

Research suggests that expanding the scope of structural measures to include aspects of physical environment, working conditions, and provider satisfaction could provide a valuable means of closing existing gaps in quality measurement.

The Forgotten Component of the Quality Triad: Can We Still Learn Something from “Structure”?

GREGG S. MEYER, MD, MSc
MICHAEL P. MASSAGLI, PhD

Health care quality, defined by the Institute of Medicine (IOM) as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with professional knowledge,”¹ has proven far more difficult to measure than to define. Traditionally, the assessment of quality in health care was accomplished through the judgment of individual actions, supplemented with the collection of standards such as medical credentials and the clinical capabilities of a facility. Case review, subjective judgments of the skills of providers, facility inspections, and documentation of training comprised the bulk of quality measurement. During the past few years, however, patients, providers, purchasers, and policymakers have demanded more sophisticated means of measuring quality in health

care.² Quality of care is now measured through a combination of characteristics of the health care provider(s) and services (procedures or tests) that result in better outcomes for the patient. It can be measured through either experiential ratings or clinical performance measures. When the health care provider and services (procedures or tests) combine to improve the condition of the patient and the patient is satisfied with his or her condition, this is said to be good quality care. Quality is doing the right thing, for the right patient, at the right time, with the best results.

The pursuit of health care quality indicators and performance measures has resulted in a rapidly evolving and growing field of health services research, producing an increasingly complex array of quality yardsticks. Accrediting agencies such as the National

Gregg S. Meyer, MD, MSc, is Director, Center for Quality Improvement and Patient Safety, Agency for Healthcare Research and Quality, Rockville, Maryland. Michael P. Massagli, PhD, was formerly Research and Development Director, The Picker Institute, Boston. The opinions and assertions contained herein are the private views of the authors and are

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Please address requests for reprints to Gregg S. Meyer, MD, MSc, Director, Center for Quality Improvement and Patient Safety, AHRQ, 6011 Executive Boulevard, Suite 200, Rockville, MD, 20852; phone 301/594-1349; fax 301/594-2155; e-mail gmeyer@ahrq.gov.

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Article-at-a-Glance

Background: Quality assessment was founded on structural measures, such as accreditation status of facilities, credentialing of providers, and type of provider. Recent efforts in measures development have focused on processes and outcomes because research has suggested that structural measures are not strong markers of the quality of care at the health plan or provider levels. Nevertheless, the literature on the quality of health care contains a number of examples illustrating the potential application of structural measures to the assessment of quality. The continued development of measures of structure—which would at least measure aspects of the physical environment, working conditions, organizational culture, and provider satisfaction—may be helpful because generalizing from studies of process and outcome requires specification of the conditions under which these linkages are found.

A road map for measures development: The Leapfrog Group of large purchasers has promoted the application of three patient safety “leaps” that are, in essence, structural measures: the use of computerized physician order entry, the selective referral of patients to high-volume providers for certain procedures, and the availability of board-certified critical care specialists in intensive care units. Structural measures, like process and outcomes measures, face the same challenges of standardization, reliability, validity, and portability. Field testing of potential measures will be required to examine the feasibility and added value of these measures in real-world settings.

Conclusion: Research to date suggests that a new cadre of structural measures of health care quality, which have largely been overlooked in the recent measures development boom, have the potential to fill in important gaps in our ability to assess quality.

Committee for Quality Assurance (NCQA; Washington, DC) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO; Oakbrook Terrace, Ill) have pushed the field significantly with their demands for valid evidence-based measures. As a result, the Agency for Healthcare Research and Quality’s Policy and Research Computerized Needs-Oriented QUality Measurement Evaluation SysTEM (CONQUEST) for collecting and evaluating clinical performance measures now has nearly 1,200 entries.³ This growth has required the development of a classification scheme to facilitate efficient use of the system. One convenient taxonomy of these measures classifies them by whether they track consumer assessments or clinical performance, the level or unit of analysis for which they were designed (national, health plan, institutional provider, group practice, individual provider, and so on), the conditions to which they are applied, the population to be sampled, and their intended purpose (accountability, comparison, or as tools to facilitate quality improvement [QI]).

