# Behavior Therapy as First-Line Treatment for Preschool-Aged Children with ADHD

## Section 1. Basic Measure Information

### 1.A. Measure Name

Behavior Therapy as First-Line Treatment for Preschool-Aged Children

### 1.B. Measure Number

0089

### 1.C. Measure Description

**Please provide a non-technical description of the measure that conveys what it measures to a broad audience.**

Percentage of patients aged 4 through 5 years with a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD), for whom ADHD-focused evidence-based behavior therapy was prescribed as the first line of treatment. Note: The two ADHD measures submitted are separate and independent measures of ADHD care.

### 1.D. Measure Owner

Pediatric Measurement Center of Excellence (PMCoE) and Agency for Healthcare Research and Quality (AHRQ).

### 1.E. National Quality Forum (NQF) ID (if applicable)

Not applicable.

### 1.F. Measure Hierarchy

**Please note here 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:**

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.**

Not applicable.

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.**

   ADHD Diagnosis and Follow-up.

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.

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.

## 1.G. Numerator Statement

Patients for whom ADHD-focused evidence-based behavior therapy was prescribed as first-line treatment.

Note: Evidence-based behavior therapy is defined here as (1) treatment that is directed to parent and caregiver (guardian, teacher, child care worker), and (2) training that is provided in parent or caregiver-administered behavior modification, and (3) treatment that does not involve child-directed play therapy. First-line treatment is defined here as therapy provided prior to prescribing any ADHD medication.

## 1.H. Numerator Exclusions

None.

## 1.I. Denominator Statement

All patients aged 4 through 5 years with a diagnosis of ADHD.

## 1.J. Denominator Exclusions

Denominator exclusions include:

1. Documentation of medical reason(s) for not prescribing behavior therapy as first-line treatment (e.g. patient with multiple psychiatric conditions referred to other provider, or patients that are determined to be at risk for harming themselves or others).

**2.** Documentation of system reason(s) for not prescribing behavior therapy as first-line treatment (e.g. lack of access to behavior therapy).

## 1.K. Data Sources

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

Paper Medical Record; Electronic Health Record.

**If other, please list all other data sources in the field below.**

Feasibility testing and guidance for implementation of this measure as an eMeasure using electronic health record (EHR) data sources.

# Section 2: Detailed Measure Specifications

**Provide sufficient detail to describe how a measure would be calculated from the recommended data sources, uploading a separate document (+ Upload attachment) or a link to a URL. 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. 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.**

Note: This is an entirely new measure that is independent of other ADHD measures proposed. ADHD Measure: Percentage of patients aged 4 through 5 years with a diagnosis of ADHD, for whom ADHD-focused evidence-based behavior therapy was prescribed as first line treatment (see Table 1).

**Table 1. Measure Specifications for ADHD Quality Measure Behavior Therapy as First-Line Treatment for Preschool-Age Children**

| | |
|---|---|
| Numerator statement | Patients for whom ADHD-focused evidence-based behavior therapy was prescribed as first-line treatment. Evidence-based behavior therapy is defined as treatment that is directed to parent or caregiver (guardian, teacher, child care worker), and training that is provided in parent or caregiver-administered behavior modification, and treatment that does not involve child-directed play therapy. First-line treatment is defined as therapy that is provided before any medication is prescribed. |
| Denominator statement | All patients aged 4 through 5 years with a diagnosis of ADHD |

| | |
|---|---|
| Denominator exceptions | Documentation of medical reason(s) for not prescribing behavior therapy as first line treatment (e.g., patient with multiple psychiatric conditions referred to other provider, or patient determined to be at risk for harming themselves or others)<br>Documentation of system reason(s) for not prescribing behavior therapy as first line treatment (e.g., lack of access to behavior therapy) |
| Supporting guideline and other references | **The following clinical recommendation statements are quoted verbatim from the referenced clinical guideline and represent the evidence base for the measure:** For preschool-aged children (4 through 5 years of age), the primary care clinician should prescribe evidence-based parent- and/or teacher-administered behavior therapy as the first line of treatment (Quality of Evidence: A/Strong Recommendation) and may prescribe treatment with methylphenidate if behavior interventions have not provided adequate improvement and there is moderate to severe continuing disturbance in the child's function. In areas where evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment (Quality of Evidence: Grade B Recommendation).<br><br>American Academy of Pediatrics (AAP), 2011. |

## For Construction Using Manual Chart Abstraction

Please see Supporting Documents for examples of the PMCoE ADHD Measures Worksheet for complete Specifications (Section 2, Attachment 1), ADHD Measures Manual Chart Abstraction Tool and Algorithm (Section 2, Attachment 2), and Guidance for Location of Measure Elements (Section 2, Attachment 3).

## For Construction as eMeasures in the Electronic Health Record

There are significant transitions in medical documentation occurring in health care. Testing in the Chicago Pediatric Quality and Safety Consortium (CPQSC) institutions found great variability in documentation of ADHD care. While electronic medical record systems have been implemented generally, paper records are still used for documentation of some mental health diagnosis and treatment information. Of the five CPQSC participating sites, one site's electronic systems were sufficiently sophisticated to make construction of the ADHD Measure "Behavior Therapy as First Line Treatment" feasible in the EHR. One would be able to implement the measure as an eMeasure with minor workflow modifications. See eMeasure Data Element Table (DET) in the Supporting Documents (Section 2, Attachment 4). However to facilitate this method for measurement there are recommendations we would make based on the testing experience and results. See below.

### Administrative Claims Data Measure Construction

The 2011 AAP ADHD Guideline represents a shift in recommended ADHD diagnosis and follow-up care, therefore new fields and codes are needed to bill for the new recommended treatments. These fields and codes do not exist in current systems. These codes could then also be used to assess the delivery of the best quality of ADHD care for patients 4 through 5 years of age who are diagnosed with ADHD, according to the current best evidence.

# Section 3. 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).**

## 3.A. Evidence for General Importance of the Measure

**Provide evidence for all applicable aspects of general importance:**

- **Addresses a known or suspected quality gap and/or disparity in quality (e.g., addresses a socioeconomic disparity, a racial/ethnic disparity, a disparity for Children with Special Health Care Needs (CSHCN), a disparity for limited English proficient (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).**

### Prevalence

According to the statistics provided by the Centers for Disease Control and Prevention (Bloom, Cohen, Freedman, 2010), for children 4-17 years of age:

- Five million children (9 percent of this age group) have ADHD.
- The percentage of children with a parent-reported ADHD diagnosis increased by 22 percent between 2003 and 2007.
- Rates of ADHD diagnosis increased an average of 3 percent per year from 1997 to 2006 and an average of 5.5 percent per year from 2003 to 2007.

In a study by Visser, Bitsko, Danielson, and colleagues (2010), researchers found that in 2007, the estimated prevalence of parent reported ADHD (ever) among children aged 4-17 years was 9.5 percent, representing 5.4 million children. Of those with a history of ADHD, 78 percent (4.1 million, or 7.2 percent of all children aged 4-17 years) were reported to currently have the condition. Of those with current ADHD, nearly half (46.7 percent) had mild ADHD, with the remainder having moderate (39.5 percent) or severe (13.8 percent) ADHD.

A diagnosis of ADHD (ever) was more than twice as common among boys as girls (13.2 percent vs. 5.6 percent, respectively). High rates of ADHD (ever) were noted among multiracial children (14.2 percent) and children covered by Medicaid (13.6 percent). Nearly one in 10 children 4-17 years of age had been diagnosed with ADHD by 2007. The overall estimate for the prevalence of children with a history of ADHD diagnosis in 2007 was higher than a recent estimate (8.4 percent of children aged 6-17 years) based on annual data from the 2004-2006 National Health Interview Survey (NHIS). The NHIS report documented an average annual increase in diagnosed ADHD (ever) of 3 percent from 1997 to 2006; this present report documents a greater average annual increase (5.5 percent) over a slightly later period (2003-2007) (Visser, et al., 2010).

A study by Rowland, Umbach, Stallone, and colleagues (2002) estimated the prevalence of medication treatment for ADHD among elementary school children in a North Carolina county. Parents of 7,333 children in grades 1 through 5 in 17 public elementary schools were asked whether their child had ever been given a diagnosis of ADHD by a psychologist or physician and whether their child was currently taking medication to treat ADHD. Parents of 6,099 children (83 percent) responded. Observations from this study suggest that the prevalence of medication treatment for ADHD is higher among boys than among girls and higher among whites than among African Americans.

