CURRENT ISSUES IN QUALITY OF CARE

by Kathleen N. Lohr, Karl D. Yordy, and Samuel O. Thier

Prologue: Defining the quality of medical care seems to be almost as elusive as measuring it. In any event, there is no question that the issues surrounding quality touch on a wide variety of questions that impinge on the future configuration of America’s health care system. In this overview paper, Kathleen Lohr, Karl Yordy, and Samuel Thier explore these issues, many of which are discussed at greater length in subsequent papers. Lohr, who holds a doctorate in public policy analysis from The RAND Graduate School, is a senior professional associate at the National Academy of Sciences’ Institute of Medicine (IOM) with responsibilities in several areas, including directing a new study of quality of medical care and participating actively in the IOM’s Council on Health care Technology. Previously, Lohr spent twelve years at The RAND Corporation and was heavily involved in its landmark health insurance experiment. Yordy, who holds degrees from Princeton and Harvard universities, is director of the IOM’s Division of Health care Services. He joined the institute in its inaugural year (1972) and has been involved in a variety of IOM studies, including most recently directing an IOM committee that examined “The Future of Public Health.” Thier, formerly chairman (1975-1986) of the Department of Internal Medicine at Yale Medical School, is the president of the IOM. As the institute’s chief executive officer since January 1987, Thier has energized the organization by raising substantial new resources, significantly expanding its staff, and involving the quasi-public enterprise in a wide variety of studies. One of these projects is the newly launched study of issues surrounding the quality of care. The study, which is supported financially by the Health care Financing Administration, was mandated by Congress in the Omnibus Budget Reconciliation Act of 1986. The emphasis of the study will be on influencing future directions of quality assessment and assurance by seeking to better define the terms and developing tools to measure quality more effectively.
The United States enjoys a high, perhaps unparalleled, level of quality from its medical care system—a degree of quality that is mostly taken for granted. Individuals usually are quite satisfied with their own medical care and their own physicians, although they may express dissatisfaction with some aspects of the system of care, such as access or financial barriers to care. Despite this justifiably positive view that, overall, quality of care is high in this country, several facts suggest that all is not well in assuring high-quality care to all. A large literature documents deficiencies in all parts of the health care sector. Malpractice “crises” are believed to reflect a deteriorating patient-physician relationship, among other things. Variations in health needs or resources do not explain satisfactorily great variations in per population rates of use of services; the degree of correspondence between variations in patient outcomes and variations in use is still open to question. Escalating health care expenditures prompt ever more stringent efforts at cost containment and more rigid management of the use of services; such efforts are widely perceived to threaten quality of care.

From these and other factors flow numerous clinical, policy, and research questions. This article highlights several that we judge will be of special interest or significance in the coming years. Some are discussed in more detail in other articles appearing in this issue.

Defining Quality Of Care

Because medicine, and health care in general, is a dynamic, growing enterprise, the quality of that enterprise is equally dynamic. Defining quality in these circumstances remains a major challenge. Most definitions rest on two basic concepts: appropriate processes of care and patient outcomes or end results of care. Most assume that the former, properly applied, will maximize the latter. Some definitions, recognizing the phenomenon of scarcity, stress outcomes within available resources, but this is a rather new view.

Cutting across these concepts are the definitional constructs of technical or scientific aspects of care and interpersonal or humanistic elements of care. The epigram that medicine is as much art as science captures the point. Both the “science” and the “art-of-care” constructs are difficult to define in objective terms and thus are often hard to measure. Furthermore, their relative importance in contributing to patient outcomes and their possible interactions are often matters of speculation but, to date, rarely topics of empirical investigation.

Definitions of the art of care rest partly on a fiduciary relationship based on trust between the patient and physician and partly on recent efforts to clarify the concept of humanism in medicine. One definition of the “humanistic physician” holds that integrity, respect, and compassion
are essential qualities; the patient-physician relationship then is one of trust and mutual respect for the dignity and freedom of both parties. This relationship assumes, unquestionably, that physicians will attempt to do good and avoid harm and that they will act in the best interests of individual patients. A critical indicator of problems with the quality of care, when quality is defined broadly to embrace art-of-care concepts, may well be a change in the degree to which patients still trust their doctors to act as their agents and advocates. When patients are unfamiliar with or uncertain about the larger organizations from which they now seek care, suspicion and mistrust are exacerbated.

