



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to subcriterion 1b).

Brief Measure Information

NQF #: 0143

Corresponding Measures:

De.2. Measure Title: CAC-1: Relievers for Inpatient Asthma

Co.1.1. Measure Steward: The Joint Commission

De.3. Brief Description of Measure: Use of relievers in pediatric patients, age 2 years through 17 years, admitted for inpatient treatment of asthma. This measure is a part of a set of three nationally implemented measures that address children's asthma care (CAC-2: Systemic Corticosteroids for Inpatient Asthma, and CAC-03: Home Management Plan of Care (HMPC) Document Given to Patient/Caregiver) that are used in The Joint Commission's accreditation process.

1b.1. Developer Rationale: Use of relievers has been established as routine treatment for asthmatic patients since the early 1970's, Ventolin (Salbutamol) was available on the market in 1968 (Bryan, J. 2001). Recent literature supports the use of relievers or bronchodilators as the primary plan of treatment for children with acute exacerbation of asthma. Use of relievers has been shown to provide relief in asthmatic pediatric patients and is the most effective bronchodilator known (Barnes, P, 2006). A systematic review by Boluyt et al., (2006) reviewed 9 studies that supported the use of relievers as primary therapy to maintain airway patency in pediatric patients presenting with an acute exacerbation of asthma.

The use of guidelines to rapidly reduce asthma exacerbations, to treat children with an acute asthmatic attack, is imperative to the health and well being of children with asthma, and the cost of US healthcare. However, even with the publication of guidelines by the American College of Chest Physicians (ACCP), the American Academy of Pediatrics (AAP), The National Asthma Education and Prevention Program (NAEPP), Childhood Asthma Research and Education (CARE) Network, and The National Heart Lung and Blood Institute (NHLBI), who all recommend the use of relievers to gain control of acute asthma exacerbation, and reduce severity as quickly as possible, it has not been demonstrated that all hospitals are routinely using relievers in children with acute asthma. This measure assists health care organizations (HCO) to track administration of relievers in the target population, therefore decreasing incidence of morbidity and mortality related to acute exacerbation of asthma in children.

Additionally, due to the high cost of emergency care representing approximately 200,000 hospital admissions and \$3 billion dollars, as well as the cost of additional treatment due to failed inappropriate care, use of recommended treatment to the pediatric asthmatic population will significantly decrease the cost of asthma care overall (Silber JH, et al., 2003).

S.4. Numerator Statement: Pediatric asthma inpatients who received relievers during hospitalization

S.7. Denominator Statement: Pediatric asthma inpatients (age 2 years through 17 years) who were discharged with a principal diagnosis of asthma.

S.10. Denominator Exclusions: Excluded Populations:

- Patients with age less than 2 years or 18 years or greater
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients with a documented Reason for Not Administering Relievers

De.1. Measure Type: Process

S.23. Data Source: Electronic Health Records, Other, Paper Medical Records

S.26. Level of Analysis: Facility, Other

IF Endorsement Maintenance – Original Endorsement Date: Mar 09, 2007 **Most Recent Endorsement Date:** Jul 31, 2012

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? Not applicable

1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. **Measures must be judged to meet all subcriteria to pass this criterion and be evaluated against the remaining criteria.**

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form
0143_Evidence_MSF5.0_Data.doc

1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- disparities in care across population groups.

1b.1. Briefly explain the rationale for this measure (e.g., the benefits or improvements in quality envisioned by use of this measure)

Use of relievers has been established as routine treatment for asthmatic patients since the early 1970's, Ventolin (Salbutamol) was available on the market in 1968 (Bryan, J. 2001). Recent literature supports the use of relievers or bronchodilators as the primary plan of treatment for children with acute exacerbation of asthma. Use of relievers has been shown to provide relief in asthmatic pediatric patients and is the most effective bronchodilator known (Barnes, P, 2006). A systematic review by Boluyt et al., (2006) reviewed 9 studies that supported the use of relievers as primary therapy to maintain airway patency in pediatric patients presenting with an acute exacerbation of asthma.

The use of guidelines to rapidly reduce asthma exacerbations, to treat children with an acute asthmatic attack, is imperative to the health and well being of children with asthma, and the cost of US healthcare. However, even with the publication of guidelines by the American College of Chest Physicians (ACCP), the American Academy of Pediatrics (AAP), The National Asthma Education and Prevention Program (NAEPP), Childhood Asthma Research and Education (CARE) Network, and The National Heart Lung and Blood Institute (NHLBI), who all recommend the use of relievers to gain control of acute asthma exacerbation, and reduce severity as quickly as possible, it has not been demonstrated that all hospitals are routinely using relievers in children with acute asthma. This measure assists health care organizations (HCO) to track administration of relievers in the target population, therefore decreasing incidence of morbidity and mortality related to acute exacerbation of asthma in children.

Additionally, due to the high cost of emergency care representing approximately 200,000 hospital admissions and \$3 billion dollars, as well as the cost of additional treatment due to failed inappropriate care, use of recommended treatment to the pediatric asthmatic population will significantly decrease the cost of asthma care overall (Silber JH, et al., 2003).

