SECTION I.
BASIC MEASURE INFORMATION

I.A. Measure Name

Hypertension Screening for Children Who Are Overweight or Obese

I.B. Measure Citation Information

Lee JM, Freed GL, Shevrin CA, McCormick JA, Gebremariam A, Madden BW, Dombkowski KJ for the Quality Measurement, Evaluation, Testing, Review, and Implementation Consortium. Hypertension screening for children who are overweight or obese. National Quality Measures Clearinghouse (NQMC). Rockville (MD): Agency for Healthcare Research and Quality (AHRQ). Published November 23, 2015.

I.C. Measure Description

This measure assesses the percentage of children, ages 3 through 17 years, with a body mass index (BMI) ≥85th percentile, who had a blood pressure percentile documented and classified as normal or abnormal during the measurement year. A higher proportion indicates better performance.

Obesity in children is associated with a broad spectrum of serious health issues, including obstructive sleep apnea, asthma, hypertension, nonalcoholic fatty liver disease, type 2 diabetes mellitus, depression, orthopedic problems, and skin conditions (Barlow, 2007). While childhood obesity rates have stabilized over the past decade, the percentage of young children and adolescents who are overweight or obese remains high (Ogden et al., 2014). For the 2011-2012 period, nearly 32% of children in the United States were reported to be overweight (having a BMI ≥85th percentile on sex-specific age-for-growth charts), and 17% were obese (having a BMI ≥95th percentile) (Ogden et al., 2014).

As levels of body fat increase above the 85th percentile of BMI, health risks also rise proportionally. Using BMI as an initial screen of body fat, providers can identify pediatric patients who, because of their excess weight, have health risks that need to be addressed (Barlow, 2007; Speiser et al., 2005). Specifically, the risk for high blood pressure (hypertension) in children is proportional to their degree of excess body fat (Tu et al., 2011). Below the 85th percentile, the association between BMI and hypertension is negligible. However, once BMI reaches the 85th percentile, risk of high blood pressure increases fourfold, along with the risk of target organ damage, which is indicative of early cardiovascular disease (Tu et al., 2011). Given that hypertension in children usually carries into adulthood, interventions to reduce BMI to below the 85th percentile will have important health benefits. Documenting and classifying blood pressure as normal or abnormal is an important element of care for children who are overweight or obese.

This measure uses medical record data and is calculated as three individual rates, as well as an overall rate that is a composite of the three individual rates. The individual rates are:

1. The percentage of children who had documentation of systolic blood pressure percentile (systolic numerator divided by denominator).
2. The percentage of children who had documentation of diastolic blood pressure percentile (diastolic numerator divided by denominator).
3. The percentage of children who had classification of blood pressure as normal or abnormal (classification numerator divided by denominator).
4. The overall rate is the percentage of children who met all three criteria, even if each occurred during separate visits.

I.D. Measure Owner

The Quality Measurement, Evaluation, Testing, Review, and Implementation Consortium (Q-METRIC)

I.E. National Quality Forum (NQF) ID (if applicable)

Not applicable

I.F. Measure Hierarchy

Please use this section to note if the measure is part of a measure hierarchy or is part of a measure group or composite measure. The following definitions are used by AHRQ's National Quality Measures Clearinghouse and are available at http://www.qualitymeasures.ahrq.gov/about/hierarchy.aspx:

I.F.1. Please identify the name of the **collection** of measures to which the measure belongs (if applicable). A Collection is the highest possible level of the measure hierarchy. A Collection may contain one or more Sets, Subsets, Composites, and/or Individual Measures.

This measure is part of the Q-METRIC High BMI in Children Follow-Up Measures collection.

I.F.2. Please identify the name of the measure **set** to which the measure belongs (if applicable). A Set is the second level of the hierarchy. A Set may include one or more Subsets, Composites, and/or Individual Measures.

Not applicable

I.F.3. Please identify the name of the **subset** to which the measure belongs (if applicable). A Subset is the third level of the hierarchy. A Subset may include one or more Composites and/or Individual Measures.

Not applicable

I.F.4. Please identify the name of the **composite** measure to which the measure belongs (if applicable). A Composite is a measure with a score that is an aggregate of scores from other measures. A Composite may include one or more other Composites and/or Individual Measures. Composites may comprise component measures that can or cannot be used on their own.

Not applicable

I.G. Numerator Statement

The eligible population for the numerator is the number of children, ages 3 through 17 years, with a BMI ≥85th percentile, who had documentation of 1) systolic blood pressure percentile 2) diastolic blood pressure percentile, 3) classification of blood pressure as normal or abnormal, and 4) met all three criteria, even if each occurred during a separate outpatient care visit during the measurement year (January 1-December 31).

Documentation, as determined by medical record review, must include, at a minimum, a note containing the date on which each test was conducted. Note: Reporting of systolic and/or diastolic blood pressure only is not sufficient to qualify as a numerator event.

The four numerators are:

1. Systolic - The number of eligible children who had documentation of systolic blood pressure percentile.
2. Diastolic - The number of eligible children who had documentation of diastolic blood pressure percentile.
3. Classification - The number of eligible children who had classification of blood pressure as normal or abnormal.
4. Overall – The number of eligible children who met all three criteria, even if each occurred during separate visits within the measurement year.

Codes to identify outpatient care visits are listed in Table 1.

Table 1: Codes to Identify Outpatient Care Visits

Description	CPT	HCPCS	ICD-9-CM Diagnosis
Office or other outpatient services	99201-99205, 99211-99215, 99241-99245		
Preventive medicine	99381-99385, 99391-99395, 99401-99404, 99411-99412, 99420, 99429	G0438, G0439	
General medical examination			V20.2, V70.0, V70.3, V70.5, V70.6, V70.8, V70.9

I.H. Numerator Exclusions (as appropriate)

1. Inpatient stays, emergency department visits, and urgent care visits are excluded from the calculation.
2. A diagnosis of pregnancy during the measurement year excludes the patient from the calculation.

I.I. Denominator Statement

The eligible population for the denominator is the number of children, ages 3 through 17 years, with a BMI ≥85th percentile, who had an outpatient care visit during the measurement year (January 1-December 31). Codes to identify outpatient care visits are listed in Table 1.

I.J. Denominator Exclusions (as appropriate)

1. Inpatient stays, emergency department visits, and urgent care visits are excluded from the calculation.
2. A diagnosis of pregnancy during the measurement year excludes the patient from the calculation.

I.K. Data Sources

Check all the data sources for which the measure is specified and tested.

Data Source	
1. Administrative Data (e.g., claims data)	
2. Paper Medical Record	X
3. Survey – Health care professional report	
4. Survey – Parent/caregiver report	
5. Survey – Child report	
6. Electronic Medical Record	
7. Other (If other, please list all other data sources in the field below.)	

References for Section I

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Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA* 2014; 311(8):806-814.

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SECTION II.
DETAILED MEASURE SPECIFICATIONS

Provide sufficient detail to describe how a measure would be calculated from the recommended data sources, either by uploading a separate document or by providing a link to a URL in the field below. Examples of detailed measure specifications can be found in the CHIPRA Initial Core Set Technical Specifications Manual 2011 published by the Centers for Medicare & Medicaid Services.[1] Although submission of formal programming code or algorithms that demonstrate how a measure would be calculated from a query of an appropriate electronic data source are not requested at this time, the availability of these resources may be a factor in determining whether a measure can be recommended for use.

Please see the specifications document, *Q-METRIC High BMI Follow up Measure 3, Hypertension Screening for Children Who Are Overweight or Obese*, at the end of this document. The codebook used for medical record data abstraction is also included as a separate file.

[1] Initial Core Set of Children's Health Care Quality Measures: Technical Specifications and Resource Manual for Federal Fiscal Year 2011 Reporting. Available at http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/Downloads/InitialCoreSetResourceManual.pdf and http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/CHIPRA-Initial-Core-Set-of-Childrens-Health-Care-Quality-Measures.html.

SECTION III.
IMPORTANCE OF THE MEASURE

In the following sections, provide brief descriptions of how the measure meets one or more of the following criteria for measure importance (general importance, importance to Medicaid and/or CHIP, complements or enhances an existing measure). Include references related to specific points made in your narrative (not a free-form listing of citations).

III.A. Evidence for General Importance of the Measure

Provide evidence for all applicable aspects of general importance, including but not limited to the following:

- Addresses a known or suspected quality gap or disparity in quality (e.g., addresses a socioeconomic disparity, a racial/ethnic disparity, a disparity for Children with Special Health Care Needs (CSHCN) and/or a disparity for limited English proficiency (LEP) populations.
- Potential for quality improvement (i.e., there are effective approaches to reducing the quality gap or disparity in quality).
- Prevalence of condition among children under age 21 and/or among pregnant women.
- Severity of condition and burden of condition on children, family, and society (unrelated to cost).
- Fiscal burden of measure focus (e.g., clinical condition) on patients, families, public and private payers, or society more generally, currently and over the life span of the child.
- Association of measure topic with children's future health—for example, a measure addressing childhood obesity may have implications for the subsequent development of cardiovascular diseases.
- The extent to which the measure is applicable to changes across developmental stages (e.g., infancy, early childhood, middle childhood, adolescence, young adulthood).

Importance

Childhood overweight and obesity are recognized as major medical and public health problems associated with serious medical complications over the life course, including conditions such as hypertension, type 2 diabetes, and metabolic syndrome (Speiser et al., 2005). Early screening and identification of weight status in children is critical to prevent and treat childhood overweight and obesity and the attendant risk factors of excess weight. Primary care providers measure weight and height at yearly visits throughout childhood and calculate BMI by dividing weight by height squared. Overweight is defined as a BMI score from the 85^{th} to 94^{th} percentile on sex-specific age-for-growth charts; obesity is defined as a BMI $\geq 95^{th}$ percentile (Barlow, 2007). Childhood obesity is the leading cause of pediatric hypertension. While disabling cardiovascular disease is unlikely to develop during childhood, markers of target organ damage (that is, damage to the major organs fed by the circulatory system, such as the kidneys) can be detected in young children. This underscores the urgency of diagnosing and addressing hypertension promptly (Falkner, 2010). Guidelines call for measuring blood pressure in children yearly; systolic or diastolic readings $\geq 95^{th}$ percentile for age, height, and sex are considered abnormal and indicative of hypertension (Expert Panel on CV Health, 2011).

