NATIONAL QUALITY FORUM

Measure Evaluation 4.1
January 2010

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The sub-criteria and most of the footnotes from the evaluation criteria are provided in Word comments and will appear if your cursor is over the highlighted area (or in the margin if your Word program is set to show revisions in balloons). Hyperlinks to the evaluation criteria and ratings are provided in each section.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each sub-criterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the* sub-criteria *(yellow highlighted areas)*.

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the sub-criterion, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few sub-criteria as indicated)

(for NQF staff use) **NQF Review** #: OT3-057-10 **NQF Project:** Patient Outcomes Measures: Child Health and Mental Health (Phase III)
MEASURE DESCRIPTIVE INFORMATION
De.1 Measure Title: Asthma Admission Rate (pediatric)
De.2 Brief description of measure*:* Admission rate for asthma in children ages 2-17, per 100,000 population (area level rate)
1.1-2 Type of Measure: access **De.3 If included in a composite or paired with another measure, please identify composite or paired measure** The indicator is not a required part of a composite, but is included in the "Pediatriac Quality Indicator (PDI) Area Level Composite" which also includes Diabetes-short term complications (PDI 15), Gastroenteritis (PDI 16), and UTI (PDI 18).
De.4 National Priority Partners Priority Area: population health **De.5 IOM Quality Domain**: effectiveness **De.6 Consumer Care Need:** Staying Healthy

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.* **A.1 Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes **A.2 Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**	**A** **Y☐** **N☐**

A.3 Measure Steward Agreement: government entity- public domain- No Agreement **A.4 Measure Steward Agreement attached:**	
B. The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section	**B** Y☐ N☐
C. The intended use of the measure includes both public reporting and quality improvement. ►**Purpose:** public reporting, quality improvement 0,0,0,	**C** Y☐ N☐
D. The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 24 months of endorsement. **D.1Testing:** Yes, fully developed and tested **D.2 Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?** Yes	**D** Y☐ N☐
(for NQF staff use) **Have all conditions for consideration been met?** **Staff Notes to Steward** (*if submission returned*)**:**	**Met** Y☐ N☐
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
Staff Reviewer Name(s):	

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
1. IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. *Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (evaluation criteria) **1a. High Impact**	Eval Rating
(for NQF staff use) Specific NPP goal:	
1a.1 Demonstrated High Impact Aspect of Healthcare: a leading cause of morbidity/mortality **1a.2** **1a.3 Summary of Evidence of High Impact:** Total admission rate for pediatric asthma in the US is 135 per 100,000 population. The rates for age strata are as follows: 2-4 year 279/100,000 5-9 years 165/100,000 10-14 years 76/100,000 15-17 years 44/100,000 Male 163/100,000 Female 105/100,000 In addition, Bronchitis and asthma was the leading DRG for admissions in 2007 in HCUPnet for patients age 1-17. **1a.4 Citations for Evidence of High Impact:** http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=C1A83212BE1B9D06&Form=SelPDIs1&JS=Y&Action=%3E%3ENext%3E	**1a** C☐ P☐ M☐ N☐

%3E&_QITables=PDI14
http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=9731A13254C6BB7F&Form=SelPAT&JS=Y&Action=%3E%3ENext%3E%3E&_InPatChar=Yes&_InHospChar=Yes&_PatChar=AGE

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure: The improvement in the measure equates to less hospitalizations for pediatric asthma. This results essentially means the population is experiencing greater control and better management of their asthma given the reduction in the rate acute asthma events.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
We see variation by gender and other patient characteristics. See responses to question 1a.3. In addition we observe variation by region:

Northeast 170/100,000
Midwest 132/100,000
South 160/100,000
West 74/100,000

1b.3 Citations for data on performance gap:
Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007, and AHRQ Quality Indicators, version 3.1.

1b.4 Summary of Data on disparities by population group:
HCUPnet reports rates by patient characteristics as follows. We see increased rates in low income populations as large urban areas as well as rural areas.

Median income of patient's ZIP code
1st quartile (lowest income) 197/100,000
2nd quartile 136/100,000
3rd quartile 107/100,000
4th quartile 92/100,000

Large central metropolitan 147/100,000
Large fringe metropolitan 134/100,000
Medium metropolitan 114/100,000
Small metropolitan 121/100,000
Micropolitan 148/100,000
Not metro/micropolitan 140/100,000

1b.5 Citations for data on Disparities:
Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007, and AHRQ Quality Indicators, version 3.1.

1b C☐ P☐ M☐ N☐

1c. Outcome or Evidence to Support Measure Focus

1c.1 Relationship to Outcomes (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** For admissions of pediatric patients (ages 1 to 17) bronchitis and asthma was the leading DRG for admissions in 2007 in HCUPnet.

Asthma is a leading cause of childhood morbidity and leading cause of hospitalization.

1c C☐ P☐ M☐ N☐

Currently asthma hospitalization rates are tracked in the National Healthcare Quality Report as well as the National Healthcare Disparities Report. It is a proposed measure for Healthy People 2020.

