

Quality Measurement in Diabetes Care

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Abstract

This study aimed to evaluate diabetes quality measurement efforts, assess their strengths and areas for improvement, and identify gaps not adequately addressed by these measures. We conducted an environmental scan of diabetes quality measures, focusing on metrics included in the National Quality Measures Clearinghouse or promulgated by leading measurement organizations. Key informant interviews were also completed with thought leaders who develop, promote, and use quality measures. The environmental scan identified 146 distinct measures spanning 31 clinical processes or outcomes. This suggests a measurement system that is both redundant and inconsistent, with many different measures assessing the same clinical indicators. Interviewees believe that current diabetes measurement efforts are excessively broad and complex and expressed a need for better harmonization of these measures. Several gaps were also found, including a lack of measures focusing on population health, structural elements of health care, and prevention of diabetes. (*Population Health Management* 2009;12:265–271)

Introduction

APPROXIMATELY 24 MILLION AMERICANS CURRENTLY HAVE DIABETES,¹ and this number may well double in the next 20 years.² Costs associated with the disease are substantial and growing rapidly, accounting for approximately \$174–\$192 billion annually in the United States.^{3,4} Best practices for treating diabetes are codified in clinical guidelines and can lead to decreased morbidity and mortality.^{5,6} Translating guidelines and knowledge into practice, however, has proven to be a significant challenge.⁷

An increasingly common strategy to promote best practices and enhance the value of care is periodic performance assessment of physicians, health systems, and health plans. A variety of organizations are dedicated to quality measurement and improvement, including the National Committee for Quality Assurance (NCQA), the National Quality Forum (NQF), and the American Medical Association's Physician Consortium for Performance Improvement (PCPI). These groups and many others have incorporated diabetes into their earliest and successive iterations of assessment and improvement activities.^{8–10} Diabetes quality metrics are also commonly included in initiatives to incentivize physician behavior and promote public reporting of performance data. For example, the Physician Quality Reporting Initiative (PQRI) of the Centers for Medicare and Medicaid Services (CMS) includes 9 diabetes measures.¹¹

These efforts and others have created an extensive menu of indicators designed to assess diabetes care. However, as the volume of activity in this area grows, measures are not always specified or applied in consistent ways. As a result, physician and practice performance is increasingly assessed by measures whose breadth and inconsistency may hamper their value.

Understanding the current state of diabetes quality measurement is a vital first step toward identifying strategies to improve the utilization and value of existing measure sets, so as to identify gaps in those sets and create new and better measures as needed. The aims of our study were to: (1) delineate and classify the landscape of diabetes measurement, (2) identify areas that are not adequately addressed, (3) examine the barriers and challenges to utilizing quality measures, and (4) explore future directions that will likely impact physicians and other providers and the way they care for patients with diabetes.

Research Design and Methods

Environmental scan

A 2-step process was utilized to generate a compilation and assessment of diabetes quality measurement initiatives. First, an environmental scan was performed to identify and categorize existing measures. The National Quality Measures

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Clearinghouse (<http://www.qualitymeasures.ahrq.gov/>) was searched for measures that address diabetes care. The Clearinghouse is a publicly-available online database of quality metrics maintained by the Agency for Healthcare Research and Quality (AHRQ), the federal agency charged with promoting a quality agenda for health care.

Next, a list of widely respected organizations and institutions that have developed and promoted clinical quality measures for diabetes care was assembled and reviewed for completeness by an expert advisory panel. Organizations with national reputations were selected to reflect the major stakeholders in American health care including physicians and other care providers, patients, payers, employers, and quality improvement experts. All diabetes measures generated by these organizations were reviewed, and those that were not already included in the Clearinghouse were added. Detailed descriptions of each organization's measures were compiled using data and specifications published or supplied by the selected organizations. Measures were classified by clinical categories that reflect specific medical processes (eg, glycosylated hemoglobin [HbA1c] testing, medication management), health status indicators (eg, lipid profiles, blood pressure), or other elements of care (eg, patient self-management, resource use) that are assessed.

Key informant interviews

A series of interviews with key thought leaders conducted between July and October 2008, formed the second stage of the research. Interviewees were recruited from most of the organizations whose measure sets were reviewed in the environmental scan. Additional interviews were undertaken with representatives of other significant stakeholders involved in the endorsement, promotion, or utilization of quality measures. A complete list of interviewed organizations is presented in Table 1. All interviewees were mid- or high-ranking leaders in their respective organizations who were familiar with the development and use of quality metrics. Interviews were semi-structured and qualitative, and lasted between 30 minutes and 1 hour.