Prevalence of Obesity and Unhealthy Weight in Children

Significant increases in the prevalence of US childhood obesity across both sexes were seen in the 1980s and 1990s (Ogden et al., 2012). For the 2011-2012 period, nearly 32% of children in the United States were reported to be overweight or obese and at least 17% were obese (Ogden et al., 2014). At the population level, this increase in prevalence is too rapid to be a genetic shift. Rather, changes in eating and physical activity behaviors are affecting the intake and expenditure of energy resulting in overweight and obesity (Barlow, 2007).

Cost of Obesity and Unhealthy Weight in Children

Excess weight young people creates great economic burden. Children who are obese are approximately three times more expensive for the health care system than the average insured child, and children diagnosed with obesity are two to three times more likely to be hospitalized (Marder and Chang, 2006). In a study by Wang et al., the authors used projected overweight/obesity prevalence and national estimates of per capita excess health care costs of overweight/obesity to estimate that health care costs attributable to overweight/obesity in the entire US population would reach between $861 and $957 billion by 2030, accounting for 16%-18% of US health care costs (Wang et al., 2008).

Pathology and Severity of Obesity and Unhealthy Weight in Children

Children gain excess weight for many reasons. There is a clear genetic component to obesity: conditions for early humans were stressful, making storage of fat advantageous (Speiser et al., 2005). Hormones such as leptin, ghrelin, and adiponectin influence appetite, satiety, and fat distribution; they are key metabolic mechanisms that can influence physiologic risk (Barlow, 2007). In those who are genetically predisposed to obesity, behavior and environment influence its development (Barlow, 2007). Currently, genetic susceptibility to obesity is influenced by an environment rife with fast food, processed foods, sugar-sweetened beverages, and easy opportunities for meals eaten outside the home (White House Task Force, 2010). Compounding unhealthy food choices is a noticeable decrease in physical activity for children, as schools cut physical education classes and community design promotes driving over walking and biking (White House Task Force, 2010). Screen time is another contributor to obesity, as children spend increasing amounts of time engaged with television, video games, smart phones, tablets, and computers.

Screen time replaces exercise, encourages consumption of advertised foods, and affects sleep quality, which itself is linked to an increased risk of obesity (White House Task Force, 2010). Medical issues associated with obesity affect almost every organ of the body, though some conditions are without symptoms and signs (Barlow, 2007). Obese children are more likely to suffer from respiratory issues such as disordered breathing (Wing et al., 2003), which can lead to right ventricular hypertrophy and pulmonary hypertension, as well as inattention, poor academic performance, and enuresis (Barlow, 2007). Asthma also occurs more frequently among children who are obese (Barlow, 2007). Gastrointestinal problems include nonalcoholic fatty liver disease (NAFLD), which is related to both obesity and diabetes (Barlow, 2007); gallstones (Kaechele et al., 2006); and gastroesophageal reflux disease and constipation, which are worsened by obesity (Barlow, 2007). Obese children are more likely to have endocrine disorders such as abnormal glucose metabolism (sometimes called pre-diabetes), which indicates higher risk for the development of diabetes (Li et al., 2009); type 2 diabetes mellitus, polycystic ovary syndrome; and hypothyroidism (Barlow, 2007). Cardiovascular problems for overweight/obese children include dyslipidemia (Lamb et al., 2011) and hypertension and (Barlow, 2007). Orthopedic problems include Blount disease (a visible bowing of the lower extremities), slipped capital femoral epiphysis, and an increased risk of fractures, musculoskeletal pain, and orthopedic problems (Dietz et al., 1982; Manoff et al., 2005). Skin conditions include acanthosis nigricans, a chronic irritation and infection in the folds of the skin (Nguyen et al., 2001). Metabolic syndrome, a cluster of concurrent conditions (abnormal triglycerides, large waist circumference, and high blood pressure) that increase the risk of heart disease, stroke, and diabetes is not yet defined in children (Speiser et al., 2005). However, among severely obese children, the risk of developing metabolic syndrome has been estimated at 50% (Weiss et al., 2004).

Children who are obese also contend with psychiatric problems, including depression, anxiety, and eating disorders (Barlow, 2007). One study found that among female adolescents who were obese, patterns of observation showed more adverse social, educational, and psychological correlates (Falkner et al., 2001). Children who are obese may also be at risk for academic difficulties, alcohol and tobacco use, premature sexual behavior, inappropriate dieting practices, and physical inactivity (Daniels et al., 2009). Increasing weight is associated with decreasing health-related quality of life, lower body satisfaction, and low self-esteem. Children who are overweight experience more teasing and are vulnerable to bullying (Daniels et al., 2009). Children share society's negative opinions about those who are overweight or obese, regardless of their own weight status or sex (Speiser et al., 2005). Their perceptions of obesity emphasize laziness, selfishness, lower intelligence, social isolation, poor social functioning, as well as low levels of perceived health, healthy eating, and activity. Children as young as 5 years of age are aware of their own levels of overweight, which affects their perceptions of appearance, athletic ability, social competence, and self-worth (Speiser et al., 2005). Research has also shown that children diagnosed with obesity are much more likely to be diagnosed with mental health disorders or bone and joint disorders than children who are not obese; they are also two-to-three times more likely to be hospitalized (Marder and Chang, 2006).

Being overweight or obese in early life also has implications for a child's future health. First, for a child with a BMI above the 85^{th} percentile, medical risks include future or persistent obesity (Barlow, 2007, Daniels et al., 2009). The risk of an obese child becoming an obese adult is 25% at age 6 years, increasing to 75% during adolescence (Baker et al., 2010). Being overweight or obese in childhood and adolescence is also associated with increased risk of premature mortality and comorbidities in adulthood. A 2011 systematic review reports a significant association between child and adolescent overweight/obesity and premature mortality, with hazard ratios ranging from 1.4 to 2.9 (Reilly and Kelly, 2011. In addition, being overweight or obese as a child or adolescent is significantly associated with increased risk of cardiometabolic morbidity (including diabetes, hypertension, heart disease, and stroke) in later life, with hazard ratios ranging from 1.1 to 5.1, as well as increased risk of asthma in adulthood and polycystic ovary syndrome in adult women (Reilly and Kelly, 2011). Obesity in adolescence is associated with negative self-image that persists into adulthood (Dietz, 1998). These children are also at long-term higher risk for chronic conditions such as breast, colon, and kidney cancer; musculoskeletal disorders; and gall bladder disease (Daniels et al., 2009). Childhood obesity contributes to a significant and increasing burden of chronic disease, rising health care costs, disability, and premature death.

Given the vulnerability of obese children to serious physical and emotional complications, the case for prevention and treatment of pediatric obesity is irrefutable (Speiser et al., 2005). Reducing childhood obesity can only be achieved through a comprehensive and coordinated effort that includes a range of multidisciplinary strategies (Daniels et al., 2009). The goals of treatment are, first, to restore the balance between energy intake and expenditure, usually through a decrease in energy consumption and an increase in energy expenditure (Daniels et al., 2009; Speiser et al., 2005). Then, over the longer term, the goal shifts to reducing BMI and reversing or preventing short- and long-term comorbidities (Speiser et al., 2005).

Entrenched environmental forces, including a superabundance of processed foods and vanishing opportunities for exercise, have contributed to the rise of unhealthy eating habits and sedentary behavior. Confronting them is not simple task. Clinicians, however, can help improve outcomes for their young patients by identifying problems early, helping families create positive home environments, and providing structured guidance to overweight and obese children and their families (Barlow, 2007). Successful obesity treatment improves long-term physical health through the development of lasting healthy lifestyle habits. For some children, these changes will be enough to induce weight loss or maintenance during growth periods. For others, further work will be needed. But developing and keeping healthy eating and exercise habits, regardless of weight loss, is important because of the long-term health benefits. Even slowed weight gain during growth periods will result in lower BMI percentiles (Barlow, 2007).

Outcomes of Hypertension Screening in Overweight Children

The importance of the childhood obesity epidemic in driving the rising prevalence of pediatric hypertension should not be underestimated (Flynn, 2008). Given the serious impact that cardiovascular disease has on adult morbidity and mortality, screening in childhood to identify hypertension early and initiate treatment will have long-term health benefits.

Hypertension is defined as an average systolic and/or diastolic blood pressure reading ≥95th percentile for age, sex, and height on more than three occasions; this is an abnormal blood pressure reading. Pre-hypertension is defined as a systolic and/or diastolic blood pressure reading between the 90th and 95th percentile for age, sex, and height (Falkner, 2010). There is a consistent and significant relationship between blood pressure, age, and height throughout childhood, and blood pressure levels in children predict future levels in adulthood (Falkner, 2010).

Hansen et al. conducted a cohort study of children, ages 3-18 years of age, with at least three well-child visits between 1999 and 2006 in a large tertiary care system and found a 4% prevalence of hypertension and a 3% prevalence of pre-hypertension (Hansen et al., 2007). Falkner et al. reported somewhat higher rates of prevalence in a 2006 study: 7% of children in their sample had a systolic or diastolic blood pressure ≥95th percentile. As BMI increased, these researchers found, both systolic and diastolic blood pressure increased. Overall, readings were high in children who were overweight and highest in those who were obese (Falkner et al., 2006).

In 2011, Tu et al. demonstrated that the risk of hypertension is proportional to the degree of excess body fat. Below the 85th percentile, the association between BMI and hypertension is negligible. However, once BMI reaches the 85th percentile, risk of high blood pressure increases fourfold, along with the risk of target organ damage, which is indicative of early cardiovascular disease (Tu et al., 2011). This notable jump in the effect of adiposity is consistent for boys and girls and across races. Given that hypertension in children usually carries into adulthood, even small improvements that reduce BMI to below the 85th percentile may have important health benefits. The pronounced nature of the shift toward hypertension at the 85th percentile also underscores the importance of weight classification in children (Tu et al., 2011).