Traditionally, quality of care has been defined primarily in terms of technical delivery of care and by clinicians. This is changing. More and more, the expectations, desires, and opinions of patients, their representatives, and society in general are seen as having a legitimate role in defining, measuring, and assuring quality of care. For example, the actions of the American Association of Retired Persons in stimulating boards of Medicare peer review organizations (PROs) to include consumer representatives are a significant step in involving the patient in quality-of-care matters. Similarly, the past and future public releases by the Health Care Financing Administration (HCFA) of hospital-specific mortality rate data are driven to a great extent by the growing need to respond to consumers' interests.

Finally, the clinical dimensions are themselves expanding, as definitions of quality of care come to encompass care delivered by health systems, not just that rendered by physicians. As health care becomes more of a team effort, and as more nonphysician professionals begin to practice independently, the entire focus of quality of care broadens. These developments present a constant challenge to how we perceive and define quality of care.

Quality of care problems. A decade ago, many studies identified problems in inpatient and ambulatory care. They included excessive or inappropriate surgery, variable outcomes of surgical procedures, nosocomial infections, problems in use of laboratory tests (overuse, underuse, and lack of proper follow-up of positive results), inappropriate diagnosis or treatment of common acute conditions (such as respiratory infections), and excessive or inappropriate use of prescription drugs. Generally, the main issues stemmed from observed or presumed excessive or inappropriate use of services. Nursing home care was a national scandal, although here the problem was underprovision of needed care.

Any review of the situation today would highlight many of the same problems. Very high variations in population-based rates of use of certain procedures are often cited. A notorious, although not necessarily the most significant, problem for the elderly is the perception that they are discharged inappropriately early ("prematurely") from the hospital.
Threats to the quality of care delivered by health maintenance organizations (HMOs) that accept Medicare at-risk contracts are also seen by some as a critical issue today, with particular concerns for the frail elderly.

**Financing And Organization**

**Financing.** Persistent and seemingly intractable increases in health expenditures have led to dramatic changes in the health care environment. The country will spend around 11 percent of its gross national product (GNP) on health care—twice the percentage consumed twenty years ago and about 10 percent more than just a year ago. Preliminary data for 1986 put the nation’s total health expenditures at $458 billion—about $1,837 per person in that year.

**Medicare issues.** Expenditures on Medicare have increased faster than national expenditures on personal medical care, reaching a total outlay for 1986 of $76 billion and about $2,375 per person enrolled. The Office of Technology Assessment recently examined the use of life-sustaining technologies and concluded that the elderly, with over one-tenth of the nation’s population, account for about one-third of all health care expenditures; expenditures on the elderly are concentrated among a small fraction of users and at the end of life. Little of this spending can be attributed to excessively aggressive care of terminally ill patients; much of it appears to be for caring for patients who are very ill but not necessarily or obviously dying. This pattern probably should not seem surprising, since much of the medical care system in this country is directed precisely at delaying death and caring for the very sick.

Still unclear are the effects on the quality of care wrought by Medicare’s prospective payment system (PPS) for inpatient care, as well as by the earlier shift from cost reimbursement of the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982. At present, PPS affects mainly inpatient hospital care; secondary, in some cases intentional and primary, effects of increasing outpatient delivery of some services have considerable quality implications in part because these are new modes of practice and in part because there are few or no established systems for monitoring or assuring quality in outpatient sites. Changes prompted by recommendations of the Physician Payment Review Commission, to modify physician reimbursement for Medicare, are largely matters for speculation, but they seem sure to affect the quality of care.

**Effects of cost sharing.** One major question is whether financial incentives to shift or control expenditures will lead to underprovision or underuse of needed and appropriate services and, in turn, to adverse effects on health outcomes and patient well-being. Evidence from the RAND Health Insurance Experiment, although confined to the nonel-
derly, suggested that cost sharing for inpatient and outpatient care reduces the use of effective and presumably needed services about as much as it lowers the use of ineffective or unnecessary services. This is especially true for persons of lower income. The effects of cost sharing on health outcomes were not uniform or clear-cut in the RAND study. Nonetheless, some findings suggested clinically meaningful improvements in health for persons who did not face cost sharing compared to outcomes for those who did.

