The Quest to Quantify Quality

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In this era of rapidly changing medical practice, it may appear to some that efforts to improve the quality of medical care are a relatively new development. In fact, current methods to enhance quality, like all of medical practice, have evolved. Although the modern conceptual framework of quality measurement, based on structure, process, and outcome, was introduced by Donabedian1 more than 30 years ago, the struggle to improve medical care has been protracted. Scholars as ancient as Hippocrates recognized the critical necessity for not only a knowledgeable physician but also a coordinated delivery system and a scientific basis for practice. Likewise, in Osler's Modern Medicine (1907), in which the absence of an effective treatment for lobar pneumonia is readily acknowledged, the authors plead for controlled studies with adequate sample sizes and detailed information on covariates: "age, sex, social circumstances and habits; the environment, character of the epidemic, season of the year ... and many other details must be constant features in the groups of cases arranged for comparison." Around the same time, Codman2 proposed that hospitals track every patient for a time sufficient to ascertain whether treatment was effective, foreshadowing today's outcomes management programs.

Thus, many of the precepts that underpin the current approach to quality improvement were established long ago. Yet, during the intervening years, progress in developing systematic methods to improve quality has been frustrated by a lack of adequate measures. Nearly 30 years ago, Brook and Appel3 found that the results of 5 different methods of assessing the quality of care delivered by physicians showed little correlation. Since then, investigators have diligently sought more quantitative and reproducible ways to describe quality.

Although numerous methods have since been created, the ideal method of quality measurement remains elusive. Robust general measures that are easy to implement, affordable, and applicable in many settings are still lacking. This is especially true in the outpatient environment, where patient encounters are brief and often difficult to ascribe to a single medical condition. New techniques for monitoring quality are constantly introduced, adding cost and complexity with uncertain benefits. In fact, authorities frequently debate whether the overall quality of medical care is actually improving or deteriorating. Likewise, recent articles4 have emphasized the difficulties with and importance of measuring quality in clinical trials used in meta-analysis and in studies of diagnostic tests.

In this issue of THE JOURNAL, Peabody and colleagues report the results of a comparison of 3 parallel methods for assessing the quality of care provided by individual physicians. Their surprising finding was that performance in actual clinical practice as measured by clinical vignettes was similar to that determined by abstraction of medical records or use of actors posing as standardized patients (which the authors considered the "gold standard"). The results of this well-designed and carefully implemented study are appealing because vignettes offer the potential for an accurate and relatively straightforward method of assessment that can be standardized.

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However, several limitations temper the interpretation and application of this study’s results. The study was small, involving only 20 physicians, and was conducted in only 2 general internal medicine clinics of 2 academically affiliated Veterans Affairs medical centers. The authors evaluated only the care of a new patient at a single point and did not examine the more complex problem of evaluating the process of medical treatment over time.

Moreover, vignettes have intrinsic shortcomings that further limit their general applicability. Although clinical vignettes may obviate the need for time consuming and expensive audits of medical records, they require participation by harried clinicians whose time and energy are increasingly precious. In addition, the vignettes used by these investigators appear to have been crafted carefully to eliminate much of the complexity and ambiguity with which real-life patients present. Scenarios that addressed thornier problems, such as optimizing glycemic control in a patient with brittle diabetes or managing dyspnea in a patient with concomitant pulmonary and cardiac disease, might have produced less clear results. Like the clinical evidence on which it is based, the content of vignettes may have a short half-life as new information on diagnosis and treatment emerges. For example, at the time the vignette study was conducted, β-blockers were considered to be unnecessary or inappropriate for patients with congestive heart failure, whereas many experts now recommend that these drugs be prescribed for most such patients.10.11 Reexamining the criteria applied 3 decades ago by Brook and Appel1 reveals few that would be considered consistent with today’s standard of care. Thus, Peabody et al are rightly guarded in the interpretation of their findings.

It appears that clinical vignettes should be regarded as a useful device for judging quality, but certainly not the only one. Vignettes ultimately may be accepted as a handy complement to the expanding role of measures derived from electronic data. Many medical data systems now permit government agencies and medical care organizations to assess adherence to clinical practice guidelines, both for individual practitioners and entire health care organizations. Using ischemic heart disease as an example, recent national and regional data indicate that most patients are prescribed aspirin and β-blockers following a myocardial infarction, whereas administration of lipid-lowering agents is suboptimal.12-15 In some settings, such as the Veterans Health System, nearly 100% of patients are given these drugs,16 while in other settings these drugs are underused.17.18 The rapid availability of such data represents an impressive and much needed advance. Although many problems remain, such as ensuring the accuracy, relevance, and availability of essential information, computerized medical information systems are swiftly achieving the potential to provide valuable information on the performance of clinicians throughout a medical care system.

