In Crossing the Quality Chasm: A New Health System for the 21st Century, the Institute of Medicine proposes 6 specific aims to improve the quality of care in the United States. These specific aims are to provide care that is safe, effective, timely, efficient, equitable, and patient centered. Of these goals, patient-centered care has received the least attention from both the scientific community and practicing clinicians. Patient-centered care gives patients opportunities to be “involved in medical decision making,” and guides care providers “in attending to their patients’ physical and emotional needs, and maintaining or improving their quality of life.”

To promote patient-centered care, clinicians should measure the health status of their patients with the use of standardized surveys, and then use this information to assist in clinical decision-making. There have been significant advances in health status surveys, and these measures are increasingly being used as primary outcomes in clinical trials. Yet formal health status measures are rarely, if ever, used in clinical practice. The reasons for this apparent gap between research and clinical practice are complex but likely include a lack of understanding of the definition of health status, a lack of familiarity with health status surveys, a perception that these measures are “soft,” and most importantly, a lack of acceptance that health status measures may be useful in clinical practice.

Health Status: Definition and Measurement
Health status is the impact of disease on patient function as reported by the patient. More specifically, health status can be defined as the range of manifestation of disease in a given patient including symptoms, functional limitation, and quality of life, in which quality of life is the discrepancy between actual and desired function (Figure 1). An important point here is that clinicians are traditionally focused on the diagnosis of disease and evaluation of symptoms, whereas patients are focused on the complete range of health status. Furthermore, patient report is essential because it has been shown that clinicians do not accurately estimate the health status of patients. There is often a large discrepancy between physician-rated and patient-rated symptom burden and functional limitation, and traditional clinical testing is of limited help because there is generally poor correlation between test results (eg, the severity of coronary disease on coronary angiography) and patient-reported health status. Therefore, for care to become more patient-centered, we need to use standardized patient surveys to measure the complete spectrum of health status.

Health status surveys have been developed over the last several decades largely through work done in the social sciences. This includes a significant body of basic science work in the field of psychometrics, analogous to the basic laboratory work done to develop diagnostic tests like serum troponin. As a result of this work, we can accurately measure the health status of our patients by use of standardized surveys that are inexpensive, easy to administer, and provide information that cannot be determined accurately in any other way. These include general surveys such as the Short-Form 36 (SF-36), which measures overall physical and mental health status without disease-specific questions, and condition-specific surveys like the Seattle Angina Questionnaire (SAQ). The SAQ was specifically developed for use in patients with coronary artery disease (CAD) and measures angina frequency, angina stability, physical limitation, quality of life, and treatment satisfaction related to angina.

An important barrier to the acceptance and use of surveys like the SF-36 and SAQ by clinicians is the perception that health status measures are soft, or not as scientific as physiological measures like exercise treadmill testing (ETT). Instruments such as the SF-36 and SAQ, however, were developed with the use of sound psychometric principles and have been subjected to extensive validity and reliability testing. In fact, the SAQ is more reproducible than either ETT or physician interpretation of coronary angiography. If the usefulness of any diagnostic test or clinical measure hinges on its validity and reliability, then present health status surveys belong along side more traditional clinical measures and physiological tests.

Health Status and Clinical Practice
Health status measurement directly promotes patient-centered care, but can also support several other quality care aims as outlined by the Institute of Medicine. For example, the delivery of effective care includes, “applying evidence-based medicine to avoid both the underuse of effective care and overuse of ineffective care that is more likely to harm than help the patient.” By accurately measuring the symptom...
burden, function, and quality of life of our patients, we can make more informed clinical decisions about the use of therapies for which the primary goal is to improve health status. For example, a patient with CAD who indicates that their current angina frequency, physical limitation, and quality of life on the SAQ are not a problem for them (eg, scores of 75 on these scales) likely does not need up-titration of antianginal medications, and would be unlikely to derive a health status benefit from percutaneous coronary intervention. On the other hand, a patient’s low scores on these scales indicate that there are significant symptom, functional, and/or quality of life deficits that need to be addressed.

In this issue of *Circulation*, Spertus et al 10 demonstrate that patient-reported health status, as measured by the SAQ, is independently predictive of subsequent mortality and hospitalization in outpatients with CAD. They found significant associations between SAQ scores and both mortality and subsequent hospitalization for acute coronary syndromes, even after adjustment for traditional clinical risk factors. In other words, patient-reported health status has incremental value in the identification of patients at elevated risk for adverse outcome.