1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (This is required for endorsement maintenance. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included). This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

As noted by Stolff (2000), mortality of children due to asthma continues today. When Stolff conducted a post mortem case review of adults and children, he found that 32% had mild-persistent or even mild-intermittent asthma prior to episode resulting in death. In 2007 the CDC conducted a mortality review for asthma, and noted an infant mortality rate of 6.75 infant deaths per 1,000 live births. Death rates rose very slightly from 2006 to 2007 by 0.7% in males and females ages 0-4 years and 5-14 years as well (Xu et al, 2007). Stolff noted the reason for these mortalities was a result of poor adherence to written NCHLB guidelines. Stolff discusses the topic that physicians believe that mild persistent or mild intermittent asthma has very little risk of mortality, and therefore physicians do not take immediate action of providing reliever therapy when patients present with mild symptoms.

Crain, et al. (1995) found that fewer than half of hospital emergency department survey respondents had heard of the NHLBI guidelines and that there was variation in the use of relievers. They noted that higher performing elements of asthma care by children's hospital emergency departments may be merely a reflection of their location, or their proximity to that of an urban public hospital.

Voluntary data collection for accreditation purposes began for this measure in 2007. Based on 17 quarters of data reported to The Joint Commission, the aggregate performance rate for CAC1a is 99.8% as of 2nd quarter 2011. Since data collection on this measure began nationally in the second quarter of 2007, aggregate performance has improved from 98.1%. Although current performance appears high, it should be noted that hospitals currently using this measure are self-selected, and therefore, presumably are more focused on improving the care delivered to asthma patients than other hospitals might be. For this reason, The Joint Commission considers that the “true” performance rate on this measure for all hospitals treating children’s asthma is likely much lower.

1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.

Crain, E.F., Weiss, K.B. and Fagan M.J. (1995). Pediatric Asthma Care in US Emergency Departments.: Current Practice in the Context of the National Institutes of Health Guidelines. ARCH Pediatric Adolescent Med/Vol 149 p 893-901.

Hartley, J P., Nogrady S G., Seaton A., (1978) Bronchodilator effect of delta1-tetrahydrocannabinol. British Journal of Clinical Pharmacology. Vol 5(6):523-525.

Mellon, M., and Parasuraman, B (2004). Pediatric Asthma: Improving Management to Reduce Cost of Care. Journa of Managed Care Pharmacy; vol 10, No.2, p130-140.

Stoloff, S.(2000). Current Asthma Management: The Performance Gap and Economic Consequences. The American Journal of Managed Care; Vol 6, No. 17, SUP: s918-929

Xu, J., Kochanek, K., Murphy, S., Tejada-Vera, B. (2007). National Vital Statistics Reports: Deaths: Final data for 2007. Retrieved November 17, 2011 fro:m http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. (This is required for endorsement maintenance. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.

For children (9.3% general prevalence), asthma prevalence was higher among Puerto Rican Hispanics (18.4%), non-Hispanic blacks (14.6%), and the multiracial (13.6%) than among non-Hispanic whites (8.2%). Asthma prevalence was higher among males (10.7%) than among females (7.8%). Among poor children, Puerto Rican children, multiracial children, and non-Hispanic black children had higher asthma prevalence (23.3%, 21.1%, and 15.8%, respectively) than poor non-Hispanic white children (10.1%) (Moorman et al., 2011).

Studies that examine poverty included analysis of poverty level, related to access to hospitals, or healthcare generally, and level of “caregivers” understanding of acute asthma exacerbation. These studies found no differing use of relievers in children. Populations who have a decreased ability to obtain insurance, or use of Medicaid, or no insurance were more likely to receive reliever therapy, during acute exacerbation of asthma due to their inability to control symptoms as home (McDaniel Paxon and Waldfogel, 2006).

Historically, asthma has been documented as more prevalent in childhood boys, when compared to childhood girls; however, equal prevalence has been reported in girls and boys in very young children. It is important to note however, that the reliability of the diagnoses of asthma in the “very young child” is not clear. Low birth weight has also been determined to be a risk factor for asthma, as well as maternal characteristics, including; Basal Metabolic Index, smoking and self reported asthma. Debate continues as to the relationship between socio economic status, low birth weight, maternal health and asthma prevalence (Mc Daniel et al., 2006).

Data reported by the National Health Interview Survey indicated that non-Hispanic Black Children were more likely to report to the Emergency Room in an acute asthmatic exacerbation and require use of reliever therapy (Mc Daniel et al., 2006).

It is not known however, if when all these factors are accounted for, if non-Hispanic black children are given more reliever therapy, when compared to the same population of other races. The study reviewed by Mc Daniel et al (2006) noted no increase association between insurance type, or lack of insurance when reviewing the high incidence of non-Hispanic black children’s’ ED visits with exacerbation of asthma.

1b.5. If no or limited data on disparities from the measure as specified is reported in 1b4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations.

American Academy of Pediatrics (2011). Pediatric Clinical Practice Guidelines and Policies: A Compendium of Evidence-based Research for Pediatric Practice, 11th Edition. American Academy of Pediatrics, Elk Grove Village, IL.

