

Does the HEDIS Asthma Measure Go Far Enough?

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In a provocative “Sounding Board” in the *New England Journal of Medicine*, Casalino argued that measuring healthcare quality may have unintended and undesirable consequences.¹ Measuring quality can affect the allocation of resources, the organization of physicians’ practices, the professionalism of physicians, and their concept of quality.¹ Although measuring quality can lead to beneficial outcomes, such as improved immunization coverage of young children triggered by deficiencies revealed through mandated quality reporting, the cumulative impact may be “that the use of techniques to measure the quality of care may actually reduce the probability that high quality care . . . will be given.”¹ For example, physician groups may receive financial incentives to improve performance defined by specific measures. Improvement efforts stimulated by these incentives may lead to better outcomes only insofar as these measures are important and accurately reflect desired attributes of quality. Such measures, however, may lead to overlooking important dimensions of quality not captured by these performance measures. In this commentary I argue that the Health Plan Employer Data and Information Set (HEDIS) 2000 asthma measure risks such “unintended” negative consequences on the overall quality of asthma care and offer recommendations to create a more robust and valid measure.

The new HEDIS 2000 asthma measure is described as the “use of appropriate medications for people with asthma.” It measures the percentage of individuals meeting a claims-based definition of persistent asthma who are dispensed at least 1 of a specified group of controller medications in the measurement year. According to the HEDIS, “members are identified as having persistent asthma by having

ANY of the following in the year prior to the measurement year:

- At least 4 occasions that asthma medication was dispensed OR
- At least 1 emergency department visit as the principal diagnosis OR
- At least 1 hospitalization based on the visit codes below with asthma (ICD-9 code 493) as the principal diagnosis OR
- At least 4 outpatient asthma visits as 1 of the listed diagnoses AND at least 2 asthma medication dispensing events.”²

Controller medications include inhaled corticosteroids, nedocromil, cromolyn sodium, leukotriene modifiers, and methylxanthines.

This quality measure is a substantial improvement from the previous, discarded measure of the rate of pediatric asthma hospitalization. The developers of the new measure readily acknowledge that it is a work in progress and that it establishes a minimal standard of asthma care.² Yet, the new HEDIS asthma measure may not meet the minimal standard of quality measurement: to stimulate improvements in the processes of care that lead to improved outcomes. Furthermore, it may divert focus and resources from more promising approaches to improving asthma care and outcomes.

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Validity of the HEDIS Asthma Measure

To be valid, a quality measure must measure what it purports to measure. The new HEDIS asthma measure may substantially miss the mark. It assumes that administrative data can successfully identify individuals with persistent asthma, which is a disease severity assessment. Disease severity is a biological attribute of the individual; at best, administrative data can identify individuals with problematic asthma control. Disease severity is an important but not exclusive determinant of asthma control. Asthma control is multifactorial, reflecting patient education, medication adherence, inhaler technique, environmental exposures, health-seeking behavior, and appropriateness of prescribed medications. High-quality asthma care, in turn, involves making assessments and appropriately targeting interventions in these relevant domains. Problems in any of these domains may lead to utilization that would identify the individual as meeting the HEDIS definition for persistent asthma. The prescription of a controller medication may often be the most appropriate intervention for these control problems; however, it may not be. Attention to these other domains may provide the requisite asthma control without the need for a controller medication (eg, eliminating a cat from the household of an allergic child or teaching the intermittent asthmatic proper inhaler technique). By defining quality as the provision of a controller medication in such circumstances, clinicians may give less attention to these critical features of asthma care. Alternatively, clinicians that attend to these critical features may be misidentified as providing less than "appropriate" care. Because no single quality measure can reasonably describe all of the important features of high-quality care, adopted measures must be robust, valid, and actionable.

The time frame of the HEDIS measure also threatens the validity of the measure. The numerator, members with 1 or more controller medications dispensed in the measurement year, looks at a different time frame than the denominator, those identified as having "persistent asthma" in the year before the measurement year. If the denominator truly captures individuals with persistent asthma, based on clinical and spirometric criteria, then the discrepancy in time frame would not be problematic. If, on the other hand, the denominator captures individuals with problematic asthma control, then there is fundamental misalignment that further threatens the validity of the measure. Suppose a child experiences a first episode of asthma, triggered

by a cold, in February 1999. Not knowing how to recognize or treat the problem, the parent brings the child to a local emergency department. The child may be sufficiently ill to be hospitalized. After discharge, the child is appropriately given an inhaled corticosteroid for several months and does well. In accordance with published guidelines, the dosage of the inhaled corticosteroid is gradually tapered and then discontinued. The child receives an influenza vaccine in the fall and the family is educated about reasonable measures to avoid respiratory tract infections. The child has no further difficulties the following year. This pattern is not atypical: an intermittent asthmatic who experiences an infrequent severe exacerbation. The child's management is optimal, yet the physician would fail to meet the standard set forth by the HEDIS measure. Might this physician receive a letter from the child's health plan listing his or her persistent asthma patients who are not receiving "recommended therapy"? How would this physician respond to such a letter?

