consequences of Publicly Reporting Quality Information

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**P**UBLIC REPORTING OF COMPARATIVE information on health care quality of physicians, hospitals, and health plans through “report cards” is hailed as a plausible way to improve health care.<sup>1-3</sup> Without publicly reported comparative information on health care quality, patients may choose their physicians based on more measurable characteristics (such as cost) or by word-of-mouth or other informal referral practices not obviously related to their needs.

Two general types of health care report cards exist: those that measure outcomes and those that measure process. Reports of cardiac surgeons' and hospitals' risk-adjusted mortality rates following coronary artery bypass graft (CABG) surgery are examples of outcomes-based reporting.<sup>4-7</sup> Process-based report cards, often called quality indicators, report on rates of medical interventions, such as screening tests and medication use, which are assumed to be related to outcomes. Examples of report cards using process-based measures include the Centers for Medicare & Medicaid Services' nursing homes report card, reporting on quality of care in nursing homes nationwide<sup>8</sup>; the Agency for Healthcare Research and Quality's congressionally mandated National Healthcare Quality Report, reporting on 150 measures of quality<sup>9</sup>; and the National Committee for Quality Assurance Health Plan Employer Data and Information Set (HEDIS), which includes quality indicators on health plan performance.<sup>10</sup>

Health care report cards publicly report information about physician, hospital, and health plan quality in an attempt to improve that quality. Reporting quality information publicly is presumed to motivate quality improvement through 2 main mechanisms. First, public quality information allows patients, referring physicians, and health care purchasers to preferentially select high-quality physicians. Second, public report cards may motivate physicians to compete on quality and, by providing feedback and by identifying areas for quality improvement initiatives, help physicians to do so. Despite these plausible mechanisms of quality improvement, the value of publicly reporting quality information is largely undemonstrated and public reporting may have unintended and negative consequences on health care. These unintended consequences include causing physicians to avoid sick patients in an attempt to improve their quality ranking, encouraging physicians to achieve “target rates” for health care interventions even when it may be inappropriate among some patients, and discounting patient preferences and clinical judgment. Public reporting of quality information promotes a spirit of openness that may be valuable for enhancing trust of the health professions, but its ability to improve health remains undemonstrated, and public reporting may inadvertently reduce, rather than improve, quality. Given these limitations, it may be necessary to reassess the role of public quality reporting in quality improvement.

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Although much of what is known about public report cards comes from research on CABG report cards, both process and outcomes report cards are published based on the same critical premise—ie, only by making quality information publicly available can one make it influential in improving health care quality. For this reason, publicly reporting quality and quality improvement are often seen hand-in-hand.

Nevertheless, this reasoning has 2 shortcomings. First, the impact of public reporting on care is assumed but has not been demonstrated. Despite the enthusiastic support for the public release of performance measures<sup>11-13</sup> and

extensive adoption of quality measurement and reporting,<sup>4-10</sup> little research examines the effect of public reporting on the delivery of health care,<sup>14,15</sup> and even less examines how report cards may improve care.<sup>15-17</sup> Second, the potential unintended and negative consequences of public reporting are largely unexplored.

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Collecting measures of provider performance and using that information to improve practice by providing private feedback to physicians, hospitals, and health plans are established mechanisms to improve health care quality.<sup>18-20</sup> The objective of this article is not to challenge those practices, but to critically examine the role of publicly reporting this information on health care quality. In this article, we use the term “provider” to include physicians, hospitals, and health plans, collectively.

### How Might Public Reporting of Health Care Quality Improve the Quality of Health Care?

Patients and referring physicians might use public report cards to help them select high-quality providers. Rated physicians might respond to report cards by improving the quality of care they deliver. Either of these 2 processes might explain how report cards enhance health care quality, if indeed they do. Less directly, report cards may also provide a mechanism to convey a sense of trust among patients or to hold health care providers accountable for quality.