Despite the explosive growth in quality measures, there are still major gaps in our capacity to capture important components of quality when examined against the framework of that taxonomy. There are a number of assessment instruments to help consumers make choices among health plans, most notably the Consumer Assessment of Health Plans (CAHPS™)

family of surveys⁴; yet few measures assist consumers in making choices between individual providers beyond the advice of trusted friends and relatives. For some common clinical conditions, such as heart failure, a number of evidence-based and validated quality measures are available. But other common conditions, which also have a major impact on quality of life and functional status, such as osteoarthritis and depression, have few extant measures that meet those criteria. A number of measures exist that can be applied to relatively healthy insured populations, but few are applicable to the most vulnerable segments of the population, including those with chronic illness or disability and those who are uninsured. Consideration of the need to risk adjust is particularly important in the case of outcomes measures, whereas process measures often impose a data collection burden because of the need for chart abstraction. Even where measures exist, there are fundamental questions to be resolved, including those about how the data should be reported to various decision makers on the clinical, organizational, and policy-making levels. In summary, we have an ever-increasing array of evidence-based and validated quality measures, yet they still apply to only a relatively narrow set of measurement levels, conditions, and populations. As a result, consumers, providers, and policymakers are often forced to rely on subjective judgments to inform important decisions regarding health care.⁵ This article

discusses why it may be appropriate now to revisit structure as an element of quality.

Can Structural Measures Fill Some of the Gap?

Three and a half decades ago, Dr Avedis Donabedian provided an important construct for the evaluation of quality in health care that provides a framework for the development of measures.⁶ Quality of health care can be assessed on the basis of structure (how the system of care is configured and descriptions of its components), process (how care is delivered), and outcome (including mortality, functional status, quality of life, and patient satisfaction). One requirement for “good” measures based on the first two (structure and process) is that they be demonstrated to have a clear relationship to the third (outcome). Although there has been significant progress in the documentation of clear linkages between certain processes and outcomes (for example, immunization to prevent childhood infection and beta-blocker use after myocardial infarction), there is a relative paucity of evidence documenting strong structure–outcome relationships.⁷

Quality assessment was founded on structural measures, such as accreditation status of facilities, credentialing of providers, and type of provider. Many of those measures were used as standards to set minimum thresholds on structural characteristics such as the size of patient care areas and the location of fire extinguishers. However, recent efforts in measures development have focused on processes and outcomes because research has suggested that structural measures are not strong markers of the quality of care at the health plan or provider level.⁸ The limitation of traditional structural measures in informing health plan and provider selection is compounded by the inability to use those measures to foster change because traditional structural measures were not easily actionable. The IOM report from the Committee on the National Quality Report on Health Care Delivery recommended that structural measures be used only rarely.⁹ As a result, recommendations concerning quality assessment have focused on the need to include measurement of both processes and outcomes of care but have largely ignored structural measures.¹⁰ Candidate measures for inclusion in the Health Plan Employer Data and Information Set (HEDIS) measurement set¹¹ and other measurement systems such as those being developed by JCAHO

have been focused on process and outcome exclusively.¹² Because of the inherent limitations of traditional structural measures, Donabedian’s three-legged structure–process–outcomes stool, supporting the evaluation of quality, is unbalanced.

Nevertheless, the literature on the quality of health care contains a number of examples illustrating the potential application of structural measures to the assessment of quality. Ownership status of a hospital¹³ and the for-profit versus not-for-profit status of health plans¹⁴ have been associated with substandard performance. Outcomes in the care of children with diabetes have been linked with the availability of a specialized treatment facility and team.¹⁵ Teaching status of hospitals has been associated with improved outcomes for patients with heart disease but at a higher cost.¹⁶ These traditional structural measures have retained a place in evolving measurement systems because they are relatively unambiguous and easy to collect, but their role is decreasing over time with the expanded availability of measures of process and outcome.

