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Is It Time for a Patient-Centered Quality Measure of Asthma Control?

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Abstract

Quality measures play a prominent role in the US health care system. They are used to monitor and report performance across health plans, providers, and health systems and are a foundational element of value-based payment. Measuring the quality of asthma care has been challenging because of a lack of reliable data to assess clinical processes and track patient-specific outcomes. Existing asthma Healthcare Effectiveness Data and Information Set measures rely on administrative claimse–derived data on dispensed medications. These are proxy measures of appropriate prescribing but are not reflective of comprehensive asthma care. The increase in the volume and specificity of longitudinal clinical data in electronic health records, movement toward electronic quality measures, and advances in electronic clinical data systems enable the development of more meaningful measures. A patient-reported measure of asthma control would incorporate key clinical indicators such as a validated age- and culturally appropriate test, and would reflect the combined outcome of medical management, self-management education, reduction of environmental exposures, and appropriate support services. Although there is a current quality measure that includes a test of asthma control (the *Optimal Asthma Control Measure*), work is needed to address questions about usability, patient literacy, and the influence of setting on self-reported scores. Comprehensive reliability and validity testing of both clinical data and stratification across risk groups will be needed to determine whether a measure based on standardized assessments of asthma control indeed promote improved clinical outcomes.

Keywords

Asthma; Quality measures; HEDIS; Patient-reported outcome measures; Electronic clinical quality measures (eCQMs)

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INTRODUCTION

Quality measures play a prominent role in the US health care system. They are used to monitor and report performance across health plans, providers, and health systems and are a foundational element of value-based payment. As the number and complexity of quality measures increases, so does the reporting burden on providers and health systems. Many agencies have emphasized the need to align measures across reporting agencies and to focus on fewer but more meaningful measures that incentivize quality care and are relevant to patients and providers.[1]

Many stakeholders, including professional organizations whose members treat patients with asthma, recognize the need for asthma quality measures that are (1) based on accepted clinical practice guidelines, (2) supported by evidence, and (3) relevant to patients.[2–4] The need for patient-reported outcome measures (PROMs) to monitor symptom severity, assess impact of treatment, and track outcomes is increasingly acknowledged, and advances in technology have made collection of patient-reported data feasible.[5,6]

This review summarizes the most commonly used outpatient asthma quality measures for application at the practice and health plan level. It discusses the limitations of existing measures and considers the advantages and challenges of adopting a PROM of asthma control. The potential of new reporting systems such as the National Committee for Quality Assurance's (NCQA's) Electronic Clinical Data System (ECDS) and the advantages of incorporating an asthma control measure into that system are discussed.

BACKGROUND ON QUALITY MEASURES

Several organizations participate in the development and application of quality measures. The National Quality Forum (NQF) is the primary organization that assesses the evidence to endorse quality measures developed by organizations such as the Physician Consortium for Performance Improvement, NCQA, the Centers for Medicare & Medicaid Services (CMS), and the Agency for Healthcare Research and Quality. Other groups develop measures for different settings such as hospitals and long-term care facilities. In addition to developing measures for accreditation purposes, the NCQA credentials or accredits providers, patient-centered medical homes (PCMHs), payers, accountable care organizations (ACOs), and other organizations based in part on performance data submitted to the NCQA.

Quality measures are used in both the private and public sectors. The most widely used are reported in the Healthcare Effectiveness Data and Information Set (HEDIS) and CMS programs. HEDIS quality measures are reported by more than 90% of America's health plans.[7] CMS uses measures from HEDIS and other sources to establish and apply criteria for incentive payments such as the Merit-based Incentive Payment System (MIPS) and alternative payment models. CMS also lists measures in the Core Set of Children's Health Care Quality Measures (Child Core Set) for Medicaid and the Children's Health Insurance Program and the Core Set of Adult Health Care Quality Measures for Medicaid (Adult Core Set) for voluntary reporting by state Medicaid programs. It has also selected measures for ACOs and PCMHs. The Measure Applications Partnership includes public and private

members convened by NQF to provide input to the Department of Health and Human Services on performance measures for CMS and other federal health programs.

The measure specifications for MIPS and PCMH are currently electronic clinical quality measures (eCQMs), referencing electronic clinical data from electronic health records (EHRs), whereas HEDIS and ACO versions use primarily a claims-based approach. The Core Sets generally list the latter.

CURRENT ASTHMA QUALITY MEASURES

Table I provides a summary of asthma quality measures actively used in quality reporting programs for the outpatient setting.