**Selection of High-Quality Providers by Patients.** Although the idea that patients will use public report cards to select the best clinical providers is plausible, this process requires several intermediate steps that are not so assured: (1) report cards must exist; (2) patients must know about the report cards and have access to them; (3) patients must be able to understand the quality rankings and believe them; and (4) patients must act on the report card information.

Public report cards have become a prominent part of the quality improvement landscape over the last quarter century.<sup>4-10</sup> While initial reports suggested that the majority of patients did not know that this comparative quality information is publicly available, the number of people who have seen quality information in the past year has slowly increased from 27% in 2000 to 35% in 2004.<sup>21-23</sup> Among the minority of patients who are aware of quality in-

formation, many do not understand it, trust it, or view it as useful. Common misunderstandings surround the language and terms used in report cards, what an indicator is supposed to reveal about quality of care, and whether high or low rates of an indicator reflect good performance.<sup>22-24</sup> Misunderstanding is more common among patients of lower socioeconomic status.<sup>24</sup>

Patients also report not trusting the information in report cards. Most consider friends and relatives as highly credible, preferring these sources to published information,<sup>25</sup> and consumers continue to report that they value information on health choices from friends, family, and personal physicians much more than information from governmental sources.<sup>22</sup>

A minority of patients actually use quality information when they make health care decisions. In 2000, a national survey found that 12% of respondents reported using any information they saw comparing quality among health plans, hospitals, or physicians in the past year.<sup>23</sup> Four years later, that number increased to 19%.<sup>22</sup> Another survey of patients in Pennsylvania who had undergone CABG surgery reported that only 1% to 2% of patients said the CABG report card was a major or moderate influence in their choice of a hospital or surgeon.<sup>21</sup> Whether from lack of awareness, lack of trust, misunderstanding, or relative inattention, few patients use report cards to select providers. These circumstances may change, but report cards' potential for helping patients select providers has not yet been realized.

**Selection of High-Quality Providers by Physicians.** Even if patients do not use public report cards for provider selection, other physicians might use them in their choice of referrals, so patients may benefit from report cards through the more informed choices of their referring physicians.<sup>26,27</sup>

The majority of physicians report being aware that public report cards exist; however, many do not trust the information. In one survey, 82% of Pennsylvania cardiologists knew of the state's

CABG report card, but thought the risk adjustment was inadequate and that the ratings could be manipulated by the surgeons and hospitals who were being rated. Sixty-two percent responded that the report card had no influence on their referral recommendations, and only 13% responded that the report card had a moderate or substantial influence on their referral recommendations.<sup>26</sup> Although limited, the available evidence suggests that public report cards have a minor influence on physician referral patterns.

**Selection of High-Quality Providers by Purchasers.** Even if the majority of patients and referring physicians do not use report cards for provider selection, purchasers might use public report card information in establishing provider contracts. Hospital administrators say that report cards are useful in negotiating with health plans, but less than one quarter of health plans say that quality rankings in report cards were a major factor in their decision to contract with surgeons.<sup>28,29</sup> More objective evidence of whether report cards have caused insurers to contract with higher-quality providers is mixed. Mukamel et al found that while purchasers are paying attention to quality report cards, the impact is small.<sup>29,30</sup> More recently, Erickson et al found that New York health plans do not use performance data to choose high-performance centers for CABG surgery.<sup>31</sup>

**Provider Response to Report Cards.** Public report cards' effect on physician selection is diminished at each of the necessary steps required to make report cards work, attenuating the ultimate impact of report cards on directing patients to higher-quality providers. This might be corrected over time as consumers become more aware of report cards' availability and more willing and able to use them in physician selection.

While waiting for greater uptake of public report cards by consumers, report cards might still provide value if they lead physicians to improve their practices. Were physicians to respond to re-

port cards by improving their quality, the population distribution of quality might improve, and even patients who do not select physicians based on quality would receive higher quality of care.