**Organization.** The vast changes taking place in health care delivery are revolutionary. New financial and management arrangements go well beyond traditional group-practice-model HMOs to the networks such as independent practice associations (PAS) and preferred provider organizations (PPOs). Changes in the sites of care, such as the shift of some types of surgery to the ambulatory setting and the growth of home health and community-based care (especially for the elderly), all produce additional uncertainty about quality. Historically, hospital care has been subjected to more quality monitoring than have these other settings; the mechanisms by which quality of care in the latter settings might be evaluated are not as well developed.

These and other organizational changes, such as vertical and horizontal integration and joint ventures, interact in as yet unpredictable ways with trends toward integration of financing and delivery of services and the entire movement toward for-profit enterprises. Distinctions between third-party payers and direct providers of care are being blurred or eliminated. Price competition among providers and insurers is vigorous, and competition for market share is being pursued through overt marketing to employers, employees, and other consumers to an unprecedented degree. One outgrowth of these trends is new relationships between managers of health care organizations and physicians; these in turn impinge on the physician-patient relationship. Utilization management is emerging as a direct influence on care decisions, in the form of financial incentives to provide less intensive care, retrospective and prospective review, and newer case-management techniques. This can severely circumscribe the professional autonomy of physicians as advocates of their patients’ interests; the impact on quality has yet to be determined.

**Physician supply.** A currently expanding supply of physicians complicates the picture. Physicians, including a wide range of specialists, are dispersing into less urbanized areas, as rates of physicians per population (on average) in urban areas continue to rise. Predictions that the nation will overshoot an “optimal” number of physicians are currently fashionable, although the uncertainty inherent in such forecasting, and hence in the policy implications, tends to be underestimated.

In theory, if the nation faces a doctor excess, managers of health care delivery systems would be well positioned to be selective about which
physicians they recruit and keep. Personnel decisions of this sort might well rest not only on information about utilization patterns but also on how satisfied patients are with aspects of the quality of care important to them. Currently available empirical evidence, however, does not convincingly support the idea that quality improves with greater physician density. In short, the trajectory of physician supply and its impact on quality of care are matters of considerable policy concern.

**Summary of financing/organizational issues.** What of diminishing returns to the health care dollar? High quality of care costs money, but additional amounts of money will not necessarily guarantee either better quality of care or improved health. Consequently, if we cannot know with certainty when additional expenditures will bring no further benefits, then we also cannot know with certainty when cost controls will begin to threaten patient well-being or harm quality of care.

With cost sharing on the rise, with new organizational, financing, and case-management arrangements expected to grow, and with continuing questions about the benefits to be derived from the marginal health care dollar, concern about the impact on quality of care can be expected to rise as well. The fear, if not the reality, that these factors may lead to restrictions on, and even explicit rationing of, needed services may be the most important pressure forcing attention to quality issues.

### Measuring Quality Of Care

**Outcomes.** Some observers argue for a definitional distinction to be maintained between assessing quality and measuring it, with the former resting more in the realm of nonquantitative or nominal judgments (“superior,” “substandard”) and the latter in the realm of quantitative (ordinal or ratio) judgments. This distinction is sometimes captured in notions of implicit and explicit quality judgments.

One of the more complex measurement debates revolves around the relative merits of process and outcome measurement. This debate is considerable and not likely to be settled soon. The debate arises largely because in a number of clinical situations processes have not (yet) been shown to lead to good outcomes.

Concepts of efficacy and effectiveness often are invoked in the quality area. Efficacy refers to “the probability of benefit to individuals in a defined population from a medical technology applied for a given medical problem under ideal conditions of use.”\(^4\) Effectiveness reflects that probability when the medical technology is applied “... under ordinary conditions by the average practitioner for the typical patient.”\(^5\) Generally, we know relatively little about the efficacy of medical practices and less about their effectiveness. When this is so, we cannot measure confidently the quality of care in terms of demonstrated relationships.
between ordinary medical practice and the ultimate well-being of the patient.

Problems related to outcome measurement are especially knotty. We can measure patient outcomes directly or indirectly; further, we can conceive of them as short- or long-term results. Each type of outcome measure requires different measurement techniques, data sets, and costs; generally, the closer we want to be to patients’ own perceptions of outcomes, the more intrusive and costly is the measurement.

Evaluating short-term results of care directly, such as the outcomes of a diagnostic procedure or set of procedures, use of a medication, or results of surgery or a hospital stay, may call for medical record review, patient follow-up questionnaire, or even patient interview. Alternatively, patient outcomes viewed over the longer run, such as recovery at one year after surgery or well-being of patients with serious chronic disease, might be studied either the same way or with less costly or less intrusive methods (such as analysis of insurance claims data).