Markers of vascular injury can be detected in very young children, demonstrating that the path to cardiovascular disease begins early in childhood, especially for those who are overweight or obese (Falkner, 2010). This target organ damage includes left ventricular hypertrophy, thickening of the carotid vessel wall, retinal vascular changes, and even impaired cognitive function (Flynn, 2008). Data suggests that adolescents with hypertension and other metabolic risk factors are at high risk for accelerated cardiovascular disease. Careful detection, clinical evaluation, and management of obesity-related hypertension in adolescents are important to lower risk of later morbidity (Flynn and Falkner, 2011).

Franks et al. found that obesity, hypertension, and glucose intolerance were strongly associated with increased rates of premature death from endogenous causes in a population of American Indian children without diabetes; the increased risk of premature death was 57% (Franks et al., 2010). Contributors to obesity, including too little exercise and too much unhealthy food, may be important components of the causal pathway between obesity and death (Franks et al., 2010). Failure to reverse this trend may have far-reaching consequences for quality of life and longevity, underscoring the importance of early prevention for obesity (Falkner et al., 2006).

Primary treatment for pediatric hypertension, especially hypertension related to obesity, is weight loss, aerobic exercise, and dietary modification (Flynn and Falkner, 2011). These changes have been shown to reduce blood pressure and improve other cardiovascular risk factors, such as dyslipidemia and insulin resistance. If target organ damage is present, anti-hypertensive medications are recommended (Flynn and Falkner, 2011). For patients with hypertension but no target organ damage, the treatment goal is to reduce blood pressure to below the 95th percentile for age, sex, and height. For those with secondary hypertension, diabetes, or target organ damage, blood pressure should be reduced to below the 90th percentile for age, sex, and height (Flynn and Falkner, 2011). Hypertensive children should be followed-up at regular intervals to make sure that blood pressure goals are being met, to check on adherence to therapy, and to monitor drug-related adverse effects (Flynn and Falkner, 2011).

Performance Gap

Barlow et al. found that more than 95% of pediatricians and pediatric nurse practitioners routinely evaluated blood pressure in children (Barlow et al., 2002). Five years later, Hansen et al. similarly reported that 94% of clinicians documented blood pressure values (Hansen et al., 2007). These rates of measurement are encouraging, as a thorough medical evaluation must precede decisions about appropriate interventions and therapies for obese and overweight children (Barlow et al., 2002). However, Hansen et al. (2007) further reported that among the 4% of children whose blood pressure readings marked them as hypertensive, only 26% of these patients had a *diagnosis* of hypertension documented in their medical record. For the 3% of children diagnosed with pre-hypertension, only 11% had a correct diagnosis in their medical record. Thus, although these children had blood pressure measured, a meaningful proportion may not have had adequate assessment of that measurement. Children who were obese had somewhat better odds for receiving a documented diagnosis (hypertension odds ratio = 2.61 [1.49-4.55]; pre-hypertension = 1.90 [0.90-4.0]). The authors hypothesized that pediatricians are trained to look more carefully for abnormal blood pressure in overweight children; such readings occur in more than 30% of such patients (Hansen et al., 2007). However, any missed diagnosis is costly. If hypertension is not identified in pediatric patients, it may be years before it is detected in the patient as an adult, allowing end-organ damage to progress. Because effective treatments exist for hypertension, the long-term outcomes could be avoided with an earlier diagnosis (Hansen et al., 2007).

Why do clinicians fail to appropriately identify hypertension if the data necessary for diagnosis are present in the medical records? Practitioners may be unaware of diagnostic thresholds for hypertension in younger children and may not pay attention to it in children who are not obese (Hansen et al., 2007). Lack of awareness of previous blood pressure readings may also be a problem (Hansen et al., 2007). Other challenges related to the diagnosis of pediatric hypertension may include a lack confidence in the readings themselves (Flynn, 2008); the cumbersome nature of the sex, age, and height percentile method of hypertension assessment for use in clinical practices (Falkner, 2010); and difficulties in providing interventions to control blood pressure and encourage lifestyle changes (Falkner, 2010). Lack of reimbursement is also a barrier to care for children who are obese (Barlow, 2007), and gaps exist between treatment of childhood obesity and what is covered by health insurance (Daniels et al., 2009). Klein et al. (2010) reported that more than half of providers surveyed perceived that coverage for referral and adjunct services was limited. Gaps in coverage restrict the services and referrals available for overweight patients.

III.B. Evidence for Importance of the Measure to Medicaid and/or CHIP

Comment on any specific features of this measure important to Medicaid and/or CHIP that are in addition to the evidence of importance described above, including the following:

- The extent to which the measure is understood to be sensitive to changes in Medicaid or CHIP (e.g., policy changes, quality improvement strategies).
- Relevance to the Early and Periodic Screening, Diagnostic and Treatment benefit in Medicaid (EPSDT).[2]
- Any other specific relevance to Medicaid/CHIP (please specify).

The Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit in Medicaid requires states to cover preventive services for children; this includes services necessary to prevent and treat obesity. The health-education component of this mandate provides an opportunity for clinicians to discuss health concerns regarding weight and nutrition with the child and/or the parent or guardian. Necessary medical services can be covered by Medicaid under the EPSDT benefit. There is, however, considerable variability in coverage among the states. In a 2010 report to Congress, *Preventive and Obesity-Related Services Available to Medicaid Enrollees*, the Department of Health and Human Services (HHS) states, "CMS will encourage States to include specific information on the standards of practice related to obesity prevention and treatment in their [State Medicaid] provider manuals. Examples include: the importance of calculating body mass index (BMI)…" BMI percentile screening is a national priority and an important part of obesity prevention; Medicaid and the State Children's Health Insurance Program (CHIP) can help improve access to preventive screenings and interventions (HHS, 2010). Through provisions in the Affordable Care Act, CMS can work with the public health community to prevent and treat obesity (HHS, 2010).

One in five children is covered by Medicaid or CHIP, and many others are eligible but do not receive services because parents are unaware of their eligibility (Daniels et al., 2009). The number of children dependent on Medicaid is important, as the burden of the obesity epidemic disproportionately affects them. Nationally, 43.2% of children with public insurance are overweight or obese versus 27.3% of children with private insurance (NICHQ, 2007). Children enrolled in Medicaid are six times more likely to be treated for obesity than children with private insurance (Marder and Chang, 2006). This may be an underestimate, given the difficulty children with Medicaid have accessing the health system. Annual health care costs for children who are obese and enrolled in Medicaid are approximately $6,700 compared with $3,700 for obese children covered by private insurance; the national cost of treating children with obesity is estimated at roughly $11 billion for children with

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[2] The EPSDT is a comprehensive set of benefits available to children and youth under age 21 who are enrolled in Medicaid. For more information, see http://www.healthlaw.org/images/stories/epsdt/3-ESDPT08.pdf.

private insurance compared with $3 billion for those covered by Medicaid (Marder and Chang, 2006).

It has further been noted that children covered by Medicaid are less likely to visit the doctor and more likely to enter the hospital compared with children covered by private insurance (Marder and Chang, 2006). This may suggest that available outpatient resources are inadequate for these Medicaid patients. This lack of services may lead families to postpone seeking treatment, allowing conditions to deteriorate until urgent care is needed.

III.C. Relationship to Other Measures (if any)

Describe, if known, how this measure complements or improves on an existing measure in this topic area for the child or adult population, or if it is intended to fill a specific gap in an existing measure category or topic. For example, the proposed measure may enhance an existing measure in the initial core set, it may lower the age range for an existing adult-focused measure, or it may fill a gap in measurement (e.g., for asthma care quality, inpatient care measures).

Many quality measures regarding pediatric BMI measurement and counseling exist. These measures assess, for populations of varying ages, regular measurement of BMI and documentation of BMI percentile; number of well-child visits with documented BMI; identification of weight classification status; and education about weight management strategies, including counseling regarding nutrition and physical activity. Furthermore, a measure exists to assess whether blood pressure is regularly documented for children over the age of 3 years, as stated in relevant guidelines (Expert Panel on CV Health, 2011). This Q-METRIC measure, *Hypertension Screening for Children Who Are Overweight or Obese*, differs from existing measures in that it explicitly assesses documentation of systolic and diastolic blood pressure percentiles and classification of blood pressure percentiles as normal or abnormal for children who are overweight or obese. Screening for hypertension in this population will help identify those at risk and help address incipient chronic health issues associated with overweight and obesity.

References for Section III

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SECTION IV.
MEASURE CATEGORIES

CHIPRA legislation[3] requires that measures in the initial and improved core set, taken together, cover all settings, services, and topics of health care relevant to children. Moreover, the legislation requires the core set to address the needs of children across all ages,[4] including services to promote healthy birth. Regardless of the eventual use of the measure, we are interested in knowing all settings, services, measure topics, and populations that this measure addresses. These categories are not exclusive of one another, so please indicate "Yes" to all that apply.

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[3] Children's Health Insurance Program Reauthorization Act of 2009. Public Law No. 111-3, 123 Stat. 8 (2009). Available at: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_public_laws&docid=f:publ003.111.

[4] Under Section 214 of CHIPRA, States may elect to cover the following groups under Medicaid only or under both Medicaid and CHIP: pregnant women and children up to age 19 for CHIP or up to age 21 for Medicaid.

		Does the measure address this category	
a.	Care Setting – ambulatory	**Yes**	
b.	Care Setting – inpatient	**No**	
c.	Care Setting – other—please specify	**No**	
d.	Service – preventive health	**Yes**	
e.	Service – care for acute conditions	**No**	
f.	Service - care for children with special health care needs/chronic conditions	**Yes**	
g.	Service – health promotion and services to promote healthy birth	**No**	
h.	Service-other (please specify)	**No**	
i.	Measure Topic -duration of enrollment	**No**	
j.	Measure Topic – clinical quality	**Yes**	
k.	Measure Topic – patient safety	**No**	
l.	Measure Topic – family experience with care	**No**	
m.	Measure Topic – care in the most integrated setting	**No**	
n.	Measure Topic – other (please specify)	**No**	
o.	Population – pregnant women	**No**	
p.	Population – neonates (28 days after birth) (specify age range)	**No**	
q.	Population – infants (29 days to 1 year) (specify age range)	**No**	
r.	Population – pre-school age children (1 year through 5 years) (specify age range)	**Yes**	Ages 3 through 5 years
s.	Population – school-age children (6 years through 10 years) (specify age range)	**Yes**	All ages in this range
t.	Population – adolescents (11 years through 20 years) (specify age range)	**Yes**	Ages 11 through 17 years (i.e., younger than 18 years old)

SECTION V.
EVIDENCE OR OTHER JUSTIFICATION FOR THE FOCUS OF THE MEASURE

The evidence base for the focus of the measures will be made explicit and transparent as part of the public release of CHIPRA deliberations; thus, it is critical for submitters to specify the scientific evidence or other basis for the focus of the measure in the following sections.