Center for Disease Control and Prevention: Morbidity and Mortality Weekly report. Supplement/ Vol 60, Jan 14, 2011, retrieved on October 26, 2011 from: <http://www.cdc.gov/mmwr/pdf/other/su6001.pdf>.

Chin, M H., Alexander-Young, M., Burnet, D. (2009). Health Care Quality-Improvement Approaches to Reducing Child Health Disparities. *Pediatrics*;124:S224-S236.

Elster, A., Jarosik, J., VanGeest J., Fleming M. (2003). Racial and Ethnic Disparities in Health Care for Adolescents, A Systematic Review of the Literature. *Arch Pediatrics Adolescent Medicine*; 157:867-874. Retrieved on September 27, 2011 from <http://archpedi.ama-assn.org/cgi/content/full/157/9/867>

Gottlieb, D J., O'Connor, G T., Beiser, A S.(1995). Poverty, Race, and Medication Use Are Correlates of Asthma Rates, A Small Area Analysis in Boston. *CHEST* Vol 108 no. 1: 28-35.

McDaniel, M., Paxson, C., and Waldfogel, J. (2006). Racial Disparities in Childhood Asthma in the United States: Evidence From the National Health Interview Survey, 1997-2003. *Pediatrics* 2006;117; e868.

Moorman, J E., Zahran, H., Truman, B I., Molla M T., (2011). Current Asthma Prevalence-United States, 2006-2008. *Morbidity and Mortality Weekly Report* January 14, 2011.

Smith, L A., Hatcher-Ross, J L., Wertheimer, R., Kahn, R S.(2005). Rethinking Race/Ethnicity, Income, and Childhood Asthma: Racial/Ethnic Disparities Concentrated Among the Very Poor. *Public Health Reports*; Mar-April, Vol 120, 109-115.

1c. High Priority (previously referred to as High Impact)

The measure addresses:

- a specific national health goal/priority identified by DHHS or the National Priorities Partnership convened by NQF; OR
- a demonstrated high-priority (high-impact) aspect of healthcare (e.g., affects large numbers of patients and/or has a substantial impact for a smaller population; leading cause of morbidity/mortality; high resource use (current and/or future); severity of illness; and severity of patient/societal consequences of poor quality).

1c.1. Demonstrated high priority aspect of healthcare

Affects large numbers, A leading cause of morbidity/mortality

1c.2. If Other:

1c.3. Provide epidemiologic or resource use data that demonstrates the measure addresses a high priority aspect of healthcare.

List citations in 1c.4.

According to the 2006-2008 data from the Centers for Disease Control (CDC), 9.3% of the US population is composed of children suffering from asthma (CDC Health Disparities and Inequalities Report, 2011). This number has increased from the 2001-2003 statistics which reported an 8.5% current asthma prevalence in the US (www.cdc.gov). Consequently, the US healthcare system is greatly impacted by the demand to service this growing population (Brown, et al., 2004). A systematic review by Boluyt, N., et al (2007) noted that there are approximately 2 million Emergency Department (ED) visits per year related to children with acute asthma. This large reported emergency population is responsible for an annual reported 200,000 hospital admissions a year for childhood asthma in the US. This consequently represents more than \$3 billion in healthcare costs (Silber JH, et al., 2003).

In 2005, 5.2% of children with asthma in the US, had at least one asthma attack in the previous year (3.8 million children). Nearly two of every three children who currently have asthma had at least one attack in the past 12 months (Akinbami, L, 2006). Although there are means to prevent attacks or exacerbations among children with asthma, unfortunately, the majority of children with asthma do not have the disease under control and still suffer from acute asthma attacks, or exacerbations of asthma (www.cdc.gov/nchs/products/pub/pubd, 2006).

Both drug categories of Short Acting Beta Antagonist (SABA) and Long Acting Beta Antagonist (LABA) are included in the CAC-1 measure definition of Reliever Medications; see Appendix C, Table 6.2. The National Heart Lung and Blood (NHLBI) provides recommendations and guidelines of care for the treatment of asthmatic patients. The NHLBI provides these updated, scientific recommendations in an Expert Panel Report (EPR), and that report states that "SABAs are the drug of choice for treating acute asthma symptoms and exacerbations and for preventing EIB (Evidence A)." (Expert Panel Report 3, Guidelines for the Diagnoses and

Management of Asthma, 2007). Additionally the Panel recommends the use of LABAs for reliever therapy in patients' who are not well controlled.

1c.4. Citations for data demonstrating high priority provided in 1a.3

Adams R. J., Fuhlbrigge, A., Finkelstein, J. A., Lozano P., Livingston J. M., Weiss, K. B., and Weiss, S. T. (2001). Use of Inhaled Anti-Inflammatory Medication in Children with Asthma in Managed Care Settings. Archives of Pediatrics and Adolescent Medicine, 155, 501-507.

Akinbami, L. J. (2006). The state of Childhood Asthma, United States 1980-2005: Advance Data From Vital Health Statistics, No 381.

American College of Chest Physicians (ACCP), 10th Annual ACCP Community Asthma and COPD Coalitions Symposium: A Physician's Perspective. Retrieved on November 28, 2011 from: http://www.chestnet.org/accp/perspective/10th_Asthma

Barnes, Peter, (2006). Treatment with [®] - Albuterol Has No Advantage over Racemic Albuterol. American Journal of Respiratory and Critical Care Medicine: Pro/Con Editorial, Vol 174, p969-971.