Public report cards might improve health care quality in 3 general ways: (1) remediation (report cards cause providers to change their practices to improve quality); (2) restriction (report cards lead to restriction or limitation of physicians' practices so that they no longer provide care for which they rated poorly); and (3) removal (report cards cause low-quality physicians to exit the health care market). These 3 responses to report cards could occur in several ways.

Report cards might remediate lower-quality practices by providing benchmarking and feedback to physicians. Educating physicians about practice guidelines can influence physician practice, especially when interventions are targeted at opinion leaders.<sup>32,33</sup> Informing individual physicians about their quality rankings may have an effect similar to educating physicians about practice guidelines. It may cause these physicians to pay more attention to standards of care and thus improve the care they provide.

Report cards might also give providers the necessary information to start formal quality improvement programs. There is some evidence that providers respond to public report cards with quality improvement initiatives. For example, the committee overseeing New York's CABG report card advises the state's department of health which hospitals and surgeons may need special attention and recommends that some hospitals obtain outside consultants to design quality improvements for their programs.<sup>34,35</sup> The report card has also been credited with removing low-volume cardiac surgeons in New York, after 27 low-volume surgeons ceased performing CABG surgery in the state between 1989 and 1992.<sup>35</sup>

The positive impact of report cards on quality improvement may be larger when the quality reports are publicly reported rather than privately reported. A

recent study on reporting hospital quality in Wisconsin randomly assigned hospitals to receive publicly reported quality information, privately reported quality information, or no quality information. The investigators found that the hospitals that had their quality information released publicly engaged in a higher number of quality improvement activities compared with the other 2 groups of hospitals. This was particularly true for hospitals that had received low-quality scores.<sup>36</sup>

Public report cards might also improve quality by stimulating quality competition, causing health care providers to compete on quality to maintain or improve their market share. However, given the apparently limited effect of report cards on consumer choice, the indirect effects on provider behavior might be even more limited. Research on the effect of reporting quality on market share suggests that report cards may encourage hospitals and physicians to compete on quality, but studies have been contradictory.<sup>35,37,38</sup>

**Report Cards Provide Accountability and May Enhance Trust.** Even if public report cards have a limited impact on improving health care quality, they fill another important need. By publicly reporting on the quality of health care, report cards allow the public to hold the health care providers accountable for the quality of care they deliver. Recent surveys have revealed that public accountability in quality is important to the public. In one study, 92% of Americans said that reporting of serious medical errors should be required,<sup>22</sup> and over 60% wanted this information released publicly.<sup>22,39</sup> Despite the public's strong preference for the public reporting of medical errors, only 6% of the public identified medical errors as a top problem facing health and medicine.<sup>39</sup>

### **Has Public Reporting of Health Care Quality Improved the Quality of Health Care?**

After New York began releasing its CABG report card, CABG mortality rates in New York dropped from 3.52% in

1989 to 2.78% in 1992, a decrease of 41%.<sup>40</sup> This decline in CABG-associated mortality rates was larger in New York than in other states at the same time<sup>41</sup> and persisted through the 1990s.<sup>42</sup> The mortality decline was hailed as a success of the CABG report card.

However, this enthusiasm has been curbed by simultaneous reports of cardiac surgeons turning away the sickest and most severely ill patients in states with CABG report cards in an effort to avoid poor outcomes and lower publicly reported ratings. Omoigui et al<sup>43</sup> noted that the number of patients transferred to the Cleveland Clinic from New York hospitals increased by 31% after the release of CABG report cards in New York, and that these transfer patients generally had higher risk profiles than patients transferred to Cleveland Clinic from other states. In Pennsylvania, which also introduced CABG report cards, 63% of cardiac surgeons admit to being reluctant to operate on high-risk patients, and 59% of cardiologists report having increased difficulty in finding a surgeon for high-risk patients with coronary artery disease since the release of report cards.<sup>26</sup> New York had a similar experience after the release of report cards, reporting that 67% of cardiac surgeons refused to treat at least 1 patient in the preceding year who was perceived to be high risk.<sup>44</sup>