Status of current asthma measures

Three asthma outpatient measures are currently used in HEDIS or CMS reporting programs. The 2 medication measures, the *Asthma Medication Ratio* (AMR) and *Medication Management for People with Asthma* (MMA), are most widely studied and used, and there is evidence of an inverse association between pharmacy fills of control medications and asthma exacerbations.[8] The evidence is stronger for the association between the AMR and higherquality patient-centered care (more favorable quality-of-life, asthma control, and symptoms severity scores) as well as fewer exacerbations (hospitalizations, emergency department [ED] visits, or oral steroid fills).[9] In 2017, the Measures Application Partnership recommended the AMR measure for inclusion in both the Adult and Child Core Sets. Both the AMR and the MMA track medication-dispensing events using claims submitted for payment, not medications prescribed or a patient's actual adherence to prescribed asthma medications.

Information on NCQA's HEDIS Web site indicates that national HEDIS scores for the MMA and the AMR vary by type of plan (Medicaid or Commercial) and age group.[10] Although there are no analyses of trends, the data suggest that overall (all ages) scores for the MMA (percentage of patients with persistent asthma who remained on an asthma controller medication for at least 75% of their treatment period) have steadily improved, ranging from 41.8 in 2012 to 50.3 in 2017 for commercial health maintenance organizations (HMOs) and from 28.9 in 2012 to 36.9 in 2017 for Medicaid HMOs. The overall score for the AMR (percentage of patients with persistent asthma who had a ratio of control medications to total asthma medications of 0.50 or greater during the measurement year) is reported for 2017 only, and it is 78.6 for commercial HMOs and 61.4 for Medicaid HMOs. Data for the AMR by age group do not suggest improvement between 2012 and 2017.

The *Optimal Asthma Contro*l Measure is a patient-reported measure of asthma control (as determined by 1 of 3 age-appropriate validated tests) and health care utilization (asthma-related hospitalizations and/or ED visits). It was developed by Minnesota Community Measurement, has been reported as part of the Minnesota Quality Reporting System since 2011, and is a MIPS measure.[11] It is not currently NQF-endorsed.

Limitations to the use of medication measures

Measures using medication-dispensing events (1 prescription of an amount lasting 30 days or less) may serve as a proxy for assessing appropriate medication prescribing, but medication management is only one part of the clinical guidelines developed by the National Asthma Education and Prevention Program (NAEPP).[12] Comprehensive asthma care services include appropriate assessment and monitoring, education for a partnership in asthma care, and control of environmental factors and comorbid conditions. Relying on dispensing events to assess quality of care may not encourage practitioners to provide these other components of care.

Several recent developments challenge the interpretation of asthma medication measures. Both the AMR and the MMA count the number of long-term control medications filled, either in relation to the treatment period (MMA) or in relation to all (long-term control and quick relief) asthma medications filled (AMR). The NAEPP is updating the guidelines and considering approving intermittent or seasonal use of long-term control medications for certain patients,[13] which would make interpretation of medication measures even more challenging. In fact, there is evidence that providers currently recommend daily use of long-term control medications in only 50% of patients to whom these are prescribed: 41% of patients are prescribed control medications for daily use only during specific seasons, and 9% of patients are prescribed control medications intermittently to treat symptoms.[14] Furthermore, there is a theoretical concern that the advent of automatic refills through prescription benefit plans may yield improved medication scores without ensuring that the medications are actually taken as prescribed to improve control or reduce risk. This possibility warrants further study. New advances in customized asthma care with biologics may also complicate the interpretation of medication data because these agents have different dosing intervals (eg, 1–2 times a month for omalizumab and every 1–2 months for the newer biologics), most of which are not currently included in the measures' medication lists. The biologics are indicated for the treatment of severe asthma, whereas the AMR and MMA are both indicated for patients with all levels of persistent asthma. Furthermore, the asthma medication measures do not address control in patients with intermittent asthma.

Advantages of further developing and endorsing a quality measure of asthma control

Monitoring a patient's level of asthma control serves as a key clinical indicator, like measuring blood pressure for hypertension, reflecting medical management, self-management, and reduction of environmental exposures. It would address a gap identified by an NQF Measure Gap Analysis in the availability and use of PROMs.[15] There are a number of validated tools for assessing asthma control on the basis of patient or caregiver report: the Asthma Control Test (ACT), the Childhood Asthma Control Test (cACT), the Asthma Therapy Assessment Questionnaire (ATAQ), the Asthma Control Questionnaire (ACQ), and the Test for Respiratory and Asthma Control in Kids (TRACK).[16]

