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**ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment
of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents**
SUBCOMMITTEE ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER,
STEERING COMMITTEE ON QUALITY IMPROVEMENT AND
MANAGEMENT

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American Academy of Pediatrics

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CLINICAL PRACTICE GUIDELINE

ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents

SUBCOMMITTEE ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, STEERING COMMITTEE ON QUALITY IMPROVEMENT AND MANAGEMENT

KEY WORDS

attention-deficit/hyperactivity disorder, children, adolescents, preschool, behavioral therapy, medication

ABBREVIATIONS

AAP—American Academy of Pediatrics

ADHD—attention-deficit/hyperactivity disorder

DSM-PC—*Diagnostic and Statistical Manual for Primary Care*

CDC—Centers for Disease Control and Prevention

FDA—Food and Drug Administration

DSM-IV—*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*

MTA—Multimodal Therapy of ADHD

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The recommendations in this report do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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abstract



Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood and can profoundly affect the academic achievement, well-being, and social interactions of children; the American Academy of Pediatrics first published clinical recommendations for the diagnosis and evaluation of ADHD in children in 2000; recommendations for treatment followed in 2001. *Pediatrics* 2011;128:000

Summary of key action statements:

1. The primary care clinician should initiate an evaluation for ADHD for any child 4 through 18 years of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity (quality of evidence B/strong recommendation).
2. To make a diagnosis of ADHD, the primary care clinician should determine that *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria have been met (including documentation of impairment in more than 1 major setting); information should be obtained primarily from reports from parents or guardians, teachers, and other school and mental health clinicians involved in the child's care. The primary care clinician should also rule out any alternative cause (quality of evidence B/strong recommendation).
3. In the evaluation of a child for ADHD, the primary care clinician should include assessment for other conditions that might coexist with ADHD, including emotional or behavioral (eg, anxiety, depressive, oppositional defiant, and conduct disorders), developmental (eg, learning and language disorders or other neurodevelopmental disorders), and physical (eg, tics, sleep apnea) conditions (quality of evidence B/strong recommendation).
4. The primary care clinician should recognize ADHD as a chronic condition and, therefore, consider children and adolescents with ADHD as children and youth with special health care needs. Management of children and youth with special health care needs should follow the principles of the chronic care model and the medical home (quality of evidence B/strong recommendation).

5. Recommendations for treatment of children and youth with ADHD vary depending on the patient's age:

- a. 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).
- b. For *elementary school-aged children (6–11 years of age)*, the primary care clinician should prescribe US Food and Drug Administration–approved medications for ADHD (quality of evidence A/strong recommendation) and/or evidence-based parent- and/or teacher-administered behavior therapy as treatment for ADHD, preferably both (quality of evidence B/strong recommendation). The evidence is particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended-release guanfacine, and extended-release clonidine (in that order) (quality of evidence A/strong recommendation). The school environment, program, or placement is a part of any treatment plan.
- c. For *adolescents (12–18 years of age)*, the primary care clinician

should prescribe Food and Drug Administration–approved medications for ADHD with the assent of the adolescent (quality of evidence A/strong recommendation) and may prescribe behavior therapy as treatment for ADHD (quality of evidence C/recommendation), preferably both.

6. The primary care clinician should titrate doses of medication for ADHD to achieve maximum benefit with minimum adverse effects (quality of evidence B/strong recommendation).

INTRODUCTION

This document updates and replaces 2 previously published clinical guidelines from the American Academy of Pediatrics (AAP) on the diagnosis and treatment of attention-deficit/hyperactivity disorder (ADHD) in children: “Clinical Practice Guideline: Diagnosis and Evaluation of the Child With Attention-Deficit/Hyperactivity Disorder” (2000)¹ and “Clinical Practice Guideline: Treatment of the School-aged Child With Attention-Deficit/Hyperactivity Disorder” (2001).² Since these guidelines were published, new information and evidence regarding the diagnosis and treatment of ADHD has become available. Surveys conducted before and after the publication of the previous guidelines have also provided insight into pediatricians' attitudes and practices regarding ADHD. On the basis of an increased understanding regarding ADHD and the challenges it raises for children and families and as a source for clinicians seeking to diagnose and treat children, this guideline pays particular attention to a number of areas.

Expanded Age Range

The previous guidelines addressed diagnosis and treatment of ADHD in chil-

dren 6 through 12 years of age. There is now emerging evidence to expand the age range of the recommendations to include preschool-aged children and adolescents. This guideline addresses the diagnosis and treatment of ADHD in children 4 through 18 years of age, and attention is brought to special circumstances or concerns in particular age groups when appropriate.