## Costs

ADHD diagnosis, follow-up, and treatment represent a significant share of the costs associated with health care and the health care provided to children. Using a prevalence rate of 5 percent, a conservative estimate of the annual societal cost of illness for ADHD in childhood and adolescence is $42.5 billion, with a range between $36 billion and $52.4 billion in 2005 dollars (Pelham, Fabiano, 2008).

## Morbidity

ADHD has a multidimensional effect on an individual's daily life functioning, and it can result in significant costs attributable to greater health care needs, more frequent unintentional injury, co-

occurring psychiatric conditions, and productivity losses. ADHD medications can reduce symptoms, but they also can be associated with side effects and symptoms effecting morbidity.

## New Eligible Diagnosis Age

A number of special circumstances support the recommendation to initiate ADHD treatment in preschool-aged children (ages 4-5 years), including the use of behavioral therapy exclusively as the first-line treatment.

## Evidence of Treatment Efficacy

Research has shown that a number of young children (4–5 years of age) experience improvements in symptoms with behavior therapy alone, and the overall evidence for behavior therapy in preschool-aged children is strong (American Academy of Pediatrics, 2011; Lee, Niew, Yang, et al, 2012; MTA Cooperative Group, 2004; Swanson, Elliott, Greenhill, et al., 2007).

There is limited information about the effects of using stimulant medication in children between the ages of 4 and 5 years. There are concerns about the possible effects of ADHD medications on growth during this rapid growth period of preschool-aged children (Swanson, et al., 2007).

## Translation of Best Evidence into Practice

It can take several years for the best evidence to move into practice. We hope that this measure will hasten the diffusion of the best practice for treatment of patients aged 4-5 years who are diagnosed with ADHD, both to encourage the most effective treatment of these pediatric patients, and to protect against the potential of significant adverse effects associated with early and unnecessary stimulant medication use in this young population. Such adverse effects have been described in the literature as pain, headaches, and sleep disturbance. The Multimodal Therapy of ADHD (MTA) study identified a more persistent effect of stimulants on decreasing growth velocity than have most previous studies, particularly when children were on higher and more consistently administered doses (Jensen, Arnold, Swanson, et al., 2007; MTA Cooperative, 2004; Swanson, Arnold, Kraemer, et al., 2008). The effects diminished by the third year of treatment, but no compensatory rebound effects were found. However, diminished growth was in the range of 1 to 2 cm.

An uncommon additional significant adverse effect of stimulant use is the occurrence of hallucinations and other psychotic symptoms (Mosholder, Gelperin, Hammad, et al., 2009). Concerns have also been raised about the rare occurrence of sudden cardiac death among children using stimulant medications. Sudden death in children on stimulant medication is extremely rare, and evidence is conflicting as to whether stimulant medications increase the risk of sudden death (Hamilton, Gray, Belanger, et al., 2009). Preschool-aged children may experience increased mood lability (mood swings) and dysphoria. For the nonstimulant atomoxetine, the adverse effects include initial somnolence and gastrointestinal tract symptoms, particularly if the dosage is increased too rapidly; a decrease in appetite; less commonly, an increase in suicidal thoughts; and rarely, hepatitis (Buitelaar, Wilens, Zhang, et al., 2009; Waxmonsky, Waschbusch, Pelham, et al., 2010). For the nonstimulant alpha-2–adrenergic agonists extended-release guanfacine and clonidine, adverse effects include somnolence and dry mouth (Biederman, Melmed, Patel., et al., 2008).

## Safety

In conclusion, many children aged 4-5 experience improvements in symptoms with behavior therapy alone. The overall evidence for behavior therapy in preschoolers is strong (Charach, Carson, Fox, et al., 2013). There are concerns about the effects of medication on growth, specifically brain growth and development, as well as other potential adverse effects that may be heightened for preschool-aged children (Poulton, Bui, Melzer, et al., 2016). There is limited information and experience about the effects of stimulant medication on children between the ages of 4 and 6 years.

## Potential for Quality Improvement

A study by Hoagwood, Kelleher, Feil, and colleagues (2000) examines knowledge on treatment services for children and adolescents with ADHD between 1989 and 1996. The researchers found that increases in stimulant prescriptions have taken place since 1989. In particular, prescriptions now represent three-fourths of all visits to physicians by children with ADHD. Research on the effects of stimulant medication on preschool-aged children is limited. Only one multisite study has carefully assessed medication use in preschool-aged children (Greenhill, Biederman, Boellner, et al., 2006). Given current data, only those preschool-aged children with moderate-to-severe dysfunctional ADHD should be considered for medication. Dextroamphetamine is the only medication approved by the FDA for use in children younger than 6 years of age. This approval, however, was based on less stringent criteria that were in force when the medication was approved rather than on empirical evidence of its safety and efficacy; there is insufficient evidence for its safety and efficacy in this age group at this time. There is moderate evidence that methylphenidate is safe and efficacious in preschool-aged children (Greenhill, et al., 2006); however, its use in this age group remains off-label.

This measure has significant potential for quality and safety improvement in the care of preschool-aged children with a diagnosis of ADHD.

## Known Gaps in Care

The ADHD Guideline (AAP, 2011) reviewed the current evidence on ADHD diagnosis and treatment and, based on the strength of this evidence, established a new threshold for diagnosis (children who might not have been diagnosed prior to the release of the Guideline) and a new standard of care for this population. As such, this measure represents a new standard for the quality of ADHD diagnosis and treatment of children 4-5 years of age diagnosed with ADHD. This measure could facilitate the translation of this new strong evidence into practice and prevent the potential for harms associated with treatments that are less effective or inappropriate and have significant potential for adverse effects. As taken from the 2011 AAP ADHD Guideline: “For preschool-aged children (4–5 years of age), the primary care clinician should prescribe evidence-based parent- and/or teacher-administered behavior therapy as the first line of treatment (quality of evidence: A/ strong recommendation) and may prescribe methylphenidate if the behavior interventions do not provide significant improvement and there is moderate-to severe continuing disturbance in the child’s function. In areas where evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an

early age against the harm of delaying diagnosis and treatment (quality of evidence: B/recommendation).

### Behavior Therapy

This represents a new measure based on a new recommendation. This new recommendation has not been incorporated into any measures.

## 3.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).**
- **Any other specific relevance to Medicaid/CHIP (please specify).**

In addition to the evidence of general importance described above, these measures also have specific features that are important to Medicaid and/or CHIP.

### Prevalence

In the United States, according to the statistics provided by CDC (2010) and several seminal studies, for children ages 4-17 years of age:

1. Over 6 million children (11 percent) have ADHD (Centers for Disease Control and Prevention, 2014).
2. When compared with children who have excellent or very good health, children who have fair or poor health status are almost four times as likely to have ADHD (8 percent vs. 22 percent) (Bloom, Jones, Freeman, 2013).
3. Parents report that approximately 9.5 percent or 5.4 million children 4-17 years of age have ever been diagnosed with ADHD, as of 2007 (Visser, et al., 2010).
4. The percentage of children with a parent-reported ADHD diagnosis increased by 22 percent between 2003 and 2007.
5. Rates of ADHD diagnosis increased at a greater rate among older teens as compared to younger children (CDC, 2011).
6. The highest rates of parent-reported ADHD diagnosis were noted among children covered by Medicaid and minority (race/ethnicity) children.
7. As of 2007, parents of 2.7 million youth ages 4-17 years (66.3 percent of those with a current diagnosis) report that their child was receiving medication treatment for the disorder (CDC, 2011).

8. Rates of medication treatment for ADHD varied by age and sex; children aged 11-17 years of age were more likely than those 4-10 years of age to take medication, and boys were 2.8 timesas likely as girls to take medication (CDC, 2011).
9. In 2003, geographic variability in the prevalence of medication treatment ranged from a low of 2.1 percent in California to a high of 6.5 percent in Arkansas (CDC, 2005).
10. Additionally, in a study by Visser and colleagues (2010), high rates of ADHD were noted among racial and ethnic minority children (14.2 percent) and children covered by Medicaid (13.6 percent).
11. The data from a national sample of children with special health care needs, ages 4-17 years, collected in 2009-2010 showed that most children with ADHD received either medication treatment or behavior therapy. However, many were not receiving treatment as described in the 2011 best practice guideline (CDC, 2014).