1c.2-3. Type of Evidence: cohort study, observational study

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
Numerous studies have shown that asthma hospitalization rates are associated with socioeconomic factors, including median household income (at the area level) and lack of insurance (at the individual level).1 A study of asthma hospitalization rates in California in 1993 (ages 0-64) found that areas with median household incomes under $35,000 had hospitalization rates that were 1.5 times higher than areas with higher median incomes.2 In Boston, in 1992, age and gender standardized hospitalization rates (all ages) were correlated with percentage poverty in an area (r=0.68), percentage holding a bachelor's degree (r=-0.61), and income (r=-0.51).3 Within New York City in 1994, asthma hospitalization rates were negatively correlated with a zip code area's median household income (r=-0.67), and positively correlated with the percentage of minorities in the population (r=0.82).3 These findings confirm an earlier study by Billings et al.,4 who reported 6.4-fold variation in asthma hospitalization rates (age 0-64) at the zip code level in New York City in 1988, with 70% of this variation explainable by the percentage of households with annual income below $15,000. Millman et al.5 reported that low-income zip codes had 5.8 times more asthma hospitalizations per capita (age 0-64) than high-income zip codes in 11 states in 1988. Using New York State data, Lin et al showed that hospitalization rates were higher in areas with higher poverty, unemployment, minority populations, and lower education levels.6 Even in England, 45% of the variation in asthma hospitalization rates across 90 family health services authorities in 1990-95 was attributable to socioeconomic factors, plus the availability of secondary care.7 To our knowledge, only one study has reported partial correlations;8 it found that in New York City, the percentage of African-American residents (age 0-34) was the strongest predictor, and median household income was the next strongest predictor, of asthma hospitalization rates.

The observation that asthma admission rates are higher in areas with low socio-economic status (SES) has led some researchers to hypothesize that lack of access to care, or poor quality outpatient care, may lead to higher admission rates. Although analyses of the National Health and Nutrition Examination Survey found that Medicaid enrollment and Spanish language preference were associated with inadequate asthma therapy, these deficiencies in care were not directly linked to hospitalizations in children.9 Studies from other settings have shown that African-American asthmatics tend to have fewer scheduled primary care visits, and more hospitalizations and emergency room visits, than White asthmatics.10, 11 African-Americans' use of asthma medications in children may also be less consistent with current practice guidelines.12

Few studies have directly linked high-quality processes of outpatient care with lower hospitalization rates at either the area or the individual level. An in-depth study of asthma treatment practices in New Haven, Boston, and Rochester found that the community with the highest asthma hospitalization rate (Boston) also had lower use of inhaled anti-inflammatory agents and oral steroids. The threshold for admission also appeared to be lower in Boston, as fewer of the admitted children were hypoxemic, relative to the other cities.13 One case control study from a large health maintenance organization established that not having a written asthma management plan was a strong risk factor for asthma hospitalization in children (after adjusting for severity of asthma), but the use of anti-inflammatory medications was not.14 However, several studies since then have found a significant protective effect of inhaled anti-inflammatory medications on the risk for hospitalizations,15-17 with an adjusted relative risk of hospitalization of 0.4 with dispensation of an inhaled corticosteroid in one study.17

More recent studies have confirmed that continuity of care with the same provider and a comprehensive asthma care program decrease the risk of ED visits and hospitalization for asthma. Conversely, studies in the US and Canada have shown that having less continuity of care is associated with increased rates of admission for asthma.18, 19 The risk of hospital admission was lower when clinical pathways were used for asthmatic children in emergency departments of Australian hospitals.20 This was also the case in a Canadian study where admission rates in children with moderate to severe asthma went from 27.5% (pre-implementation of clinical pathway) to 13.5% (post-implementation).21 In another Australian study, having a written asthma action plan contributed to a reduction in hospital and emergency department attendance.22 This was also found in several US studies.23-25 Admissions in one medical group, for example, declined by 60% over the

1993 – 2000 period.23

With patient and parent education, good medical therapy, and outreach programs, adverse outcomes for children can be reduced considerably.14, 26 For example, Medicaid HMO enrollees had higher age-gender-race adjusted asthma hospital discharge rates than Medicaid recipients enrolled in primary care case management program under fee-for-service reimbursement.27 In New York City children in schools with school-based health centers were found to have lower rates of hospitalization for asthma than children in schools without such programs.28 On the other hand, experience with Child Health Plus (CHPlus), a health insurance program providing ambulatory and ED coverage for uninsured and low-income children (0-13 years) in New York, suggests that some access-improving interventions do NOT reduce asthma hospitalization rates. Visit rates, follow-up visits, and total visits to primary care providers were significantly higher during CHPlus than before enrollment. There was no significant association between CHPlus coverage and ED visits or hospitalizations for asthma, although specialty utilization increased.29

Finally, three studies have investigated the impact insurance coverage might have on asthma admission rates. In Colorado, children with public, or no health insurance have a rate ratio of 1.64 for asthma admissions when compared to children with private insurance.30 In a another study using nationwide data, expansions of the State Children's Health Insurance Program coverage resulted in a decrease in hospitalizations for children with chronic conditions (including diabetes), though this decrease was not found to be statistically significant.31 Finally, Szilagyi, et al found that enrollment in New York State's SCHIP program was associated with improved asthma outcomes, including a significant decrease in admissions.32 These studies suggest that insurance, and access to care, can improve the health of children with asthma.