The literature on the relationship between aspects of structure and quality suggests that the continued development of measures of structure—which would at least measure aspects of the physical environment, working conditions, organizational culture, and provider satisfaction—is helpful because our ability to generalize from studies of process and outcome requires specification of the conditions under which these linkages are found. Consider the following quotes from focus groups of hospital employees, conducted by The Picker Institute in Boston-area hospitals:

The lack of cooperation and efficiency with staff affects if the patient has a good experience. It is very common when you are finished doing surgery that there is no bed in the recovery room. The patient has to recover for a half an hour to forty-five minutes after surgery. The patient will sit in a bed in the operating room waiting for a bed to open in the recovery room. The rules are if you are in the operating room, an anesthesiologist has to stay with you, a resident has to stay with you, the OR nurse has to stay with you, the facilities can’t be used for the next patient, who may be in the emergency room or maybe waiting to get into surgery. This is a whole cooperation system.¹⁷—*a physician in an academic medical center, Boston*

I work in the operating room where there is an increased effort to decrease turnover time between procedures. I was pushed to not finish my care of a ‘local’ patient because

the anesthetist want to bring another patient into the room.¹⁷—*an operating room nurse in the same academic medical center, Boston*

These comments speak to the importance of structure. Health care workers' ability to execute the processes of care that will produce desired outcomes is either constrained or enabled by features of the system in which care is delivered. The sociologist W.I. Thomas observed the importance of the definition of the situation; Merton and colleagues confirmed the need for such considerations in their study of the development of professional self-image—that is, the individual's prior conception of and attitudes toward a given situation that influence his or her behavior when he or she meets that situation.¹⁸ For example, the hierarchical nature of the relationship between physicians and nurses has a profound impact on physician–nurse communications. Health care organizations and the way health care is organized contribute to the definition of the situation that workers confront and react to in the course of delivering care. These elements of organization are the focus of structural measurement.

The Potential of a New Generation of Structural Measures in Assessing Quality

The application of structural measures to health care quality assessment may appear to assume diminished importance, but an emerging literature makes such pronouncements premature. There is also a body of research on structural measures that goes beyond the traditional measures utilized earlier, challenging the measures development field to consider a new range of possible measure candidates. These studies take a broader view of structure, to include a total description of the health care environment. That environment supplements facility and provider characteristics with an examination of the physical environment, aesthetics, working conditions, and provider satisfaction.

There are a number of examples of the effect of the environment on clinical care delivery. The effect of the physical environment on quality of life has been well appreciated, as shown by the attention given to architectural design and ambience. A 1995 review of the effects of the physical environment on patient outcomes identified 48 references that associated physical characteristics such as ventilation, ambient

music, light intensity, humidity, and temperature to a wide variety of clinical and behavioral consequences.¹⁹ Other studies have documented the impact of furniture arrangement and ward design on outcomes.^{20,21} Focus group studies indicate that patients want an environment that facilitates a connection to staff and caregivers, is conducive to a sense of well-being, and facilitates a connection to the outside world.²² These studies have informed a science around the relationship between physical environment and quality of care.²³

A number of studies have documented the effect of working conditions on provider health and job satisfaction. The occupational health literature has documented a relationship between shift work and myocardial infarction.²⁴ A study of ambulatory blood pressure readings in emergency room physicians on night shifts documents a stress-related elevation in blood pressure during night shifts.²⁵ Nursing shifts have been correlated with overall job performance. Nurses assigned to the day shift had the highest performance ratings, and those assigned to rotating shifts had the lowest. Rotating shifts were also associated with increased job-related stress.²⁶

The literature on the impact of working conditions on patient outcomes and quality of care is less mature but exceptionally provocative. Higher nurse staffing levels have been associated with a decreased risk of postoperative pneumonia and urinary tract infections.²⁷ In the wake of the recent IOM report on patient safety, the state of California has passed legislation mandating minimum nurse staffing ratios, and other states are considering similar actions.²⁸

Longer shifts for nurses have been associated with decreased performance, but the measures were largely subjective and came from the nurses themselves.²⁹ The most infamous example of the relationships between long shifts and poor performance is the Libby Zion case, in which poor decision making by exhausted hospital residents with limited supervision was cited as the root cause of her in-hospital death. The state of New York, through the Bell Commission, responded with the imposition of work-hour limitations and augmented supervisory requirements that have changed the structure of residency training throughout the country.³⁰ Comprehensive analyses that go beyond these small studies and anecdotal reports, however, have not yet been performed.