### Appropriateness of Treatment

Research has shown that a number of young children (4-5 years of age) experience improvements in symptoms with behavior therapy alone (AAP, 2011; Charach, et al., 2013). Moreover, there are concerns about the possible side effects of ADHD medication on brain growth and development during this rapid growth period of preschool-aged children. Behavior therapy programs for this age group typically run in the form of group parent training programs; however, these programs are not always compensated by health insurance.

### Relevance to the Early and Periodic Screening, Diagnostic, and Treatment Benefit

The Centers for Medicare & Medicaid Services (CMS) has stressed the importance of the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit in relation to these measures (Medicaid EPSDT Web site). When screening for ADHD, it is expected that that there will be a comprehensive health and developmental history obtained, as well as laboratory tests when indicated. When a further evaluation is indicated, diagnostic services must be provided. Necessary referrals to behavioral or medical treatment should be made without delay, and follow-up should occur to ensure the enrollee receives a complete diagnostic evaluation. Quality assurance procedures also must be in place to assure that comprehensive care is provided. In keeping with the EPSDT benefit expectations, when ADHD is diagnosed or any similar condition using screening and diagnostics, necessary health care services must be made available for treatment. It is not sufficient to simply screen and diagnose ADHD.

### Specific Relevance to Medicaid/CHIP or to Populations Overrepresented in Medicaid or CHIP

According to a report to Congress on Medicaid and CHIP, children enrolled in Medicaid or CHIP are more likely than privately insured or uninsured children to be in fair or poor health and to have certain impairments and health conditions (e.g., ADHD/ADD, etc.) (Medicaid and CHIP Payment and Access Commission [MACPAC], 2014). According to the survey data, the prevalence of ADHD/ADD among Medicaid/CHIP-enrolled children is high but varied: 43.2 percent for children receiving Supplemental Security Income (SSI), 40.3 percent for non-SSI CSHCN, and 2.0 percent for children who are neither SSI nor CSHCN (MACPAC, 2012).

ADHD is significant in the population of Medicaid/CHIP-enrolled children and youth with special health care needs (CYSHCN).

## 3.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).**

This ADHD Measure #2 (Behavior Therapy for Preschool-aged Children) is an entirely new measure.

The 2011, AAP ADHD Guideline reviewed the current evidence on ADHD diagnosis and treatment and, based on the strength of this evidence established a new threshold for diagnosis, including children aged 4 through 5 years of age (children who might not have been diagnosed prior to the release of the Guideline) and a new standard of care for this population age group. As such, this is an entirely new measure topic that represents critical components of a new standard for the quality of ADHD diagnosis and treatment for the group of children 4-5 years of age diagnosed with ADHD. This measure could facilitate the translation of this new strong evidence into practice and prevent the potential for harms from inappropriate prescribing of medication with significant potential for adverse effects.

# Section 4. Measure Categories

**CHIPRA legislation 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, 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.**

**Does the measure address this category?**

a. **Care Setting – ambulatory:** Yes.
b. **Care Setting – inpatient:** Yes.
c. **Care Setting – other – please specify:** Yes; other community and public health settings.
d. **Service – preventive health, including services to promote healthy birth:** No.
e. **Service – care for acute conditions:** No.
f. **Service – care for children with acute conditions:** Yes.
g. **Service – other (please specify):** No.
h. **Measure Topic – duration of enrollment:** No.

i. **Measure Topic – clinical quality:** Yes.
j. **Measure Topic – patient safety:** Yes.
k. **Measure Topic – family experience with care:** No.
l. **Measure Topic – care in the most integrated setting:** No.
m. **Measure Topic other (please specify):** No.
n. **Population – pregnant women:** No.
o. **Population – neonates (28 days after birth) (specify age range):** No.
p. **Population – infants (29 days to 1 year) (specify age range):** No.
q. **Population – pre-school age children (1 year through 5 years) (specify age range):** Yes; 4-5 years.
r. **Population – school-aged children (6 years through 10 years) (specify age range):** Yes; 6-10 years.
s. **Population – adolescents (11 years through 20 years) (specify age range):** Yes; 11-18 years.
t. **Population – other (specify age range):** No.
u. **Other category (please specify):** Not applicable.

# Section 5. 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.**

## 5.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.**

In November 2011, AAP published a new evidence based guideline for ADHD diagnosis, follow-up, and treatment based on an extensive review of the existing evidence. In the 2011 AAP ADHD Guideline, there are several recommendations with high levels of evidence that represent a new standard of care for children with ADHD. One of these recommendations with strong levels of evidence (**"A" level of evidence**) is as follows:

**Action Statement 5a**: For preschool-aged children (4–5 years of age), the primary care clinician should prescribe evidence-based parent and/ or teacher-administered behavior therapy as the first line of treatment (quality of evidence A/strong recommendation) and may prescribe methylphenidate if the behavior interventions do not provide significant improvement and there is moderate-to-severe continuing disturbance in the child's function. In areas in which evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment (quality of evidence B/recommendation)

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The evidence base for this statement can be found in the AAP ADHD Guideline Evidence (See Supporting Documents, Section 5, Attachment 1). The following attachments were prepared or consulted to describe the evidence base influencing the development of this measure:

**AAP ADHD Guideline Evidence** (see Supporting Documents, Section 5, Attachment 1) - This document is an excerpt from the 2011 American Academy of Pediatrics (AAP) ADHD Guideline, which highlights the evidence base used for the AAP's recommendation of Action Statement 5a.

**ADHD Gaps in Care** (see Supporting Documents, Section 5, Attachment 2) - This document, prepared by our ADHD Quality Measures Leadership Team, highlights the gaps in care. It was developed by consulting relevant literature, and it was used to inform measure topics and measure development.

**Existing ADHD Measures** (see Supporting Documents, Section 5, Attachment 3) - This document, prepared by our ADHD Quality Measures Leadership Team, highlights the ADHD measures that were in existence prior to our development work. This was prepared by consulting national quality standards databases, and the document was used to inform measure topics and measure development. This document demonstrates the measurement gap, given the new recommendation for treatment with behavior therapy as a first-line treatment for patients 4-5 years of age who are diagnosed with ADHD.

**ADHD Guidelines Review** (see Supporting Documents, Section 5, Attachment 4) - This document, prepared by our ADHD Quality Measures Leadership Team, describes the current guidelines, their aspect of care, the recommendations, and the evidence ranking or rating.

**ADHD Measures Worksheet** (see Supporting Documents, Section 2, Attachment 1) - This document, prepared by our ADHD Quality Measures Leadership Team, describes the prevalence, morbidity, costs, medication use, disparities, and opportunities for improvement of ADHD care.

**AAP ADHD Guideline** (see Supporting Documents, Section 5, Attachment 5) - This document, published in November 2011 by the American Academy of Pediatrics, provided a new threshold for diagnosis of ADHD and a new standard of care for ADHD diagnosis, follow-up, and treatment. The Guideline represented a new standard of care in many dimensions including: accurate diagnosis with a validated tool, eligible age for diagnosis, behavior therapy as first-line treatment, and timing for follow-up.

## 5.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.**

Safety concerns for patients 4-5 years of age who are diagnosed with ADHD include:

It can take several years for the best evidence to move into practice. We hope that this measure will hasten the diffusion of the best practice for treatment of patients 4-5 years old who are diagnosed with ADHD; both to (1) encourage the best and most effective treatment of these pediatric patients and (2) protect against the potential of significant harms from adverse effects associated with early and unnecessary stimulant medication use in this young population.

The literature identified the most common stimulant adverse effects to be appetite loss, abdominal pain, headaches, and sleep disturbance. The Multimodal Therapy of ADHD (MTA) study identified a more persistent effect of stimulants on decreasing growth velocity than have most previous studies, particularly when children were on higher and more consistently administered doses. The effects diminished by the third year of treatment, but no compensatory rebound effects were found. However, diminished growth was in the range of 1 to 2 cm (MTA Cooperative Group, 2004; Murray, Arnold, Swanson, et al., 2008; Swanson, Arnold, Kraemer, et al., 2008).

An uncommon additional significant adverse effect of stimulants is the occurrence of hallucinations and other psychotic symptoms (Mosholder, et al., 2009). Concerns have also been raised about the rare occurrence of sudden cardiac death among children using stimulant medications. Sudden death in children on stimulant medication is extremely rare, and evidence is conflicting as to whether stimulant medications increase the risk of sudden death (Hamilton, et al., 2009). Preschool-aged children may experience increased mood lability and dysphoria. For the nonstimulant atomoxetine, the adverse effects include initial somnolence and gastrointestinal tract symptoms, particularly if dosage is increased too rapidly; a decrease in appetite; less commonly, an increase in suicidal thoughts; and rarely, hepatitis (Buitelaar, 2009; Waxmonsky, et al., 2010). For the nonstimulant alpha-2–adrenergic agonists extended-release guanfacine and clonidine, adverse effects include somnolence and dry mouth (Biederman, et al., 2008; Kollins, Jain, Brams, et al., 2011).