A new concept of nonintrusive outcomes is gaining currency. These are proxy measures not directly related to data gathered from individual patients or records; rather, they are indicators estimated from administrative or insurance claims data that purport to signal probable levels of quality of care (typically, of poor care). The best-known of these are hospital-specific mortality rates; readmission rates also are proposed.

Issues raised about these measures include their validity when severity of illness and case-mix are not adequately controlled, the correct definition of the rate, and the appropriate statistical techniques to be used to calculate and identify outliers. Releasing such data immediately and directly to the public, without giving facilities that are identified as potential outliers appropriate time to act constructively on the information, also may be called into question.

Severity-of-illness indexes (or similar patient classifications) are sometimes offered as proxy outcome indicators, although many experts remain dubious. One thesis, still untested, is that negative differences between admission and discharge, or worst-day, values might serve as screens for possibly poor quality of inpatient care. Other proxy measures involving severity of illness or stage of disease upon admission to the hospital are proposed as indicators of the outcomes of ambulatory care.

**The process of care.** Much of the quality of care literature derives from measures of the technical processes of care. Evaluating the process of care in most cases requires explicit criteria; such criteria reflect diagnosis- or problem-specific elements of care that the medical profession (or other provider groups) agree are relevant, important, and measurable. Increasingly, criteria for evaluation must accommodate patient values and preferences. They also must be reliable and valid, that is, produce the same results when the same object is measured and measure
what they purport to measure.

The degree to which existing criteria are statistically or clinically valid is central to quality-of-care research and development. No comprehensive inventory exists of all the diagnosis-specific criteria sets that might be put to use today. That implies in part that funding for process of care research and for validation of criteria sets cannot be as well targeted as it might be. It also implies that health care delivery systems wishing to institute their own quality assurance programs have no central repository of information to use for reliable and valid criteria and standards.

**The art of care.** Measuring the art of care is much more difficult than assessing patient outcomes or evaluating the technical aspects of care. When looked at in terms of effective communication between patient and physician, the art of care may be assessed by techniques that tap the content of information or the affect conveyed during a medical visit. Especially in research circumstances, these aspects might be measured by written transcripts, audiotapes, or videotapes of medical encounters. In ordinary practice, patient interview or questionnaire methods might be used, as could various self-report measures of physicians’ humanistic attitudes, values, and behaviors. Some form of observation and review by “peer” or “senior” physicians also is possible.

The process of developing these techniques, applying them in formal quality assessment or quality assurance programs, and introducing them into policy making is in its infancy. A substantial research effort will be needed to establish the reliability, internal validity, and generalizability of these concepts and methods.

**Technology assessment.** Although technology assessment has a considerable history in the public and private sectors, it has not traditionally been associated with quality measurement or assurance. More recently, Congress established the Council on Health Care Technology within the Institute of Medicine (IOM) expressly as a public-private partnership. The council takes the position that improving the quality of care and patient well-being is the objective of technology assessment, and it emphasizes that the foremost purpose of technology assessment is to determine patient benefit. From this flows a focus on clinical practice evaluation as the structure within which technologies should be assessed.

One early outreach activity of the council was a forum on quality assurance and technology assessment, which underlined its commitment to patient well-being and its view that quality assurance and technology assessment are inextricably linked. Both quality assurance and technology assessment require a broad definition of health; both make evaluative judgments; both call for causal linkage between process and outcome; and both call for the distinctions between efficacy and effectiveness to be clearly understood.

Thus, quality assurance presupposes reliable and valid information
about the effectiveness of medical practice—information produced partly by technology assessments. If such assessments are to be constructive guides for medical practice, they should be performed with explicit assumptions about the levels of quality likely to be obtained should the practice become widely diffused; this again is a matter of effectiveness. Two major questions flow from these principles. First, can the quality and technology fields organize themselves so that technology assessments can explicitly include levels of quality and that quality assessments can make correct use of technology assessment outputs? Second, can both endeavors be used primarily to improve patient well-being?

Accountability In Quality Assurance

Who should be accountable for quality assurance—the health professions, health care institutions and organizations, government, private external quality review organizations, or group purchasers of care? Currently, each of these plays some role in quality assurance.