The relationship between organizational characteristics, provider satisfaction, and the quality of health care delivery is also a relatively underdeveloped field. Work with the Institute for Healthcare Improvement (Boston) suggests that characteristics of the provider group have an effect on the ability of an organization to improve quality.³¹ A recent study examining the characteristics of high-performing and low-performing hospitals in prescribing beta blockers after myocardial infarction demonstrated that organizational characteristics such as solid support from hospital administration, strong physician leadership, shared goals of improving medical practice, and an effective way of monitoring progress were predictors of high performance.³² A survey of emergency physicians regarding employment structure and finances, professional society policies, and quality of patient care found that 75% felt that they had been financially exploited by the emergency department contract holder. The majority reported encountering instances of substandard emergency medical care, most commonly in settings with multihospital contract company coverage.³³ A 1999 study examining the explanatory power of descriptions of service organizations found that these were more predictive of quality than were traditional structural measures such as physician specialty.³⁴ Other studies have featured preliminary examinations of the relationship of managed care to provider satisfaction and the quality of care, raising more questions than answers.³⁵ In this regard it is notable that the decision of the American Medical Association House of Delegates to proceed with a physician union, named Physicians for Responsible Negotiations (PRN), was couched in terms relating provider satisfaction to the quality of care received by patients instead of focusing on provider economics. In a press release at the union's inception, AMA President Thomas R. Reardon, MD, said

This new organization will represent employed physicians and eligible resident physicians, and be the strong voice of organized medicine exactly where it's needed—at the bargaining table. . . . The intent of PRN is to allow physicians to advocate effectively for their patients and ensure quality care.”³⁶

Some of the complex relationship between working conditions, provider satisfaction, and the ultimate quality of care received by patients is transmitted

through communication performance. In addition to the organization of care delivery, the attitudes and communication skills of providers have been shown to have an influence on patient satisfaction with care. A follow-up survey of patients who received emergency room care found that patient satisfaction (and dissatisfaction) was highly correlated with the expressive qualities of physician and nurse staff.³⁷ A survey of nurses found that interpersonal relationships were integral to job satisfaction and that disruptions to established workgroups had a pernicious effect on provider satisfaction. More importantly, these disruptions were associated with nurse perceptions of patient safety and quality of care.³⁸ In some cases these structural elements have been incorporated into QI and quality assurance programs. For example, the NCQA accreditation review asks whether multilingual staff are available.³⁹

A Road Map for Measures Development

Research to date suggests that expanding the scope of structural measures to include aspects of the physical environment, working conditions, and provider satisfaction could provide a valuable means of closing existing gaps in quality measurement. Some measures in this field have already been developed to examine the relationship of staffing levels to the quality of patient care.^{40,41} These studies are a natural extension of traditional measures of quality, which link staffing levels to patient outcomes. However, much work could be done on more innovative measure development.

The development of measures de novo is a science unto itself, but there is a generally accepted road map for creating practical measures. In an effort to set standards for the evaluation of potential quality measures, the Performance Measurement Coordinating Council (PMCC), which included representatives from JCAHO, NCQA, and the now-defunct American Medical Accreditation Program, has developed explicit criteria for measure selection that provide a convenient checklist for developers of potential measures.⁴² A modification of those criteria was adopted in March 2001 by the IOM Committee on the National Quality Report on Health Care Delivery⁹ and provided a framework for its consideration of quality measures in *Crossing the Quality Chasm: A New Health System for the 21st Century*.⁴³ The PMCC criteria are based on the assumption that although there is no “perfect” quality

measure (just as there is no “perfect” clinical laboratory test), measures that satisfy a majority of the criteria are worthy of further consideration. Three major criteria are applied to the assessment of potential measures:

- *Relevance*: Including whether the measure is meaningful to consumers, purchasers, or health plans/providers; clinically important; financially important; cost-effective; strategically important; controllable (or actionable); easily interpretable; and whether the measure has demonstrated variance and potential for improvement.

- *Scientific validity*: Including whether the measure is reproducible, valid, accurate, and risk adjustable when appropriate; is stable between data sources; has professional support; and is acceptable to patients.

- *Feasibility*: Including whether the measure is precisely specified, has a reasonable cost burden in terms of data collection and analysis, is confidential, is logistically feasible, and is auditable.⁴⁴

This guide can be used to make explicit progress in the development of an expanded range of quality measures to capture the important effects of physical environment, working conditions, and provider satisfaction.