Expanded Scope

Behavioral interventions might help families of children with hyperactive/impulsive behaviors that do not meet full diagnostic criteria for ADHD. Guidance regarding the diagnosis of problem-level concerns in children based on the *Diagnostic and Statistical Manual for Primary Care (DSM-PC), Child and Adolescent Version*,³ as well as suggestions for treatment and care of children and families with problem-level concerns, are provided here. The current DSM-PC was published in 1996 and, therefore, is not consistent with intervening changes to *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*. Although this version of the DSM-PC should not be used as a definitive source for diagnostic codes related to ADHD and comorbid conditions, it certainly may continue to be used as a resource for enriching the understanding of ADHD manifestations. The DSM-PC will be revised when both the DSM-V and ICD-10 are available for use.

A Process of Care for Diagnosis and Treatment

This guideline and process-of-care algorithm (see Supplemental Fig 2 and Supplemental Appendix) recognizes evaluation, diagnosis, and treatment as a continuous process and provides recommendations for both the guideline and the algorithm in this single publication. In addition to the formal recommendations for assessment, diagnosis, and treatment, this guideline

provides a single algorithm to guide the clinical process.

Integration With the Task Force on Mental Health

This guideline fits into the broader mission of the AAP Task Force on Mental Health and its efforts to provide a base from which primary care providers can develop alliances with families, work to prevent mental health conditions and identify them early, and collaborate with mental health clinicians.

The diagnosis and management of ADHD in children and youth has been particularly challenging for primary care clinicians because of the limited payment provided for what requires more time than most of the other conditions they typically address. The procedures recommended in this guideline necessitate spending more time with patients and families, developing a system of contacts with school and other personnel, and providing continuous, coordinated care, all of which is time demanding. In addition, relegating mental health conditions exclusively to mental health clinicians also is not a viable solution for many clinicians, because in many areas access to mental health clinicians to whom they can refer patients is limited. Access in many areas is also limited to psychologists when further assessment of cognitive issues is required and not available through the education system because of restrictions from third-party payers in paying for the evaluations on the basis of them being educational and not health related.

Cultural differences in the diagnosis and treatment of ADHD are an important issue, as they are for all pediatric conditions. Because the diagnosis and treatment of ADHD depends to a great extent on family and teacher perceptions, these issues might be even more prominent an issue for ADHD. Specific cultural issues

are beyond the scope of this guideline but are important to consider.

METHODOLOGY

As with the 2 previously published clinical guidelines, the AAP collaborated with several organizations to develop a working subcommittee that represented a wide range of primary care and subspecialty groups. The subcommittee included primary care pediatricians, developmental-behavioral pediatricians, and representatives from the American Academy of Child and Adolescent Psychiatry, the Child Neurology Society, the Society for Pediatric Psychology, the National Association of School Psychologists, the Society for Developmental and Behavioral Pediatrics, the American Academy of Family Physicians, and Children and Adults With Attention-Deficit/Hyperactivity Disorder (CHADD), as well as an epidemiologist from the Centers for Disease Control and Prevention (CDC).

This group met over a 2-year period, during which it reviewed the changes in practice that have occurred and issues that have been identified since the previous guidelines were published. Delay in completing the process led to further conference calls and extended the years of literature reviewed in order to remain as current as possible. The AAP funded the development of this guideline; potential financial conflicts of the participants were identified and taken into consideration in the deliberations. The guideline will be reviewed and/or revised in 5 years unless new evidence emerges that warrants revision sooner.

The subcommittee developed a series of research questions to direct an extensive evidence-based review in partnership with the CDC and the University of Oklahoma Health Sciences Center. The diagnostic review was conducted by the CDC, and the evidence was evaluated in a combined effort of

the AAP, CDC, and University of Oklahoma Health Sciences Center staff. The treatment-related evidence relied on a recent evidence review by the Agency for Healthcare Research and Quality and was supplemented by evidence identified through the CDC review.

The diagnostic issues were focused on 5 areas:

1. ADHD prevalence—specifically: (a) What percentage of the general US population aged 21 years or younger has ADHD? (b) What percentage of patients presenting at pediatricians' or family physicians' offices in the United States meet diagnostic criteria for ADHD?
2. Co-occurring mental disorders—of people with ADHD, what percentage has 1 or more of the following co-occurring conditions: sleep disorders, learning disabilities, depression, anxiety, conduct disorder, and oppositional defiant disorder?
3. What are the functional impairments of children and youth diagnosed with ADHD? Specifically, in what domains and to what degree do youth with ADHD demonstrate impairments in functional domains, including peer relations, academic performance, adaptive skills, and family functioning?
4. Do behavior rating scales remain the standard of care in assessing the diagnostic criteria for ADHD?
5. What is the prevalence of abnormal findings on selected medical screening tests commonly recommended as standard components of an evaluation of a child with suspected ADHD? How accurate are these tests in the diagnosis of ADHD compared with a reference standard (ie, what are the psychometric properties of these tests)?