In conclusion, many children aged 4-5 experience improvements in symptoms with behavior therapy alone, and the overall evidence for behavior therapy in preschoolers is strong (AAP, 2011; Charach, et al., 2013).

# Section 6. 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.**

## 6.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.**

### Manual Chart Abstraction of the Measures

#### Testing Sites

The testing sites for this measure were the hospitals of the Chicago Pediatric Quality and Safety Consortium (CPQSC). These hospitals include Mount Sinai Children's Hospital, John H. Stroger Hospital of Cook County, Advocate Lutheran General Hospital/ Lutheran General Children's Hospital, Advocate Christ Medical Center/Hope Children's Hospital, and Anne and Robert H. Lurie Children's Hospital. Each site will participate in the testing of the ADHD Measures: Accurate ADHD Diagnosis and ADHD Measure: Behavior Therapy as First-line Treatment for patients 4-5 years of age who are diagnosed with ADHD (Behavior Therapy as First-line Treatment).

#### Methods

Each site identified two research nurses, who are experienced in chart abstraction. The research nurses were provided specific training on how to identify, select, and stratify by age group patient charts for inclusion to test reliability of the construction of this measure through manual chart abstraction and to assess clinical performance on the measure. A chart abstraction tool and algorithm were developed by the ADHD Quality Measures Leadership Team.

Training was delivered, and relevant training materials were provided. This tool (see Supporting Documents, Section 6, Attachment 1) was used at each site to complete the manual chart abstractions. At each site, two research nurses, were instructed to identify a retrospective set of 25-40 charts for the period December 2011 – June 2012 that matched the denominator criteria, while taking into account any exclusions that existed. For this measure, chart abstractors abstracted the relevant elements from the charts regarding demographics, numerator elements, and denominator elements, and they noted any pertaining exclusions according to the developed algorithm.

To complete the manual chart abstraction, the following algorithm was followed:

1. Select charts: Patients diagnosed with ADHD.
2. Stratify and select by age groups 4-5, 6-10, 10-14, 15-18.
3. Review criteria for inclusion: Age, date of diagnosis.
4. Collect demographics and elements for equity assessment: Gender race/ethnicity, language preference, insurance status/type, age.

5. Review charts for patients age 4-5 for both measures: Accuracy of ADHD Diagnosis and Behavior Therapy as First-line Treatment.
6. Review and document measure elements in the ADHD Measures Chart Abstraction Tool.
7. Record summary of measure elements.
8. Review for documentation that there is a medical reason to explain why behavior therapy should not be the first-line treatment. If yes, exclude the chart for the ADHD measure – Behavior Therapy as First-line Treatment.
9. Note relevant comments.

### Analysis

Data analyses included construction of the measure and assessment of the agreement. The intent of data analysis is to (1) test the ability to construct the ADHD measure –"Behavior Therapy as First-line Treatment" and (2) to determine the reliability of the construction of the measure to provide a basis for using it as a measure of performance for public reporting and for use in quality improvement. The results of this project will be reported as a summary of findings, aggregating the information found in the records from all sites, without any reference to any individual practice, patient, or patient level information.

### Results

Of the 58 charts initially selected across two sites, 11 charts were selected for this age group. When the charts were abstracted, eight charts actually met the age criteria for the measure. All of the elements necessary for the assessment of the ADHD measure "Behavior Therapy as First-line Treatment" were determined to be available for abstraction. Reliability of the abstracted elements was good (see Table 1). This measure is reproducible for manual chart abstraction under the conditions set forth.

**Table 1. Agreement with the ADHD Measure; Behavior Therapy as First-Line Treatment**

| | Number | Agree (percent) |
|---|---|---|
| ADHD-focused evidence-based behavior therapy prescribed (Yes-1/No 2) | 8 | 72.73 |
| ADHD treatment medication prescribed (Yes-1/No-2) | 8 | 72.73 |
| For patients aged 4-5, behavior therapy was prescribed as first-line treatment prior to medication prescription (Yes-1/No-2) | 8 | 75.00 |

## 6.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., R2 for concurrent validity).***

The measure was assessed for content validity by looking for agreement among subject matter experts, specifically by the panel of stakeholder representatives participating in the ADHD Expert Workgroup during the development process (see Supporting Documents, Appendix A, Section 2, Attachment 1). This subject matter expert panel comprised 25 members, with representation from pediatricians, pediatric neurologists, social workers, school psychologists, family physicians, school-based learning disability specialists, teachers, parents, consumer representatives, child and adolescent psychologists, occupational therapists, clinical psychologists, pediatric nurses, and measure methodologists.

Additionally, input on the content validity of draft measures was obtained through a 21-day public comment period convened by the AMA-PCPI. All comments received were reviewed by the expert workgroup, and the measures were adjusted as needed (see Supporting Documents, Section 6, Attachment 2).

The following questions were considered during the content validity assessment of this measure.

**1. How strong is the scientific evidence supporting the validity of this measure as a quality measure?**

As the AAP describes in the 2011 ADHD Guideline, the level of evidence is very strong. A multilevel, systematic approach was taken to identify the literature that built the evidence base for both diagnosis and treatment. To increase the likelihood that relevant articles were included in the final evidence base, the reviewers first conducted a scoping review of the literature by systematically searching literature using relevant key words, after which they summarized the primary findings of articles that met standard inclusion criteria. The reviewers then created evidence tables that were reviewed by content area experts who were best able to identify articles that might have been missed through the scoping review. Articles that were missed were reviewed carefully to determine where the abstraction methodology failed, and adjustments to the search strategy were made as required (AAP, 2011). Finally, although published literature reviews did not contribute directly to the evidence base, the articles included in review articles were cross-referenced with the final evidence tables to ensure that all relevant articles were included in the final evidence tables. For the scoping review, articles were abstracted in a stratified fashion from three article-retrieval systems that provided access to articles in the domains of medicine, psychology, and education: PubMed (www.ncbi.nlm.nih.gov/sites/entrez), PsycINFO (www.apa.org/pubs/databases/psycinfo/index.aspx), and ERIC (www.eric.ed.gov). English language, peer-reviewed articles published between 1998 and 2009 were queried in the three search engines. Key words were selected with the intent of including all possible articles that might have been relevant to one or more of the questions of interest. The articles included in relevant review articles were revisited to ensure their inclusion in the final evidence base. The evidence tables were then presented to the committee for expert review. The DSM-IV system is used by professionals in psychiatry, psychology, health care systems, and primary care. Use of DSM-IV criteria, in addition to having the best evidence to date for criteria for ADHD, also affords the best method for communication across clinicians and is established with third-party payers. The criteria are under review for the development of the DSM-V, but these changes will

not be available until at least 1 year after the publication of this 2011 AAP ADHD guideline. The diagnostic criteria have not changed since the previous ADHD guidelines published in 2000 and 2001. An anticipated change in the DSM-V is increasing the age limit for first presentation of ADHD from 7 to 12 years (AAP 2011 ADHD Guideline).

**2. Are all individuals in the denominator equally eligible for inclusion in the numerator?**
Yes, except for those in the exclusion categories—that is, those who have documentation of medical reasons for not prescribing behavior therapy as first-line treatment (e.g., patient with multiple psychiatric conditions referred to other provider) and documentation of system reasons for not prescribing behavior therapy as first-line treatment.

**3. Are those providers being examined in control of the result being measured?**
Yes, the measure assesses that a clinician prescribes behavior therapy for patients 4-5 years of age who are diagnosed with ADHD as first-line treatment (prior to prescription of medication therapy) instead of specifying the measure to read "receiving behavior therapy" according to the recommendations of the ADHD pediatric measures Expert Workgroup to ensure that the result of the measure requirement (that behavior therapy is prescribed as first-line therapy for patients 4-5 years of age who are diagnosed with ADHD) is in the control of the clinician being assessed.