V.A. Research Evidence

Research evidence should include a brief description of the evidence base for valid relationship(s) among the structure, process, and/or outcome of health care that is the focus of the measure. For example, evidence exists for the relationship between immunizing a child or adolescent (process of care) and improved outcomes for the child and the public. If sufficient evidence existed for the use of immunization registries in practice or at the State level and the provision of immunizations to children and adolescents, such evidence would support the focus of a measure on immunization registries (a structural measure).

Describe the nature of the evidence, including study design, and provide relevant citations for statements made. Evidence may include rigorous systematic reviews of research literature and high-quality research studies.

This measure focuses on a process (documenting blood pressure percentile in children ages 3 through 17 years with a BMI ≥85th percentile and classifying the reading as normal [below the 95th percentile for age, sex, and height] or abnormal [≥95th percentile for age, sex, and height]), that, if followed, results in a desirable clinical outcome (determining a child's risk for hypertension and cardiovascular disease in order to provide appropriate treatment). The measure highlights where providers or health systems are falling short in documenting and classifying blood pressure percentile in children who are overweight or obese, according to expert recommendations.

Hypertension is a risk factor for cardiovascular disease, and childhood obesity is the leading cause of pediatric hypertension. While full-blown cardiovascular disease does not appear in childhood, markers of cardiovascular damage — including left ventricular hypertrophy, thickening of the carotid vessel wall, retinal vascular changes, and even subtle cognitive changes — are detectable in children and adolescents with high blood pressure (Falkner, 2010). Guidelines call for measuring blood pressure annually for all children ages 3 through 17 years; charting results for age, sex, and height; reviewing results with parents; and offering management. If blood pressure is ≥90th percentile further evaluation is called for (Expert Panel for CV Health, 2011). Table 2 summarizes several key sources of evidence for this measure, using the US Preventive Services Task Force (USPSTF) rankings (criteria denoted as a note to Table 2).

Table 2: Evidence for Hypertension Screening for Children Who are Overweight or Obese

Type of Evidence	Key Findings	Level of Evidence (USPSTF Ranking*)	Citations
Expert recommendation	Hypertension is a risk factor for cardiovascular disease; approximately 13% of overweight children have elevated systolic blood pressure, and approximately 9% have elevated diastolic blood pressure. Blood pressure should be assessed at all health supervision visits, and offices should have large cuffs, including thigh cuffs, which allow accurate assessment of blood pressure for severely obese youths. The National Heart, Lung and Blood Institute has updated tables defining elevated blood pressure levels, according to age, gender, and height percentile, which offices should have for easy reference. Three or more readings above the 95th percentile for either systolic or diastolic blood pressure indicate hypertension. The expert committee recommends that physicians and allied health care providers obtain a focused family history for obesity, type 2 diabetes, and cardiovascular disease (particularly hypertension), and early deaths resulting from heart disease or stroke, to assess the risks of current or future comorbidities associated with a child's overweight or obese status.	III	Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics* 2007; 120(Suppl 4):S164-S192
Consensus statement	Hypertension occurs more commonly in obese persons of every age, and childhood obesity is the leading cause of pediatric hypertension. Genetic, metabolic, and hormonal factors such as insulin resistance, increased serum aldosterone levels, salt sensitivity, and possibly elevated leptin levels are linked to the hypertension of obesity. Systolic blood pressure correlates positively with BMI. Laboratory assessments for children with a BMI above the 95th percentile should include screening for comorbidities, including hypertension. Obese children with hypertension will require the services of specialists in the setting of a specialized obesity clinic.	III	Speiser PW, Rudolf MC, Anhalt H, et al. Childhood obesity. *J Clin Endocrinol Metab* 2005; 90(3):1871-1887
Integrated guidelines	Atherosclerotic cardiovascular disease remains the leading cause of death in North America. Risk factors and risk behaviors accelerate the development of atherosclerosis, and risk reduction delays progression toward clinical disease, which culminates in thrombosis,	III	Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents; National Heart, Lung and Blood Institute. Expert Panel

	vascular rupture, or acute ischemic syndrome. Overweight and obesity, nutrition/diet, physical inactivity, and blood pressure are all factors to be evaluated to determine risk. Over the last 20 years, blood pressure levels have been increasing, and the prevalence of hypertension and pre-hypertension are also increasing, explained partially by obesity rates. Higher BMI in childhood is directly associated with increased coronary heart disease in adult life. Extrapolation from current data suggest that adolescent obesity will likely increase adult coronary heart disease by 5% to 16% over the next 25 years, with more than 100,000 excess cases of coronary heart disease attributable to increased obesity in childhood. Guidelines call for measuring blood pressure annually for all children ages 3 through 17 years; charting results for age, gender, and height; reviewing results with parent; and offering management. If blood pressure is ≥90th percentile, further evaluation is called for.		on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report. *Pediatrics* 2011; 128:(Suppl5):S213-S256
Clinical guidelines	Primary hypertension is detectable in children and adolescents and, as in adults, is associated with obesity, lifestyle, and a positive family history of hypertension. The childhood obesity epidemic has led to an increasing population prevalence of high blood pressure in children. Although death and cardiovascular disability don't occur in children with hypertension, intermediate markers of target organ damage (left ventricular hypertrophy, thickening of the carotid vessel wall, retinal vascular changes, and even subtle cognitive changes) are detectable in children and adolescents with high blood pressure. Given the rates of hypertension and pre-hypertension in asymptomatic children and adolescents, high blood pressure should be considered a long-term health problem in childhood.	III	Falkner B. Hypertension in children and adolescents: Epidemiology and natural history. *Pediatr Nephrol* 2010; 25:1219-1224

Note: *USPSTF criteria for assessing evidence at the individual study level are as follows: I) Properly powered and conducted randomized controlled trial (RCT); well-conducted systematic review or meta-analysis of homogeneous RCTs. II) Well-designed cohort or case-control analytic study. III) Opinions of respected authorities, based on clinical experience; descriptive studies or case reports; reports of expert committees.*

V.B. Clinical or Other Rationale Supporting the Focus of the Measure (optional)

Provide documentation of the clinical or other rationale for the focus of this measure, including citations as appropriate and available.

SECTION VI.
SCIENTIFIC SOUNDNESS OF THE MEASURE

Explain the methods used to determine the scientific soundness of the measure itself. Include results of all tests of validity and reliability, including description(s) of the study sample(s) and methods used to arrive at the results. Note how characteristics of other data systems, data sources, or eligible populations may affect reliability and validity.

VI.A. Reliability

Reliability of the measure is the extent to which the measure results are reproducible when conditions remain the same. The method for establishing the reliability of a measure will depend on the type of measure, data source, and other factors. Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., the Kappa statistic). Provide appropriate citations to justify methods.

This measure is based on medical record data. Reliability testing is described below.

Data and Methods

Our testing data were obtained through an audit of medical records maintained by HealthCore, Inc. HealthCore is an independent subsidiary of Anthem, Inc., the largest health benefits company/insurer in the United States. HealthCore owns and operates the HealthCore Integrated Research Database (HIRD), a longitudinal database of medical and pharmacy claims and enrollment information for members from 14 geographically diverse Blue Cross and/or Blue Shield Health Plans in the Northeast, South, West and Central regions of the United States with members living in all 50 states. In total, the HIRD includes approximately 59 million individuals between January 2006 and June 2014.

More than 12 million members were enrolled at some point during the 2013 measurement year for this study, among which 2.3 million were aged 2-18 years old. There were 637,100 children aged 2-18 with a routine outpatient encounter in 2013, who were currently enrolled and were fully insured. This group was narrowed to a subset who had a provider with a specialty of pediatric medicine or general practice/family practice (451,003). One child per family was then randomly selected, resulting in 293,741 eligible children from all 50 states, as well as the District of Columbia and territories such as Puerto Rico and the Virgin Islands.

A simple random sample (SRS) was used to select 27,000 candidates for a parent survey, of which 26,569 (98%) had valid contact information. From this group, a total of 1,580 parent surveys were completed, of which 402 had a BMI ≥85th percentile according to parent-reported height and weight for their eligible child. Additionally, an independent SRS of 750 candidates was selected to provide additional cases for medical record abstraction to ensure the study goal for abstracted charts would be achieved; 722 children from this group had valid contact information. Combining these two groups, medical records were requested for review for 1,124 (402+722) children. In total, 600 medical records were reviewed and abstracted.

Once subjects were identified, patient medical records were requested from provider offices and health care facilities; these records were sent to a centralized location for data abstraction. Trained nurse or pharmacist medical record abstractors collected and entered information from paper copies of the medical records into a password-protected database. To help ensure consistency of data collection, the medical record abstractors were trained on the study's design and presented with a standardized data collection form designed to minimize the need to make subjective judgments during the abstraction process. In addition, data entered onto a scanner form and subsequently scanned was reviewed through a series of quality checks.

Reliability of medical record data was determined through re-abstraction of patient record data to calculate the inter-rater reliability (IRR). Broadly, IRR is the extent to which the abstracted information is collected in a consistent manner. Low IRR may be a sign of poorly executed abstraction procedures, such as ambiguous wording in the data collection tool, inadequate abstractor training, or abstractor fatigue. For this measure, the medical record data collected by two abstractors was individually compared with the data obtained by a senior abstractor to gauge the IRR for each abstractor. Any differences were remedied by review of the chart. IRR was determined by calculating both percent agreement and Cohen's Kappa statistic.