Although assessing the level of a patient's asthma control is a central concept in the NAEPP guidelines, there is considerable room for improvement in how it is measured and documented in practice. Evidence suggests that the level of asthma control, assessed using a validated tool, is documented in only 15% of encounters for asthma in primary care settings,

[17] whereas the percent of people with asthma whose symptoms are not well controlled ranges from 35% to 72%.[18,19] If not systematically assessed, patients and caregivers overestimate patients' level of asthma control.[17,20,21] Providers who do not specifically assess their patients' level of control generally overestimate it and may undertreat their patients, especially in certain minority populations.[22]

Focus groups conducted by NCQA under a contract with CMS indicate that patients with asthma or their caregivers value regular asthma assessment using a standardized instrument as a measure of their disease status.[23] Furthermore, using standardized instruments helped patients better understand their condition and aided collaborative care discussions based on their scores.

Having uncontrolled asthma is associated with increased ED visits and hospitalizations.[24] Prompting health care providers to assess their patient's level of asthma control and providing specific recommendations for adjustment on the basis of results improves the quality of care and decreases symptom days[25] and hospitalizations and ED visits.[26] Focusing on this outcome may encourage providers to refer patients whose asthma is not well controlled with medical management alone to comprehensive services, including asthma self-management education, home visits, and social services.[27] Furthermore, a measure of control is more efficient than tracking multiple individual processes (eg, whether spirometry or allergy testing was done, education provided, or a home visit offered.)

Challenges to implementing a quality measure of asthma control

The current *Optimal Asthma Contro*l Measure is a composite measure that includes self-reported ED visits and hospitalizations and a validated test of asthma control. When reviewed by NQF, the panel expressed concern about the use of patient recall to identify ED visits and/or hospitalizations and suggested the developer use a source other than recall.[28] This would involve linking and matching 2 data sources (administrative claims data with self-report data) for the quality measure. Another option is to base the measure on the score from a standardized assessment of asthma control and measure utilization as a separate outcome.

Stakeholders have raised other concerns about the *Optimal Asthma Control* Measure. In a review of current quality measures, the American College of Physicians rated it "not valid" because (1) there is insufficient evidence on the basis for the measure, (2) it is not risk adjusted for disease severity and socioeconomic status, and (3) it includes assessment tools that are proprietary. The ACP review criteria included documentation of validity (that it measures what it is designed to measure and correctly distinguishes good and bad quality) and reliability (that the results are the same when extracted by different people). Absence of this information led to the determination of "insufficient evidence." It is true that the *Optimal Asthma Control* Measure is not risk adjusted for severity and socioeconomic status, but neither is the AMR or the MMA. Although Minnesota Community Measurement secured permission to use the ACT and the cACT, use was subject to important limitations (eg, that they be used in paper format only). The ACP reviewer did not deny the need for a measure of asthma control and commented that "A better measure may promote shared

accountability for asthma-related outcomes between patients with asthma and primary care clinicians."[29]

The challenges of implementing a quality measure of asthma control are similar to those of other PROMs, including the need for multiple assessment tests specific to patient factors such as age and language. Health care providers may argue that the measured outcomes are only partially under their control, as is the case with any outcome measure. Hopefully, a measure that is more relevant to patient-level outcomes will result in lower resistance to the measurement process because the providers will be able to see the value of the information provided by the measure query.

There is also some debate on the reliability and validity of this and other PROMs and potential variability depending on the source of the report (self vs proxy), the mode of administration (self vs interviewer), the method of administration (paper and pencil vs electronic), and the setting of administration (clinic, home, or other).[30] For example, studies have shown a poor correlation between patient reports of receiving an asthma action plan and information derived from chart review[31] and discrepancies between parent and child assessments, with parents overestimating their children's asthma control.[20]

Examples of other PROMs

Patient-reported data are needed for other diseases affecting physical and mental health. Depression, for example, has a high burden and requires patient-reported outcomes (such as mood and appetite) to assess the impact of therapy. To increase collection of patient-reported outcomes for depression and leverage improved technology, NCQA developed 3 HEDIS eCQMs for depression.[32] Two are relevant to this discussion. The measures use a standardized tool for depression, the Patient Health Questionnaire-9 (PHQ-9). *Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults* measures use of the tool for patients with a diagnosis of major depressive disorder or dysthymia. *Depression Remission or Response for Adolescents and Adults* measures response or remissions within 4 to 8 months after the initial elevated PHQ-9 scores.