The extant literature suggests that many of the relevance requirements have been met for potential quality measures related to the physical environment, working conditions, and provider satisfaction. Measures in these areas are clearly relevant to providers and patients, as attested to by recent developments in the organization of the provider workforce and the investments made in structural design of health care facilities. The actionability criterion, however, provides some significant challenges to the development of new structural measures. The IOM Committee on the National Quality Report on Health Care Delivery expressed concern about the inability of structural measures to foster innovation and the possibility that the use of structural measures of performance could “lock in” existing structures.⁹

Others have recognized, however, that the structural and organizational levers that can influence the physical environment, working conditions, and provider satisfaction provide opportunities for actionability. The Leapfrog Group of large purchasers has promoted the application of three patient safety “leaps”—that are, in essence, structural measures:

- The use of computerized physician order entry;
- The selective referral of patients to high-volume

providers for certain procedures; and

- The availability of board-certified critical care specialists in intensive care units.⁴⁵

Patients, providers, purchasers, and policymakers can easily interpret descriptions of these factors. Other studies have demonstrated improvement in clinical outcomes such as diabetes control with practice redesign interventions.⁴⁶

The first major hurdles are in the establishment of scientific validity for these measures. First, there must be an expansion of current research efforts around the relationship between physical environment, working conditions, and provider satisfaction and the quality of health care delivery to include developing instruments to standardize the assessment of the former and using standard measures of the latter. We cannot propose new structural measures of quality without this fundamental linkage; measures must have a strong base in evidence. Although studies associating working conditions with provider appraisals of the quality of care they deliver are thought-provoking, they do not make a sufficient link to the actual experience of patients.

One requirement for valid measures based on structure and process is that they be demonstrated to have a clear relationship to outcomes. There has been significant progress in the documentation of clear linkages between certain process and outcomes (for example, beta blocker use after myocardial infarction), but there is a relative paucity of evidence documenting strong structure–outcome relationships.⁷ For example, the volume–performance relationship for certain medical conditions and procedures is well established in the literature, but it appears to be a proxy for more direct performance indicators such as the appropriate use and execution of procedures.⁴⁷ Measures of structure are necessary but not sufficient to tell us how they affect the processes of care. Nor are measures of structure sufficient to tell us whether process is linked to outcomes or whether the outcomes will be of high quality. We must establish the linkages among structure, process, and outcome and determine the conditions that cause the linkages to vary.

As measures of structure that are relevant, valid, and feasible are developed, a number of other considerations should inform the design of studies and interpretation of results; otherwise, we will never accurately

decipher how structure affects process and outcome and why it is important. One notion involves distinguishing direct from indirect effects. It is relatively easy to think about changes in protocol that will change the physician's or nurse's perception of operating room practices. But how will these affect the quality of patient experiences? And if more than one practice alternative is available, how can we decide which is preferable?

In addition, we must clarify causal ordering and relationships and we must identify spurious components, particularly in statistical analysis of nonexperimental data. In measuring structure, we must determine whether its impact is on outcome, process, or both. Research so far cannot tell us much about this, but there are big differences among

- a controllable factor in a work situation that changes a worker's experience and, separately, causes a change in the patient's experience of quality (Figure 1, right); versus
- a factor that directly affects quality without changing the worker's experience; and versus
- a controllable factor that directly changes the patient's experience and the worker's experience, which in turn leads to additional changes in the patient's experience (Figure 2, right).

Determining which of these factors is most important in a given situation will entail a full accounting of the effects of structure and explicitly acknowledging that direct effects of structure can also have unintended consequences. Factors that produce indirect effects on patient experience (such as provider satisfaction) may be either positive—and thereby reinforce the direct effect—or negative—and thereby mitigate or cancel out the direct effect.

We also need to determine whether well-defined effects of workers' experience on patients, experience simply transmit the effects of structure or are changed by the effects of structure. That is, we need to pay careful attention to

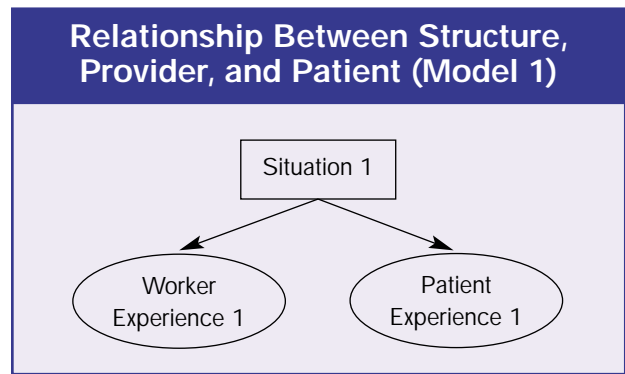


Figure 1. A controllable factor in a work situation changes a worker's experience and, separately, causes a change in the patient's experience of quality.