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom***):** The evidence has been reviewed by a clinical review panel. The panel recommended the use of this indicator. For quality improvement purposes, the panel rated the indicator as acceptable with agreement (highest rating possible) and for comparative reporting purposes as acceptable with indeterminate agreement (second highest rating possible). Details on this review and methods can be found at http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_measures_v31.pdf.

1c.6 Method for rating evidence: Details on the methods can be found at www.qualityindicators.ahrq.gov/downloads/pdi/pdi_measures/v31.pdf
Acceptable with agreement: Median falls between 7 and 9 inclusive of both with two or fewer panelists rating below 7.
Acceptable without agreement. Median falls between 7 and 9 inclusive of both without agreement or disagreement

1c.7 Summary of Controversy/Contradictory Evidence: No major contradictory guidelines.

1c.8 Citations for Evidence (*other than guidelines***):**
1. Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. Jama. 1992;268(17):2388-2394.
2. Ray NF, Thamer M, Fadillioglu B, Gergen PJ. Race, income, urbanicity, and asthma hospitalization in California: a small area analysis. Chest. 1998;113(5):1277-1284.
3. Gottlieb DJ, Beiser AS, O'Connor GT. Poverty, race, and medication use are correlates of asthma hospitalization rates. A small area analysis in Boston. Chest. 1995;108(1):28-35.
4. Billings J, Zeital L, Lukomnik J, Carey T, Blank A, Newman L. Analysis of variation in hospital admission rates associated with area income in New York City: Unpublished Report.; 1992.
5. Millman M, ed Committee on Monitoring Access to Personal Health Care Services. Washington, D.C.: National Academy Press; 1993. Acess to health care in America/ Committee on Monitoring Access to Personal Health Care Services, Institute of Medicine.
6. Lin S, Fitzgerald E, Hwang SA, Munsie JP, Stark A. Asthma hospitalization rates and socioeconomic status in New York State (1987-1993). J Asthma. 1999;36(3):239-251.
7. Giuffrida A, Gravelle H, Roland M. Measuring quality of care with routine data: avoiding confusion between performance indicators and health outcomes. Bmj. 1999;319(7202):94-98.
8. Carr W, Zeitel L, Weiss K. Variations in asthma hospitalizations and deaths in New York City. Am J Public Health. 1992;82(1):59-65.

9. Halterman JS, Aligne CA, Auinger P, McBride JT, Szilagyi PG. Inadequate therapy for asthma among children in the United States. Pediatrics. 2000;105(1 Pt 3):272-276.
10. Murray MD, Stang P, Tierney WM. Health care use by inner-city patients with asthma. J Clin Epidemiol. 1997;50(2):167-174.
11. Lozano P, Connell FA, Koepsell TD. Use of health services by African-American children with asthma on Medicaid. Jama. 1995;274(6):469-473.
12. Bosco LA, Gerstman BB, Tomita DK. Variations in the use of medication for the treatment of childhood asthma in the Michigan Medicaid population, 1980 to 1986. Chest. 1993;104(6):1727-1732.
13. Homer CJ, Szilagyi P, Rodewald L, et al. Does quality of care affect rates of hospitalization for childhood asthma? Pediatrics. 1996;98(1):18-23.
14. Lieu TA, Quesenberry CP, Jr., Capra AM, Sorel ME, Martin KE, Mendoza GR. Outpatient Management Practices Associated With Reduced Risk of Pediatric Asthma Hospitalization and Emergency Department Visits. Pediatrics. 1997;100(3):334-341.
15. Suissa S, Ernst P, Kezouh A. Regular use of inhaled corticosteroids and the long term prevention of hospitalisation for asthma. Thorax. 2002;57(10):880-884.
16. Cloutier MM, Hall CB, Wakefield DB, Bailit H. Use of asthma guidelines by primary care providers to reduce hospitalizations and emergency department visits in poor, minority, urban children.[see comment]. Journal of Pediatrics. 2005;146(5):591-597.
17. Adams RJ, Fuhlbrigge A, Finkelstein JA, et al. Impact of inhaled antiinflammatory therapy on hospitalization and emergency department visits for children with asthma. Pediatrics. 2001;107(4):706-711.
18. Christakis DA, Mell L, Koepsell TD, Zimmerman FJ, Connell FA. Association of lower continuity of care with greater risk of emergency department use and hospitalization in children. Pediatrics. 2001;107(3):524-529.
19. Cyr MC, Martens AC, Berbiche D, Perreault S, Blais L. Continuity of care in the ambulatory treatment of adolescents with asthma. Journal of Adolescent Health. 2006;39(6):926 e911-927.
20. Browne GJ, Giles H, McCaskill ME, Fasher BJ, Lam LT. The benefits of using clinical pathways for managing acute paediatric illness in an emergency department. J Qual Clin Pract. Sep 2001;21(3):50-55.
21. Norton SP, Pusic MV, Taha F, Heathcote S, Carleton BC. Effect of a clinical pathway on the hospitalisation rates of children with asthma: a prospective study. Archives of Disease in Childhood. 2007;92(1):60-66.
22. Woolcock AJ, Bastiampillai SA, Marks GB, Keena VA. The burden of asthma in Australia. Med J Aust. Aug 6 2001;175(3):141-145.
23. Martin E. The CGHA asthma management program and its effect upon pediatric asthma admission rates. Clinical Pediatrics. 2001;40(8):425-434.
24. Portnoy JM, Jennings D. Utilization patterns in an asthma intervention. Annals of Allergy, Asthma, & Immunology. 2006;97(1 Suppl 1):S25-30.
25. Harish Z, Bregante AC, Morgan C, et al. A comprehensive inner-city asthma program reduces hospital and emergency room utilization.[see comment]. Annals of Allergy, Asthma, & Immunology. 2001;86(2):185-189.
26. Greineder DK, Loane KC, Parks P. A randomized controlled trial of a pediatric asthma outreach program. J Allergy Clin Immunol. 1999;103(3 Pt 1):436-440.
27. Lwebuga-Mukasa JS, Pszonak R. Patterns of inpatient and outpatient care for asthma in Erie and Niagara Counties, western New York State. J Asthma. Apr 2001;38(2):155-160.
28. Webber MP, Carpiniello KE, Oruwariye T, Lo Y, Burton WB, Appel DK. Burden of asthma in inner-city elementary schoolchildren: do school-based health centers make a difference?[see comment]. Archives of Pediatrics & Adolescent Medicine. 2003;157(2):125-129.
29. Anis AH, Lynd LD, Wang XH, et al. Double trouble: impact of inappropriate use of asthma medication on the use of health care resources. Cmaj. Mar 6 2001;164(5):625-631.
30. Todd J, Armon C, Griggs A, Poole S, Berman S. Increased rates of morbidity, mortality, and charges for hospitalized children with public or no health insurance as compared with children with private insurance in Colorado and the United States. Pediatrics. 2006;118(2):577-585.
31. Davidoff A, Kenney G, Dubay L. Effects of the State Children's Health Insurance Program Expansions on children with chronic health conditions. Pediatrics. 2005;116(1):e34-42.
32. Szilagyi PG, Dick AW, Klein JD, et al. Improved asthma care after enrollment in the State Children's Health Insurance Program in New York. Pediatrics. 2006;117(2):486-496.