Data for the depression measures and other eCQMs are collected using the ECDS reporting standard that integrates data across a network of distinct clinical data sets containing patients' personal health information and records of their experiences within the health care system. NCQA hopes that the new approach will decrease the need for medical record review and enable collection of more detailed patient-reported data.[32]

EMERGING OPPORTUNITIES

The emphasis on patient-reported outcomes, the development of new tools, the widespread adoption of EHRs, and the development and adoption of eCQMs create an opportunity to advance a patient-centered measure of asthma control. As with the depression measures, measures of asthma control may be process-oriented (assessing whether a validated test of control was completed and/or whether any action was taken in response to the result), outcome-oriented (whether control or improvements in control were achieved), and/or patient-centered (incorporating goals and preferences).

Certain validated and age-specific tools for measuring asthma control, such as the ACT and cACT, have been incorporated into some EHRs, providing the opportunity to develop relatively simple process measures related to their use. The Asthma APGAR (Activities, Persistent, triGGers, Asthma medications, Response to therapy) tool, developed for primary care practices, has been validated against the ACT and offers the advantage of incorporating questions about triggers, adherence to medications, and response to treatment into a 1-page form.[33] The Asthma APGAR tool (Figure 1) is nonproprietary and has been shown to improve adherence to the NAEPP guidelines, increase rates of asthma control, and reduce asthma-related ED, urgent care, and hospital visits.

The increase in the volume and specificity of longitudinal clinical data in EHRs and patient and clinical data registries offers quality measurement and improvement opportunities. The collection and documentation of patient-reported data in a consistent fashion allows clinicians to make decisions based on a patient's own information; quality clinical data registries such as that of the AAAAI Allergy, Asthma, and Immunology function as practice improvement and reporting tools.[34] There is movement toward developing and testing eCQMS using standardized assessment data (patient-reported clinician/technologyfacilitated) that are sensitive to individual patient priorities.[35] In addition to reflecting quality in a meaningful way, these standardized assessment data can support patient-provider decision making.

Developing measures using the ECDS program

As previously described, NCQA has developed an infrastructure for measure reporting on the basis of collection and use of patient-reported outcomes. ECDS is a HEDIS reporting program that incentivizes automated, bidirectional sharing of clinical quality information, tracking patient data across settings and health care providers to give a complete picture of a patient's experiences of care.[26] One of the core principles of the HEDIS ECDS program is a member-centered, team-based approach, using the data collected for quality measures and clinical decision support. New measures developed for this program specifically define the clinical concepts and patient variables needed to assess quality of care at an individual patient level.

Development, testing, and implementation of these measure requires interoperability of data systems and several steps of research and coordination including the following:

- Use of patient focus groups to answer usability and patient literacy questions about standardized assessment tools, both clinical and patient-focused (ACT, Asthma Severity Tool, Asthma APGAR tool, etc).
- Analysis of large clinical data sets, preferably using natural language processing, to determine the extent to which asthma assessments and patient goals are documented within patient records and which elements recur with adequate frequency to build a reliable measure.
- Assessment of clinician workflow to determine where standardized asthma tools could be incorporated to inform care decision making and explore how results can be made available to other treating providers.

- Assessment of the validity and reliability of the measure and determination of whether implementation of the measure improves quality of care processes and patient-level outcomes.

This information can then be used to outline the measure specifications describing the population to be measured, the parameters for inclusion in and exclusion from the measure calculation, and the specific values that meet the measure criteria for each element (denominator, numerator). Thus, the ECDS quality reporting standard represents a step forward in advancing quality measurement to accommodate the information available in electronic clinical data sets. Health care organizations that establish a network of interoperable clinical data will foster a member-centered, team-based approach to improving health care quality and communication across health care providers.

CONCLUSIONS

Measuring the quality of asthma care has been limited by a lack of reliable clinical data to assess the quality of patient-centered asthma care and track patient-specific outcomes. Existing measures rely on administrative claimse–derived data on dispensed medications. There is need for a quality approach that is more meaningful to both the patient and the clinician. A good patient-centered approach uses those data that directly inform care and can be used to manage the condition. The movement toward patient-centered and patient-reported outcomes argues for the implementation of a new approach to promoting high quality asthma care. Validated assessment tools for measuring asthma control can be incorporated into EHRs at this time. Further work is needed to resolve issues around the influence of setting, mode, and method of administration on self-reported asthma control scores. Reliability and validity testing and stratification across various risk groups will be needed to determine whether risk stratification is appropriate and whether a measure based on those tools indeed promotes improved monitoring and clinical outcomes.