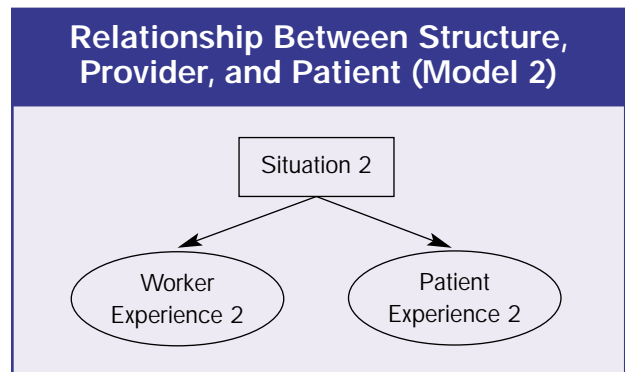


Figure 2. A controllable factor directly changes the patient's experience and the worker's experience, which in turn leads to additional changes in the patient's experience.

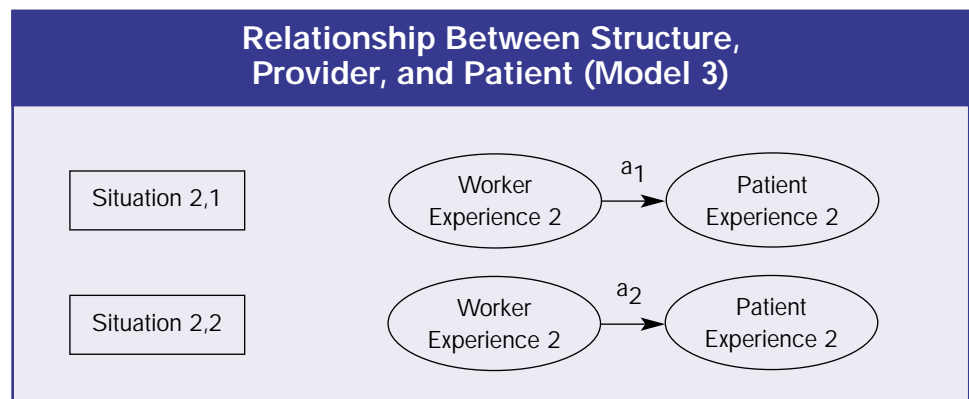


Figure 3. Different degrees of structure (Situation 2,1 versus Situation 2,2) cause the direct worker-patient interaction effect (a_1 , a_2) to vary.

whether structure interacts with process and outcome; this may not always be the case. In Figure 2 we depict a situation where there is no interaction; different degrees

of structure do not cause the direct worker–patient link to vary. In Figure 3 (above), we depict a situation where different degrees of structure (Situation 2,1 versus Situation 2,2) cause the direct worker–patient effect to vary. For example, there is much concern that staffing ratios will harm workers, and therefore patient satisfaction. If this impact is the same in academic medical centers and community hospitals, then one solution may improve both worker and patient satisfaction. However, if the impact varies between these two settings, different solutions may be required.

After establishing the scientific base and links to accepted and valid definitions of outcomes, measures must be developed that meet the criteria for reproducibility, validity, accuracy, and stability across measurement settings. Many of the studies to date that attempt to relate physical environment, working conditions, and provider satisfaction to health care quality use idiosyncratic definitions and tailored assessment instruments (for example, institution-specific provider satisfaction surveys) that have limited potential to provide more than provocative evidence. Creating the measures will require a research initiative aimed at developing measures that are more nuanced than the traditional definitions of structure. The need to capture the important constructs of physical environment, working conditions, and provider satisfaction as they relate to health care quality must be balanced by the competing demand of making the measures reliable and portable across settings. As a first step, a standardized lexicon to describe the attributes of physical environment, working conditions, and provider satisfaction must be established to serve as the dictionary from which reliable measures can be developed.

