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Modernizing Diabetes Care Quality Measures

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Abstract

The proliferation of diabetes quality measures in the US since the mid-1990s has increased the burden of measurement without commensurate improvements in the quality of care or health outcomes. Measures in use today do not represent or incentivize achievement of care goals in all domains of quality that are necessary to achieve optimal diabetes health. We recommend reimagining and improving diabetes quality measurement through the following propositions: widespread adoption of new measures and modernization of existing measures across six domains of quality; use of a subset of new and modernized metrics as top-line measures for reporting and reimbursement; and optional use of the remaining new and modernized measures for evaluative purposes at all levels of the care delivery system to identify and address gaps in care quality and outcomes. These propositions would support practices and policies at all levels of the health care system to improve the health of people with diabetes.

Approximately one in seven US adults are living with diabetes,¹ making it a leading cause of morbidity, disability, impaired quality of life, and mortality.² Diabetes is one of the costliest chronic health conditions for patients and society, with approximately one in four US health care dollars spent caring for people with diabetes in 2017.³ Therefore, reducing the burden of diabetes, its treatment, and its complications are high priorities for patients, clinicians, health systems, communities, and governments. To promote these goals, a large number of quality measures—some of which must be publicly reported and many of which are linked to reimbursement—have been introduced in the US since the mid-1990s.⁴ Public dissemination of performance data based on these measures is intended to allow patients and other stakeholders to identify high-quality providers and pinpoint potential gaps in care quality. Quality measures are a core component of value-based payment models for both

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public and private payers, and health systems devote human and logistical resources to quality measurement, improvement, and reporting. However, the proliferation of quality measures has not translated to meaningful improvements in the health and well-being of people with diabetes. Instead, the growing administrative burden associated with the measures has diverted resources away from investment in innovation and patient care.⁵

To improve the quality of diabetes care, we propose reimagining diabetes care quality measurement through the following propositions: widespread adoption of new measures and modernization of existing measures across the six domains of quality identified in 2001 by the Institute of Medicine (effectiveness, efficiency [also described as value], safety, timeliness, patient-centeredness, and equity);⁶ use of a subset of new and modernized metrics as top-line measures for reporting and reimbursement; and optional use of the remaining new and modernized measures for evaluative purposes at all levels of the care delivery system to identify and address gaps in diabetes care quality and outcomes.

Current State Of Diabetes Care Quality

Diabetes quality measures currently in use and summarized in online appendix exhibit 1⁷ are mainly process measures—focusing on activities that reflect evidence-based care processes to maintain or improve health (such as completion of retinopathy screening)—and surrogate outcome measures (such as hemoglobin A1c, blood pressure, and low-density lipoprotein cholesterol levels), which are clinical parameters that capture aspects of patients' health status and reflect risk for certain hard outcomes. Hard outcomes are health events such as end-stage kidney disease, blindness, amputation, atherosclerotic cardiovascular disease events, and death.⁸ A glossary of quality measurement terms is provided in appendix exhibit 2.⁷

Despite the evolution in diabetes care quality measurement in the US, there has been no commensurate improvement in the health of people with diabetes. A recent population-based study found that during 2015–18 just 21 percent of US adults with diabetes achieved diabetes management goals for HbA1c, blood pressure, and low-density lipoprotein control.⁹ Data from the Centers for Disease Control and Prevention (CDC) show that rates of hard diabetes-related outcomes, including atherosclerotic cardiovascular disease, lower extremity amputation, and other acute and chronic complications, have not improved meaningfully since 2015.¹⁰

Disparities In Diabetes Care And Outcomes

Challenges associated with stagnant or worsening population-level diabetes care quality are compounded by pervasive disparities across race and ethnicity, socioeconomic status, health insurance coverage status and type, geographic region, and rural and urban residence. The burden of diabetes and its complications falls disproportionately on racial and ethnic minoritized populations.¹¹ Minoritized patients have higher prevalence of diabetes,¹² are less likely than White patients to achieve glycemic targets, and experience higher rates of acute and chronic complications^{13,14} and death.¹⁵ People with lower socioeconomic status similarly have higher prevalence of diabetes and are less likely to receive high-quality

diabetes care,¹⁶ have worse glycemic control, and are less likely to achieve other diabetes management goals^{17,18} than people with higher socioeconomic status.