1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number***):**

- The goal for therapy is to control asthma by (Evidence A):
- Reducing impairment
- Prevent chronic and troublesome symptoms (e.g., coughing or breathlessness in the daytime, in the night, or after exertion)
- Require infrequent use (<2 days a week) of inhaled short-acting beta2-agonist (SABA) for quick relief of symptoms (not including prevention of exercise-induced bronchospasm [EIB])
- Maintain (near) normal pulmonary function
- Maintain normal activity levels (including exercise and other physical activity and attendance at work or school)
- Meet patients' and families' expectations of and satisfaction with asthma care
- Reducing risk
- Prevent recurrent exacerbations of asthma and minimize the need for emergency department (ED) visits or hospitalizations
- Prevent progressive loss of lung function; for children, prevent reduced lung growth
- Provide optimal pharmacotherapy with minimal or no adverse effects
- A stepwise approach to pharmacologic therapy is recommended to gain and maintain control of asthma in both the impairment and risk domains (Evidence A):
- The type, amount, and scheduling of medication is dictated by asthma severity for initiating therapy and the level of asthma control for adjusting therapy (Evidence A).
- Step-down therapy is essential to identify the minimum medication necessary to maintain control (Evidence D).
- Monitoring and follow up is essential (Evidence B).
- When initiating therapy, monitor at 2- to 6-week intervals to ensure that asthma control is achieved (Evidence D).
- Regular follow up contacts at 1- to 6-month intervals, depending on level of control, are recommended to ensure that control is maintained and the appropriate adjustments in therapy are made: step up if necessary or step down if possible. Consider 3-month intervals if a step down in therapy is anticipated (Evidence D).
- Because asthma is a chronic inflammatory disorder of the airway, persistent asthma is most effectively controlled with daily long-term control medication directed toward suppression of airway inflammation (Evidence A).
- Therapeutic strategies should be considered in concert with clinician-patient partnership strategies; education of patients is essential for achieving optimal pharmacologic therapy (Evidence A).
- At each step, patients should be advised to avoid or control allergens (Evidence A), irritants, or comorbid conditions that make the patient's asthma worse (Evidence B).
- A written asthma action plan detailing for the individual patient the daily management (medications and environmental control strategies) and how to recognize and handle worsening asthma is recommended for all patients; it is particularly recommended for patients who have moderate or severe asthma, a history of severe exacerbations, or poorly controlled asthma (Evidence B). The written asthma action plan can be either symptom or peak-flow based; evidence shows similar benefits for each (Evidence B).
- Referral to an asthma specialist for consultation or co management of the patient is recommended if there are difficulties achieving or maintaining control of asthma; if additional education is needed to improve adherence; if the patient requires step 4 care or higher (step 3 care or higher for children 0 to 4 years of age); or if the patient has had an exacerbation requiring hospitalization. Consider referral if a patient requires step 3 care (step 2 care for children 0 to 4 years of age) or if additional testing for the role of allergy is indicated (Evidence D)