**4. How well do the measure specifications capture the event that is the subject of the measure?**
The measure, as specified, assesses directly the 2011 AAP ADHD Guideline recommendation 5.a., which is based on the strongest level of evidence. The Guideline recommendation: "For preschool-aged children (4 through 5 years of age), the primary care clinician should prescribe evidence-based parent- and/or teacher-administered behavior therapy as the first line of treatment (Quality of Evidence: A/Strong Recommendation) and may prescribe treatment with methylphenidate if behavior interventions have not provided adequate improvement and there is moderate to severe continuing disturbance in the child's function. In areas where evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment (Quality of Evidence: B/Recommendations. For patients aged 4 through 5 years of age who are diagnosed with ADHD, behavior therapy should be offered prior to medication treatment. However, the measure includes a denominator exclusion for patients who have medical issues or other significant comorbidities that may be important to address prior to ADHD treatment.

**5. Does the measure provide for fair comparisons of the performance of providers, facilities, health plans, or geographic areas?**
While there is now strong evidence for this treatment option for this age group of children who have been diagnosed with ADHD (AAP, 2011), behavior therapy for this age group is not currently broadly available in all health care markets and is not covered by all health plans. The 2011 ADHD Guideline states, "In areas where evidence-based behavioral treatments are not available, the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment (Quality of Evidence: B/Recommendation)." Because of these limitations, the measure includes a denominator exclusion for system reasons, such as the documented lack of availability of behavior therapy as an option.

**6. Does the measure allow for adjustment of the measure, excluding patients with rare performance-related characteristics when appropriate?**
Yes, the measure specifies denominator exclusions from the measure requirements for medical reasons for pediatric patients 4 through 5 years of age who are diagnosed with ADHD who may present with extreme severity or other significant comorbid conditions that may take precedent or for which special considerations should be made.

# Section 7. 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.**

## 7.A. Race/Ethnicity

The PMCoE ADHD Leadership Team was focused from the beginning of our work on including specified elements to assess equity/disparities, particularly race/ethnicity, socioeconomic status, and language. This focus included understanding and implementing within any measures to be developed, effective methods for assessing the equity/disparities in measures of ADHD diagnosis, follow-up, and treatment. Attention to equity/disparities assessment was incorporated into each stage of the measure development and testing process.

ADHD is the most common neurobehavioral disorder of childhood, and it often persists into adulthood. A 2003 CDC survey found an estimated 7.8 percent of children aged 4-17 years had ever been diagnosed with ADHD (Visser, Lesesne, Perou, 2007). Health practitioners should be aware of changes in the geographic and demographic patterns of ADHD in the United States, and that an estimated 1 million more children were reported with ADHD in 2007 than in 2003 (Visser, et al., 2007). Of note is the increase in diagnosis of 53 percent of Hispanic children during 2003-2007 and the 43.2 percent increase in the same group during the 2012-2014 period (CDC, 2014). Gaps in care are known to exist among racial and ethnic groups, and children living in socioeconomically disadvantaged neighborhoods are less likely to obtain a diagnosis of ADHD. Despite a diagnosis of ADHD, black and Hispanic children are less likely to be prescribed a stimulant drug. Additionally, children with private insurance are more likely to obtain a prescription for a stimulant drug, while children with no insurance or public insurance are less likely to be prescribed a stimulant. For this reason, it is important to have measures that allow us to monitor and ultimately address disparities, as well as changes in diagnosis and treatment.

### Measure Development and Specification

Generally race/ethnicity assessment is addressed following the development of a particular measure of health care quality. The PMCoE ADHD leadership team aimed to incorporate

specification of elements to assess equity/disparities for race/ethnicity within the measure development and specification phase. Three levels of race/ethnicity measure specification have been established:

OMB: The Office of Management and Budget utilizes broad racial and ethnic categories in government data. These five categories include: black, white, Asian, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander. Ethnicity is defined as Hispanic or non-Hispanic.

Institute of Medicine (IOM): The IOM recommends using the OMB broad categories of race and ethnicity, as well as more finely-tuned categories of ethnicity and language need (IOM, 2009).

Affordable Care Act (ACA): The Patient Protection and Affordable Care Act utilizes data standards for race and ethnicity built on the OMB standard, adding the type of granularity for Asian and Latino populations that is used in the American Community Survey (ACS) and that was used in the 2000 and 2010 Decennial Census.

Based on assessment of the testing sites, we included the OMB/ACA race/ethnicity requirements in the assessment specification of the measures.

## Testing

The testing sites for this measure included the network of care systems called the Chicago Pediatric Quality and Safety Consortium (CPQSC). The sites were assessed for the methods used for documentation of racial and ethnic categories, language preference, and type of insurance.

It was determined that all of the testing sites adhere to the OMB standards for data collection of race/ethnicity data. These standards define race and ethnicity quite broadly to constitute four distinct categories: American Indian or Alaskan Native, Asian or Pacific Islander, black, and white. Ethnicity is recorded as Hispanic or non-Hispanic. The ACA recommended collection of race/ethnicity data for the assessment of disparities, and it recommended use of the race/ethnicity data collection standards established by the OMB. It is important to note that the IOM expands the OMB standards as more finely-tuned categories of racial and ethnic data, including factors of national origin, such as Cuban or Mexican rather than the broad category of Hispanic. Additionally, the distinctions of national origin such as Chinese or Vietnamese, rather than the broad category of Asian, may make it possible to reveal disparities in care and differential outcomes or perhaps cultural barriers to health care and access to timely diagnosis of illness. The IOM standard provides more detailed data and analysis so that interventions may occur that are specific to distinct populations. However, it has the disadvantage of small sample sizes within certain populations.

All of the testing sites complied with the OMB standard. For those institutions and practices within the CPQSC that used electronic medical records for the assessed clinical settings related to ADHD, each included queriable fields in their EHRs to capture the measure elements in order to stratify the measure by OMB designated sub-populations. Stratified measures can be used internally or more broadly by the medical community to target interventions more specifically to

particular sub-populations of patients and families to improve the equity of ADHD diagnosis, follow-up, and treatment.

## 7.B. Special Health Care Needs

According to the 2011 AAP ADHD Guidelines, ADHD is to be considered a chronic condition, and as such, it merits the inclusion of youth with this diagnosis as children and youth with special health care needs (CYSHCN). Especially important to CYSHCN is the establishment and regular care from a provider that constitutes their medical home. No other consideration was incorporated into the measure.

## 7.C. Socioeconomic Status

Insurance status and type were incorporated into the measure specification as a proxy for socioeconomic status (SES). This will enable stratification of this measure by insurance status and type which will also provide stratified information about the SES of ADHD patients and families. Children of different SES categories make up a diverse population of individuals with care needs that vary in complexity. The elements specified to assess SES and insurance status and type include: Private Insurance, Medicaid/CHIP, Uninsured.

## 7.D. Rurality/Urbanicity

While most children live in urban metropolitan areas, the care context for children in rural environments can differ significantly, and substantial variations in care can exist particularly for mental health disorders. This topic was considered in discussions among members of the ADHD Expert Workgroup, and the challenge of available clinical resources was discussed. Additionally, the availability of resources to provide training and education to child care providers living in rural areas was considered as well. Such measures as distance to the behavior therapy site and verification of the completion of specified therapeutic visits were not incorporated into this measure. The preschool-aged children's measurement does provide a solid quality measurement and does lay the foundation for future expansion. As initial testing was to take place in urban/suburban care contexts, this measure was not initially specified to stratify results across different levels of rurality/urbanity. This consideration of rurality/urbanity can be further addressed in future testing.

## 7.E. Limited English Proficiency (LEP) Populations

### Measure Development and Specification

This ADHD Measure specifying “Behavior Therapy as First-Line Treatment” for patients aged 4 through 5 years old who are diagnosed with ADHD was developed to include elements related to language preference according to the IOM standard categories of proficiency of spoken English, which was done to enable stratification of the measure by language preference. Such elements were included during the measure development. The IOM recommendation: assess language need – hierarchy:

- What is the patient’s English proficiency?
- What is the patient’s preferred language when communicating with his/her health care

- provider?
- What is the patient's preferred language for receiving written materials?
- What language does the patient speak at home?

### Testing

Testing at each of the participating sites in the CPQSC was conducted to determine the methods, capacity, and current status related to collecting information on the assessment of English language proficiency at each of the sites. The following items were specifically assessed:

- How are you collecting this data?
- When are these data being collected (upon admission?)
- What style are you using to collect this information?
- Is all of this information recorded, and recorded in OMB-style?
- Where is the most reliable place to obtain these data?
- Do you have a field for this?
- Is it possible to get the information we want from it?