Moreover, patients undergoing bypass surgery in Pennsylvania and New York had lower illness severity than patients in states that did not publicly release the information, particularly among surgeons rated as low quality.<sup>45</sup> Furthermore, the release of New York's CABG report card was associated with an increase in racial disparities in CABG use, suggesting that surgeons also may have responded to CABG report cards by avoiding patients perceived to be at risk for bad outcomes, such as blacks and Hispanics.<sup>46</sup> Although some prior studies have noted improvements in CABG mortality rates after the release of CABG report cards,<sup>40-42</sup> if quality report cards cause physicians to select patients based on risk profile, the quality of care

and outcomes of people eligible for CABG may worsen even as mortality rates among those who receive CABG improves.

Other public report cards have also been hailed for improving health care quality. The National Committee on Quality Assurance publishes its HEDIS measures of health plan performance annually, and over the past 5 years has reported that performance on key measures of clinical quality improved from the preceding year.<sup>10</sup> These improvements should be interpreted with caution. Public disclosure of the HEDIS measures is voluntary, and in past years less than one third of health plans chose to disclose their quality scores.<sup>47</sup> Evidence suggests that lower-scoring health plans are more likely to stop disclosing their quality data.<sup>48</sup> Biased drop-out rates among poorer performers may falsely inflate the apparent performance of the health plans as a whole.

The nursing home quality reports published by the Centers for Medicare & Medicaid Services have thus far had mixed results on nursing home quality. The *Boston Globe* recently reported that fewer nursing home residents experience untreated pain or are placed in restraints since the report card was first published in 2002. However, there has been no significant change in other areas of nursing home quality such as the occurrence of pressure sores among residents or the ability of residents to walk or feed themselves.<sup>49</sup>

There have been some noteworthy quality improvements following performance measurement without public profiling. Both the Department of Veterans Affairs (VA) and Medicare have instituted performance evaluation programs that provide feedback to hospitals on the quality of care they deliver, but do not make the performance information publicly available. Notably, both the VA and Medicare report improvements in quality since performance evaluation was initiated.<sup>18,20,50</sup>

Others have noted there may be a downside to using quality indicators to rate performance.<sup>51</sup> Quality indicators may cause physicians to screen or treat

all patients, regardless of whether they are appropriate for the intervention. Quality indicators are based on practice guidelines derived from evidence linking treatment to outcomes. Practice guidelines are meant to offer clinicians guidance to help improve patient care. However, translating practice guidelines into publicly reported quality measures shifts their emphasis away from providing guidance and toward achieving target rates. Because these quality measures assume that providing higher levels of compliance with practice guidelines always translates into higher-quality care, report cards may lead to unnecessary interventions, discounting clinician judgment and patient preferences.

A recent study by Walter et al<sup>51</sup> examined the use of performance evaluation using quality indicators at the VA. Examining rates for colorectal cancer (CRC) screening at a center noted for failing to meet the target rate for CRC screening, the researchers found that among patients who did not undergo CRC screening, 47% had declined screening, 12% failed to complete or keep appointments for screening, and in 31% of patients, testing was not medically indicated or the patient had high levels of comorbid illnesses.<sup>51</sup> While the hospital in question may have failed to meet the VA's target rate of CRC screening, 90% of unscreened patients may have been appropriately unscreened. If quality indicators push physicians to meet target rates, they may fail to reward physicians for appropriately incorporating their clinical judgment and patient preferences into their decision making and result in inappropriately high rates of screening tests, medication use, or other items being measured.

### Implications

Public reporting of health care quality may represent an important step in improving openness and accountability among the health professions. Public reporting has also been hailed as a critical step in improving health care quality. Principle supports the first of these

goals, but the evidence supporting success with the second goal is mixed. Moreover, some evidence suggests that public reporting reduces overall health care quality.