Bryan, J., (2001) Ventolin Remains A Breath of Fresh Air for Asthma Suffers, After 40 Years. Pharmaceutical Journal, Vol 279; No. 7473, 404-405.

Bisgaard, H., Le Roux, P., Bjamer, D., Dymek, A., Vermueulen, J. H., and Hultquist, C. (2006). Budesonide/Formoterol Maintenance Plus Reliever Therapy: A New Strategy in Pediatric Asthma. CHEST 2006;130; 1733-1743.

Boluyt, N, Van der Lee, J. H., Moyer, V. A., Brand, P. L., and Offringa, M. (2007). State of the Evidence on Acute Asthma Management in Children: A Critical Appraisal of Systematic Reviews. Pediatrics 120; p1334-1343.

Centers for Disease Control and Prevention: Morbidity and Mortality Weekly report. Supplement/ Vol 60, Jan 14, 2011, retrieved on October 26, 2011 from: <http://www.cdc.gov/mmwr/pdf/other/su6001.pdf>.

Childhood Asthma Research and Education Network (CARE). Retrieved on January 9, 2012 from <http://www.asthma-care.net.org/index.html>.

Craven, D., Kercksmar C. M., Myers, T. R., O'Riordan M. A., Golonka G., and Moore, S. (2001). Ipratropium bromide plus nebulized albuterol for the treatment of hospitalized children with acute asthma. Journal of Pediatrics; 138:51-58.

Fuhlbrigge, A.L., Adams, R.J., Guilbert, T.W. Grant, E., Lozano, P., Janson, S.L., Martinez, F., Weiss, K.B., and Weiss, S.T. (2002). The Burden of Asthma in the United States : Level and Distribution Are Dependent on Interpretation of the National Asthma Education and Prevention Program Guidelines (NAEPP). American Journal of Respiratory and Critical Care Medicine. Vol 166, p 1044-1049.

Goggin, N., Macarther, C., Parkin, P. C. (2001). Randomized trial of the addition of ipratropium bromide to albuterol and corticosteroid therapy in children hospitalized because of an acute asthma exacerbation. Arch Pediatr Adolesc Med; 155 (12): 1329-34.

Hermansen, M. N, Nielsen, K. G., Buchvald, F, Jespersen, J.J., Bengtsson, T., and Bisgaard, H. (2006). Acute Relief of Exercise-Induced Bronchoconstriction by Inhaled Formoterol in Children with Persistent Asthma. CHEST 129; 1203-1209.

Kim, I. K., Phrampus, E., Venkataraman, S., Pitetti, R., Saville, A., Corcoran T., Gracely E., Funt, N., and Thompson, A. (2005). Helium/oxygen-driven albuterol nebulization in the treatment of children with moderate to severe asthma exacerbations: A Randomized Control Trial. Pediatrics; 116(5):1127-1133.

Lozano, P., Finkelstein, J.A., Hecht, J., Shulruff, R., Weiss, K.A. (2003). Asthma Medication Use and Disease Burden in Children in a Primary Care Population. Arch Pediatric Adolescent Medicine. Vol 157, p81-87.

Mellon, M., and Parasuraman, B. (2004). Pediatric Asthma: Improving Management to Reduce Cost of Care. Journal of Managed Care Pharmacy; Vol 10, No. 2, 130-141.

Moorman, J. E., Zahran, H., Truman, B. I., Molla M. T., (2011). Current Asthma Prevalence-United States, 2006-2008. Morbidity and

Mortality Weekly Report January 14, 2011.

National Center for Health Statistics, Centers for Disease Control and Prevention. Asthma Prevalence, Health Care Use and Mortality, 2003–2005. Available from [http:// www.cdc.gov/nchs/products/pubs/ pubd/hestats/asthma03-05/asthma0305.htm](http://www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma03-05/asthma0305.htm). Accessed November 29, 2006.

National Center for Health Statistics, Center for Disease Control and Prevention, Asthma Prevalence, Health Care Use and Mortality, 2006-2008. Available from <http://www.cdc.gov/nchs/products/pub/pubd>, Accessed October 27, 2011.

National Center for Heart Lung and Blood Institute (2007) National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma Full Report. United States Department of Health and Human Services, retrieved on October 28th 2011 from www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf.

National Health Interview Survey. Asthma Prevalence, Health Care Use and Mortality: United States, 2005-2009. Retrieved on Oct 27, 2011 from <http://www.cdc.gov/nchs/data/nhsr/nhsr032.pdf>.

National Heart Lung and Blood Institute (NHLBI). Guidelines for the Diagnosis and Management of Asthma (EPR-3). Retrieved on November 29, 2011 from: <http://www.nhlbi.nih.gov/guidelines/asthma/>.

Rivera, M L., Kim, T Y., Stewart, G M., Minasyan, L., Brown, L. (2006). Albuterol nebulized in heliox in the initial ED treatment of pediatric asthma: A blinded, randomized controlled trial. American Journal Emergency Medicine;24(1):38-42.