# Section 8. 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. Using the following sections, explain the methods used to determine the feasibility of implementing the measure.**

## 8.A. Data Availability

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

The CPQSC, a network of sites with larger pediatric services in the Chicago metropolitan area, was the setting to test the feasibility and reliability of the manual chart abstraction and eMeasure construction for the ADHD Measure – Behavior Therapy as First-Line ADHD Treatment for Preschool-Aged Children.

### 1. Manual Chart Abstraction

Manual chart abstraction of this measure using either paper or electronic medical records is feasible and reliable. All of the elements for construction of this measure were present and able to be reliably abstracted through manual chart abstraction of paper or electronic medical records. New elements based on the 2011, American Academy of Pediatrics (AAP) ADHD Guideline recommendations for a new standard of care of such as Behavior Therapy as First-line Treatment for pediatric patients 4 through 5 years of age with a diagnosis of ADHD could be documented

in the charts in queriable fields or could be indicated in the notes sections of charts, whether paper or electronic. Location and context for documentation varied across sites.

## 2. Electronic Health Records

Assessment of the feasibility of construction of the ADHD measure – "Behavior Therapy as Firstline Treatment" as an eMeasure in the EHR was conducted using the AMA-PCPI methodology. A Data Element Table (DET) tool was developed by the PCPI testing team. The DET was based on the measure elements and specifications in an Excel spreadsheet designed to capture information that will determine whether or not a site can feasibly collect the data electronically for the measure. It is structured to collect metadata about each data element necessary to construct each measure stored in the EHR. It will also collect information related to the integrity and validity of an element's data collection. Specifically, the DET is designed to capture the following information:

**Data element information:** Whether or not the data element is captured in the EHR, the data source application, primary user interface data location, data type, coding system, unit of measure, frequency of collection, and calculability within the measure context.

**Measure integrity information:** An assessment by the testing site as to what degree the measure, as specified, retains the originally stated intention of the measure.

**Measure validity information:** An assessment by the testing site as to what degree the scores obtained from the measure, as specified, will accurately differentiate quality performance across providers.

The responses collected by the DETs were used to assess technical and implementation feasibility for each measure. The responses were captured in the form of a rating using the following responses:

- "Feasible. Can do today."
- "Feasible with workflow modification/changes to EHR."
- "Non-feasible. Unable to do today."

This information was entered from drop-down options pertaining to the specific criteria and in free text fields for questions related to specific workflow and EHR configurations. The free text fields and specific narrative questions provide qualitative feedback from the sites, which can be factored into the overall feasibility grade for the measure.

The DET is completed by staff at each testing site. After the sites complete the DET, a determination can be made as to which of the measures are feasible for eMeasure construction at each site. For some sites, all of the measures in the Maternity Care Performance Measurement Set may be collected, for others it may be only a few. Once the completed DETs were submitted by the test sites, the ADHD Quality Measures Leadership Team, in conjunction with the AMA-PCPI Team, conducted quality assurance of the DETs to ensure the data were complete and ready for analysis. A series of analyses were subsequently performed in order to characterize the feasibility, integrity, and face validity of the measures being tested.

Feasibility testing was conducted at four sites within the CPQSC. Two test sites reported that their EHR can capture all data elements through code, text, or Boolean format. A third test site reported that all but one data element can be found in their EHR and could easily beaddressed with workflow changes. See Table 2.

**Table 2. eMeasure Feasibility Testing Results**

| Institution | Electronic Health Record System | Feasible for Implementation | Elements Missing |
|---|---|---|---|
| John H. Stroger Jr. Hospital of Cook County | Cerner | No | Prescription for behavior therapy, active and inactive medications, exclusion criteria elements |
| Advocate Lutheran General Hospital | Cerner | Yes | Not applicable |
| Advocate Christ Hope | Paper records for mental health documentation | No | Paper records are used for mental health documentation |
| Ann & Robert H. Lurie Children's Hospital | EPIC | Yes, with workflow modifications | Prescription for behavior therapy, initial diagnosis date, exclusion criteria elements |
| Mt. Sinai | Paper records for mental health documentation | No | Paper records are used for mental health documentation |

## Measure Technical Feasibility and Implementation Feasibility

The CPQSC sites also used the scale below to assess measure implementation feasibility. Implementation feasibility represents the site's ability to implement the measure using current workflows and EHRs and addresses issues of projected data reliability, related to the consistency with which providers document and capture the data elements needed to implement the measure.

- "Feasible. Can do today."
- "Feasible with workflow mod/changes to EHR."
- "Nonfeasible. Unable to do today."

The technical feasibility and implementation feasibility were rated the same for each of the measures. For example, if the technical feasibility of a measure was rated as "Feasible. Can do today," its implementation feasibility was also rated as "Feasible. Can do today."

One of the five sites that evaluated the technical and implementation feasibility for this measure selected the highest rating of "Feasible. Can do today." At a second site, one of the elements was not available, but only minimal changes would be required, and they are able to calculate the measure with their current technical configuration.

Empirical testing of the feasibility of eMeasure implementation of the ADHD measure of Behavior Therapy as First-Line Treatment determined that it is possible to construct this measure as an eMeasure in some settings.

### 3. Administrative Claims Data

The data elements for this measure do not exist at this time. Currently, there is no ability to distinguish between evidence-based treatment and non-evidenced-based treatment. Recommendations include designation of a distinct code to differentiate treatment.

**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?**

### 1. Manual Chart Abstraction

While all of the elements for construction of this measure in paper records or EHRs were available, and the measure construction was feasible and reliable, there are improvements that could facilitate collection and reporting of this measure through the availability of specific fields or workflow documents to indicate the specific elements, such as the documentation of the prescription of Behavior Therapy.

### 2. EHR System Requirements and Codes

The data elements for eMeasure construction of this measure are currently available. Workflow changes, such as an ADHD Follow-up and Treatment Workflow Document, would assist clinicians in reliably documenting in queriable fields all of the necessary elements according to the current standard of care based on the 2011 AAP ADHD Guideline recommendations and for construction of eMeasure metrics to assess the quality of ADHD care. For this ADHD measure, "Behavior Therapy as First-line Treatment of patients 4-5 diagnosed with ADHD," the addition of fields to the EHR and coding systems to indicate prescription of behavior therapy and fields and codes for exclusions for medical reasons or system reasons would facilitate more broadly the reliable construction of this measure as an eMeasure.

### 3. Administrative Claims Data Codes Requirements and Recommendations

A specific billing code for the relatively new evidence-based recommended treatment is needed to bill for ADHD evidence-based behavior therapy as a therapeutic treatment for pediatric patients with a diagnosis of ADHD. This could then be used as an administrative claims code to improve the performance of this measure construction through the use of administrative claims data to differentiate treatment, so that it will be obvious to the reviewer that behavior therapy was prescribed. However, construction of this measure through manual chart abstraction and construction in the EHR are likely to continue to be superior methods for calculation and use of this measure.

## 8.B. Lessons from Use of the Measure

**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.**

Measures in the EHR, manual chart abstraction, and administrative claims data are not currently in use at this time.

**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?**

The measure is not in use and has not been used.

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

The measure is not in use and has not been used.

## Section 9. 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 the 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.**

***Level of aggregation (Unit) for reporting on the quality of care for children covered by Medicaid/ CHIP†:***

***State level* Can compare States***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Abstraction from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Other geographic level: Can compare other geographic regions (e.g., MSA, HRR)***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Medicaid or CHIP Payment model: Can compare payment models (e.g., managed care, primary care case management, FFS, and other models)***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Health plan*: Can compare quality of care among health plans.***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Provider Level***
***Individual practitioner: Can compare individual health care professionals***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Provider Level***
***Hospital: Can compare hospitals***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

***Provider Level***
***Practice, group, or facility:** Can compare: (i) practice sites; (ii) medical or other professional groups; or (iii) integrated or other delivery networks***

***Intended use:*** **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes.

***Data Sources:*** **Are data sources available to support reporting at this level?**
Data abstracted from EHRs.

***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?**
Unknown.

***In Use:*** **Have measure results been reported at this level previously?**
No.

***Reliability & Validity:*** **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No.

***Unintended consequences:*** **What are the potential unintended consequences of reporting at this level of aggregation?**
Unknown.

# Section 10. 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).**

### For Public Reporting

This measure can be used to provide transparency concerning comparative best evidence-based practice to assess the evidence-based appropriate prescription of Behavior Therapy as first line treatment, prior to medication therapy, for families of patients aged 4-5 years of age diagnosed with ADHD. This measure is meant to be used to calculate performance and/or reporting at the practice, institution, health plan, State, regional, and national levels.