Developing a measure that also incorporates patient preferences and tracks data across different providers and settings requires further testing. To that end, NCQA has developed the HEDIS ECDS program, a first step toward providing a more complete picture of patient experience of care and the quality of care received. Coordination across technical, clinical, and patient groups and better coordination across EHR vendors can help when developing an asthma control quality measure using complex clinical data and patient inputs. When carefully developed and specified, an asthma quality measure based on patient-centered assessments of asthma control can contribute to a more meaningful reflection of comprehensive and high quality of care than using measures of medication-dispensing events alone.

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Abbreviations used

AMR	Asthma Medication Ratio

Asthma APGAR	Activities, Persistent, triGGers, Asthma medications, Response to therapy
CMS	Centers for Medicare & Medicaid Services
ECDS	Electronic Clinical Data Systeme
CQM	electronic clinical quality measure
ED	emergency department
EHR	electronic health record
HEDIS	Healthcare Effectiveness Data and Information Set
HMO	health maintenance organization
MIPS	Merit-based Incentive Payment System
NAEPP	National Asthma Education and Prevention Program
NCQA	National Committee for Quality Assurance
NQF	National Quality Forum
MMA	Medication Management for People with Asthma
PCMH	patient-centered medical home
PHQ-9	Patient Health Questionnaire-9
PROM	patient-reported outcome measure

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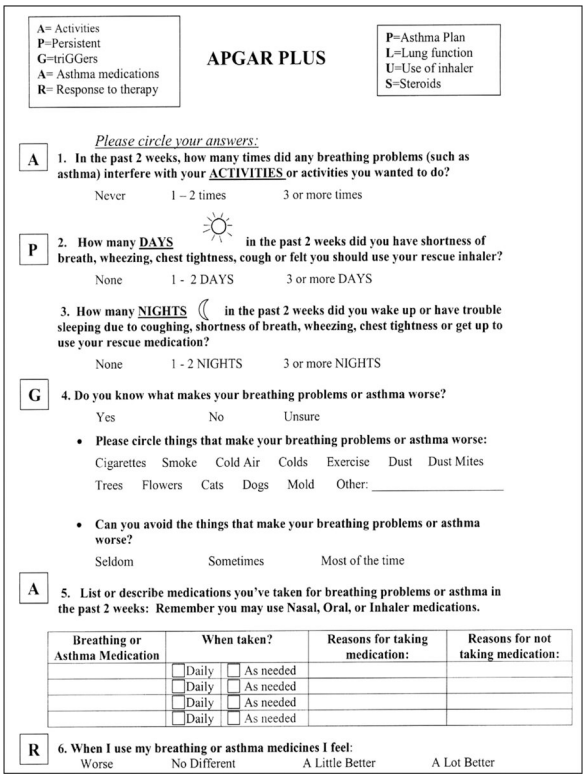

FIGURE 1.

Asthma APGAR patient form. This tool was developed for primary care practices. It provides a score for asthma control, a guide to further evaluate inadequate control, and a link to a care algorithm. It is similar to the ACTand cACT in the assessment of asthma control. Reprinted with permission from Yawn et al.[26]

TABLE I.

Commonly used asthma quality measures

No. and description of measures	Used by		NQF-endorsed?	Comment
	HEDIS	CMS		
NQF 1799: MMA: The percentage of people with asthma aged 5–64 y during the measurement year who were identified as having persistent asthma and were dispensed appropriate medications that they remained on during the treatment period. Two rates are reported: 1) The percentage of patients who remained on an asthma controller medication for at least 50% of their treatment period and 2) The percentage of patients who remaned on an asthma controller medication for at least 75% of their treatment period.	Yes	MIPS, ACO, PCMH, Child Core Set	Previously but not currently	MAP recommended in 2017 that this measure be replaced with NQF 1800, the AMR, in the Child Core Set. NQF discontinued endorsement in 2017, but the measure continues to be reported for HEDIS and is approved for public reporting such as for NCQA programs
NQF 1800: AMR: The percentage of people with asthma aged 5–64 y who were identified as having persistent asthma and had a ratio of controller medications to total asthma medications of 0.50 or greater during the measurement year	Yes	Core sets	Yes	MAP recommended in 2017 that this measure be added to both the Adult and Child Core Sets
MIPS 398 *Optimal Asthma Control*: Composite measure of the percentage of pediatric and adult patients whose asthma is well controlled as demonstrated by 1 of 3 age-appropriate patient-reported outcome tools and not at risk for exacerbation	No	MIPS	No	Previously a PQRS measure and is now an MIPS measure. Minnesota uses it for state reporting and ACOs[8]

MAP, Measures Application Partnership; *PQRS*, Physician Quality Reporting System.