The health professions uphold the self-policing tradition of professions via specialty board certification and continuing medical education requirements for recertification. Hospitals and HMOs have their own internal quality assurance programs. Foundations for medical care, which combine concerns of utilization and quality, arose decades ago in California.

State governmental authority is exercised through the licensure of individual practitioners and health care institutions; the federal government imposes conditions of participation for facilities wishing to qualify for reimbursement through Medicaid and Medicare. Private quality-certifying organizations, such as the Joint Commission on Accreditation of Healthcare Organizations, have provided external review and certification of quality standards in hospitals and other health care institutions; the Joint Commission’s accreditation can substitute for conditions of participation approval for the federal programs. Legal action against malpractice is another form of governmental-plus-private action to assure quality standards.

Third-party payers, both government and private, are increasingly involved in accountability questions. PROS (and PSROs before them) are the main arm of Medicare review. Private payers are rapidly moving into this territory through utilization management, often carried out by consultant firms that have developed “norms” of care and supporting data systems.

The current situation is a patchwork quilt of accountability for quality assurance—a mixture of public and private mechanisms that have developed along separate paths. The result is jurisdictional confusion, competition for turf, suspicion about motives, and questions about the
sources and validity of criteria, standards, and data. The professions and health care institutions can be perceived as self-interested, especially in an era of open competition. Those who pay for care, whether governmental or private, may be more interested in cost containment (or in the appearance of concern for quality) than in quality assurance. Court action has limited the professions in policing themselves.

In all of this complexity, who best looks out for the interests of the patients? What role does the free dissemination of quality-relevant information play? Who certifies external criteria and standards applied by payers? Are new forms of quality assurance organizations needed to provide for objective external review, free from the possibilities for conflict of interest inherent in many current mechanisms? If so, what is the appropriate duty of government? Will a second generation of competition in health care emphasize quality of care, as some competition advocates hope? These accountability issues will need to be addressed in determining the future directions for quality assurance.

Research Priorities

In highlighting research priorities, we might invoke several criteria: (1) the history and persistence of the problem; (2) the likely utility, persuasiveness, and generalizability of the research; (3) the probability of obtaining data and results in a timely way; (4) the ease and cost of acquiring clinically valid data; and (5) the opportunity costs of equivalently appealing allocations of research dollars. Research questions mentioned earlier in this article, together with those that follow, meet most of these criteria, although not all to the same degree.

Several formal research agendas have appeared in the past few years. In 1984, the National Center for Health Services Research convened a conference to plan “for the third decade of health services research;” certain chapters in the proceedings deal explicitly with measuring and assuring quality of care and assessing health status and outcomes. HCFA recently sponsored a two-day research symposium on quality of care. Attention was given to the following: (1) outcome assessment to determine the health status of the public, the effectiveness of health care interventions, and epidemiologic surveillance; (2) strengths and limitations of mortality rates as quality measures; (3) uses of severity-of-illness and risk-adjusted mortality severity measures; (4) process measures and explicit process criteria; (5) structural measures and organizational characteristics related to quality of care; and (6) issues of feedback to providers. Less ambitious agendas have focused on, for example, the impact of prospective payment on quality of care in Medicare, health promotion and disease prevention issues (targeted on the elderly and children), and primary care generally.
The HCFA agenda highlights numerous key areas for future research and demonstrations. More specific topics mentioned below build in part on that agenda; we advance additional ones that, in our judgment, warrant early exploration.

**Quality assurance programs.** We already have alluded to the need to improve quality measurement methods in general, including better techniques for assessing technical aspects of the process and the art of care. Quality assurance as such also can claim a large portion of available research and demonstration resources. For example, better methods for large-scale data analysis, including techniques for estimating or approximating epidemiological or population-based rates, are needed. This includes overcoming problems of missing or erroneous data (such as miscoded diagnoses or patient status upon discharge), small samples, and problems when expected rates of adverse events are extremely low. Relatively little is known about successful strategies for provider education and feedback, especially methods not grounded in financial incentives or punitive sanctions.

One question that has not received much empirical investigation is standard setting. Standards are the thresholds above or below which one declares quality to be excellent (good, fair, or poor, and so forth). They should lead to decisions and actions. For instance, case-based standards are often dichotomous and may lead to decisions about more intensive review of that case; population-based criteria (for example, of all cases, 15 percent or fewer should fail the criterion) may direct attention to patterns involving entire institutions or provider caseloads.