Guideline author's rating of strength of evidence (If different from USPSTF, also describe it and how it relates to USPSTF): Evidence Category A: Randomized controlled trials (RCTs), rich body of data.
Evidence is from end points of well-designed RCTs that provide a consistent pattern of findings in the population for which the recommendation is made. Category A requires substantial numbers of studies involving substantial numbers of participants.
Evidence Category B: RCTs, limited body of data.
Evidence is from end points of intervention studies that include only a limited number of patients, post hoc or subgroup analysis of RCTs, or meta-analysis of RCTs. In general, category B pertains when few randomized trials exist; they are small in size, they were undertaken in a population that differs from the target population of the recommendation, or the results are somewhat inconsistent.
Evidence Category C: Nonrandomized trials and observational studies.

Evidence is from outcomes of uncontrolled or nonrandomized trials or from observational studies. Evidence Category D: Panel consensus judgment. This category is used only in cases where the provision of some guidance was deemed valuable, but the clinical literature addressing the subject was insufficient to justify placement in one of the other categories. The Panel consensus is based on clinical experience or knowledge that does not meet the criteria for categories A through C. **1c.10 Clinical Practice Guideline Citation:** Managing asthma long term in children 0-4 years of age and 5-11 years of age. In: National Asthma Education and Prevention Program (NAEPP). Expert panel report 3: guidelines for the diagnosis and management of asthma. Bethesda (MD): National Heart, Lung, and Blood Institute; 2007 Aug. p. 281-325. [84 references] **1c.11 National Guideline Clearinghouse or other URL:** http://www.guideline.gov/summary/summary.aspx?ss=15&doc_id=11675&nbr=6024 **1c.12 Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):** The overall evidence base is strong with 12/15 recommendations derived from RCTs. However, this guideline refers to the treatment of asthma without regards to hospitalization and the ability to prevent hospitalizations. Therefore, it is best viewed as providing face validity for the indicator. **1c.13 Method for rating strength of recommendation** (*If different from* USPSTF system*, also describe rating and how it relates to USPSTF)***:** Category A: Randomized controlled trials (RCTs), rich body of data. Evidence is from end points of well-designed RCTs that provide a consistent pattern of findings in the population for which the recommendation is made. Category A requires substantial numbers of studies involving substantial numbers of participants. Evidence Category B: RCTs, limited body of data. Evidence is from end points of intervention studies that include only a limited number of patients, post hoc or subgroup analysis of RCTs, or meta-analysis of RCTs. In general, category B pertains when few randomized trials exist; they are small in size, they were undertaken in a population that differs from the target population of the recommendation, or the results are somewhat inconsistent. Evidence Category C: Nonrandomized trials and observational studies. Evidence is from outcomes of uncontrolled or nonrandomized trials or from observational studies. Evidence Category D: Panel consensus judgment. This category is used only in cases where the provision of some guidance was deemed valuable, but the clinical literature addressing the subject was insufficient to justify placement in one of the other categories. The Panel consensus is based on clinical experience or knowledge that does not meet the criteria for categories A through C. **1c.14 Rationale for using this guideline over others:** National federal agency guideline specific to pediatrics.	
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Importance to Measure and Report?*	**1**
Steering Committee: Was the threshold criterion, *Importance to Measure and Report***, met?** **Rationale:**	**1** **Y☐** **N☐**
2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES	
Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria)	Eval Rating
2a. MEASURE SPECIFICATIONS	

S.1 Do you have a web page where current detailed measure specifications can be obtained?
S.2 If yes, provide web page URL:

2a. Precisely Specified

2a.1 Numerator Statement (*Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):**
Inpatient discharges ages 2 to 17 years with ICD-9-CM principal diagnosis code of asthma.
Exclude cases:
- MDC 14 (pregnancy, childbirth, and puerperium)
- transfer from other institution
- age less than 2 years
- with any diagnosis code for cystic fibrosis and anomalies of the respiratory system

2a.2 Numerator Time Window (*The time period in which cases are eligible for inclusion in the numerator***):**
Time window can be determined by user, but is generally 1 year.