Is it worth revisiting whether public reporting should continue? The number of public report cards has increased tremendously over the past several decades. Enthusiasm for the practice stems from the idea that publicly reporting quality information allows consumers to make informed choices. Yet there is limited evidence that public report cards improve quality through this mechanism, and there is some evidence that they paradoxically reduce quality. Instead of publicly reporting quality, report cards might be more constructively used to give more private feedback to the providers who are being rated, as is done in Medicare and the VA. Such an approach might limit physicians' negative response to report cards while retaining incentives to improve. Just as distancing system participants from blame may encourage an open environment that reduces medical errors and enhances patient safety, the most constructive audience for report cards may be physicians alone.

However, keeping quality information private may appear conspiratorial, reduce patient trust, damage the profession's credibility, and hinder future efforts at quality improvement. The Institute of Medicine has suggested that what is really needed to improve quality is a culture that encourages sharing rather than hiding errors.<sup>52</sup> Leaders in health care have suggested that the principal obstacle to broader action on quality improvement is a lack of consensus on publicly reporting quality measures,<sup>53</sup> and the public is unambiguously positive about the accountability provided by public reporting.<sup>39</sup> Because public reporting provides this important mechanism for accountability, its perceived value is hard to challenge. If this is the case, what can be done to help public reporting achieve its goals in reality?

First, if publicly reporting quality measures is to facilitate the selection of

high-quality physicians, those measures must be promoted widely, understandably, and credibly. An emerging literature suggests that the design format and type of information presented in report cards affects its interpretation and use.<sup>54,55</sup> Other work has extensively explored ways to link reported quality information to specific decisions made by consumers to increase the likelihood that consumers will use the information in report cards to select high-quality physicians.<sup>56-59</sup> As quality information is presented more saliently, its uptake and use may increase.

Second, publicly reported quality measures should decrease physicians' incentive to select patients to improve their rankings. With outcomes-based report cards, the incentive to avoid patients at high risk for adverse outcomes is best addressed through detailed and credible risk adjustment. New York State's CABG report card set the standard over a decade ago for adjusting rankings based on detailed clinical information.<sup>34</sup> However, detailed risk adjustment does little to mitigate physicians' incentive to migrate toward healthy patients for whom treatment may provide fewer benefits. One way to decrease this unintended consequence of public reporting is to include measures of the appropriateness of care. In the case of CABG report cards, appropriateness criteria might diminish surgeons' incentive to substitute potentially less appropriate low-risk patients for potentially more appropriate high-risk patients.

Adjusting report card rankings for case-mix may be relevant, not only for outcomes-based measures, but also for process-based measures. As Walter et al found in the case of CRC screening, the reason some patients do not undergo screening is because of a high level of comorbid illnesses.<sup>51</sup> Severity-adjusting screening rates is critical to make sure that patients receiving primary prevention are those who will benefit the most from it. Other factors, such as patients' socioeconomic status and race, may also confound the

measurement of quality through indicators. Quality indicators such as satisfaction with care are correlated with race and socioeconomic status.<sup>60</sup> Performance measures that fail to adjust for these factors may penalize physicians who care for minority patients or patients of low socioeconomic status.<sup>61</sup> Race and socioeconomic status may also affect a physician's perception of whether a patient will follow recommendations for screening or treatment.<sup>62</sup> If performance measures are not adjusted for race and socioeconomic status in addition to severity of illness, physicians may shy away from treating some groups of patients out of fear of being penalized in their report card rankings.

Finally, if public report cards are to improve the quality of care, participation must be mandatory and quality measurement and reporting must be universally adopted. Otherwise, providers who receive low-quality scores face incentives to avoid reporting and the sickest patients will be shifted from rated to unrated providers.

Public reporting of health care quality information is well-intentioned. But enthusiasm for public reporting should not interfere with focusing on the ultimate goal—to improve the care received by patients and populations. That goal seems within reach, but current processes will need to improve to get there.