Results

Data were abstracted from 600 medical records; 91 children (15.2%) met denominator criteria for being between 3 through 17 years and having a *recorded* BMI ≥85th percentile, based on a BMI percentile recorded by the provider. Of these, six records (6.6%) from the two abstractors were reviewed for IRR. Agreement was assessed for six measure variables, including documentation of BMI ≥85th percentile, blood pressure, systolic blood pressure value, diastolic blood pressure value, and both height and weight (necessary to calculate BMI).

Table 3 shows the percent agreement and Kappa statistic for each measure variable. Abstractor agreement for all variables (documentation of BMI ≥85th percentile, blood pressure, systolic blood pressure, diastolic blood pressure, height, and weight) was 100%, with a Kappa statistic of 1. These results indicate a perfect level of IRR was achieved for all measure variables.

Table 3: Agreement and Kappa Statistics for Inter-Rater Reliability

Variable Description	Records Reviewed For IRR (N)	N Agreed (%)	Kappa Statistic
Documentation that BMI is ≥85th percentile	6	6 (100)	1
Documentation of blood pressure contained in the medical record	6	6 (100)	1
Systolic blood pressure value present	6	6 (100)	1
Diastolic blood pressure value present	6	6 (100)	1
Documentation of height	6	6 (100)	1
Documentation of weight	6	6 (100)	1

VI.B. Validity

Validity of the measure is the extent to which the measure meaningfully represents the concept being evaluated. The method for establishing the validity of a measure will depend on the type of measure, data source, and other factors. Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., R^2 for concurrent validity). Provide appropriate citations to justify methods.

Face Validity

Face validity is the degree to which the measure construct characterizes the concept being assessed. The face validity of this measure was established by a national panel of experts and advocates for families of children with high BMI convened by Q-METRIC. The Q-METRIC expert panel included nationally recognized experts in childhood obesity, representing pediatrics, nephrology, nutrition and dietetics, endocrinology, gastroenterology, health behavior/education, and family advocacy. In addition, measure validity was considered by experts in state Medicaid program operations, health plan quality measurement, health informatics, and health care quality measurement. In total, the Q-METRIC High BMI Follow-up panel included 17 experts, providing a comprehensive perspective on childhood obesity and the measurement of quality metrics for states and health plans.

The Q-METRIC expert panel concluded that this measure has a high degree of face validity through a detailed review of concepts and metrics considered to be essential to effective management and treatment of childhood obesity. Concepts and draft measures were rated by this group for their relative importance. This measure was very highly rated, receiving an average score of 7.9 (with 9 as the highest possible score).

Abstracted Medical Record Data

This measure was tested using medical record data. This source is considered the gold standard for clinical information; our findings indicate that these data have a high degree of face validity and reliability. In total, 600 charts were reviewed.

The eligible population for the denominator is the number of children, ages 3 through 17 years old, with a BMI ≥85th percentile, who had an outpatient care visit during the measurement year (January 1-December 31). This measure was tested using two methods for determining the denominator:

1) *Calculated* BMI ≥85th percentile; based on BMI calculated from height and weight recorded in the medical record.
2) *Recorded* BMI ≥85th percentile; based on a BMI percentile recorded in the medical record.

Three individual numerators and one overall composite of the three numerators are calculated:

1. Systolic - The percentage of children who had documentation of systolic blood pressure percentile (systolic numerator divided by denominator).
2. Diastolic - The percentage of children who had documentation of diastolic blood pressure percentile (diastolic numerator divided by denominator).
3. Classification - The percentage of children who had classification of blood pressure as normal or abnormal (classification numerator divided by denominator).

4. Overall – The percentage of children who met all three criteria, even if each occurred during a separate visit within the measurement year.

Calculated BMI. A total of 207 children (34.5%) met denominator criteria for being between 3 through 17 years old and having a *calculated* BMI ≥85^{th} percentile, based on height and weight from the medical record (Table 4). Among children with a calculated BMI ≥85^{th} percentile, 2.4% (n=5) of children had documentation of systolic blood pressure percentile; 2.4% (n=5) had documentation of diastolic blood pressure percentile, and none (n=0) had documentation of classification of blood pressure as normal or abnormal. Consequently, none of the children (n=0) met all three criteria.

Recorded BMI. Overall, 91 children (15.2%) met denominator criteria for being between 3 through 17 years old and having a *recorded* BMI ≥85^{th} percentile, based on a BMI percentile recorded by the provider (Table 5). Among children with a recorded BMI ≥85^{th} percentile, 6.6% (n=6) of children had documentation of systolic blood pressure percentile; 6.6% (n=6) had documentation of diastolic blood pressure percentile, and 3.3% (n=3) had documentation of classification of blood pressure as normal or abnormal. Overall, one child (1.1%) met all three criteria.

Table 4: Documentation of Blood Pressure Percentile for Children with Calculated BMI ≥85^{th} Percentile

Measure	Numerator (N)	Children with Calculated BMI ≥85^{th} Percentile (N)	Proportion (%)
Documentation of Systolic Blood Pressure Percentile	5	207	2.4%
Documentation of Diastolic Blood Pressure Percentile	5	207	2.4%
Documentation of Blood Pressure Classification As Normal or Abnormal	0	207	0%
Overall Rate: Percentage Meeting all Three Criteria	0	207	0%

Table 5: Documentation of Blood Pressure Percentile for Children with Recorded BMI ≥85th Percentile

Measure	Numerator (N)	Children with Recorded BMI ≥85th Percentile (N)	Proportion (%)
Documentation of Systolic Blood Pressure Percentile	6	91	6.6%
Documentation of Diastolic Blood Pressure Percentile	6	91	6.6%
Documentation of Blood Pressure Classification As Normal or Abnormal	3	91	3.3%
Overall Rate: Percentage Meeting all Three Criteria	1	91	1.1%

SECTION VII.
IDENTIFICATION OF DISPARITIES

CHIPRA requires that quality measures be able to identify disparities by race, ethnicity, socioeconomic status, and special health care needs. Thus, we strongly encourage nominators to have tested measures in diverse populations. Such testing provides evidence for assessing measure's performance for disparities identification. In the sections below, describe the results of efforts to demonstrate the capacity of this measure to produce results that can be stratified by the characteristics noted and retain the scientific soundness (reliability and validity) within and across the relevant subgroups.

VII.A. Race/Ethnicity

Recent analyses by Ogden et al. (2014) of data from the 2011-2012 National Health and Nutrition Examination Survey (NHANES) covered many demographic aspects of childhood obesity, including race. Among NHANES participants aged 2 to 19 years old, the prevalence of obesity (BMI≥ 95^{th} percentile) was highest in Hispanics (22%) compared with non-Hispanic blacks (20%), non-Hispanic whites (14%), and non-Hispanic Asians (9%) (Ogden et al., 2014). This order was consistent among racial and ethnic groups when looked at by sex: Hispanic boys and girls had the highest incidence of obesity (24% and 21%, respectively) compared with non-Hispanic black boys and girls (20% and 21%), white boys and girls (13% and 16%), and Asian boys and girls (12% and 6%). The order also held when considering the broader category of those who were overweight or obese (i.e., having a BMI ≥85^{th} percentile): Hispanic boys and girls had the highest incidence of obesity (41% and 37%, respectively) compared with non-Hispanic black boys and girls (34% and 36%), white boys and girls (28% and 29%), and Asian boys and girls (25% and 14%). In both weight classifications, Hispanic boys had the highest rate of obesity and Asian girls the lowest; for both black and white children, girls tended to have slightly higher rates of excess weight than boys (Ogden et al., 2014).

It is interesting to note that two studies reported better communication regarding the topic of excess weight among children who often receive substandard care. Non-Hispanic black girls were more likely to be told they were overweight compared with non-Hispanic white girls (47% vs. 31%) (Ogden and Tabak, 2005). And notification of overweight status by a doctor or health professional was more likely to occur among Mexican American and other Hispanic children; there was a trend toward increased notification about excess weight to the parents of non-Hispanic black and publicly insured children (Perrin et al., 2012). This is the opposite of most health-related disparities (Perrin et al., 2012).

Census Characteristics
Race and ethnicity were not available from the medical records reviewed for this study. However, the overall race and ethnicity characteristics can be summarized using demographic characteristics based upon ZIP codes of sampled children. This race/ethnicity information was obtained from the 2010 United States Census (US Census Bureau, 2010), which enables characterization of the areas in which sampled children live.

These summary statistics are reported below (Tables 6 and 7) for the following sampled individuals with valid ZIP codes:

1) candidates for the parent survey with non-missing contact information (n=26,569; n=25,961 with valid ZIP codes);
2) an SRS for medical chart abstraction (n=722; n=711 with valid ZIP codes); and
3) a subset of children with reviewed and abstracted medical records (a combination of medical records from the SRS and the parent survey, n=600; n=590 with valid ZIP codes).

Overall, the proportion of residents in specific racial groups was similar in all three groups of sampled children. On average, sampled children reside in ZIP codes reporting primarily white race and approximately 10%-11% of residents within ZIP codes reporting Hispanic ethnicity.

Table 6. Mean (Standard Deviation) Proportion in Racial Groups within ZIP Codes of Residence

	American Indian or Alaska Native	Asian	Black or African American	Native Hawaiian or Other Pacific Islander	White	Mixed Race	Other
Candidates for parent survey (n=25,961)*	0.5 (1)	6.6 (10)	6.4 (11)	0.1 (0.2)	79.0 (17)	2.9 (2)	4.4 (7)
SRS for medical chart abstraction (n=711)**	0.5 (1)	6.2 (9)	6.6 (11)	0.1 (0.2)	79.5 (17)	2.9 (2)	4.3 (7)
Reviewed and abstracted medical charts (n=590)***	0.6 (4)	5.2 (8)	6.1 (10)	0.1 (0.2)	81.3 (16)	2.7 (2)	3.9 (6)

*Among candidates for the parent survey (n=26,569), no information available for 608 members due to missing or unmatched ZIP code, yielding n=25,961
** Among an SRS for medical chart abstraction (n=722), no information available for 11 members due to missing or unmatched ZIP code, yielding n=711
*** Among children with reviewed and abstracted medical records (n=600), no information available for 10 members due to missing or unmatched ZIP code, yielding n=590

Table 7. Mean (Standard Deviation) Proportion Reporting Hispanic Ethnicity within ZIP Codes of Residence

	Hispanic Ethnicity
Candidates for parent survey (n=25,961)*	11.4 (15)
SRS for medical chart abstraction (n=711)**	11.2 (15)
Reviewed and abstracted medical charts (n=590)***	10.1 (15)

*Among candidates for the parent survey (n=26,569), no information available for 608 members due to missing or unmatched ZIP code, yielding n=25,961
** Among an SRS for medical chart abstraction (n=722), no information available for 11 members due to missing or unmatched ZIP code, yielding n=711
*** Among children with reviewed and abstracted medical records (n=600), no information available for 10 members due to missing or unmatched ZIP code, yielding n=590

VII.B. Special Health Care Needs

The medical records data abstracted for this study do not include indicators of special health care needs.