TABLE 1. INTERVIEW PARTICIPANTS

Ambulatory Care Quality Alliance
American Academy of Family Physicians
American Association of Diabetes Educators
American Board of Internal Medicine
American Board of Medical Specialties
American College of Physicians
American Medical Association's Physician Consortium for Performance Improvement
Blue Cross Blue Shield Association
Centers for Disease Control and Prevention
Centers for Medicare and Medicaid Services' Physician Quality Reporting Initiative
HealthPartners of Minnesota
Institute for Healthcare Improvement
National Business Coalition on Health
National Committee for Quality Assurance
National Quality Forum
Pharmacy Quality Alliance
Wisconsin Collaborative for Healthcare Quality

Most interviews were conducted telephonically by a 2-person team, although some were conducted face-to-face or by a solo interviewer. Interviewees were not compensated for their time, and were guaranteed individual confidentiality. Interviews with 21 individuals representing 17 institutions were completed. The interview protocol addressed 8 key themes: current utilization of quality measures, facilitators of measurement, barriers to measurement, strengths and weaknesses of existing measures, gaps that are not addressed well by current measures, value derived from diabetes quality measurement, impact of environmental factors on quality (eg, reimbursement, information technology, and organization of health care delivery), and expectations for future directions in diabetes quality measurement.

Results

The breadth of diabetes measurement is striking. AHRQ's Clearinghouse had 98 measures at the time of this writing, and we identified an additional 48 measures that are used or promoted by major quality organizations. Our analysis focused on these 146 measures, which are summarized in Table 2.

A relatively small number of institutions or programs developed most of the measures. Eight sources, in particular, account for three fifths of the metrics: the Health Disparities Collaborative, Institute for Clinical Systems Improvement, NCQA, PCPI, Pharmacy Quality Alliance, RAND Corporation, Wisconsin Collaborative for Healthcare Quality, and the Veterans Administration. Notably, clinical practitioners are the organizing force for only 1 of these measure development groups, the PCPI.

Clinical categories

Thirty-one different facets of clinical care are captured by the measures in Table 2. Tracking and management of blood glucose and significant risk factors such as lipids and blood pressure constitute a substantial share of the measures. Monitoring for risk of major diabetic complications, including nephropathy, blindness, or amputation, is also well represented. Several indicators of pharmacotherapy and medication management were identified, as were a small number of measures of prevention and wellness.

Many of these measures reflect multiple ways to assess a given clinical indicator, and differ only in the precise specification of a numerator or denominator, the target goal to be achieved, or the time horizon for collecting data. Measures were included in this study only if their technical specifications were unique. Nevertheless, 21 measures address control of HbA1c, and 22 measures focus on lipid management. Table 3 illustrates some of the different specifications detected in measures of HbA1c, blood pressure, and lipid management.

The measures also reflect different aspects of quality of care. AHRQ's Clearinghouse identifies 7 domains of quality: process, outcomes, population health, structure, access, patient experience, and use of services.¹² Nearly two thirds of the diabetes measures we found address processes of care, while most of the remainder assess outcomes. Process measures found most frequently include ordering tests for HbA1c and lipid profiles, conducting eye and foot examinations, and screening for microalbuminuria and

TABLE 2. DIABETES QUALITY MEASURES BY CLINICAL CATEGORY

<i>Clinical category</i>	<i>Number of measures</i>
Blood glucose management	
Hemoglobin A1c	21
Blood glucose	5
Comorbidities	
Eye examination	12
Microalbumin	8
Foot examination	5
Kidney disease/nephropathy	4
Screening for depression	3
Peripheral pulses	2
Dental exam	1
Glomerular filtration rate/serum creatinine	1
Lower extremity amputation rate	1
Neuropathy testing	1
Risk factor management	
Lipid profile	22
Blood pressure	13
Smoking	7
Body mass index	2
Diabetes education	1
Exercise	1
Pharmacotherapy management	
Medication management	6
Angiotensin-converting enzyme inhibitor/angiotensin II receptor blockers	4
Aspirin/antithrombotic	3
Angiotensin-converting enzyme inhibitor/calcium channel blocker	1
Statins	1
Prevention and wellness	
Immunizations	5
Screening for diabetes	2
Follow-up visit	1
Self-management goals	1
Other	
Composite measures	6
Hospital admission rate	4
Diabetes registry	1
Relative resource use	1
Total	146

nephropathy. The most frequent outcome measures assess whether patients met targets for HbA1c, lipids, and blood pressure. Only 1 structural measure, existence of a diabetes patient registry, was identified.