Is the Bar Set Too Low?

Beyond the aforementioned threats to validity, the HEDIS asthma measure risks setting the bar too low and encouraging more casual prescribing of controller medications. To meet the standard created by the measure, one need prescribe only 1 controller medication to individuals with "persistent" asthma. By defining quality in this manner, might not physicians be encouraged to more liberally prescribe these medications to demonstrate superior performance? If so, "conformance" quality may improve; clinical processes will be more predictable and variation may be reduced. Yet, overall "performance" quality, doing the right thing at the right time in the right way, may be unaffected or may worsen (R. Bohmer, MD, personal communication, April 2000).

By promoting conformance quality, the HEDIS measure may increase the numerator, the prescribing of any controller medications, rather than encourage the more painstaking disease severity assessment that would define the need for, and level of, controller use. The unintended effect might be that prescribing of controller medications becomes "a mile wide and an inch deep." Evidence exists to support this hypothesis. Goodman et al³ analyzed temporal trends in pharmacy use for children with asthma at Group Health Cooperative. They found that compared with 1984, more children in 1993 received an anti-inflammatory prescription; however, anti-inflammatory users in 1993 had less intense

use, with only 29% filling more than 2 such prescriptions during the year.

How might we assess whether controller use becomes more generalized but less focused as a result of the HEDIS asthma measure? We may wish to create a corollary measure, "use of appropriate medications for asthmatics without persistent asthma." The numerator of the measure would remain unchanged but the denominator would be patients with asthma who do not meet the definition of persistent asthma. We would expect this ratio to be markedly lower than the actual HEDIS measure if controller medication use was appropriately targeted to those who may realize the greatest benefit. Such a measure might provide the necessary counterbalance that detects unfocused prescribing of controller medications.

Maintaining Controller Use

Inattention to sustaining controller medication use, once prescribed, may be the most serious potential unintended effect of the proposed HEDIS measure. By requiring only 1 dispensing of a controller medication to satisfy the HEDIS measure, emphasis is placed on the prescribing of a controller medication rather than on its actual use. Prescribing, dispensing, and actual use of medication are interdependent but not strictly correlated. In one comparison, only 80% of prescribed outpatient asthma medications were actually dispensed to patients.⁴ In clinical trials, mean adherence to twice-daily inhaled corticosteroid treatment was 63% in adults⁵ and 77% in children.⁶ In less-monitored settings, self-reported adherence to daily inhaled corticosteroid treatment is considerably lower.⁷ The 1997 Expert Panel Report⁸ recommends long-term, daily anti-inflammatory therapy to effectively control persistent asthma. Clearly, having a controller medication prescribed is a necessary but insufficient condition for achieving long-term control. Yet, the HEDIS measure sets the bar too low and, in the process, may divert resources and emphasis from sustaining controller medication use.

Achieving sustained use of controller medications is problematic. Sixty-four percent of adults with moderate to severe asthma reported underuse of inhaled corticosteroids (≤ 4 days per week or ≤ 4 puffs per day).⁹ In the analysis by Goodman et al³ of health maintenance organization-enrolled children, only 13% of anti-inflammatory users filled >4 prescriptions per year, the minimal level consistent with regular use. In a more recent analysis from the Pediatric Outcomes Research Team,¹⁰ only 12% of

children with asthma were dispensed more than 5 canisters of controller medication per year. Restricting the analysis to high β -agonist users (≥ 6 canisters per year), 41% of children received more than 5 controller medications per year. However, 78% of high β -agonist users received any controller medication.¹⁰ A similar pattern emerged from my analysis from Harvard Pilgrim Health Care that included adults and children with asthma. Ninety percent of patients with asthma taking ≥ 4 β -agonists per year received any controller. However, only 50% of moderate β -agonist users (4-8 canisters per year) and 61% of high β -agonist users (more than 8 canisters per year) demonstrated chronic anti-inflammatory drug use (more than 4 canisters per year)(J.H.G., unpublished data, 2000). In the earlier analysis by Donahue et al¹¹ from Harvard Pilgrim Health Care, the greatest risk reductions for asthma hospitalization were shown in enrollees that had 2 or more prescriptions for inhaled corticosteroids (although any inhaled corticosteroid prescription was protective). These data collectively suggest that greater opportunities for improvement exist in the measurement and promotion of *sustained* controller use rather than *any* controller use.