In this context, clinical vignettes can afford a more detailed understanding for circumstances in which aggregate data indicate that practice is below par. Clinical scenarios can be constructed to determine whether deficits in knowledge or perceived barriers in the system might account for suboptimal performance. This approach has, for instance, been used to investigate the low proportion of patients with atrial fibrillation who are prescribed warfarin.19 Vignettes also can be specifically designed to address clinical topics that cannot be assessed using electronic systems. In the study by Peabody et al, the 2 vignettes presented assessed the diagnosis and management of ischemic heart disease. Widespread use of vignettes on this topic might be redundant in settings in which data regarding use of aspirin and β-blockers following myocardial infarction are automatically collected on all eligible patients, although a comparison of these 2 approaches might be of academic interest. Other topics investigated by the authors, such as low back pain, are less amenable to evaluation using information systems and would be more suitable for vignettes. Likewise, vignettes also can be used to explore variations in quality related to other factors, such as race and sex.10

The limitations of vignettes notwithstanding, the results of the study by Peabody et al should be encouraging to educators, as they appear to reassess the fundamental precept that clinicians' knowledge is a key determinant of process and outcome. In this era of shrinking resources and escalating time pressures, practitioners and health care systems should not neglect the fact that training is an effective means of quality improvement.20.21 In fact, it may be time to rethink the model of "structure, process, and outcome" in relation to evaluating the quality of care delivered by individual clinicians. Knowledge, in and of itself, is neither a structure nor a process. It may be useful to return to a Hippocratic conceptualization of "information, application, system, and outcome." Practitioners must first possess the basic information and skills necessary to provide care of the highest quality. That information must then be applied and actuated by the delivery system to achieve a favorable outcome.

Reconfiguring the notions about the delivery of care and the measurement of quality in this fashion might highlight the crucial importance of ensuring that physicians have ready access to necessary information and understand how to apply it. Educational and information systems should be accorded the same importance as the pharmacy or laboratory, perhaps with increasing availability of these systems at the point of care. Vignettes represent an excellent process measure to test the effectiveness of these systems.

The imperative to measure, promote, and improve the quality of medical care will continue to be a daunting but essential endeavor. The more accurate the measures available, the more successful those efforts will be and the more likely that every participant in the health care system will benefit.

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A Public Health Approach to Reducing Error: Medical Malpractice as a Barrier

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The mortality resulting from medical errors each year in the United States is estimated to be between 44,000 and 98,000—accounting for more deaths than from motor vehicle crashes, breast cancer, or acquired immunodeficiency syndrome. Medically induced injuries and deaths not only represent a major public health problem, but also incur economic costs and loss of trust in the medical profession. The Institute of Medicine has initiated a project on Quality of Health Care in America to redesign the health care delivery system, align incentives, and transform information technology to dramatically improve patient safety. In response, President Clinton proposed a national error prevention system that includes mandatory reporting of all medical errors that result in death or serious injury. As Mohr explains in this issue of the Journal, these reforms will take place within a deep historical and contemporary backdrop of medical malpractice litigation. A key issue is whether and to what extent medical malpractice creates barriers to quality improvement and, if so, what kinds of tort reforms could be helpful.

The quality of health care is, by many accounts, a serious problem. Research has demonstrated that physicians overuse health care services by ordering unnecessary interventions, that are costly and cause harm to patients. Underuse occurs when harm occurs by failing to provide standard care that would produce favorable outcomes; and misuse occurs by devising the wrong treatment plan or improperly executing the correct plan. The quality of care for racial minorities and uninsured patients presents a particularly important problem in many hospitals.

A complex public and private system for improving quality is in place, but considerable uncertainty exists about whether it works. From a legal perspective, government directly and indirectly (through the tort system) regulates the health care system. From a medical perspective, an ethos of professionalism and a system of self-regulation exist. From a consumer perspective, choice among health care professionals and health plans, together with market forces, can influence quality. For example, the publication of performance measures, or report cards, provides incentives to improve quality because poor outcomes may result in government sanctions, loss of accreditation, and consumer dissatisfaction.

Despite all of these efforts, the health care system has not matched the safety record attained in other industries, leading policymakers to consider systemic approaches to quality improvement. The lesson learned from other high-risk industries is that quality improvement requires designing processes and systems to prevent human error rather than focus on blame. For example, the aviation and motor vehicle industries have dramatically reduced injuries and deaths primarily by improving product design and personnel training, as well as by identifying and learning from errors. Using the model from other industries, the most innovative and modern approaches to quality improvement in health care call for a comprehensive strategy including (1) a national agency to provide leadership and research; (2) mandatory and voluntary reporting of medical errors; and (3) safety systems within health care organizations.

Ostensibly, medical malpractice litigation seeks the same objective—higher quality of care. A primary function, or goal, of tort law is deterrence of substantial medical conduct to avoid unnecessary injury. Despite the apparent identity of interests, law and medicine, persistently and deeply, are seen to be in conflict. At the very least, convincing data exist demonstrating the inadequacy of the tort system both as a deterrent and as a source of compensation.

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