Key informant interviews

Our interviews provided stimulating and sometimes conflicting insights into the development, promotion, and use of diabetes quality measures. Four prevailing themes emerged: (1) diabetes quality measurement is too complex and disjointed, (2) a broad range of factors contribute to this perception, (3) views differ sharply on how to develop a more streamlined approach, and (4) current measures do not adequately address a multitude of gaps.

Although the organizations that develop, use, and promote diabetes measures share a commitment to better qual-

ity, our interviewees described goals and approaches that vary widely. Some institutions, such as NCQA, seek to set national benchmarks, while regional quality collaboratives aim to stimulate and support specific improvement initiatives. Other agencies, such as CMS, link performance to public reporting initiatives or financial rewards, while others do not employ external incentives or disincentives. Although nearly all of our interviewees believed that each of these organizations can contribute positively to health care improvement, they also felt that the cumulative impact of these efforts could be enhanced by greater alignment of methods and goals.

Variation also emerges because measures are designed for different units of analysis, including health systems, health plans, group practices, or individual physicians. Additionally, measures apply to a range of providers including specialists and primary care physicians, optometrists, pharmacists, and diabetes educators. Measures that are intended to evaluate the same process or outcome may be framed differently when applied to varying targets. All of these distinctions in purpose, method, and unit of analysis help explain the rapid growth of measures, according to our interviews.

Many interviewees described the recent emergence of quality measurement as an evolutionary process that began in earnest with NCQA's establishment of standardized health plan assessment approximately 15 years ago. This focus on insurers, supported in large part by employers, dominated the early development of quality metrics for diabetes and many other conditions.

As quality measurement became increasingly well established, new efforts arose to apply measures to health systems and group practices. Only recently have measures designed by and for individual physicians been introduced. However, physician societies and quality collaboratives that seek to develop new programs to improve care also struggle to determine which measures are useful. In addition, physicians voice concern about adding to a measurement burden that frequently is redundant or inconsistent and requires excessive time to manage the demands of payers and other external stakeholders.

Significantly, according to nearly all the interviewees, these trends have resulted in an excessively broad, complex, and unwieldy environment for diabetes measurement and improvement. Although the diversity of measures could be a positive factor if it enabled measurement tailored to individual physician or practice needs and resources, most of our respondents felt that the existing complexity hampers improvement by creating confusion and producing inconsistent data.

Interviewees were also asked to discuss major barriers and challenges encountered in the course of measure development and promotion. One of the barriers described by almost everyone was the lack of comprehensive data sources to support consistent data collection and analysis. For example, data drawn from a health plan's administrative database offer different analytical opportunities than information extracted from patient charts. The latter can be more precise and reveals a different level of performance, but requires greater resources for data collection. More than half the interviewees discussed how these variations make it more difficult for uniform measurement standards to emerge.