### For Performance Improvement

Performance measurement serves as an important component in a quality improvement strategy. This measure can be used appropriately for performance measurement directed at improving ADHD treatment for patients 4 through 18 years of age to ensure prescription of Behavior Therapy as first-line treatment for this young population prior to prescription of medication therapy. These measures can provide critical information for improvement, as they are linked directly to the specific treatment decisions, processes, and operational steps that clinicians can apply in practice to improve care.

# Section 11. 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 measure calculation.**

## 11.A. Health IT Enhancement

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

The adoption of Electronic Health Records (EHRs) has enabled the standardization of documentation of clinical information. The 2011 AAP ADHD Guideline established diagnostic, follow-up, and treatment recommendations that represent a new standard of care for pediatric patients diagnosed with ADHD. Measures that reflect these diagnostic, follow-up, and treatment standards have been developed through broad stakeholder involvement in an Expert Workgroup. Adoption of these new measures and incorporation of workflow documents within the EHR to enable the documentation of the critical elements of the new standard of care represented in the 2011 AAP ADHD Guideline can facilitate and support the diffusion of current best evidence for diagnosis and care for pediatric patients.

If these elements are represented through new workflow documents, they could be constructed regularly in the EHR to provide consistent feedback to clinics, practices, and institutions about their performance relative to their own previous practice for improvement and relative to best practices in the field and for public reporting.

## 11.B. Health IT Testing

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

Yes.

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

While this measure was not fully tested as part of an EHR, it was tested to determine initial feasibility and guidance for implementation using EHR data sources. The testing was completed within the Chicago Pediatric Quality and Safety Consortium (CPQSC), a testing network that comprises Chicago-area hospitals with pediatric services seeking to understand and improve the quality and safety of pediatric medical care. Member hospitals include John H. Stroger Jr. Hospital of Cook County, Advocate Christ Hope Children's Hospital, Advocate Lutheran General Hospital, Ann & Robert H. Lurie Children's Hospital, and Mount Sinai Children's Hospital. The network's unique characteristics include its heterogeneous settings of urban and suburban environments, the diversity of the populations served, and the broad diversity of both patients and providers. The systems tested included Cerner and EPIC. Sites tested the feasibility of implementing the ADHD measures to help determine the necessary workflow and documentation practices to assure uniform data collection and identify best practices in data collection.

Of the five sites, three were able to test the feasiblity of implementing this measure as an eMeasure in the EHR. The results of the testing included two of the three hospitals reporting that the measure was feasible, and they could implement into their system. The third hospital reported that it was not feasible due to the inability to capture the required elements in their current system, mainly the prescription for behavior therapy, active and inactive medications, and exclusion criteria elements.

## 11.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.**

The information needed to calculate the measure may be captured as part of the routine clinical workflow as follows:

- Initial ADHD Diagnosis Encounter: coded field within the chart in "Registration System" field.
- Current Active ADHD Diagnosis: ICD-9 code linked within the chart in the "Diagnosis" field.
- Behavior therapy intervention ordered: entered into note using "smart text" but not easily extractible electronically.
- Medications Prescribed: coded field within the chart in "Medications" field.
- Date of ADHD Medication Prescription: field within the chart in the "Medications" field.
- Medical/System Reasons (exclusions): entered into note using "smart text" but not easily extractible electronically.

## 11.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 healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov__standards_ifr/1195)?**

Yes.

**If yes, please describe.**

Working with the AMA-PCPI process for developing the EHR specifications, the National Quality Forum (NQF) Quality Data Model (QDM) was followed as noted below:

- The QDM vocabulary recommendations named by the Health IT Standards Committee (of the Office of the National Coordinator for Health IT), (e.g., SNOMED, RXNorm, LOINC).
- Vocabulary standards consistent with recommendations proposed for Stage II of CMS EHR incentive program (Meaningful Use).

## 11.E. Health IT Calculation

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

The likelihood that missing or ambiguous information will lead to calculation errors is average. Much of the data needed for construction of this measure is not documented in queriable fields. With missing data, for example, if the date of medication prescription is missing, it will lead to an inability to determine which treatment was the first-line treatment, information that is needed to calculate the measure. Additionally, the presence of ambiguous data, such as a progress note

that is non-specific about the type of therapy provided, makes it difficult to determine if the guideline-recommended parent behavior therapy training was provided.

## 11.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 characteristics on the measure?**

Pediatric quality metrics for ADHD diagnosis and care are now being recommended through the CHIPRA and AHRQ Pediatric Quality Measures Program (PQMP) to assess adherence to the new standards for ADHD diagnosis and care established through the recommendation in the 2011 AAP ADHD Guidelines. These measures—with broader use of EHR systems in pediatric primary and specialty care and with minor modifications to the EHR documentation systems to include Workflow Documents that provide a critical set of brief and defined queriable documentation elements—could be used to develop clinical decision support systems. These systems could alert clinicians to the need for use of specific tools for diagnosis and specific therapy recommendations of Behavior Therapy for pediatric patients aged 4 through 5 who are diagnosed with ADHD. The use of computerized decision support built to support these new diagnostic and care recommendations could provide a vehicle for education and real-time clinical diagnostic and care decisionmaking, as well as facilitate and support the adoption of the AAP ADHD care Guidelines.

# Section 12. 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).**

### Administrative Claims Data

Limitations in calculating this measure from administrative claims data include the inability to procure distinct codes that represent the numerator accurately. Since there is no specific code for behavior treatment (rather all psych codes are the same for therapy), this means we cannot distinguish evidence-based treatment and non-evidence-based treatment. A recommendation to overcome this limitation would be to establish two distinct billing codes that would differentiate between the types of therapy.

### Electronic Health Records

Limitations in constructing the measure from EHR data include current workflow in the field. Recommendations to overcome this limitation would be to establish a standardized workflow or establish required fields to be completed when diagnosing ADHD. For example, having a field for "Behavior Therapy Prescribed" with a drop-down menu of specific types of behavior therapy would result in a more accurate calculation of our measure, as this information is typically found in progress notes as free text.

### Testing Environment

This measure was tested in the Chicago Pediatric Quality and Safety Consortium (CPQSC), which has provided a solid foundation for understanding the validity, feasibility, and reliability of the measures through medical record review and the feasibility of construction via an EHR, with recommendations to make this possible. While this exclusive area of testing (the CPQSC) is a limitation, it should be noted that U.S. metropolitan areas are home to 80 percent of the Nation's children (Acevedo-Garcia, 2007). The testing results from the CPQSC have provided a valuable glimpse into the potential for this measure holds for assessing and improving the quality of care for preschool-aged children diagnosed with ADHD.

## Section 13. 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.**

Attention Deficit Hyperactivity Disorder (ADHD) is prevalent in the pediatric population. According to statistics provided by the Centers for Disease Control and Prevention (CDC), 5 million children aged 4-17 years (9 percent of this age group) have ADHD. ADHD is also very prevalent in the Medicaid CHIP population. According to a report to Congress on Medicaid and CHIP, children enrolled in Medicaid or CHIP are more likely than privately insured or uninsured children to be in fair or poor health and to have certain impairments and health conditions (e.g., ADHD/ADD). According to the survey data, the prevalence of ADHD/ADD among Medicaid/CHIP enrolled children is high but varied (43.2 percent for SSI children). The American Academy of Pediatrics (AAP) convened an ADHD Work Group to review the current evidence on ADHD diagnosis, follow-up, and treatment. Based on their 2-year review of the evidence, the AAP released a new ADHD guideline in November 2011, which included several new and critical recommendations for ADHD diagnosis, follow-up, and treatment. The critical changes included the establishment of a new age threshold of 4 years for diagnosis of ADHD (children who might not have been diagnosed prior to the release of the Guideline) and a new standard of care for this new population.

This measure represents a new standard for the quality of ADHD diagnosis and treatment of children 4 through 5 years of age diagnosed with ADHD. This measure could facilitate the translation of this new, strong evidence into practice and prevent the potential of harms from treatments that are inappropriate and have significant potential for adverse effects. It can take several years for the best evidence to move into practice. We hope that this measure will hasten the diffusion of the best practice for treatment of patients 4-5 years of age who are diagnosed with ADHD, both to (1) encourage the best, most effective treatment of these pediatric patients; and (2), protect against the potential of significant harm from adverse effects associated with early and unnecessary stimulant medication use in this young population.