Given the same set(s) of reliable and valid process criteria, different evaluators may still establish different standards by which they will judge the care provided. Some, for instance, may wish to set minimal standards to pinpoint only those providers who score very poorly (outliers); other may wish to set more stringent criteria or, for different purposes, identify exemplary providers or practices. Questions of standards have important ramifications for efficient quality assurance programs, yet little is known empirically about how standard setting affects the type or number of activities in such programs, let alone its ultimate effect on quality.

**Medical records and discharge abstracts.** Questions abound concerning medical records and other sources of data about care delivered in ambulatory settings, by home health care providers, in short-term skilled nursing facilities, through HMOs and other capitated or network systems, and in such other nonhospital facilities or settings as seem appropriate. Problems with reliability of these data sources persist, a decade or so after major IOM studies documented such deficiencies, although some investigators are more optimistic. Other questions involve access to records (by patients to their own records, by researchers, and by quality auditors), legibility, comprehensiveness of data recorded, and
coding problems. Among the more important problems is that medical record keeping is local and uses practice-specific terminology; this fragmentation means that information on diagnosis, treatment, and outcomes cannot be linked across settings.

**Computer applications.** Research into quality assessment and assurance systems should be done with a view of the technologic capacities coming in the next five to ten years. Opportunities are expanding greatly to use mainframe, mini, and personal computers and electronic record technologies in creating and maintaining medical records and in quality assessment, quality assurance, provider feedback, and other activities. These opportunities must be identified and studied.

Some capacities may already be available; in HCFA, for instance, portable personal computers can be used on site to complete surveys of long-term care facilities. Other capabilities may still be in a pilot-testing or research phase. A related development is that of “smart cards,” by which individuals can retain a long-term record of their medical history, including relevant family and risk-factor information, history of preventive care, history of illnesses and treatments, and so forth. Development and wide diffusion of this technology goes hand-in-hand with improving important aspects of quality of care, such as continuity.

Finally, standardization is a key problem that extends beyond patient records to insurance claims forms and other reporting instruments and even to large-scale databases. Ways to exploit computer capabilities, for instance, electronic submission and transfer of insurance claims data, warrant a new generation of technical and empirical investigation.

**The law and quality assurance.** Among the more difficult problems in this arena will be a multitude of privacy and confidentiality concerns, which are largely a matter of individuals’ rights, and how those rights and protections are to be balanced against society’s need for more and better aggregate information about medical practice and patient outcomes. These issues relate directly to an important set of legal questions that will need to be confronted.

Another major issue centers on improving our definition of informed consent and on methods for obtaining it. Issues of information disclosure and malpractice, especially in relation to public release of institution- or provider-specific data, also have high visibility; due process and rights of appeal in cases alleging poor quality of care also may prove fruitful areas of investigation.

Federal and state laws and regulations governing insurance, licensure and certification, practice privileges, collecting and reporting of quality-related information, and malpractice are complex and in a state of flux; the implications for quality assurance are by no means clear. For instance, it would not be surprising if the data collection, analysis, and reporting requirements embodied in recent state legislation have much broader
CURRENT QUALITY ISSUES

The Future Of Quality Assurance

Quality of care is a multidimensional concept reflecting a judgment that the services rendered to a patient were those most likely to produce the best outcomes that could reasonably be expected for the individual patient and that those services were given with due attention to the patient-physician relationship. Implicit in the concept of quality of care is the idea that services should be provided in a cost-efficient and cost-effective manner, because unnecessary, excessive, or inappropriate services do not contribute to a patient’s well-being, may in fact be harmful, and waste the patient’s resources. But these statements are more theoretical than operational guides to improving and assuring quality.

To aid in developing that guidance, we have raised a number of questions about definition, financing and organization, measurement,
accountability, and research priorities; in our view, all warrant immediate and substantial attention by both the public and private sectors. Most of these questions are not new; the results of failing to address them fully in the past are compounded by the dynamics of change in both medical practice and the larger social environment in which the health care system is embedded. The investment implied by these questions is large; failing to make it poses a threat to the level of quality of medical care that we now enjoy but should not take for granted.

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1. At the request of the editors, only selected references are cited here; the full set used for this article is available from the authors at the Institute of Medicine, National Academy of Sciences, 2101 Constitution Avenue, NW, Washington, D.C. 20418.