TABLE 3. EXAMPLES OF VARIATION IN MEASURES OF GLYCOSYLATED HEMOGLOBIN, BLOOD PRESSURE, AND LIPIDS

<i>Clinical category</i>	<i>Numerator variation</i>	<i>Denominator variation</i>
Glycosylated hemoglobin (HbA1c)	HbA1c test performed	Identification of diabetic patients
	Two or more HbA1c tests performed ≥ 60 days apart	Diagnosis of diabetes
	One or more HbA1c tests performed	Diagnosis of diabetes Types 1 and 2
	Most recent HbA1c value	Diagnosis of diabetes Type 2
	Average HbA1c value	Diagnosis of diabetic retinopathy
	Record of HbA1c test	Age
	HbA1c $< 7.0\%$	Pediatric patients
	HbA1c $\geq 7.0\%$	18+ years old
	HbA1c $\leq 7.5\%$	18–75 years old
	HbA1c $\leq 9.0\%$	18–85 years old
	HbA1c $> 9.0\%$	Vulnerable elder
	HbA1c $\leq 10.0\%$	Time frame
	HbA1c 9.0%–10.9% with therapeutic intervention	Most recent
	HbA1c $\geq 11.0\%$ with therapeutic intervention	Diagnosis of diabetes
		Last 6 months
	Last 12 months	
	Last 15 months	
	Measurement year	
Blood pressure (BP)	BP measurement performed	Identification of diabetic patients
	BP $< 130/80$	Diagnosis of diabetes
	BP $< 140/80$	Diagnosis of diabetes Types 1 and 2
	BP $\leq 145/85$	Age
	BP $< 140/90$	18–75 years old
	BP $\geq 140/90$	18–85 years old
	BP 150–160/90–100	Vulnerable elder
	BP $> 160/100$	Time frame
		Most recent
		Last 12 months
	Last 15 months	
Lipid profile and management: low-density lipoprotein (LDL)	Full lipid panel	Identification of diabetic patients
	Lipid profile	Diagnosis of diabetes
	LDL value	Diagnosis of diabetes Types 1 and 2
	LDL < 100	Prescription for at least 1 diabetes drug
	LDL 100–130	Age
	LDL > 130	18–75 years old
	LDL ≥ 130	18–85 years old
	Total cholesterol screening test	Vulnerable elder
	Cholesterol value	Time frame
	Total cholesterol ≥ 240	Most recent
		Last 12 months
		Last 15 months
	Last 24 months	
	Measurement year	

Several respondents addressed how physician-level measurement is hampered by the challenge of attributing patients accurately to the individual physicians who are responsible for the measured indicators. This operates on 2 levels. When a patient seeks treatment from a practice with multiple providers, the care received often reflects the efforts of more than 1 physician within the group. Similarly, patients with diabetes receive care from primary care providers and a range of specialists, usually from different medical practices. Quality measures typically cannot account for this complexity.

Another significant challenge is presented by changes in the clinical evidence for some critical measures, especially HbA1c, lipids, and blood pressure. Institutional processes are often required to make changes in established measure

sets, and many measurement programs are modified only once a year (or less frequently). When new studies emerge that influence treatment protocols, as in the summer of 2008 regarding tight glucose control,^{13,14} measurement organizations may not be able to respond quickly. CMS, for example, cannot readily change measurement rules in the middle of a data collection cycle.

Conclusion

Measurement harmonization

Although the broad array of existing measures creates valuable opportunities to quantify, benchmark, and improve a wide range of clinical processes and outcomes, providers and other stakeholders report that the broad scope of activ-

ities lacks clarity. Currently, the environment is characterized by hundreds of measures that frequently do not conform completely with key facets of measure selection, data sources, and standards for defining high-quality care. Clinicians report dissatisfaction when they encounter mixed messages regarding testing and screening schedules or target goals for key outcome indicators such as HbA1c.

Several interviewees also questioned the balance between process and outcome measures, though from different perspectives. Some felt that outcomes should receive greater attention, while others believed that outcome measures should be de-emphasized because they reflect a broad range of factors outside the provider's control. While this debate is partly philosophical, it has important implications for how physicians respond to measurement. Clinician-led organizations might consider fully debating the respective value of these approaches and working toward mutual resolution of these concerns.

Physicians are not alone in grappling with these challenges. Many of the stakeholders driving the quality agenda are also becoming frustrated with the current state of affairs. Large employers increasingly seek to enhance the value of the health care services they purchase, but these efforts can be hampered by purchasers' limited expertise in the methodological details of quality measurement and the volume and inconsistency of the data they encounter. Policy makers charged with designing programs that reward performance or publicly report data also struggle to identify the best measures for their initiatives. Finally, as consumer-driven health plans grow more widespread, patients will shoulder greater responsibility for understanding performance data and making informed health care decisions. It is unlikely that most patients are prepared for this challenge¹⁵ and may turn to their physicians and/or online sources of information for guidance.

Recognizing these growing challenges, some national organizations have begun developing processes to better harmonize quality measures. One approach is the development of a "comprehensive" measure set, a subset of measures that focuses on the most clinically significant indicators such as HbA1c, lipids, and blood pressure. This alternative seeks to define the metrics that have the largest impact on patient well-being, while filtering out many other measures that are less clearly indicative of a patient's health. Providers can also use this set of measures to target improvement activities and focus on areas where progress is most needed.

Another strategy is the development of a "composite score" that would weight multiple indicators and generate a single, overarching score that reflects a broad range of measures. This approach would lead to single data points that might be more readily understood by purchasers, patients, and policy makers. One challenge, however, is that rolling multiple measures into a single score could make it more difficult to determine specific areas for improvement. A few interviewees also cautioned that a composite score is likely to generate controversy about inclusion criteria and component weights, possibly resulting in physician skepticism and the reluctance of other stakeholders to use such measures.