VII.C. Socioeconomic Status

Findings have varied regarding the relationship between socioeconomic status and excess weight. In 2003, Gordon-Larsen et al. reported that in adolescents (ages 12 to 20 years) overweight prevalence decreased among white girls as their socioeconomic status increased, while the reverse was true for African American girls. Higher socioeconomic status was associated with elevated and/or increasing BMI in African American adolescent girls. The authors suggest that efforts to reduce disparities regarding excess weight between ethnic groups must look beyond income and education to consider environmental, contextual, biological, and socio-cultural influences (Gordon-Larsen et al., 2003). More recent findings by Miech et al. (2006) produced different results when dividing adolescents into two age groups (12- to 14-year olds and 15- to 17-year olds). Trends of increasing overweight showed a greater effect among families living below the poverty line compared with those above it for older, but not younger adolescents. Additional analyses suggested that physical inactivity and eating habits such as skipping breakfast and consuming sugary drinks contributed to disparities. The authors reason that there is a unique association in later adolescence between poverty and overweight because food choices and activity levels at this age differ considerably from those of early childhood and adulthood. Older adolescents have opportunities and discretionary income to make their own choices regarding food and activities (Miech et al., 2006).

Census Characteristics

Socioeconomic status was not available from the medical records reviewed for this study. However, the overall median household income can be summarized based upon the overall characteristics of the ZIP codes of sampled children. This information was obtained from the 2011 American Community Survey (ACS) (US Census Bureau, 2013), which enables characterization of the areas in which sampled children live.

The summary statistics for median household income are reported below (Table 8) for the following sampled individuals with valid ZIP codes:

1) candidates for the parent survey with non-missing contact information (n=26,569; n=25,961 with valid ZIP codes);
2) an SRS for medical chart abstraction (n=722; n=711 with valid ZIP codes); and
3) a subset of children with reviewed and abstracted medical records (a combination of medical records from the SRS and the parent survey, n=600; n=590 with valid ZIP codes).

Overall, median household income at the ZIP code level was similar among the candidates for the parent survey and the SRS for medical chart abstraction ($71,418); the median household income for the subset with reviewed and abstracted medical charts was slightly lower at $66,679.

Table 8. Median Household Income within ZIP Codes of Residence

Description	Mean	SD	Min	25th Percentile	Median	75th Percentile	Max
Candidates for parent survey (n=25,961)*	$71,418	$28,320	$9,487	$50,794	$66,624	$86,364	$234,932
SRS for medical chart abstraction (n=711)**	$71,019	$28,306	$17,058	$49,629	$65,980	$87,680	$213,423
Reviewed and abstracted medical charts (n=590)***	$66,679	$26,831	$17,058	$46,729	$62,237	$80,157	$213,423

*Among candidates for the parent survey (n=26,569), no information available for 608 members due to missing or unmatched ZIP code, yielding n=25,961

** Among an SRS for medical chart abstraction (n=722), no information available for 11 members due to missing or unmatched ZIP code, yielding n=711

*** Among children with reviewed and abstracted medical records (n=600), no information available for 10 members due to missing or unmatched ZIP code, yielding n=590

VII.D. Rurality/Urbanicity

Census Characteristics

Urbanicity was not available from the medical records reviewed for this study. However, urbanicity can be summarized based upon the overall characteristics of the ZIP codes of sampled children. This information was obtained from the 2010 United States Census (US Census Bureau, 2010), which enables characterization of the areas in which sampled children live.

The summary statistics for urbanicity are reported below (Table 9) for the following sampled individuals with valid ZIP codes:

1) candidates for the parent survey with non-missing contact information (n=26,569; n=25,961 with valid ZIP codes);
2) an SRS for medical chart abstraction (n=722; n=711 with valid ZIP codes); and
3) a subset of children with reviewed and abstracted medical records (a combination of medical records from the SRS and the parent survey, n=600; n=590 with valid ZIP codes).

Overall, the ZIP codes of the candidates for the parent survey and the ZIP codes for the SRS for medical chart abstraction were largely categorized as being urban (80.4%); the subset with reviewed and abstracted medical charts resided in ZIP codes categorized primarily as urban, but to a lesser degree (76.7%).

Table 9. Proportion of ZIP Codes Categorized as Urban

Description	Mean	SD	Min	25th Percentile	Median	75th Percentile	Max
Candidates for parent survey (n=25,961)*	80.4	31.0	0	73.7	97.0	100	100
SRS for medical chart abstraction (n=711)**	80.4	31.0	0	74.0	96.9	100	100
Reviewed and abstracted medical charts (n=590)***	76.7	33.7	0	66.1	95.7	100	100

*Among candidates for the parent survey (n=26,569), no information available for 608 members due to missing or unmatched ZIP code, yielding n=25,961

** Among an SRS for medical chart abstraction (n=722), no information available for 11 members due to missing or unmatched ZIP code, yielding n=711

*** Among children with reviewed and abstracted medical records (n=600), no information available for 10 members due to missing or unmatched ZIP code, yielding n=590

VII.E. Limited English Proficiency (LEP) Populations

The medical records data abstracted for this study do not include indicators of LEP.

References for Section VII

Gordon-Larsen P, Adair LS, Popkin BM. The relationship of ethnicity, socioeconomic factors, and overweight in U.S. adolescents. *Obes Res* 2003; 11(1):121-129.

Miech RA, Kumanyika SK, Stettler N, Link BG, Phelan JC, Chang VW. Trends in the association of poverty with overweight among US adolescents, 1971-2004. *JAMA* 2006; 295(20):2385-2393.

Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA* 2014; 311(8):806-814.

Ogden CL, Tabak CJ. Children and teens told by doctors that they were overweight — United States, 1999-2002. *MMWR* 2005; 54(34):848-849.

Perrin EM, Cockrell-Skinner A, Steiner MJ. Parental recall of doctor communication of weight status. *Arch Pediatr Adolesc Med* 2012; 166(4):317-322.

US Census Bureau. 2011 American Community Survey (ACS). http://www.census.gov/acs/www/data_documentation/2011_release. Published January 29, 2013. Accessed March 9, 2015.

US Census Bureau. 2010 United States Census. http://www.census.gov/2010census/. Published December 21, 2010. Accessed March 9, 2015.

SECTION VIII.
FEASIBILITY

Feasibility is the extent to which the data required for the measure are readily available, retrievable without undue burden, and can be implemented for performance measurement.[5] Using the following sections, explain the methods used to determine the feasibility of implementing the measure.

VIII.A. Data Availability

VIII.A.1. What is the availability of data in existing data systems? How readily are the data available?

As noted within the Reliability section of this report, our testing data consisted of an audit of medical records acquired by HealthCore, Inc., which maintains the HealthCore Integrated Research Database (HIRD). This longitudinal database contains medical and pharmacy claims and enrollment information for members from 14 geographically diverse Blue Cross and/or Blue Shield Health Plans, with members living in all 50 states. In total, the HIRD includes approximately 59 million individuals between January 2006 and June 2014.

More than 12 million members were enrolled at some point during the 2013 measurement year that was used for this study, among which 2.3 million were aged 2-18 years old. The sample began with 1,048,559 children aged 2-18 years with a routine outpatient encounter in 2013. This group was subsequently narrowed as described in the Reliability section of this report.

In total, 600 charts were reviewed. The eligible population for the denominator is the number of children, ages 3 through 17 years, with a BMI ≥85th percentile, who had an outpatient care visit during the measurement year (January 1-December 31). This measure was tested using two methods for determining the denominator:

1) *Calculated* BMI ≥85th percentile; based on BMI calculated from height and weight recorded in the medical record.
2) *Recorded* BMI ≥85th percentile; based on a BMI percentile recorded in the medical record.

Three individual numerators and one overall composite of the three numerators are calculated:

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[5] The definition is adapted from: Centers for Medicare & Medicaid Services Quality Measurement and Health Assessment Group glossary, as part of the Measures Management System Measure Development Overview. Available at: http://www.cms.gov/MMS/19_MeasuresManagementSystemBlueprint.asp#TopOfPage. Accessed February 6, 2012.

1. Systolic - The percentage of children who had documentation of systolic blood pressure percentile (systolic numerator divided by denominator).
2. Diastolic - The percentage of children who had documentation of diastolic blood pressure percentile (diastolic numerator divided by denominator).
3. Classification - The percentage of children who had classification of blood pressure as normal or abnormal (classification numerator divided by denominator).
4. Overall – The percentage of children who met all three criteria, even if each occurred during a separate visit within the measurement year.

Calculated BMI. A total of 207 children met denominator criteria for being between 3 through 17 years old and having a *calculated* BMI $\geq 85^{th}$ percentile, based on height and weight from the medical record (Table 4). Among children with a calculated BMI$\geq 85^{th}$ percentile, 2.4% (n=5) of children had documentation of systolic blood pressure percentile; 2.4% (n=5) had documentation of diastolic blood pressure percentile, and none (n=0) had documentation of classification of blood pressure as normal or abnormal. Consequently, none of the children (n=0) met all three criteria.