2a.3 Numerator Details (*All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**
Inpatient discharges with ICD-9-CM principal diagnosis code of asthma:

ICD-9-CM Asthma diagnosis codes
49300 EXT ASTHMA W/O STAT ASTH
49321 CH OB ASTHMA W STAT ASTH
49301 EXT ASTHMA W STATUS ASTH
49322 CH OBS ASTH W ACUTE EXAC OCT00¬
49302 EXT ASTHMA W ACUTE EXAC OCT00-
49381 EXERCSE IND BRONCHOSPASM OCT03-
49310 INT ASTHMA W/O STAT ASTH
49382 COUGH VARIANT ASTHMA OCT03-
49311 INT ASTHMA W STATUS ASTH
49390 ASTHMA W/O STATUS ASTHM
49312 INT ASTHMA W ACUTE EXAC OCT00-
49391 ASTHMA W STATUS ASTHMAT
49320 CH OB ASTH W/O STAT ASTH
49392 ASTHMA W ACUTE EXACERBTN OCT00

ICD-9-CM Cystic Fibrosis and Anomalies of the Respiratory System diagnosis codes

27700 CYSTIC FIBROS W/O ILEUS
74860 LUNG ANOMALY NOS
27701 CYSTIC FIBROS W ILEUS
74861 CONGEN BRONCHIECTASIS
27702 CYSTIC FIBROS W PUL MAN
74869 LUNG ANOMALY NEC
27703 CYSTIC FIBROSIS W GI MAN
7488 RESPIRATORY ANOMALY NEC
27709 CYSTIC FIBROSIS NEC
7489 RESPIRATORY ANOMALY NOS
74721 ANOMALIES OF AORTIC ARCH
7503 CONG ESOPH FISTULA/ATRES
7483 LARYNGOTRACH ANOMALY NEC
7593 SITUS INVERSUS
7484 CONGENITAL CYSTIC LUNG
7707 CHRONIC RESPIRATORY DISEASE
7485 AGENESIS OF LUNG ARISING IN THE PERINATAL PERIOD

2a-specs
C☐
P☐
M☐
N☐

2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured***):**
Population ages 2 to 17 years in Metro Area or county.

2a.5 Target population gender: Female, Male
2a.6 Target population age range: ages 2 to 17 years

2a.7 Denominator Time Window (*The time period in which cases are eligible for inclusion in the denominator***):**
Time window can be determined by user, but is generally 1 year.

2a.8 Denominator Details (*All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Population ages 2 to 17 years in Metro Area or county.

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population***):** There are no denominator exclusions

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
There are no denominator exclusions

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
The measure is not stratified.

2a.12-13 Risk Adjustment Type: risk-adjustment devised specifically for this measure/condition

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
The measure uses age and sex in the risk adjustment. Poverty risk adjustment is optional

2a.15-17 Detailed risk model available Web page URL or attachment: Attachment
submission_PDI14_attach_detail risk model.doc

2a.18-19 Type of Score: rate/proportion
2a.20 Interpretation of Score: better quality = lower score
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
1) Determine unit of analysis. For this example use county.
2) Use zip code on the discharge claim to assign the numerator event to a given county
3) The software outputs the county population for use as the denominator.
4) The rate is calculated as the numerator divided by the denominator.

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
A lower rate reflects a lower incidence of acute hospital events for the outcome of interest.

2a.23 Sampling (Survey) Methodology *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:
The application of this indicator uses inpatient administrative data. All patients discharges are used without sampling.

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested)*
Electronic adminstrative data/claims

2a.25 Data source/data collection instrument (*Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
The user supplies an inpatient electronic claims data set for the calculation of the measures.

2a.26-28 Data source/data collection instrument reference web page URL or attachment: URL
http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_nqi_sas_documentation_v41.pdf

2a.29-31 Data dictionary/code table web page URL or attachment: URL

http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_nqi_sas_documentation_v41.pdf

2a.32-35 Level of Measurement/Analysis (*Check the level(s) for which the measure is specified and tested)*
Population: states, Population: counties or cities, Population: national, Population: regional/network

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Other (specify) This indicator utilizes hospital data as a proxy for ambulatory care.

2a.38-41 Clinical Services (*Healthcare services being measured, check all that apply*)
Other This indicator uses hospital data to examine ambulatory care and access

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)***:** Reliability testing was conducted on 1995-1997 Nationwide Inpatient Sample (NIS) and State Inaptient Databases for 5 states (CA, FL, IL, NY, PA)

2b.2 Analytic Method *(type of reliability & rationale, method for testing)***:**
The technique used for reliability testing on this indicator is signal extraction. This technique is designed to "clean' or "smooth" the data of noise and extract the actual signal associated with the are performance. We used two techniques for signal extraction to potentially improve the precision of the indicator. First, univariate methods estimated the "true" quality signal of an indicator based on information from the specific indicator and one year of data. Second, new multivariate signal extraction (MSX) methods estimated the signal based on information from a set of indicators and multiple years of data. In most cases, MSX methods extract additional signal.

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
Reliability testing was completed during the original development of the indicator and reflects the original definition. The indicator demonstrated high variation between area. The signal ratio was high at 85.1%

2b C☐ P☐ M☐ N☐

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)***:** Face validity of the indicators has been evaluated by a clinical review panel using a structured review process.

2c.2 Analytic Method *(type of validity & rationale, method for testing)***:**
We evaluated the potential exclusions using a structured review process based on the RAND Appropriateness Method (Nominal Group Technique).

2c.3 Testing Results *(statistical results, assessment of adequacy in the context of norms for the test conducted)***:**
The panel recommended the use of this indicator. For quality improvement purposes, the panel rated the indicator as acceptable with agreement (highest rating possible) and for comparative reporting purposes as acceptable with indeterminate agreement (second highest rating possible).