This article joins other studies that have demonstrated that health status independently predicts mortality in patients with and without cardiovascular disease.11–15 Thus, contrary to its perception as a soft measure, it seems that quantitative assessment of health status can predict hard outcomes. Furthermore, in the study by Spertus et al,10 the magnitude of health status as a risk factor in patients with CAD compares favorably to established risk variables like diabetes and left ventricular hypertrophy.16

The results of this study further support adding health status measurement to our present clinical armamentarium. The use of health status data in clinical practice can provide a way for patients to participate further in their care, in this case by providing information useful in their risk stratification. A patient with high SAQ scores has a significantly better prognosis than a patient with similar coronary anatomy and comorbid conditions who has lower SAQ scores. Conversely, a patient with low SAQ scores is at elevated risk for subsequent mortality and hospitalization for ACS, above and beyond their traditional demographic, cardiac, and comorbid factors.

The study by Spertus et al10 has several limitations that deserve attention. Firstly, potential selection bias from missing assessments is a concern for almost all studies with survey-based data. In this case, 19% of the surveys were missing, and the authors employed multiple imputation methods to try to address this issue. Missing assessments are the Achilles heel of health status research, but newer statistical techniques may help to overcome this problem.17

Secondly, health status should be measured longitudinally whenever possible. Although this study demonstrates the value of a single health status measurement in the prediction of outcomes, it is important to know whether serial measurement would give a more accurate picture of the health status of a patient, and whether changes in health status (eg, declines from one measurement to the next) would provide a more robust prediction of outcomes than a single ‘snapshot’ measurement.

Finally, although the study by Spertus et al10 helps further define a clinical role for health status measures, it does not prove that the standardized measurement of the health status and the improved knowledge of prognosis will translate into better outcomes for our patients. This is an important focus for future research in this field.

**Future Directions**

The field of health status research has made tremendous advances, but researchers need to continue to strive to meet several important challenges (Figure 2), such as:

1. Developing surveys that are designed for rapid administration, scoring, and interpretation in clinical practice

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**Figure 1.** The range of health status: symptoms, function, and quality of life. Figure adapted from Spertus et al (*Am Heart J.* 2002;143:636–642) and Wilson and Cleary (*JAMA.* 1995;273:59–63).

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**Figure 2.** Health status research: past, present, and future.
(ie, filled out by patients in the waiting room, with results immediately available to clinicians).

(2) Providing better clinical interpretation of survey results. Although many health status surveys are “valid and reliable,” most produce results that do not have obvious clinical meaning or suggest an obvious clinical response. For example, SAQ scores by themselves do not mean much unless they are converted to categories like “severe,” “moderate,” “mild,” or “no significant” physical limitation due to angina.

(3) Conducting studies with longitudinal measurement of health status, and use newer statistical techniques to deal with response bias from missing surveys.

(4) Most importantly, conducting studies that are specifically designed to evaluate whether health status measures can, when used in clinical practice, improve patient outcomes, including mortality, hospitalization, and quality of life. For these studies to be successful, health status must be modifiable and the survey results must be actionable (ie, the survey results need to be linked to specific clinical actions to improve patient care). Fortunately, some of the determinants of health status in patients with CAD seem to be good targets for intervention. For example, angina and depressive symptoms are prevalent in CAD patients, are strongly associated with worse quality of life, and can be modified with appropriate recognition and treatment.16,18–20

It is useful to draw an analogy between health status and blood pressure. First, neither can be inferred from observation without formal measurement. Second, health status measurement is as reproducible, if not more so, than blood pressure measurement. Finally, health status is an independent predictor of outcome on par with blood pressure. Future research is needed to prove that standardized measurement of health status can guide clinical decisions in ways that will improve patient outcomes, just as the treatment of high blood pressure improves outcomes.

In the meantime, consideration should still be given to the use of health status surveys in clinical practice. On the basis of the existing evidence, including the study by Spertus et al,10 these surveys can accurately measure the health status of our patients, thereby providing a better understanding of the impact of disease and medical intervention on their lives; help with clinical decisions about treatments such as antianginal therapy and percutaneous coronary intervention, which are specifically intended to improve symptom control, functional status, and quality of life; and improve our assessment of patient prognosis. Hopefully, the future will see standardized health status measurement used as a vital clinical instrument that complements our current clinical toolbox and directly improves the quality of care we provide through the promotion of patient-centered care.

References


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