Recorded BMI. Overall, 91 children met denominator criteria for being between 3 through 17 years old and having a *recorded* BMI $\geq 85^{th}$ percentile, based on a BMI percentile recorded by the provider (Table 5). Among children with a recorded BMI $\geq 85^{th}$ percentile, 6.6% (n=6) of children had documentation of systolic blood pressure percentile; 6.6% (n=6) had documentation of diastolic blood pressure percentile, and 3.3% (n=3) had documentation of classification of blood pressure as normal or abnormal. Overall, one child (1.1%) met all three criteria.

Data abstraction was completed by experienced medical record abstractors who were trained on the study's design and presented with a standardized data collection form. In addition to the specific data values required for this measure, key patient characteristics, such as date of birth and sex, were also obtained.

Abstraction Times

In addition to calculating IRR, the study team assessed how burdensome it was to locate and document the information used to test this measure by having abstractors note the time it took to complete each record. On average, the abstractors spent 4 minutes per record abstracting the data for this measure.

VIII.A.2. If data are not available in existing data systems or would be better collected from future data systems, what is the potential for modifying current data systems or creating new data systems to enhance the feasibility of the measure and facilitate implementation?

VIII.B. Lessons from Use of the Measure

VIII.B.1. Describe the extent to which the measure has been used or is in use, including the types of settings in which it has been used, and purposes for which it has been used.

Not applicable

VIII.B.2. If the measure has been used or is in use, what methods, if any, have already been used to collect data for this measure?

Not applicable

VIII.B.3. What lessons are available from the current or prior use of the measure?

Not applicable

SECTION IX.
LEVELS OF AGGREGATION

CHIPRA states that data used in quality measures must be collected and reported in a standard format that permits comparison (at minimum) at State, health plan, and provider levels. Use the following table to provide information about this measure's use for reporting at the levels of aggregation in the table.

For the purpose of this section, please refer to the definitions for provider, practice site, medical group, and network in Section XVI. Glossary of Terms.

If there is no information about whether the measure could be meaningfully reported at a specific level of aggregation, please write "Not available" in the text field before progressing to the next section. Table IX-1 shows the questions (in columns) about the measure's use at different levels of aggregation for quality reporting (in rows) included in the CHIPRA PQMP Candidate Measure Submission Form (CPCF).

Table IX-1. Questions about the measure's use at different levels of aggregation for quality reporting

Level of aggregation (Unit) for reporting on the quality of care for children covered by Medicaid/CHIP†	Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	Data Sources: Are data sources available to support reporting at this level?	Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	In Use: Have measure results been reported at this level previously?	Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?
State level*: Can compare States	☐Yes ☒No	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Other geographic level: Can compare other geographic regions (e.g., MSA, HRR)	☐Yes ☒No	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Medicaid or CHIP Payment model: Can compare payment models (e.g., managed care, primary care case management, FFS, and other models)	☐Yes ☒No	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Health plan*: Can compare quality of care among health plans.	☒Yes ☐No	This measure requires medical record abstraction; medical records are maintained by all health services providers.	This measure has not been tested at the health plan level and consequently, the minimum number of providers per plan has not been determined.	Not Available	Not Available	Not Available

Level of aggregation (Unit) for reporting on the quality of care for children covered by Medicaid/CHIP[†]	Intended use: Is measure intended to support meaningful comparisons at this level? (Yes/No)	Data Sources: Are data sources available to support reporting at this level?	Sample Size: What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?	In Use: Have measure results been reported at this level previously?	Reliability & Validity: Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?	Unintended consequences: What are the potential unintended consequences of reporting at this level of aggregation?
Provider-level* Individual practitioner: Can compare individual health care professionals	☒Yes ☐No	This measure requires medical record abstraction; medical records are maintained by all health services providers.	Availability of medical records meeting inclusion criteria will vary by practice, but require that providers furnish services to children. A minimum of 30 abstracted charts for children with BMI ≥85th percentile is recommended. Our results indicate that approximately 35% of children in the eligible age group met this criterion based on *calculated BMI*, which indicates that approximately 90 charts for children in the eligible age range will require abstraction. Our results indicate that approximately 15% of children in the eligible age group met this criterion based on *recorded BMI percentile* which indicates that approximately 200 charts for children in the eligible age range will require abstraction.	Not Available	Not Available	Not Available
Hospital: Can compare hospitals	☐Yes ☒No	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Practice, group, or facility:** Can compare: (i) practice sites; (ii) medical or other professional groups; or (iii) integrated or other delivery networks	☒Yes ☐No	This measure requires medical record abstraction; medical records are maintained by all health services providers.	This measure has not been tested at the practice group or facility level and consequently, the minimum number of providers per group has not been determined.	Not Available	Not Available	Not Available

[†] There could be other levels of reporting that could be of interest to Medicaid agencies such as markets and referral regions.

* Required in CHIPRA legislation.

** There is no implication that measures that are applicable at one level are automatically applicable at all three of the levels listed in this row.

SECTION X.
UNDERSTANDABILITY

CHIPRA states that the core set should allow purchasers, families, and health care providers to understand the quality of care for children. Please describe the usefulness of this measure toward achieving this goal. Describe efforts to assess the understandability of this measure (e.g., focus group testing with stakeholders).

This measure provides families with a straightforward means to assess how well basic levels of comprehensive care are being provided in regard to efforts by clinicians to provide follow-up care, including hypertension screening and documentation for pediatric patients who are overweight or obese. Low rates for the provision of care are easily understood to be unsatisfactory. The simplicity of the measure likewise makes it a straightforward guide for providers and purchasers to assess how well comprehensive care is provided to assess, prevent, and treat children who are overweight or obese.

This measure has not been assessed for comprehension. The primary information needed for this measure comes from medical record data and includes basic demographics, weight classification, diagnostic codes, procedure codes, and dates of services, all of which are widely available.

SECTION XI.
HEALTH INFORMATION TECHNOLOGY

Please respond to the following questions in terms of any health information technology (health IT) that has been or could be incorporated into the calculation of the measure.

XI.A. Health IT Enhancement

Please describe how health IT may enhance the use of this measure.

This is a complex measure that will require data from a number of potential sources in the electronic health record (EHR), depending on the practice workflow. However, health information technology (IT) can be used to provide alerts to all practice staff at workflow-appropriate timings, once these measures are obtained. For example, communication about weight classification might be an alert the provider receives before signing a note. A prompt to record a blood pressure might be provided to a nurse on a dashboard that he or she sees before discharging the patient.

Electronic health applications offer benefits for addressing overweight and obesity: more complete and accurate data with fewer errors, cost-effectiveness, use of online assessment tools, ease of sharing data, more security, elimination of paper document storage; and shorter time for analysis. Disadvantages include providers transitioning to new data collection workflows, cost, logistics, and intellectual property concerns (Daniels et al., 2009).

Relatively poor identification of abnormal blood pressure could be addressed by having a clinical decision support algorithm built into the EHR that would review current and prior blood pressure readings, as well as age, height, and sex to determine if abnormal blood pressure criteria had been met. The algorithm could also provide guideline-based evaluation, treatment, and education materials for the patient and family (Hansen et al., 2007).

XI.B. Health IT Testing

Has the measure been tested as part of an electronic health record (EHR) or other health IT system?

No

If so, in what health IT system was it tested and what were the results of testing?

Not applicable

XI.C. Health IT Workflow

Please describe how the information needed to calculate the measure may be captured as part of routine clinical or administrative workflow.

These measures will require the aggregation of data collected and stored in various locations in the EHR, by various stakeholders, and likely using variable ways to represent work. For example, documentation of weight classification requires the child's age in months (under age 36 months) or years, so that one of the terms listed (e.g., normal weight) can be looked for—including all abbreviations —in nursing notes, physician notes, and technician notes. Other ways to classify weight, such as BMI percentile, will likely be found in the vital signs. Over the age of 16 years, the data might be found in the vital signs or in the documentation sections of the record.

XI.D. Health IT Standards

Are the data elements in this measure supported explicitly by the Office of the National Coordinator for Health IT Standards and Certification criteria (see: http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov__standards_ifr/1195)?

Yes

If yes, please describe.

The ONC's Health IT Standards explicitly address the recording of vital signs such as height, weight, and BMI into EHRs, which are directly relevant to this measure. The ONC standards include the following specific requirements in the Certification criteria (Federal Register, 2010) pertaining to Stage 2 Meaningful Use requirements:

1. Enable a user to electronically record, modify, and retrieve a patient's vital signs including, at a minimum, the height, weight, blood pressure, temperature, and pulse.
2. Automatically calculate and display BMI based on a plot and display patient's height and weight.
3. Plot and electronically display, upon request, growth charts (height, weight, and BMI) for patients 2-20 years old.

XI.E. Health IT Calculation

Please assess the likelihood that missing or ambiguous information will lead to calculation errors.

Missing or ambiguous information in the following areas could lead to missing cases or calculation errors:

1. Child's date of birth
2. Date and time of treatment
3. ICD-9 codes selected to identify obesity or abnormal weight gain
4. BMI percentile or score
5. Weight classification based on BMI percentile or score
6. Systolic or diastolic blood pressure values
7. Choice of CPT, HCPCS, or ICD-9 CM Diagnosis codes to identify outpatient care visits

XI.F. Health IT Other Functions

If the measure is implemented in an EHR or other health IT system, how might implementation of other health IT functions (e.g., computerized decision support systems in an EHR) enhance performance on the measure?

Performance on this measure could benefit from a number of health IT integration steps:

- Documentation templates filled out by providers (or potentially by scribes, in communication with providers during the visit) could improve provider behavior with respect to these issues during the visit.
- Documentation templates created in specialty clinics could help with missed opportunities to provide this counseling in emergency departments, other clinic visits, home visits, or through patient-initiated contact with the health system via a patient portal or personal health application.
- Active decision support before, during, or after the visit could prompt providers or patients about these issues.
- EHRs could generate triggers to providers to document more carefully.

References for Section XI

Daniels SR, Jacobson MS, McCrindle BW, Eckel RH, McHugh Sanner B. American Heart Association Childhood Obesity Research Summit: Executive Summary. *Circulation* 2009; 119:2114-2123.

Hansen ML, Gunn PW, Kaelber DC. Underdiagnosis of hypertension in children and adolescents. *JAMA* 2007; 298(8):874-879.