Silber, J H., Rosenbaum, P R., Even-Shosha, O., Shabbout M., Zhang, X., Bradlow E T., and Marsh, R R. (2003). Length of Stay, Conditional Length of Stay, and Prolonged Stay in Pediatric Asthma. Health Services Research, 38: 3, 867-886.

1c.5. If a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)

2. Reliability and Validity—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. **Measures must be judged to meet the subcriteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.**

2a.1. Specifications The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

De.5. Subject/Topic Area (check all the areas that apply):

Behavioral Health

De.6. Non-Condition Specific (check all the areas that apply):

Safety : Medication

S.1. Measure-specific Web Page (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures/

S.2a. If this is an eMeasure, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

Attachment:

S.2b. Data Dictionary, Code Table, or Value Sets (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

No data dictionary Attachment:

S.3. For endorsement maintenance, please briefly describe any changes to the measure specifications since last endorsement date and explain the reasons.

S.4. Numerator Statement (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome)

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Pediatric asthma inpatients who received relievers during hospitalization

S.5. Time Period for Data (What is the time period in which data will be aggregated for the measure, e.g., 12 mo, 3 years, look back to August for flu vaccination? Note if there are different time periods for the numerator and denominator.)

Episode of Care

S.6. Numerator Details (All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

One data element is used to calculate the numerator:

Relievers Administered. This data element is defined as: Documentation that the patient received reliever medication(s) for asthma exacerbation during this hospitalization. Inpatient hospitalization includes the time from arrival to the emergency department (ED) or observation area until discharge from the inpatient setting.

S.7. Denominator Statement (Brief, narrative description of the target population being measured)

Pediatric asthma inpatients (age 2 years through 17 years) who were discharged with a principal diagnosis of asthma.

S.8. Target Population Category (Check all the populations for which the measure is specified and tested if any):

Children

S.9. Denominator Details (All information required to identify and calculate the target population/denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

Six Data Elements are used to calculate the denominator:

- Admission Date

The month, day, and year of admission to acute inpatient care.

- Birthdate

The month, day, and year the patient was born.

- Clinical Trial

Documentation that during this hospital stay the patient was enrolled in a clinical trial in which patients with the same condition as the measure set were being studied.

- Reason for Not Administering Relievers

Reasons for not administering relievers during this hospitalization:

- o Allergy to relievers

- o Other reasons documented by physician/APN/PA or pharmacist

- Discharge Date

The month, day, and year the patient was discharged from acute care, left against medical advice, or expired during this stay.

- ICD-9-CM Principal Diagnosis Code for asthma as defined in Appendix A. Table 6.1 below

Table 6.1 Asthma

Code -Shortened Description

493.00 -EXTRINSIC ASTHMA NOS
493.01 -EXT ASTHMA W STATUS ASTH
493.02 -EXT ASTHMA W(ACUTE) EXAC
493.10 -INTRINSIC ASTHMA NOS
493.11 -INT ASTHMA W STATUS ASTH
493.12 -INT ASTHMA W (AC) EXAC
493.81 -EXERCISE IND BRONCHOSPASM
493.82 -COUGH VARIANT ASTHMA
493.90 -ASTHMA NOS
493.91 -ASTHMA W STATUS ASTHMAT
493.92 -ASTHMA NOS W (AC) EXAC

S.10. Denominator Exclusions (Brief narrative description of exclusions from the target population)

Excluded Populations:

- Patients with age less than 2 years or 18 years or greater
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients with a documented Reason for Not Administering Relievers

S.11. Denominator Exclusion Details (All information required to identify and calculate exclusions from the denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

- The patient age in years is equal to the Admission Date minus the Birthdate. The month and day portion of the admission date and birthdate are used to yield the most accurate age.
- Length of stay (LOS) in days is equal to the Discharge Date minus the Admission Date. If the LOS is greater than 120 days, the patient is excluded.
- Patients are excluded if “Yes” is selected for Clinical Trial.
- Reasons for not administering relievers during this hospitalization: Acceptable reasons include allergy to relievers, and other reasons documented by physician/APN/PA or pharmacist

S.12. Stratification Details/Variables (All information required to stratify the measure results including the stratification variables, definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b)

This measure is stratified by age as noted in the following table:

CAC-1a Relievers for Inpatient Asthma (age 2 years through 17 years) - Overall Rate
CAC-1b Relievers for Inpatient Asthma (age 2 years through 4 years)
CAC-1c Relievers for Inpatient Asthma (age 5 years through 12 years)
CAC-1d Relievers for Inpatient Asthma (age 13 years through 17 years)

S.13. Risk Adjustment Type (Select type. Provide specifications for risk stratification in S.12 and for statistical model in S.14-15)

No risk adjustment or risk stratification

If other:

S.14. Identify the statistical risk model method and variables (Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development and testing should be addressed with measure testing under Scientific Acceptability)

Not Applicable

S.15. Detailed risk model specifications (must be in attached data dictionary/code list Excel or csv file. Also indicate if available at measure-specific URL identified in S.1.)

Note: Risk model details (including coefficients, equations, codes with descriptors, definitions), should be provided on a separate worksheet in the suggested format in the Excel or csv file with data dictionary/code lists at S.2b.