Insurance coverage is another strong predictor of diabetes care quality. Inadequate health care coverage (resulting from uninsurance or high out-of-pocket expenses under high-deductible health plans) is associated with higher rates of diabetes, undiagnosed diabetes, diabetes complications, and forgoing care.^{19,20} Data on diabetes care quality among Medicaid beneficiaries are mixed, although Medicaid expansion under the Affordable Care Act improved the quality of diabetes care.²¹ Patients of the Veterans Affairs (VA) health system often have better diabetes care quality and achieve better diabetes outcomes than members of commercial plans.²² This difference may stem from the VA's role as both a provider and a payer, which offers the opportunity to align care models, reimbursement, and quality measures, thereby offering insight into how higher quality of care may be achieved.

Geographic disparities in care quality and outcomes exist on several levels. Rural residents are more likely than those in urban areas to have diabetes and are less likely to achieve glycemic control and receive critical eye and foot examinations.²³ People in socioeconomically deprived areas have higher rates of diabetes,²⁴ lower diabetes care quality,²⁵ and higher rates of severe hypoglycemic and hyperglycemic events²⁶ than people living in less deprived areas. People living within the "Diabetes Belt" (Alabama, Florida, Georgia, Kentucky, Mississippi, and Tennessee) are more likely to forgo recommended medical care²⁷ and experience higher rates of complications²⁸ followed by death²⁹ than patients in other regions of the US.

Limitations Of Contemporary Diabetes Quality Measurement

The types of diabetes quality measures currently in use, and their sheer number, contribute to missed opportunities to align quality measurement with the pursuit of high-quality diabetes care and optimal health outcomes. Two commonly used quality measures are the National Committee for Quality Assurance (NCQA)'s Healthcare Effectiveness Data and Information Set (HEDIS) measure³⁰ used by health plans and health systems and the MN Community Measurement (MNCM) D5 measure,³¹ which must be publicly reported by all health systems in Minnesota and has been adapted by other organizations and regulatory bodies (appendix exhibit 1).⁷ Both are composite hybrid measures, meaning that they comprise multiple component measures in different categories (appendix exhibit 2).⁷ HEDIS and D5 include both process (for example, completed retinal exam and prescription of statin or aspirin) and surrogate outcome (for example, HbA1c below 8%) measures.

Both sets of measures have several limitations. First, they do not safeguard against inappropriate treatment or overtreatment, as there are no safety countermeasures assessing for hypoglycemia, hypotension, treatment burden, or financial toxicity.³² Second, surrogate outcome measures included in HEDIS and D5 do not correlate perfectly with hard outcomes.⁸ Third, these surrogate outcome measures are constructed as threshold measures, or all-or-nothing measurements of whether specific levels of HbA1c and blood pressure are achieved. Use of threshold-based measures is common, accounting for thirty-one of the thirty-seven diabetes care quality measures listed in appendix exhibit 1.⁷ A major limitation

of threshold measures is that they do not reflect clinical actions that may substantively lower the risk for diabetes complications even if the patient does not reach the specified thresholds. Fourth, because HEDIS and D5 are composite measures that are met only if all components of the measure are achieved simultaneously, they do not recognize or reward the clinically meaningful risk reduction that occurs when a subset of component measures are achieved.

These limitations have the cumulative, unintended effect of incentivizing providers to focus on patients most likely to achieve the measure rather than those who would benefit the most clinically. For example, population health management programs using these measures may place a priority on outreach to patients who meet all but one component of a composite measure or who are close to meeting a specific threshold. The deficiencies of existing composite measures are likely to disproportionately disadvantage patients with socioeconomic barriers to optimal health, as they are more likely to have multiple unmet measures or not meet a measure that is more difficult to achieve than others, such as not smoking, thereby exacerbating health disparities. A more equitable approach would be to support higher-risk (and higher-need) patients who fall short of multiple components of a composite measure or deviate far from the specified thresholds.

Most currently used quality measures assess the effectiveness of diabetes care; however, as noted above, effectiveness is just one of six domains of quality as defined by the Institute of Medicine.⁶ There are no measures of equity, efficiency or value, timeliness, or patient-centeredness of care. The large number of quality measures spanning multiple domains and issued by multiple organizations are frequently inconsistent and even conflicting, resulting in administrative burden, allocation of scarce health resources to reporting the measures and away from supporting patient care, and increasing clinician burnout.³³ Most available measures apply to clinicians and health care provider organizations. Only a few apply to payers, and none apply to governments, despite the growing evidence of broader structural factors at the payer, county, state, and federal levels that affect care delivery, use of care, and health outcomes. These factors include social determinants of health and the availability, accessibility, and affordability of health care services.