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## REFERENCES

- Arrow KJ. Uncertainty and the welfare economics of medical care. *Am Econ Rev*. 1963;53:941-973.
- Akerlof G. The market for lemons. *Q J Econ*. 1970; 84:488-494.
- Stiglitz JE. Imperfect information in the product market. In: Schmalensee R, Willig RD, eds. *Handbook of Industrial Organization, Volume I*. New York, NY: Elsevier Science Publishers BV; 1989:769-847.
- Pennsylvania Health Care Cost Containment Council. *A Consumer Guide to Coronary Artery Bypass Graft Surgery*. Harrisburg: Pennsylvania Health Care Cost Containment Council; 1992.
- New York State Department of Health. *Coronary Artery Bypass Surgery in New York State, 1990-1992*. Albany: New York State Dept of Health; 1993.
- New Jersey Department of Health and Senior Services. *Cardiac Surgery in New Jersey: Consumer Report*. 2003. Available at: [http://www.state.nj.us/health/hcsa/cabgs01/cabg\\_consumer01.pdf](http://www.state.nj.us/health/hcsa/cabgs01/cabg_consumer01.pdf). Accessibility verified February 4, 2005.
- California CABG Mortality Reporting Program. *The California Report on Coronary Artery Bypass Graft Surgery: 1997-1998 Hospital Data*. Summary report. 2001. Available at: <http://www.oshpd.ca.gov/hqad/outcomes/studies/cabg/ccmrp9798.htm>. Accessibility verified February 4, 2005.
- Centers for Medicare & Medicaid Services. *Nursing Home Compare*. 2003. Available at: <http://www.medicare.gov/Nhcompare/Home.asp>. Accessibility verified February 4, 2005.
- Agency for Health Care Research and Quality. *National Health Care Quality Report*. 2003. Available at: [http://qualitytools.ahrq.gov/qualityreport/download\\_report.aspx](http://qualitytools.ahrq.gov/qualityreport/download_report.aspx). Accessibility verified February 4, 2005.
- National Committee for Quality Assurance. *The State of Health Care Quality: 2004*. Available at: <http://www.ncqa.org/communications/SOMC/SOHC2004.pdf>. Accessibility verified February 4, 2005.
- Steinberg EP. Improving the quality of care—can we practice what we preach? *N Engl J Med*. 2003; 348:2681-2683.
- Berwick DM. Public performance reports and the will for change. *JAMA*. 2002;288:1523-1524.
- Chassin MR, Hannan EL, DeBuono BA. Benefits and hazards of reporting medical outcomes publicly. *N Engl J Med*. 1996;334:394-398.
- Marshall MN, Shekelle PG, Leatherman S, Brook RH. The public release of performance data: what do we expect to gain? a review of the evidence. *JAMA*. 2000;283:1866-1874.
- Leatherman ST, Hibbard JH, McGlynn EA. A research agenda to advance quality measurement and improvement. *Med Care*. 2003;41(1 suppl):180-186.
- Berwick DM, James B, Coye MJ. Connections between quality measurement and improvement. *Med Care*. 2003;41(1 suppl):130-138.
- Longo DR, Land G, Schramm W, Fraas J, Hoskins B, Howell V. Consumer reports in health care: do they make a difference in patient care? *JAMA*. 1997; 278:1579-1584.
- Jha AK, Perlin JB, Kizer KW, Dudley RA. Effect of the transformation of the Veterans Affairs health care system on the quality of care. *N Engl J Med*. 2003;348: 2218-2227.
- Ferguson TB, Peterson ED, Coombs LP, et al. Use of continuous quality improvement to increase use of process measures in patients undergoing coronary artery bypass graft surgery: a randomized controlled trial. *JAMA*. 2003;290:49-56.
- Jencks SF, Huff ED, Cuedon T. Change in the quality of care delivered to Medicare beneficiaries, 1998-1999 to 2000-2001. *JAMA*. 2003;289:305-312.
- Schneider EC, Epstein AM. Use of public performance reports: a survey of patients undergoing cardiac surgery. *JAMA*. 1998;279:1638-1642.
- Kaiser Family Foundation and Agency for Health Care Research and Quality. *National Survey on Consumers' Experiences With Patient Safety and Quality Information*. Washington, DC: Kaiser Family Foundation; 2004.
- Kaiser Family Foundation and Agency for Health Care Research and Quality. *Americans as Health Care Consumers: An Update on the Role of Quality Information*. Washington, DC: Kaiser Family Foundation; 2000.