S.15a. Detailed risk model specifications (if not provided in excel or csv file at S.2b)

S.16. Type of score:

If other:

S.17. Interpretation of Score (Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)

S.18. Calculation Algorithm/Measure Logic (Describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; aggregating data; risk adjustment; etc.)

1. Start processing. Run cases that are included in the CAC Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Check Clinical Trial

a. If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

b. If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

c. If Clinical Trial equals No, continue processing and proceed to Relievers Administered.

3. Check Relievers Administered

a. If Relievers Administered is missing, the case will proceed to a Measure Category Assignment of X for Overall Rate (CAC-1a) and will be rejected. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

b. If Relievers Administered equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

c. If Relievers Administered equals No, continue processing and proceed to Reason for Not Administering Relievers.

4. Check Reason for Not Administering Relievers

a. If Reason for Not Administering Relievers is missing, the case will proceed to a Measure Category Assignment of X for Overall Rate (CAC-1a) and will be rejected. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

b. If Reason for Not Administering Relievers equals Yes, the case will proceed to a Measure Category Assignment of B for Overall Rate (CAC-1a) and will not be in the measure population. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

c. If Reason for Not Administering Relievers equals No, the case will proceed to a Measure Category Assignment of D for Overall Rate (CAC-1a) and will be in the Measure Population. Proceed to step 5 and check the Stratified Measures for Overall Rate (CAC-1a).

5. Continue processing for the Stratified Measures. Note: Initialize the Measure Category Assignment for all Strata Measure to equal 'B.' Do not change the Measure Category Assignment that was already calculated for the overall rate CAC-1a). The rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (CAC-1a) Measure Category Assignment.

6. Check Overall Rate Category Assignment

a. If the Overall Rate Category Assignment is equal to B or X, keep Measure Category Assignment for the strata measures equal B, not in the Measure Population. Stop processing.

b. If the Overall Rate Category Assignment is equal to D or E, continue processing and check the Patient Age. Note: The Patient Age is calculated from Admission Date minus Birthdate as part of the ICD Population logic.

7. Check the Patient Age

- a. If the Patient Age is greater than or equal to 2 years and less than 5 years for Stratified Measure CAC-1b, set the Measure Category Assignment for measure CAC-1b to equal the Measure Category Assignment for measure CAC-1a. Stop processing.
- b. If the Patient Age is greater than or equal to 5 years and less than 13 years for Stratified Measure CAC-1c, set the Measure Category Assignment for measure CAC-1c to equal the Measure Category Assignment for measure CAC-1a. Stop processing.
- c. If the Patient Age is greater than or equal to 13 years and less than 18 years for Stratified Measure CAC-1d, set the Measure Category Assignment for measure CAC-1d to equal the Measure Category Assignment for measure CAC-1a. Stop processing.

S.19. Calculation Algorithm/Measure Logic Diagram URL or Attachment (You also may provide a diagram of the Calculation Algorithm/Measure Logic described above at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

S.20. Sampling (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

Hospitals that choose to sample have the option of sampling quarterly or sampling monthly. A hospital may choose to use a larger sample size than is required. Hospitals whose Initial Patient Population size is less than the minimum number of cases per quarter/month for the stratum cannot sample that stratum.

Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to exclusions, hospitals selecting sample cases MUST submit AT LEAST the minimum required sample size.

Quarterly Sampling

Hospitals selecting sample cases for this measure must ensure that each individual stratum's population and quarterly sample size meets the following conditions:

Select within each of the three individual measure strata. Cases are placed into the appropriate stratum based upon the patient's age.

Quarterly Sample Size

Based on Initial Patient Population Size for the CAC Measure Set
Hospital's Measure

Average Quarterly

Stratum Initial Patient Population Size

"N"

Minimum Required

Stratum Sample Size

"n"

= 971

195

196-970

20% of Initial Patient Population size

39-195

39

< 39

No sampling; 100% Initial Patient

population required

Monthly Sampling

Hospitals selecting sample cases for this set must ensure that each individual stratum population and monthly sample size meets the following conditions:

Select within each of the three individual measure strata. Cases are placed into the appropriate stratum based upon the patient's age.

Monthly Sample Size

Based on Initial Patient Population Size for the CAC Measure Set

Average Monthly

Stratum Initial Patient Population Size

"N"