Many children in the 4-5 age group experience improvements in symptoms with behavior therapy alone, and the overall evidence for behavior therapy in preschoolers is strong. There is heightened concern about the effects of medication on growth, specifically brain growth that may affect development, and other adverse effects that may be more significant for preschool-aged children. There is limited information and experience about the effects of stimulant medication on children between the ages of 4 and 6 years.

## Potential General Adverse Effects from ADHD Medications

The literature indicates that the most common adverse effects of stimulants are appetite loss, abdominal pain, headaches, and sleep disturbance (Buitelaar, et al., 2009; Jensen, et al., 2007; MTA Cooperative, 2004; Swanson, et al., 2008; Waxmonsky, et al., 2010). The results of the Multimodal Therapy of ADHD (MTA) study have identified a more persistent effect of stimulants on decreasing growth velocity than have most previous studies, particularly when children were on higher and more consistently administered doses (Jensen, et al., 2007; MTA Cooperative, 2004; Swanson, et al., 2008). The effects diminished by the third year of treatment, but no compensatory rebound effects were found. However, diminished growth was in the range of 1 to 2 cm (Jensen, et al., 2007; Swanson, et al., 2007). An uncommon additional significant adverse effect of stimulants is the occurrence of hallucinations and other psychotic symptoms (Mosholder, et al., 2009). Concerns have also been raised about the rare occurrence of sudden cardiac death among children using stimulant medications. Sudden death in children on stimulant medication is extremely rare, and evidence is conflicting as to whether stimulant medications increase the risk of sudden death (Hamilton, et al., 2009) Preschool-aged children may experience increased mood lability and dysphoria. For the non-stimulant atomoxetine, the adverse effects include initial somnolence and gastrointestinal tract symptoms, particularly if dosage is increased too rapidly; decrease in appetite; less commonly, an increase in suicidal thoughts; and rarely, hepatitis Buitelaar, et al., 2009; Waxmonsky, et al., 2010). For the non-stimulant alpha-2-adrenergic agonists extended-release guanfacine and clonidine, adverse effects include somnolence and dry mouth (Biederman, et al., 2008; Kollins, et al., 2011).

## Background on Measure Development

In early 2009, Congress passed the Children's Health Insurance Program Reauthorization Act (CHIPRA, Public Law 111-3), which presented an unprecedented opportunity to measure and improve health care quality and outcomes for children. As part of this law, the CHIPRA Pediatric Quality Measures Program (PQMP) was developed to establish a set of measures to effectively assess the quality of pediatric care. Twenty-five pediatric measures were developed and comprised the Initial Core Set that was and selected for recommended use. In addition, seven Centers of Excellence were funded by, the Agency for Healthcare Research and Quality (AHRQ) to extend, improve, add to, and strengthen this Initial Core Set as part of the CHIPRA PQMP. The Pediatric Measurement-Center of Excellence (PMCoE) which comprised the Medical College of Wisconsin (Lead); Northwestern University, Feinberg School of Medicine (NU-FSM); the American Medical Association – Physician Consortium for Performance Improvement (AMA-PCPI), the American Academy of Pediatrics (AAP), the American Board of Pediatrics (ABP), the American Board of Medical Specialties (ABMS), Children’s Hospital and Health System (CHHS), Truven Health Analytics (formerly Thomson Reuters) (THA), and TMIT Consulting, LLC (TMIT), was funded by AHRQ to develop, extend, and test pediatric quality measures. The proposed PMCoE measure development and testing method applies the

American Medical Association (AMA)-convened Physician Consortium for Performance Improvement (PCPI™) methodology.

The PMCoE was assigned to develop and extend pediatric quality measures for Attention Deficit Hyperactivity Disorder (ADHD). An ADHD Measures Leadership Team was established and led by Donna Woods, EdM, PhD from NU-FSM and included Mark Antman, DDS, and Molly Siegel, MS from the AMA-PCPI; Fan Tait, MD, FAAP, and Keri Thiessen, MEd, from the AAP; Nicole Muller and Caroline Mazurek, MS, also from NU- FSM; Ramesh Sachdeva, MD, from the Medical College of Wisconsin; and two ADHD experts who served as the Expert Work Group Co-Chairs, Mark Wolraich, MD, and Karen Pierce, MD. The ADHD Measures Leadership Team reviewed in detail the level of evidence for the current 2011 AAP ADHD Guideline recommendations, existing ADHD measures, and associated peer reviewed literature, including systematic reviews related to ADHD diagnosis, follow-up, and treatment. This review was used to facilitate the construction of an ADHD proposed measure set of potential measures for review and discussion by an ADHD Expert Work Group.

In November 2011, as the result of 2 years of work, the AAP published a new ADHD Guideline based on a review of the best evidence. Significant changes to the recommendations included age range changes – reducing the age of possible ADHD diagnosis to age 4; evidence-based age range recommendations for treatment of Behavior Therapy as first-line treatment prior to medication therapy for patients aged 4 through 5 based on the strongest level of evidence; enhancement of the diagnostic recommendations through the use of validated tools that include all of the DSM IV criteria; and designation of ADHD as a chronic condition with the recommendation for patients diagnosed with ADHD to be included as Children and Youth with Special Healthcare Needs (CYSHN) and treated in a Medical Home context, which would provide continuity of ADHD care.

The ADHD Measures Leadership Team then selected and convened an Expert Work Group that comprised a diverse set of stakeholders in pediatric ADHD care. All Expert Work Group participants underwent the rigorous AMA-PCPI Conflict of Interest, Disclosure, and Review process. A diverse set of stakeholders was selected based on expertise and experience in many different areas and included clinical and caregiver perspectives, as well as methodology, measure testing, and health information technology expertise. The selected Expert Work Group included:

- Developmental-behavioral Pediatricians.
- Child and Adolescent Psychiatrists.
- Primary Care Pediatricians.
- Clinical Psychologists.
- Pediatric Neurologists.
- A Family Physician.
- School Psychologists.
- Parents.

- Teachers.
- Allied Health Professionals.
- School-based Learning Disability Specialists.
- A Pediatric Nurse.
- Expert in Health Care Equity.
- An Expert in Maintenance of Certification Requirements.

The national ADHD Expert Work Group was convened in Chicago, IL, at the AAP campus for an in-person meeting in February 2012, where ADHD measures were developed and enhanced. Additional considerations including the ability to specify and operationalize the measures were discussed. (See Supporting Documents, Appendix 1 for the list of the ADHD Expert Work Group members). The ADHD Expert Work Group was convened again at the end of February 2012, in a follow-up phone conference to review the measure recommendations discussed in the initial meeting, confirm the changes that were made, and discuss the need for further refinement of the measures. The diversity of the stakeholders has enabled a rich and meaningful dialogue to continue throughout the measure development process. The diverse perspectives have also contributed to the robustness of each ADHD measure.

This work presents the measures resulting from these activities. The proposed draft measures will assess effective ADHD treatment for patients 4 through 5 years of age who have been diagnosed with ADHD, based on the recommendation in the 2011, AAP ADHD Guideline. The measures developed by the ADHD Expert Work Group through discussion of the evidence on ADHD diagnosis, follow-up, and treatment and the 2011 AAP ADHD Guideline were prepared for a Public Comment period. Comments were solicited throughout this period from relevant stakeholder organizations, with requests to circulate the measures among their members. Following the Public Comment period, the measures were refined by the Expert Work Group and finalized for testing.

## Measure Testing

The measures were tested and found to be valid measures that can be reliably constructed through manual chart abstraction, using either paper medical records or electronic health records. We assessed the measures for feasibility of implementation as eMeasures in the EHR and found that at some testing sites, the eMeasures were feasible while at others modifications to the systems or the implementation of Workflow documentation would be necessary. The use of administrative claims to calculate the measure would require the establishment of new specific billing codes, as this measure establishes a new standard of care that currently does not have a standard billing code.

These measures are meant to be used to assess performance for reporting at the group or system level. Performance measurement serves as an important component in a quality improvement strategy for ADHD Diagnosis and care.

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# Section 14: Identifying Information for the Measure Submitter

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**The CHIPRA Pediatric Quality Measures Program (PQMP) Candidate Measure Submission Form (CPCF) was approved by the Office of Management and Budget (OMB) in accordance with the Paperwork Reduction Act.**

**The OMB Control Number is 0935-0205 and the Expiration Date is December 31, 2015.**

## 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.**

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