24. Jewett JJ, Hibbard JH. Comprehension of quality care indicators: differences among privately insured, publicly insured, and uninsured. *Health Care Financ Rev.* 1996;18:75-94.
25. Gibbs DA, Sangl JA, Burrus B. Consumer perspectives on information needs for health plan choice. *Health Care Financ Rev.* 1996;18:55-74.
26. Schneider EC, Epstein AM. Influence of cardiac-surgery performance reports on referral practices and access to care: a survey of cardiovascular specialists. *N Engl J Med.* 1996;335:251-256.
27. Hannan EL, Stone CC, Biddle TL, DeBuono BA. Public release of cardiac surgery outcomes data in New York: what do New York State cardiologists think of it? *Am Heart J.* 1997;134:55-61.
28. Romano PS, Rainwater JA, Antonius D. Grading the graders: how hospitals in California and New York perceive and interpret their report cards. *Med Care.* 1999;37:295-305.
29. Mukamel DB, Mushlin AI, Weimer D, Zwanziger J, Parker T, Indridason I. Do quality report cards play a role in HMOs' contracting practices? evidence from New York State. *Health Serv Res.* 2000;35:319-332.
30. Mukamel DB, Weimer DL, Zwanziger J, Mushlin AI. Quality of cardiac surgeons and managed care contracting practices. *Health Serv Res.* 2002;37:1129-1144.
31. Erickson LC, Torchiana DF, Schneider EC, Newburger JW, Hannan EL. The relationship between managed care insurance and use of lower-mortality hospitals for CABG surgery. *JAMA.* 2000;283:1976-1982.
32. Berner ES, Baker CS, Funkhouser E, et al. Do local opinion leaders augment hospital quality improvement efforts? a randomized trial to promote adherence to unstable angina guidelines. *Med Care.* 2003;41:420-431.
33. Billi JE, Duran-Arenas L, Wise CG, Bernard AM, McQuillan M, Stross JK. The effects of a low-cost intervention program on hospital costs. *J Gen Intern Med.* 1992;7:411-417.
34. New York State Department of Health. Coronary Artery Bypass Surgery in New York State 1992-1994. 1996. Available at: <http://www.health.state.ny.us/nysdoh/consumer/heart/coronary.pdf>. Accessibility verified February 4, 2005.
35. Chassin MR. Achieving and sustaining improved quality: lessons from New York State and cardiac surgery. *Health Aff (Millwood).* 2002;21:40-51.
36. Hibbard JH, Stockard J, Tusler M. Does publicizing hospital performance stimulate quality improvement efforts? *Health Aff (Millwood).* 2003;22:84-94.
37. Mukamel DB, Mushlin AI. Quality of care information makes a difference: an analysis of market share and price changes after publication of the New York State cardiac surgery mortality reports. *Med Care.* 1998;36:945-954.
38. Baker DW, Einstadter D, Thomas C, Husak S, Gordon NH, Cebul RD. The effect of publicly reporting hospital performance on market share and risk-adjusted mortality at high-mortality hospitals. *Med Care.* 2003;41:729-740.
39. Blendon RJ, DesRoches CM, Brodie M, et al. Views of practicing physicians and the public on medical errors. *N Engl J Med.* 2002;347:1933-1940.
40. Hannan EL, Kilburn H Jr, Racz M, Shields E, Chassin MR. Improving the outcomes of coronary bypass surgery in New York State. *JAMA.* 1994;271:761-766.
41. Peterson ED, DeLong ER, Jollis JG, Muhlbaier LH, Mark DB. The effects of New York's bypass surgery provider profiling on access to care and patient outcomes in the elderly. *J Am Coll Cardiol.* 1998;32:993-999.
42. Hannan EL, Vaughn Sarrazin MS, Doran DR, Rosenthal GE. Provider profiling and quality improvement efforts in coronary artery bypass graft surgery: the effect on short-term mortality among Medicare beneficiaries. *Med Care.* 2003;41:1164-1172.