With those steps completed, the stage will be set for a major research effort to develop new quality measures relating to these nuanced aspects of structure. As with the development of process and outcomes measures, which face the same challenges of standardization, reliability, validity, and portability, it is reasonable to assume that the process will take both time and significant resources. A review of recent funding decisions from the Agency for Health Care Policy and Research indicates that *de novo* measure development requires 1 to 2 years and carries a price tag of nearly \$200,000 per measure.⁴⁸ Experience with process measures for which the links to outcomes are already well established in the

literature indicates that it takes 2 to 3 years to develop and validate, which suggests that the time line for validating structural measures of quality may require a long duration and will face serious design challenges. For example, if these new structural measures are going to be utilized in validation studies that demonstrate how they link to process and outcome, it will be necessary to carefully consider the scope of such studies to ensure that essential features of the physical environment and work organization are not confounded.

Such studies will necessarily require participation of diverse sites, varying by size, ownership, staffing mix, and case mix. Within-site studies will need to be ongoing for us to understand shorter-term and longer-term effects of structure changes, as well as latent and manifest effects. Recruiting study sites and managing ongoing data collection across the sites will be enormously challenging and time-consuming. As a result it will be critical to develop public–private partnerships that will provide the impetus and resources to move this process forward.

An essential prerequisite of such an ambitious effort will be determining priorities for measure development on structure. That process has already been initiated through the work of the IOM Committee on the National Quality Report on Health Care Delivery, which set a framework for quality measurement; the work of the National Quality Forum's Strategic Framework Board; and a September 2000 Quality Interagency Coordination Task Force summit on Patient Safety Research.^{49,50} Some of the work linking structures, processes, and outcomes which could facilitate the development of a new generation of structural measures is already being initiated under the patient safety rubric. In spring 2001 AHRQ released a request for applications to examine the relationship between working conditions and quality of care.⁵¹

Measure development, however, will not be enough. Field testing of potential measures will be required to examine the feasibility and added value of these measures in real-world settings. The evaluation of those field tests will have to pay particular attention to whether the measurement activity promoted evidence-based decision making (that is, the measure promoted rational selection among alternatives) or resulted in improvement (that is, change based on the actionability of the measure). One potential head start on these activities would be the evaluation of current

experiments in the application of structural measures to quality assessment and improvement. An example of such an opportunity would be the rigorous evaluation of purchaser initiatives such as the Leapfrog Group.

Conclusion

Research to date suggests that a new cadre of structural measures of health care quality, which have largely been overlooked in the recent measures development boom, have the potential to fill in important gaps in our ability to assess quality. Developing a measurement capability capturing aspects of the physical

environment, working conditions, and provider satisfaction, however, will require an expansion of current research with a special focus on documenting linkages to patient outcomes, examining whether the measure is actionable or promotes evidence-based decision making, and ensuring reliability across settings. The task is formidable but feasible, and the steps to the development of important quality measures in these areas are well defined. The real question is whether the requisite human and financial resources, which may exceed those normally allocated to measures development, can be applied to the task. **J**

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MAYO CLINIC

Section Head

Health Services Evaluation

The Mayo Clinic invites experienced health services researchers to apply for the position of Head, Section of Health Services Evaluation (HSE). HSE is a multidisciplinary group of health economists, biostatisticians, disease management coordinators, programmers, and analysts. Their mission is to conduct health services research in support of the practice, administrative, and educational missions of Mayo. Collaboration is encouraged with the closely integrated Sections of Biostatistics, Clinical Epidemiology, and Medical Information Resources.

The responsibilities of the position include conducting and facilitating applied health services research in support of the practice of the Mayo Clinic and independent inquiry in related fields. Mayo provides an attractive start up package including salary and support persons to facilitate the personal research program of the selected candidate. Relevant areas of inquiry include, but are not limited to: health care financing and organization, cost-effectiveness analysis, technology assessment, population health management, quality of care measurement, and outcomes research. The selected person will be expected to serve as a collaborator, role model and catalyst to encourage interested clinicians to become actively involved in health services research. He or she will make frequent presentations to high level institutional committees. Effective communication skills are essential.

Candidates should have earned a doctorate degree in health administration, public health, medicine, economics, sociology or a related health services discipline. Candidates must have a strong record of scholarship evidenced by the coordination and publication of high-quality multidisciplinary health services research. Although the salary for this position does not require extramural support, demonstrated ability to obtain funding will be considered a significant strength. Candidates with demonstrated leadership, administrative and process improvement skills are highly preferred. Applications should be sent to:

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Mayo Clinic

Department of Health Sciences Research

200 First Street SW

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The deadline for receipt of applications is October 15, 2001

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