Looking Forward: Innovations In Diabetes Quality Measurement

As quality measurement is reimagined to incentivize care that meaningfully improves the health of all people with diabetes while reducing administrative burden, it is important to be parsimonious and strategic in the selection and implementation of measures. To act as effective incentives, quality measures need to connect directly to reimbursement, as in value-based payment models such as accountable care organizations with twosided risk models. Reimagined measures need to give clinicians, providers, and payers incentives to support evidence-based care; place a priority on patients—including those who are clinically complex and socioeconomically disadvantaged—most likely to benefit from the targeted interventions; encourage cross-sector collaboration; and reduce administrative burdens on clinicians and health systems. Because diabetes is a complex, multifaceted disease, it will take a coordinated effort by all levels of the health care system to improve care quality (exhibit 1). Thus, quality measures are needed that are measurable and actionable at each level. To these ends, we offer three propositions to guide changes in diabetes care quality

measurement. We highlight opportunities for innovation in each quality domain, as well as implementation challenges (see appendix exhibit 3).⁷

PROPOSITION 1

Our first proposition is the development, validation, and implementation, for widespread adoption, of a set of new and modernized measures across the six domains of quality. Below, we propose a reimagined approach to each quality domain (definitions in appendix exhibit 2).⁷

EFFECTIVENESS: Effectiveness measures assess whether patients are receiving evidence-based care that achieves desired goals (that is, reduces risk of complications, controls symptoms, or improves quality of life). Several effectiveness process measures are already in use to promote the completion of evidence-based services (appendix exhibit 1),⁷ but additional measures should be developed to align with scientific evidence and a risk-based (rather than threshold-based) evaluation strategy. Thus, we recommend introduction of measures designed to assess whether patients are prescribed evidence-based pharmacotherapies according to their risk of diabetes complications³⁴ (appendix exhibit 3).⁷ Before medication-related process measures can be implemented, payers should align their formulary tiering systems with evidence-based recommendations to minimize financial burden on patients and administrative burdens on clinicians stemming from prior authorization and coverage denials. To improve effectiveness measurement, a complementary approach would be to assess medication adherence.³⁵ Findings could prompt health systems and health plans to assess and improve patients' self-management skills and their capacity to access, obtain, and adhere to recommended therapies.

Along with measures of medication use, we recommend measures of nonpharmacological interventions that incentivize the reduction of risk for complications. Such measures could include receipt of diabetes self-management education and support, referral to weight or lifestyle management programs, and actions to address social determinants of health that impede optimal diabetes care.

Another opportunity to improve effectiveness measurement is through the use of appropriateness measures, whereby specific patient characteristics are considered as part of the measure itself. For example, an appropriateness of glucose-lowering therapy quality measure can track whether patients receive the intensity and type of treatment that is recommended for them given their comorbidity burden. A complementary approach to improving effectiveness measurement is through individualized risk-based measures, which use validated risk-based prediction models to assess patients' likelihood for benefit or harm from an intervention and determine whether that intervention was completed only when warranted based on a patient's risk assessment.³⁶

Effectiveness measurement should be improved by prioritizing a focus on hard outcomes and redesign of surrogate measures to support risk reduction over attainment of prespecified thresholds. New surrogate outcome measures could be calibrated based on predicted clinical benefits,³⁶ thus supporting shared decision making and individualized care. We recommend additional investment in patient-reported outcome metrics, such as the Centers for Medicare

and Medicaid Services (CMS) measures that examine health-related quality of life, symptom burden, and health behaviors.³⁷ Composite measures, if used, should allow for "partial credit" when some components of the quality measure are met (appendix exhibit 3).⁷

EFFICIENCY AND VALUE: Efficiency measures, alternatively called value measures, encompass cost and health care use. Reducing costs while improving care quality is necessary to improve health equity, reduce financial barriers to care, lessen treatment burden, and help safeguard the health care system's long-term financial stability. This goal is particularly relevant as the cost of diabetes care continues to rise³ and the value of new and costly therapeutics to patients and society needs to be assessed. Currently, however, no efficiency measures exist. New efficiency measures should be created by pairing effectiveness and cost measures. Cost-of-care measures should include costs to patients, health care provider organizations, and payers.³⁸ Other efficiency measures should include those tracking unplanned hospitalizations for acute complications³⁹ and all-cause hospital readmissions.⁴⁰ These measures should prompt health care provider organizations and payers to invest in lower-cost interventions that improve health outcomes and lessen reliance on and need for costly acute care services.