Comprehensive measures and composite scores are just 2 of the more prominent pathways that are under consideration by leading quality measurement organizations, including NCQA and NQF. It is unclear whether these strategies will ultimately gain widespread acceptance, or how effec-

tively they will streamline quality measurement. Nevertheless, these efforts highlight the need for more efficient measurement programs.

Measurement gaps

Harmonization of measures is an important step, but our findings also point to significant gaps in current measurement activity. First, there are virtually no population-based or epidemiologic measures in the contemporary environment. Health plans, health systems, and physicians typically are not asked to collect data that could generate population-based measures. Recent research estimates that one-third of patients with diabetes are not diagnosed,¹ although early intervention can have a tremendous impact on their health. Physicians and other providers can benefit from measures that help identify the size of their diagnosed and undiagnosed diabetes populations.

Data could also be collected on the distribution of diabetes by the categories of age, sex, race, and ethnicity. Disparities in prevalence, severity, and treatment of diabetes have been well documented.¹⁶⁻¹⁸ Interventions that have been proven to reduce these disparities¹⁹⁻²¹ could benefit from more comprehensive data collected on a regular basis by existing performance assessment programs.

Current measurement and improvement initiatives also reflect a focus on the employed and insured population, with little attention paid to the unemployed or uninsured. NCQA is primarily dedicated to assessing health plan quality, PQRI is limited to patients covered by Medicare, and most financial incentive and public reporting programs are driven by insurers or employers. Data collected by these programs ignore millions of Americans and may not accurately reflect the overall state of diabetes care. Efforts to capture the quality of care provided to less visible and more vulnerable populations (eg, the uninsured, the homeless) could lead to a better understanding of diabetes prevalence, severity, and treatment. Such initiatives may not require new types of measures, but rather the innovative application of existing measures to different populations.

Patient perspectives are also not included in prominent measurement sets that typically rely on data drawn from administrative databases and patient records. Restricting measures to elements that are readily available from these sources narrows the scope of quality measurement and overlooks the enormous importance of how patients think and feel about their care. Valid and reliable tools for assessing patient perspectives on how they are affected by diabetes, and how their disease is managed, do exist.^{22,23} Incorporating these tools into quality assessment could better enable physicians to engage their patients in discussion about the challenges of managing a complex chronic disease.²⁴

Measures of access to care, structures of care, and use of services are also rare. AHRQ has identified these domains as important components of quality, and they also reflect the Institute of Medicine's call for a health care system that is more equitable and efficient.²⁵ Public health authorities and local and state governments have a strong interest in improving access to services, while payers and purchasers seek a more efficient system that can reduce long-term costs and improve overall health. Development of new measures to address these issues would be worthwhile.

Finally, prevention of diabetes was cited repeatedly by interviewees as a key to reducing its impact on individuals and society. Identification of prediabetics or those at risk for the condition is a crucial—and measurable—first step. Advising patients about how to avoid diabetes or prevent its progression could have a major impact on their future health. Some measures of this type, such as tracking body mass index, nutritional and exercise counseling, and smoking cessation counseling, already exist but are used in limited contexts. Broadening the use of these measures within diabetes care is a goal worth the attention of physicians and those who develop, endorse, and utilize quality measures.

Limitations

Our findings have some important limitations. First, we confined the environmental scan to measures included in the National Quality Measures Clearinghouse and the measure sets of prominent organizations. This approach was sufficient to highlight the scope and diversity of measurement activity, but necessarily underestimates its total breadth and complexity. Measures that address some of the gaps we identified may also have been overlooked. Our analysis is similarly limited by the small number of organizations interviewed. The 17 institutions included many of the key stakeholders in health care, but some important perspectives may not have been adequately represented. Thus, we may not have fully characterized all of the relevant positions on these issues.

Diabetes quality measurement is characterized by a vast array of measures that can contribute to better care and outcomes. Utilization of these indicators is unfortunately hindered in part by their breadth and variety. Streamlining and harmonizing existing measures is an important challenge that must be addressed to encourage wider use of performance assessment. Important gaps in measurement also require the attention of physicians, researchers, and policy makers.

As performance assessment has evolved from health plan to health care provider, new opportunities—and responsibilities—have emerged to shape these efforts for the well-being of patients.

Disclosure Statement

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