Minimum Required

<p>Stratum Sample Size "n"</p> <p>= 321 65 66-320 20% of Initial Patient Population size 13-65 13 <13 No sampling; 100% initial patient pop</p> <p>S.21. Survey/Patient-reported data (<i>If measure is based on a survey, provide instructions for conducting the survey and guidance on minimum response rate.</i>) IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.</p> <p>S.22. Missing data (specify how missing data are handled, e.g., imputation, delete case.) <u>Required for Composites and PRO-PMs.</u></p>
<p>S.23. Data Source (<i>Check ONLY the sources for which the measure is SPECIFIED AND TESTED</i>). <i>If other, please describe in S.24.</i> Electronic Health Records, Other, Paper Medical Records</p> <p>S.24. Data Source or Collection Instrument (<i>Identify the specific data source/data collection instrument e.g. name of database, clinical registry, collection instrument, etc.</i>) IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration. Each data element in the data dictionary includes suggested data sources. The data are collected using contracted Performance Measurement Systems (vendors) that develop data collection tools based on the measure specifications. The tools are verified and tested by Joint Commission staff to confirm the accuracy and conformance of the data collection tool with the measure specifications. The vendor may not offer the measure set to hospitals until verification has been passed.</p> <p>S.25. Data Source or Collection Instrument (<i>available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1</i>)</p> <p>S.26. Level of Analysis (<i>Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED</i>) Facility, Other</p> <p>S.27. Care Setting (<i>Check ONLY the settings for which the measure is SPECIFIED AND TESTED</i>) Inpatient/Hospital If other:</p>
<p>S.28. COMPOSITE Performance Measure - Additional Specifications (<i>Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.</i>)</p>
<p>2a. Reliability – See attached Measure Testing Submission Form 2b. Validity – See attached Measure Testing Submission Form 0143_MeasureTesting_MSF5.0_Data.doc</p>

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

3a.1. Data Elements Generated as Byproduct of Care Processes.

generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition, Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims), Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry), Other If other: Data elements such as admission date or discharge date may be generated by administrative data.

3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

3b.1. To what extent are the specified data elements available electronically in defined fields? (*i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields*)

Some data elements are in defined fields in electronic sources

3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.

The Joint Commission is in the process of preparing for conversion to eMeasure specifications beginning in the 4th quarter 2011 for the CAC measure set.

3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL.

Attachment:

3c. Data Collection Strategy

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

3c.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 and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

IF a PRO-PM, consider implications for both individuals providing PROM data (patients, service recipients, respondents) and those whose performance is being measured.

Hospitals using this performance measure generally collect measure data via manual review of the paper medical record. Collected data are submitted to The Joint Commission on a quarterly basis, by way of contracted performance measurement system vendors, as described previously. Specifications for this measure are freely available to anyone who wishes to use the measure. Feedback from hospitals using this measure indicates that required data elements are generally available in the medical record, and measure specifications are robust and easy to understand. As described above, as feedback from measure users has indicated the need for clarification or revision of measure specifications, this has taken place.

3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (*e.g., value/code set, risk model, programming code, algorithm*).

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Planned	Current Use (for current use provide URL)
Public Reporting	
Regulatory and Accreditation Programs	
Quality Improvement (Internal to the specific organization)	

4a.1. For each CURRENT use, checked above, provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included

4a.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)

4a.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

4b. Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b.1. Progress on Improvement. (Not required for initial endorsement unless available.)

Performance results on this measure (current and over time) should be provided in 1b.2 and 1b.4. Discuss:

- Progress (trends in performance results, number and percentage of people receiving high-quality healthcare)
- Geographic area and number and percentage of accountable entities and patients included

4b.2. If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4c. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4c.1. Were any unintended negative consequences to individuals or populations identified during testing; OR has evidence of unintended negative consequences to individuals or populations been reported since implementation? If so, identify the negative unintended consequences and describe how benefits outweigh them or actions taken to mitigate them.

When the Children's Asthma Care (CAC) measures were first published in the aligned Specifications Manual for National Hospital Quality Measures, minor updates were made to the measure information forms and data elements in the Data Dictionary to provide that the verbiage for CAC was consistent with all of the other aligned measure sets and concordant with current General Abstraction Guidelines in the specifications manual.

Based upon input from the measure users, the Measure Information Form was updated. The Numerator-Included Populations was restated to clarify the time frame for administration of relievers.

The former data element Contraindications to Relievers was changed to: Reasons for not Administering Relievers. This was done as part of the greater initiative to address "contraindication" data elements across other measure sets in the aligned Specifications Manual for National Hospital Quality Measures. As part of this process, the updated data element was revised to provide additional clarity for data abstraction based upon input from the measure users.

The medication table for relievers is reviewed with every specifications manual publication. The table is updated via consultation with a PharmD member of the asthma advisory panel to insure that the most current list of relievers available is provided at the time of publication. Selected References were updated to reflect current guidelines. To the best of our knowledge, there have been no reports of unintended consequences.

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.
Yes

5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0001 : Asthma assessment

0025 : Management plan for people with asthma

0036 : Use of Appropriate Medications for People With Asthma (ASM)

0047 : Asthma: Pharmacologic Therapy for Persistent Asthma

0283 : Asthma in Younger Adults Admission Rate (PQI 15)

0548 : Suboptimal Asthma Control (SAC) and Absence of Controller Therapy (ACT)

0620 : Asthma - Short-Acting Beta Agonist Inhaler for Rescue Therapy

5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

5a. Harmonization

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):

Are the measure specifications completely harmonized?

No

5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

The Joint Commission measures in the Children's Asthma Care measure set specifically focus on acute asthma care for the inpatient pediatric population, targeting children ages 2 – 17. None of the above measures apply to the inpatient pediatric population, the above measures focus on ambulatory care. The population of the above measures is variable, ranging in the following targeted age groups: 5 – 40, 5 - 56, 18 and older, 5 - 50

5b. Competing Measures

The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);

OR

Multiple measures are justified.