SAFETY: Safety measures assess whether patients experience preventable adverse events (such as severe hypoglycemia); they provide a counterbalance to effectiveness measures. Hospitals are already tracking inpatient hypoglycemic and hyperglycemic events as an inpatient safety indicator.^{41,42} Development of ambulatory safety measures related to hypoglycemia and other adverse events resulting from treatment should be encouraged (appendix exhibit 3).⁷

TIMELINESS: Despite the need for timeliness measures, none currently exist. Timeliness measures should examine therapeutic inertia, such as failure to intensify glucose-lowering therapy after an elevated HbA1c to bring glucose levels to goal in a timely manner. These measures can also assess whether patients received needed services, such as diabetes self-management education or podiatry care, within a reasonable time frame.

PATIENT-CENTEREDNESS: Patient-centeredness measures, which do not currently exist, should assess the process of shared decision making in diabetes care and whether treatment plans align with patients' goals and preferences. Patient-reported outcomes that could be assessed through patient-centeredness measures could include aspects of care such as treatment burden; quality of life; fear of hypoglycemia; and measures of psychological well-being, diabetes distress, and depression.

EQUITY: There are no existing measures that address and promote equity. Improving equity across all domains of social determinants of health—racial, ethnic, socioeconomic, geographic, and organizational—is an urgent national priority, and several equity-focused measures have been proposed. Vizient, a health care solutions group, has been working with hospitals to collect and assess information on patient outcomes and racial equity at the hospital level.⁴³ The Leapfrog Group has added several equity-focused questions to its annual hospital survey, including whether hospitals have ethical billing practices and what actions hospitals are taking to identify and reduce health care disparities.⁴⁴ *U.S. News &*

World Report is devising strategies to evaluate health care provider organizations' health equity performance.⁴⁵ Other indicators discussed in scientific literature examine racial and ethnic differences in rates of potentially preventable diabetes complications,⁴⁶ but these have not been proposed as quality measures. We recommend considering strategies used by federally qualified health centers (FQHCs) and other safety-net providers to promote equity in health care. FQHCs are required to collect and report on many standardized measures of social determinants of health, including patient-reported homelessness, preferred language, income, and clinic-level services availability such as transportation assistance and child care.⁴⁷ Despite the social adversity faced by their patients, many FQHCs have demonstrated outstanding care quality.⁴⁸

Proposed equity measures are nascent and will require testing and validation. Most are process measures that focus on data collection. Reliable, accurate, and actionable process and outcome measures of health equity are still needed.

PROPOSITION 2

Our second proposition is the use of a subset of new and modernized outcome and process measures as top-line measures for public reporting and reimbursement. These top-line measures would accurately, reliably, and appropriately capture evidence-based care and overall reduction in the risk for experiencing adverse health outcomes. The measures could be developed by a central governing agency with broad oversight over the health care delivery system, such as the Department of Health and Human Services. Top-line metrics should do the following: prioritize hard outcome measures; in the case of surrogate outcome and process measures, have strong causality to hard outcomes; incentivize reduction in the risk for adverse hard outcomes (in contrast to the all-one-none composite and threshold-based surrogate outcome measures in use today); focus on patient populations likely to benefit from the health goals associated with them; aim to eliminate health care disparities; and span across all six domains of quality.

PROPOSITION 3

Our third proposition is the optional use of the remaining new and modernized measures for evaluative purposes at all levels of the health care system to identify and address factors contributing to gaps in diabetes care quality and outcomes.

If clinicians, health care provider organizations, or payers are underperforming on top-line measures, the optional evaluative measures could be used to assess and remedy contributing factors and to identify target areas for quality improvement. Besides the new and modernized measures discussed in proposition 1, evaluative measures could include structural measures (defined in appendix exhibit 2)⁷ of workforce diversity and inclusion (corresponding with top-line equity measures), and indicators of access to and availability of recommended services.