43. Omoigui NA, Miller DP, Brown KJ, et al. Outmigration for coronary bypass surgery in an era of public dissemination of clinical outcomes. *Circulation.* 1996;93:27-33.
44. Burack JH, Impellizzeri P, Homel P, Cunningham JN. Public reporting of surgical mortality: a survey of New York State cardiothoracic surgeons. *Ann Thorac Surg.* 1999;68:1195-1200.
45. Dranove D, Kessler D, McClellan M, Satterthwaite M. Is more information better? the effects of "report cards" on health care providers. *J Polit Econ.* 2003;111:555-588.
46. Werner RM, Asch DA, Polsky D. Racial profiling: the unintended consequences of CABG report cards. *Circulation.* In press.
47. Farley DO, McGlynn EA, Klein D. *Assessing Quality in Managed Care: Health Plans Reporting of HEDIS Performance Measures.* New York, NY: The Commonwealth Fund; 1998.
48. McCormick D, Himmelstein DU, Woolhandler S, Wolfe SM, Bor DH. Relationship between low quality-of-care scores and HMOs' subsequent public disclosure of quality-of-care scores. *JAMA.* 2002;288:1484-1490.
49. Dembner A, Dedman B. Nursing homes show uneven gains: national effort at grading has mixed results. *Boston Globe.* December 13, 2004:A1.
50. Asch SM, McGlynn EA, Hogan MM, et al. Comparison of quality of care for patients in the Veterans Health Administration and patients in a national sample. *Ann Intern Med.* 2004;141:938-945.
51. Walter LC, Davidowitz NP, Heineken PA, Covinsky KE. Pitfalls of converting practice guidelines into quality measures: lessons learned from a VA performance measure. *JAMA.* 2004;291:2466-2470.
52. Institute of Medicine. *Patient Safety: Achieving a New Standard of Care.* Washington, DC: National Academy Press; 2003.
53. Altman DE, Clancy C, Blendon RJ. Improving patient safety—five years after the IOM report. *N Engl J Med.* 2004;351:2041-2043.
54. McGee J, Kanouse DE, Sofaer S, Hargraves JL, Hoy E, Kleimann S. Making survey results easy to report to consumers: how reporting needs guided survey design in CAHPS. Consumer Assessment of Health Plans Study. *Med Care.* 1999;37:MS32-MS40.
55. Spranca M, Kanouse DE, Elliott M, Short PF, Farley DO, Hays RD. Do consumer reports of health plan quality affect health plan selection? *Health Serv Res.* 2000;35:933-947.
56. Hibbard JH, Slovic P, Peters E, Finucane ML, Tusler M. Is the informed-choice policy approach appropriate for Medicare beneficiaries? *Health Aff (Millwood).* 2001;20:199-203.
57. Hibbard JH, Stockard J, Mahoney ER, Tusler M. Development of the Patient Activation Measure (PAM): conceptualizing and measuring activation in patients and consumers. *Health Serv Res.* 2004;39:1005-1026.
58. Hibbard JH. Engaging health care consumers to improve the quality of care. *Med Care.* 2003;41:161-170.
59. Hibbard JH, Slovic P, Peters E, Finucane ML. Strategies for reporting health plan performance information to consumers: evidence from controlled studies. *Health Serv Res.* 2002;37:291-313.
60. Harpole LH, Orav EJ, Hickey M, Posther KE, Brennan TA. Patient satisfaction in the ambulatory setting: influence of data collection methods and sociodemographic factors. *J Gen Intern Med.* 1996;11:431-434.
61. Fiscella K, Franks P. Influence of patient education on profiles of physician practices. *Ann Intern Med.* 1999;131:745-751.
62. van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Soc Sci Med.* 2000;50:813-828.