2c C☐ P☐ M☐ N☐

2d. Exclusions Justified

2d.1 Summary of Evidence supporting exclusion(s):
Exclusions were evaluated by a clinical review panel using a structured review process.

2d.2 Citations for Evidence:
http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_measures_v31.pdf

2d.3 Data/sample *(description of data/sample and size)***:** Sampling not employed given use of a clinical review panel.

2d.4 Analytic Method *(type analysis & rationale)***:**
We evaluated the potential exclusions using a structured review process based on the RAND Appropriateness

2d C☐ P☐ M☐ N☐ NA☐

Method (Nominal Group Technique).

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:
Panelists requested the exclusion of complicated patients, arguing that patients with respiratory disorders may have complications requiring admission. In this case admission may be much less preventable. Second the panel reinforced the exclusion of patients 0-1 years of age, stating that diagnoses in younger children may be difficult to distinguish from brochospasm.

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 **Data/sample** *(description of data/sample and size)*: We assessed the need for risk adjustment during the initial development of the indicator, using the 1997-1999 State Inpatient Databases. We calculated the c-statistic of the current indicator, using the 2006 State Inpatient Databases.

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:
To assess the need for risk adjustment we calculated the change in signal variation before and after risk adjustment, the average absolute change in area performance, and the relative change in performance. We calculated the c-statistic of the current indicator and RA model.

2e.3 **Testing Results** *(risk model performance metrics)*:
The indicator was rated as Good or Very Good on all measures. However, these tests only account for the bias that can be observed using available data, namely age and gender, and does not account for issues such as underlying disease burden associated risk adjustment. The indicator's current risk adjustment performance is modest, with a c-statistic of 0.57. Adjusting for underlying disease burden would likely improve performance but has not been tested.

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:** NA

2e C☐ P☐ M☐ N☐ NA ☐

2f. Identification of Meaningful Differences in Performance

2f.1 **Data/sample from Testing or Current Use** *(description of data/sample and size)*: The following is an example of use from one major report. Users can specify their own parameters of use, but the following example demonstrates one successful use of the indicator.

National Healthcare Disparities Report

2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:
In order to identify disparities between populations of interest (race / ethnicity and SES) the NHDR incorporates multivariate models, controlling for race, ethnicity, income, education, insurance, age, gender and residence location. Rates are also examined relative to a standard reference group to quantify the magnitude of disparities and to identify the largest disparities.

2f.3 **Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:
See responses in "importance": 1a.3, 1b.2, 1b.4.

Additionally, results show lower rates of pediatric asthma hospitalizations in blacks and hispanics.

2f C☐ P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 **Data/sample** *(description of data/sample and size)*: This does not apply as there is only one data method.

2g.2 **Analytic Method** *(type of analysis & rationale)*:
This does not apply as there is only one data method.

2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*:

2g C☐ P☐ M☐ N☐ NA ☐

This does not apply as there is only one data method.	
2h. Disparities in Care **2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*: Stratification is not required for this measure. **2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** Stratification is not required for this measure.	**2h** **C**☐ **P**☐ **M**☐ **N**☐ **NA** ☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Scientific Acceptability of Measure Properties*?	**2**
Steering Committee: Overall, to what extent was the criterion, *Scientific Acceptability of Measure Properties*, **met?** **Rationale:**	*2* **C**☐ **P**☐ **M**☐ **N**☐
3. USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)	Eval Rating
3a. Meaningful, Understandable, and Useful Information **3a.1 Current Use:** in use **3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*)**:** National Healthcare Disparities Report, National Healthcare Quality Report http://www.ahrq.gov/qual/nhdr07/nhdr07.pdf, http://www.ahrq.gov/qual/nhqr08/nhqr08.pdf, New York State Preventable Hospitalizations Report www.myhealthfinder.com/newyork09/ahrq-pqi/PQI09.doc California Office of Statewide Health Planning and Development has published rates through 2007 http://www.oshpd.ca.gov/HID/Products/PatDischargeData/AHRQ/pdi_overview.html Health Council of South Florida http://www.healthcouncil.org/documents/Remaining_Miami_Dade_PQI.pd North Carolina CATCH report www.ncpublichealthcatch.com/ Vermont Explore www.vtexplor.org Center for Health Statistics Texas Health Care Information Collection, Preventable Hospitalizations 2005 http://www.dshs.state.tx.us/THCIC/Publications/Hospitals/PQIReport2005/PreventableHospitalizations2005.shtm Preventable Hospitalizations in Kansas http://www.kdheks.gov/ches/download/ASCpreventionPIfinal.pdf Preventable Hospitalizations and Associated Costs in Connecticut http://www.ct.gov/ohca/lib/ohca/publications/2009/preventablehospitalizationsandcosts_2007.pdf Nevada Compare Care	**3a** **C**☐ **P**☐ **M**☐ **N**☐