Health information technology: Initial set of standards, implementation specifications, and certification criteria for electronic health record technology. *Fed Regist* 2010; 75(8): 2013-2047.

SECTION XII.
LIMITATIONS OF THE MEASURE

Describe any limitations of the measure related to the attributes included in this CPCF (i.e., availability of measure specifications, importance of the measure, evidence for the focus of the measure, scientific soundness of the measure, identification of disparities, feasibility, levels of aggregation, understandability, health information technology).

This measure assesses the percentage of children, ages 3 through 17 years, with a BMI ≥85th percentile, who had a blood pressure percentile documented and classified as normal or abnormal during the measurement year. Obesity in children is associated with a broad spectrum of serious health issues, including hypertension. The risk for high blood pressure (hypertension) in children is proportional to their degree of excess body fat. Once BMI reaches the 85th percentile, risk of high blood pressure increases fourfold, along with the risk of target organ damage, which is indicative of early cardiovascular disease (Tu et al., 2011). A higher proportion indicates better performance.

This measure was developed with the use of medical record data. The testing results reported here required the development of an abstraction tool and use of qualified medical record abstractors. Information needed for this measure includes demographics, date of birth, diagnosis codes, height, weight, blood pressure, and free text documentation in the note from the clinician. Our findings indicate that these data are generally available.

However, we observed several limitations. Height, weight, and blood pressure were sometimes missing from the chart, and there could be substantial variation in how providers document/describe their assessment. In future implementation, the use of data from electronic medical records may ease the burden of data collection.

References for Section XII

Tu W, Eckert GJ, DiMeglio LA, Zhangsheng Y, Jung J, Pratt JH. Intensified effect of adiposity on blood pressure in overweight and obese children. *Hypertension* 2011; 58:818-824.

SECTION XIII.
SUMMARY STATEMENT

Provide a summary rationale for why the measure should be selected for use, taking into account a balance among desirable attributes and limitations of the measure. Highlight specific advantages that this measure has over alternative measures on the same topic that were considered by the measure developer or specific advantages that this measure has over existing measures. If there is any information about this measure that is important for the review process but has not been addressed above, include it here.

This measure, *Hypertension Screening for Children Who Are Overweight or Obese,* assesses the percentage of children ages 3 through 17 years, with a BMI ≥85^{th} percentile, who had a blood pressure percentile documented and classified as normal or abnormal during the measurement year. Once BMI reaches the 85^{th} percentile, risk of high blood pressure increases fourfold, along with the risk of target organ damage, which is indicative of early cardiovascular disease. A higher proportion of children screened for hypertension indicates better performance. This measure was tested using medical record data. While similar measures exist, this measure differs in that it explicitly assesses documentation of systolic and diastolic blood pressure percentiles and classification of blood pressure percentiles as normal or abnormal for children who are overweight or obese.

Nearly a third of young children and adolescents in the United States are either overweight or obese. This situation is of pressing concern, given the association between obesity in children and a broad spectrum of serious health issues, including hypertension. The risk for hypertension in children is proportional to their degree of excess body fat. Because hypertension in children usually carries into adulthood, early and careful detection, clinical evaluation, and management will have important health benefits. However, clinicians often fail to classify blood pressure readings as normal or abnormal. If hypertension is not identified in pediatric patients, it may be years before it is detected, allowing end-organ damage to progress. The existence of effective treatments for hypertension means that these long-term outcomes could be avoided with earlier diagnoses. Among the issues that work against routine hypertension screening include lack of knowledge about diagnostic thresholds for hypertension in younger children, lack of awareness of previous blood pressure readings, lack confidence in the readings themselves, lack of reimbursement, and the cumbersome nature of the sex, age, and height percentile method of hypertension assessment.

Data were abstracted from the medical records of 600 children. For *calculated* BMI, 207 children met denominator criteria for being between 3 through 17 years old and having a *calculated* BMI ≥85^{th} percentile, based on height and weight from the medical record. Among children with a calculated BMI ≥85^{th} percentile, 2.4% (n=5) of children had documentation of systolic blood pressure percentile, 2.4% (n=5) had documentation of diastolic blood pressure percentile, and none (n=0) had documentation of classification of blood pressure as normal or abnormal. Consequently, none of the children (n=0) met all three criteria. For *recorded* BMI, 91 children met the same denominator criteria for age and having a *recorded* BMI ≥85^{th} percentile, based on a BMI percentile recorded by the provider. Among children with a recorded BMI ≥85th percentile, 6.6% (n=6) of children had documentation of systolic blood pressure percentile; 6.6% (n=6) had documentation of diastolic blood pressure percentile, and 3.3% (n=3) had documentation of classification of blood pressure as normal or abnormal. Overall, one child (1.1%) met all three criteria. Limitations for this measure include missing chart values for height, weight, and/or blood pressure, as well as substantial variation in how providers document/describe their assessment

This measure provides families with a straightforward means to assess how well basic levels of comprehensive care are being provided in regard to screening overweight and obese children for hypertension and documenting results. The primary information needed for this measure includes basic demographics, dates of services, BMI percentile, blood pressure readings and classifications, diagnostic codes, and procedure codes, all of which are widely available. Continuing advances in the development and implementation of health information technology may establish the feasibility of regularly implementing this measure with data supplied by electronic medical records.

SECTION XIV.

IDENTIFYING INFORMATION FOR THE MEASURE SUBMITTER

Complete information about the person submitting the material, including the following:

a. Gary L. Freed, MD, MPH
b. Percy and Mary Murphy Professor of Pediatrics, School of Medicine; Professor of Health Management and Policy, School of Public Health
c. University of Michigan
d. 300 North Ingalls, Room 6E08, Ann Arbor, MI 48109
e. 734-615-0616
f. gfreed@med.umich.edu
g. Signed written statement guaranteeing that all aspects of the measure will be publicly available, as defined in the Public Disclosure Requirements.

Public Disclosure Requirements

Each submission must include a written statement agreeing that, should U.S. Department of Health and Human Services accept the measure for the 2014 and/or 2015 Improved Core Measure Sets, full measure specifications for the accepted measure will be subject to public disclosure (e.g., on the Agency for Healthcare Research and Quality [AHRQ] and/or Centers for Medicare & Medicaid Services [CMS] websites), except that potential measure users will not be permitted to use the measure for commercial use. In addition, AHRQ expects that measures and full measure specifications will be made reasonably available to all interested parties. “Full measure specifications” is defined as all information that any potential measure implementer will need to use and analyze the measure, including use and analysis within an electronic health record or other health information technology. As used herein, “commercial use” refers to any sale, license or distribution of a measure for commercial gain, or incorporation of a measure into any product or service that is sold, licensed or distributed for commercial gain, even if there is no actual charge for inclusion of the measure. This statement must be signed by an individual authorized to act for any holder of copyright on each submitted measure or instrument. The authority of the signatory to provide such authorization should be described in the letter (Section XIV: Identifying Information for the Measure Submitter).

Gary L. Freed, MD, MPH
Percy and Mary Murphy Professor of Pediatrics, School of Medicine
Professor of Health Management and Policy, School of Public Health
Principal Investigator, Q-METRIC
Child Health and Evaluation Research (CHEAR) Unit
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BMI Follow-up

Measure 3: Hypertension Screening for Children Who Are Overweight or Obese

Description

The percentage of children aged 3 through 17 years with an outpatient care visit and a BMI ≥85th percentile who had a blood pressure percentile documented and classified as normal or abnormal during the measurement year. A higher proportion indicates better performance.

Calculation

This measure requires medical record data and is calculated as three rates as well as an overall rate that is a composite of the three individual rates. The three individual rates are:

1. The percentage of children who had documentation of systolic blood pressure percentile (systolic numerator divided by denominator).
2. The percentage of children who had documentation of diastolic blood pressure percentile (diastolic numerator divided by denominator).
3. The percentage of children who had classification of blood pressure as normal or abnormal (classification numerator divided by denominator).

The overall rate is the percentage of children who met all three criteria, even if each occurs during a separate visit (overall numerator divided by denominator).

Definitions

Intake period	January 1 to December 31 of the measurement year.
Blood pressure	Blood pressure is measured as systolic blood pressure and diastolic blood pressure.
Blood Pressure Percentile	The percentile ranking based on the National Heart Lung and Blood Guidelines, which are based on age, sex, and height percentile. Percentiles are available for both systolic and diastolic blood pressures.
Blood Pressure Classification	Based on BP percentiles, children can be classified into categories of normal (<95th percentile) and abnormal (≥95th percentile).
Outpatient care	A Health Maintenance Exam (HME) or an Evaluation and Management (E&M) visit with primary care provider or a specialist (see Table 3-A).

Table 3-A: Codes to Identify Ambulatory or Preventive Care Visits

Description	CPT	HCPCS	ICD-9-CM Diagnosis
Office or other outpatient services	99201-99205, 99211-99215, 99241-99245		
Preventive medicine	99381-99385, 99391-99395, 99401-99404, 99411-99412, 99420, 99429	G0438, G0439	
General medical examination			V20.2, V70.0, V70.3, V70.5, V70.6, V70.8, V70.9

Eligible Population

The determination of eligible population for this measure requires medical record data.

Ages 3 through 17 years of age. The eligibility period begins with the third birthday and ends the day before the 18th birthday.

Event/Diagnosis An outpatient care visit and BMI ≥85th percentile.

Specification

Denominator Eligible children with an outpatient care visit and BMI ≥85th percentile

Numerators Eligible children with an outpatient care visit and BMI ≥85th percentile who…

Systolic …had documentation of systolic blood pressure percentile as determined by medical record review.

Diastolic …had documentation of diastolic blood pressure percentile as determined by medical record review.

Classification …had classification of blood pressure as normal or abnormal as determined by medical record review.

Overall …met all three criteria, even if each occurs during a separate visit, as determined by medical record review.

Documentation in medical record must include, at a minimum, a note containing the date on which each test was conducted.

Note: Reporting of systolic and/or diastolic blood pressure only is not sufficient to qualify as a numerator event.

Exclusions

- Inpatient stays, emergency department visits, urgent care visits.
- A diagnosis of pregnancy during the measurement year.