What are the consequences of intermittent controller medication use by persistent asthmatics? Growing evidence supports the hypothesis that the benefits of controller use are not sustained after discontinuation. Recent studies^{12,13} of short-term use of inhaled corticosteroids demonstrate rapid deterioration in airway responsiveness and pulmonary function after discontinuation of therapy. Previous studies¹⁴⁻¹⁷ in children have shown an increase in asthma symptoms and bronchodilator use after tapering or discontinuation of inhaled corticosteroid therapy. Simultaneously, evidence accumulates that chronic airway inflammation may lead to irreversible airway obstruction through remodeling.¹⁸ The role of controller medication use in preventing or ameliorating the ultimate progression toward airway remodeling is unknown. However, prudence suggests that we remain vigilant to the possibility that early, intensive, and sustained controller use may impact the trajectory of the disease for a subset of individuals with asthma. Does the HEDIS measure get us any closer?

High Risk Populations

A final criterion by which to judge a performance measure is the inclusion of populations at greatest risk of adverse outcomes. Events in early life, such as infections and allergen exposure, are crucial to

understanding asthma's increasing prevalence and morbidity. The HEDIS 2000 asthma measure excludes children younger than 5 years with asthma. Yet, early childhood may be a "critical period" for initiating interventions that may reduce short- and long-term asthma morbidity. Children younger than 5 years experience the highest rate of asthma hospitalization and compose the age group for whom this rate is increasing most rapidly.¹⁹ Severity of illness during hospitalization also seems to be greatest in children younger than 5 years.²⁰ Asthma prevalence is highest in early childhood, and onset before age 3 years increases the risk of persistence into adulthood.²¹ Duration of asthma is also significantly associated with greater bronchial reactivity, lower pulmonary function, and assessed asthma severity.²² In particular, there is a negative correlation between percentage of predicted lung function and duration of asthma before treatment is initiated.²³ Results of several studies²⁴⁻²⁶ suggest that early initiation of controller medication therapy relative to asthma onset improves clinical efficacy. Despite these risk factors, children younger than 5 years with asthma are less likely to receive any controller medication compared with older children.^{3,6} Given the accumulating evidence that early initiation of anti-inflammatory drug therapy may "modify" the course of the disease, exclusion of the population with early childhood asthma seems injudicious.

Racial/ethnic minorities and individuals of lower socioeconomic status experience greater deficiencies in asthma care and are also at higher risk for adverse outcomes. Blacks are at highest risk for asthma hospitalization and death.^{27,28} Blacks with asthma have higher emergency department utilization and lower rates of primary care and specialist visits compared with whites.^{28,29} In Boston, Massachusetts, neighborhoods characterized by higher proportions of black and Hispanic residents and lower per capita income had the highest asthma hospitalization rates.³⁰ These neighborhoods, in turn, had the lowest ratio of dispensed inhaled anti-inflammatory to inhaled β -agonist medications compared with more affluent neighborhoods.³⁰ In the same community, black and Hispanic children were less likely to receive maximally effective care both before and after an asthma hospitalization compared with whites.³¹ Black and Hispanic children with asthma are prescribed less anti-inflammatory medication after controlling for self-reported disease severity and β -agonist use.³² In the National Health and Nutrition Examination III survey, age younger

than 5 years, Medicaid insurance, and Spanish language were independently associated with inadequate asthma maintenance therapy.³³ This evidence supports the proposition that elimination of these disparities should be a primary goal of asthma quality improvement efforts. Yet, generic HEDIS measures fail to capture the experience of high-risk subgroups.³⁴ Furthermore, health plans predominantly serving low-income and minority populations, such as Medicaid enrollees, may be adversely profiled without adequate adjustment of the HEDIS asthma measure for these demographic differences. This remains a formidable challenge because accurate racial/ethnic and socioeconomic data are not routinely contained within the administrative databases used to generate the HEDIS asthma measure. We must therefore seek collaborative and affordable ways to incorporate the important demographic characteristics associated with care process and outcome inequalities into the HEDIS quality measures.³⁴

Recommendations

Based on the foregoing arguments, the following recommendations to augment or amend the current HEDIS asthma measure are offered:

- Because administrative data reflect current asthma control rather than severity, the numerator—controller medication use—should assess the same time frame as the denominator.
- Consider adding a corollary measure—"the use of controller medication among asthmatics without persistent asthma"—to assess whether controller use is being narrowly targeted to those with persistent asthma.
- If the previous measures suggest that prescribing has achieved this minimal threshold, consider supplanting the current measure with one that measures sustained controller use among those with "persistent" asthma.
- Develop an appropriate performance measure for children aged 2 to 5 years with asthma.
- Future efforts to measure asthma care need to highlight the subgroups at highest risk for disparities in quality of care and outcomes.

The difficulty of measuring the quality of asthma care should not overshadow its importance. The burden of asthma on our society is too great to permit a retreat from laudable efforts to measure the effectiveness of asthma care. The foregoing criticisms are offered in the hope of advancing these efforts. Although "the perfect should not be the enemy of the good," in quality measurement we

should also pursue the next steps to bring us closer to the "perfect."

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