5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):

Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)

[None](#)

Appendix

A.1 Supplemental materials may be provided in an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.

Attachment:

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): [The Joint Commission](#)

Co.2 Point of Contact: [Ann, Watt, awatt@jointcommission.org, 630-792-5944-](#)

Co.3 Measure Developer if different from Measure Steward: [The Joint Commission](#)

Co.4 Point of Contact: [Jeord, Loeb, jloeb@jointcommission.org, 630-792-5920-](#)

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

[Howard Eigen, MD](#)

[Chief, Pediatric Pulmonary Disease](#)

[Associate Chairman of Pediatrics](#)

[Professor of Pediatrics and Respiratory Therapy](#)

[James Whitcomb Riley Hospital for Children](#)

[702 Barnhill Drive, Room 4270](#)

[Indianapolis, IN 46202](#)

[Phone: 317-274-3434](#)

[Fax: 317-274-3442](#)

[Email: \[heigen@iupui.edu\]\(mailto:heigen@iupui.edu\)](#)

[Craig Jones, MD](#)

[Assistant Professor, Department of Pediatrics](#)

[University of Southern California School of Medicine](#)

[24725 Avenida Asoleada](#)

[Calabasas, CA 91302](#)

[Pager: 213-919-7870](#)

[Cell: 818-519-2653](#)

[Fax: 818-222-0166](#)

[craigjones@adelphia.net](#)

[Kurt Elward, MD, MPH](#)

[1082 Still Meadow Crossing](#)

[Charlottesville, VA 22901](#)

[Phone: 434-973-9744 \(practice\)](#)

Fax: 434-979-2415
Email: kselward@aol.com

Paul Kurtin, MD
Vice President for Innovation at
Children's Hospital-San Diego and
Director of the Center for Child Health Outcomes
3020 Children's Way
San Diego, CA 92123
Phone: 858-966-5924
Fax: 858-576-7134
Email: pkurtin@chsd.org

Linda Gibson, PNP
Asthma Educator
Children's Hospital of Alabama
1600 Seventh Avenue, South
Birmingham, AL 35233-1785
Phone: 205-558-2985
Fax: 205-975-5983
Email: linda.gibson@chsys.org

Albin B. Leong, MD
Sacramento Kaiser
Pediatric Pulmonology and Allergy
2025 Morse Avenue
Sacramento, CA 95825-2100
Phone: 916-973-7324
Fax: 916-973-7338
Email: albin.leong@kp.org

Charles Homer, MD, MPH
CEO
National Initiative for Children's Healthcare Quality
375 Longwood Avenue, 3rd floor
Boston, MA 02215
Phone: 617-754-4881 (assistant)
Fax: 617-754-4899
Email: chomer@nichq.org

Sai Nimmagadda, MD (Co-facilitator)
2500 West Higgins Road, Suite 220
Hoffman Estates, IL 60195
Phone: 847-433-7660 or
Phone: 847-885-1400
Fax: 847-885-1497
Email: snimmagadda@northwestern.edu

John Salyer, RRT, MBA
Director of Respiratory Care
Children's Hospital and Regional Medical
PO Box 5371, Mailstop 3D-6
4800 Sand Point Way, NE
Seattle, WA 98105
Phone: 206-987-2606

Fax: 206-987-2639
Email: John.Salyer@seattlechildrens.org

Carol Taketomo, PharmD
Pharmacy Manager
Children's Hospital Los Angeles
Adjunct Assistant Professor of Pharmacy Practice
University of Southern California
School of Medicine
PO Box 54700
4650 Sunset Boulevard
Los Angeles, CA 90054
Phone: 323-669-5988
Fax: 323-664-0326
Email: ctaketomo@chla.usc.edu

Craig A. Schramm, MD
Director, Pulmonary Medicine
Connecticut Children's Medical Center
Associate Professor of Pediatrics
University of Connecticut
282 Washington Street
Hartford, CT 06106
Phone: 860-545-9440
Fax: 860-545-9445
Email: cschram@ccmckids.org

Skip Valusek, PhD
Phone: 651-254-3542
Email: skipvalusek@ccomcast.net

Jeffrey H. Silber, MD, PhD
Associate Professor of Pediatrics
Anesthesiology and Health Care Systems
Center for Outcomes Research
Children's Hospital of Philadelphia
3535 Market Street, Suite 1029
Philadelphia, PA 19104
Phone: 215-590-2540
Email: silber@email.chop.edu

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2007

Ad.3 Month and Year of most recent revision: 01

Ad.4 What is your frequency for review/update of this measure? Biannually

Ad.5 When is the next scheduled review/update for this measure? 07, 2012

Ad.6 Copyright statement: The Specifications Manual for National Hospital Inpatient Quality Measures (Specifications Manual) version 4.0, January, 2012 is the result of the collaborative efforts of the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission to publish a uniform set of national hospital quality measures. A primary objective of this collaborative effort is to promote and enhance the utility of these measures for all hospitals.

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performance measures systems; are required to update their software and associated documentation based on the published manual production timelines.

Ad.7 Disclaimers: none

Ad.8 Additional Information/Comments: The Month and Year of the Most Recent Revision is Jan 2012. ICD 9- ICD10 Crosswalk included via email.