Implementation Challenges

As the US moves toward a modernized system of diabetes care quality measurement, several challenges must be addressed. First, when developing equity measures, it is important to

safeguard against setting a double standard for care quality in the adjustment of measures for race, geography, health plan, or socioeconomic status. The goal of adjusting quality measures for social determinants of health is to acknowledge the barriers that health systems, clinicians, and patients face to achieving optimal care and to prevent organizations and clinicians serving disadvantaged populations from being penalized if such care is not achieved.⁴⁸ However, adjustment of quality measures for social determinants has the potential to create a differential standard of care for marginalized communities and thus disincentivize the pursuit of the highest quality of care for these populations. An alternative option is to stratify quality measure reporting by different levels of social determinants of health to allow for direct comparisons among strata while still holding organizations accountable for delivering high-quality care to all patients.⁴⁹ It is also important to recognize that measuring discrimination and disparities in health care access, use, and outcomes can shed light on gaps in care delivery that must be rectified if equitable, high-quality care is to be achieved.

Another challenge is the measurement of disparities that occur at different levels of the health care system as a result of structural racism. Diabetes quality measures are needed to quantify disparities,⁵⁰ allocate actionable responsibility for inequities, and promote cross-level collaboration to improve equity at each level.⁵¹ Last, it is important to recognize that people who do not interact with the health care system because of structural barriers to care are not captured in the individual-level quality data collected by providers or payers. This gap can be mitigated by using population-level data, such as the National Health Interview Survey, the National Health and Nutrition Examination Survey, and the Behavioral Risk Factor Surveillance System, as complementary mechanisms of quality measurement.

Not all diabetes quality measures are suitable for measurement at all levels of the care delivery system. For example, low rates of certain hard outcomes limit the validity of measuring these events at the clinician or even clinic level. These measures are best suited for large health care provider organizations, payers, and governments.

The modernization of diabetes quality measures should include safeguards to ensure that measuring hard outcomes does not disincentivize health care provider organizations and payers from accepting patients at high risk for these events because of comorbid conditions or adverse social-determinants-of-health profiles. These safeguards should include purposeful risk adjustment, inclusion of measures that span all quality domains (including equity), higher reimbursement for caring for patients with complex health needs, and stratified reporting by patient complexity.

We recognize that many of the proposed quality measures will need to be designed, rigorously tested, and validated in diverse settings and populations before they are ready for widespread use. Such testing is critical to ensuring that measures are accurate, reliable, valid, and meaningful to stakeholders and communities.

Conclusion

There are pervasive and persistent gaps in diabetes care quality across the US, not only in the effectiveness of diabetes care—the traditional focus of quality measurement—but also in its safety, patient-centeredness, timeliness, efficiency, and equity. To improve the quality of diabetes care, the quality measurement framework needs to be reimaged. Because diabetes care quality is driven by stakeholders across the care delivery spectrum, a federal agency such as the Department of Health and Human Services may be optimally positioned to select top-line measures and hold stakeholders, including health care provider organizations, payers, and governments accountable through public reporting and performance-based reimbursement. Redesigning diabetes care quality measurement and reporting would support practices and policies at all levels of the health care system to improve the health of people with diabetes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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EXHIBIT 1

How different levels of the US health care system could use quality measurement to improve diabetes care Levels of the US health

care system	Possible uses of quality measurement to improve diabetes care
Government ^a	Allocate funding and prioritize resources and investments to underperforming regions based on measures to narrow gaps and disparities in care delivery and health outcomes Facilitate cross-sector collaborations and partnerships
Large employer ^b	Identify and select employee health plans based on performance with respect to diabetes care quality measurement Invest in health promotion programs for people with diabetes that demonstrate improved health outcomes (including less disability and absenteeism), lower cost of care, and better quality of life
Payer ^c	Support competitive contract negotiations and selection of in-network providers to incentivize higher quality of care Reduce costs of care and health care use
Health care provider organization ^d	Launch quality improvement initiatives to improve performance in the quality of diabetes care Support competitive contract negotiations with payers to incentivize higher quality of care Improve population health and narrow disparities in care and health outcomes Reduce costs of care and health care use
Clinician	Launch quality improvement initiatives to improve performance in diabetes care quality Engage in professional development and improvement efforts to address performance in diabetes care quality
Patient	Select and monitor hospital and clinician performance with respect to diabetes care quality

SOURCE Authors' analysis.

^a County, state, and federal governments.

^b Applicable large employers under the Affordable Care Act, which defines *large employer* as a company with more than 50 full-time employees.

^c Organization that pays for an administered health service, such as Medicare, Medicaid, and private insurance companies.

^d Any organization that provides health services to patients