http://nevadacomparecare.net/additionalresources/QIDefinitions.aspx **3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):** Norton Health System (a 12 hospital system in KY publicly reporting their performance), Norton Healthcare Quality Report http://www.nortonhealthcare.com/body.cfm?id=157 **Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*) **3a.4 Data/sample** *(description of data/sample and size)***:** No interpretability testing performed. **3a.5 Methods** *(e.g., focus group, survey, QI project)***:** No interpretability testing performed. **3a.6 Results** *(qualitative and/or quantitative results and conclusions)***:** No interpretability testing performed.	
3b/3c. Relation to other NQF-endorsed measures **3b.1 NQF # and Title of similar or related measures:** #0283 (AHRQ PQI 15 - adult asthma admission rate)	
(for NQF staff use) **Notes on similar/related** endorsed **or submitted measures:**	
3b. Harmonization If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population): **3b.2 Are the measure specifications harmonized? If not, why?** This indicator is similar to our AHRQ PQI 15 measure (adult asthma admission rate), but is specific to the pediatric population, rather than the adult population examined with the PQI.	**3b** C☐ P☐ M☐ N☐ NA ☐
3c. Distinctive or Additive Value **3c.1 Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:** NA. Different population. **5.1 Competing Measures If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), describe why it is a more valid or efficient way to measure quality:** NA. Different population.	**3c** C☐ P☐ M☐ N☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Usability*?	**3**
Steering Committee: Overall, to what extent was the criterion, *Usability***, met?** **Rationale:**	**3** C☐ P☐ M☐ N☐
4. FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria)	Eval Rating
4a. Data Generated as a Byproduct of Care Processes **4a.1-2 How are the data elements that are needed to compute measure scores generated?**	**4a** C☐ P☐

coding/abstraction performed by someone other than person obtaining original information,	M☐ N☐
4b. Electronic Sources 4b.1 **Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*) Yes 4b.2 **If not, specify the near-term path to achieve electronic capture by most providers.**	**4b** C☐ P☐ M☐ N☐
4c. Exclusions 4c.1 **Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?** No 4c.2 **If yes, provide justification.**	**4c** C☐ P☐ M☐ N☐ NA ☐
4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences 4d.1 **Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.** Principal diagnoses are generally accurate for asthma in children. However, patients may be treated in an outpatient setting, short stay unit or emergency department without admission. These practice patterns may be systematic and may result in rate changes without changes in quality of care. Another source of systematic variation unrelated to quality of care is underlying disease burden, since asthma rates are known to be higher in some populations.	**4d** C☐ P☐ M☐ N☐
4e. Data Collection Strategy/Implementation 4e.1 **Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:** The indicator has been in use for nearly 10 years and AHRQ operates a user support system for users to submit concerns and successes with the indicators. The issues involved in data collection for this measure are standard for all administrative based indicators. The cost of implementation is minimal, and software to compute the measure is provided at not charge from AHRQ. Cost to obtain electronic data sets vary state by state. Census data to calculate population rates by MSA or county are integrated in the software. 4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** In regard to data: Since the measure is based on electronic administrative data, the cost of implementation is minimal. In regard to use of the measure: There is no cost to use the measure. 4e.3 **Evidence for costs:** Cost to acquire data varies by State. The software to calculate the measure can be downloaded at no cost at http://www.qualityindicators.ahrq.gov/software.htm . 4e.4 **Business case documentation:** None	**4e** C☐ P☐ M☐ N☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Feasibility*?	**4**
Steering Committee: Overall, to what extent was the criterion, *Feasibility*, **met?** **Rationale:**	**4** C☐

	P☐ M☐ N☐
RECOMMENDATION	
(for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.**	Time-limited ☐
Steering Committee: Do you recommend for endorsement? **Comments:**	Y☐ N☐ A☐

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner)
Co.1 Organization
Agency for Healthcare Research and Quality | 540 Gaither Road | Rockville | Maryland | 20850

Co.2 Point of Contact
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Measure Developer If different from Measure Steward
Co.3 Organization
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Co.4 Point of Contact
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Co.5 Submitter If different from Measure Steward POC
John | Bott, MSSW, MBA | john.bott@ahrq.hhs.gov | 301-427-1317- |Agency for Healthcare Research and Quality

Co.6 Additional organizations that sponsored/participated in measure development
Battelle Memorial Institute
UC Davis
Stanford University

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.
Workgroup/panel used
We conducted a structured panel review using a Modified Delphi Method (Nominal Group). Users rated the indicators on issues of face validity, reliability, coding accuracy, bias, and overall usefulness. Details on these methods can be found at: http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_measures_v31.pdf

Ad.2 If adapted, provide name of original measure: AHRQ Prevention Quality Indicator 15: Asthma admission rate (adult)
Ad.3-5 If adapted, provide original specifications URL or attachment URL
http://www.qualityindicators.ahrq.gov/pqi_archive.htm

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.6 Year the measure was first released: 2001
Ad.7 Month and Year of most recent revision: 2010-01
Ad.8 What is your frequency for review/update of this measure? annual
Ad.9 When is the next scheduled review/update for this measure? 2011-01

Ad.10 Copyright statement/disclaimers: The AHRQ QI software is publicly available. We have no copyright disclaimers.

Ad.11 -13 Additional Information web page URL or attachment:

Date of Submission (*MM/DD/YY*)**:** 02/23/2010