The treatment issues were focused on 3 areas:

1. What new information is available

regarding the long-term efficacy and safety of medications approved by the US Food and Drug Administration (FDA) for the treatment of ADHD (stimulants and nonstimulants), and specifically, what information is available about the efficacy and safety of these medications in preschool-aged and adolescent patients?

2. What evidence is available about the long-term efficacy and safety of psychosocial interventions (behavioral modification) for the treatment of ADHD for children, and specifically, what information is available about the efficacy and safety of these interventions in preschool-aged and adolescent patients?
3. Are there any additional therapies that reach the level of consideration as evidence based?

Evidence-Review Process for Diagnosis

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 and then 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 (see technical report to be published). 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 3 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 3 search engines. Key words were selected with the intent of including all possible articles that might have been relevant to 1 or more of the questions of interest (see the technical report to be published). The primary abstraction included the following terms: “attention deficit hyperactivity disorder” or “attention deficit disorder” or “hyperkinesis” and “child.” A second, independent abstraction was conducted to identify articles related to medical screening tests for ADHD. For this abstraction, the same search terms were used as in the previous procedure along with the additional condition term “behavioral problems” to allow for the inclusion of studies of youth that sought to diagnose ADHD by using medical screening tests. Abstractions were conducted in parallel fashion across each of the 3 databases; the results from each abstraction (complete reference, abstract, and key words) were exported and compiled into a common reference database using EndNote 10.0.⁴ References were subsequently and systematically deduplicated by using the software’s deduplication procedure. References for books, chapters, and theses were also deleted from the library. Once a deduplicated library was developed, the semifinal

database of 8267 references was reviewed for inclusion on the basis of inclusion criteria listed in the technical report. Included articles were then pulled in their entirety, the inclusion criteria were reconfirmed, and then the study findings were summarized in evidence tables. 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.

Evidence-Review Process for Treatment

In addition to this systematic review, for treatment we used the review from the Agency for Healthcare Research and Quality (AHRQ) Effective Healthcare Program “Attention Deficit Hyperactivity Disorder: Effectiveness of Treatment in At-Risk Preschoolers; Long-term Effectiveness in All Ages; and Variability in Prevalence, Diagnosis, and Treatment.”⁵ This review addressed a number of key questions for the committee, including the efficacy of medications and behavioral interventions for preschoolers, children, and adolescents. Evidence identified through the systematic evidence review for diagnosis was also used as a secondary data source to supplement the evidence presented in the AHRQ report. The draft practice guidelines were developed by consensus of the committee regarding the evidence. It was decided to create 2 separate components. The guideline recommendations were based on clear characterization of the evidence. The second component is a practice-of-care algorithm (see Supplemental Fig 2) that provides considerably more detail about how to implement the guidelines but is, necessarily, based less on available evidence and more on consensus of the committee members. When data were lacking, particularly in the

Evidence Quality	Preponderance of Benefit or Harm	Balance of Benefit and Harm
A. Well-designed RCTs or diagnostic studies on relevant population	Strong recommendation	Option
B. RCTs or diagnostic studies with minor limitations; overwhelmingly consistent evidence from observational studies	Recommendation	
C. Observational studies (case-control and cohort design)	Option	No Rec
D. Expert opinion, case reports, reasoning from first principles	Option	No Rec
X. Exceptional situations in which validating studies cannot be performed and there is a clear preponderance of benefit or harm	Strong recommendation	
	Recommendation	

FIGURE 1

Integrating evidence-quality appraisal with an assessment of the anticipated balance between benefits and harms if a policy is conducted leads to designation of a policy as a strong recommendation, recommendation, option, or no recommendation. The evidence is discussed in more detail in a technical report that will follow in a later publication. RCT indicates randomized controlled trial; Rec, recommendation.

process-of-care algorithmic portion of the guidelines, a combination of evidence and expert consensus was used. Action statements labeled “strong recommendation” or “recommendation” were based on high- to moderate-quality scientific evidence and a preponderance of benefit over harm.⁶ Option-level action statements were based on lesser-quality or limited data and expert consensus or high-quality evidence with a balance between benefits and harms. These clinical options are interventions that a reasonable health care provider might or might not wish to implement in his or her practice. The quality of evidence supporting each recommendation and the strength of each recommendation were assessed by the committee member most experienced in epidemiology and graded according to AAP policy (Fig 1).⁶

The guidelines and process-of-care algorithm underwent extensive peer review by committees, sections, councils, and task forces within the AAP; numerous outside organizations; and other individuals identified by the subcommittee. Liaisons to the subcommittee also were invited to distribute the draft to entities within their organizations. The re-

sulting comments were compiled and reviewed by the chairperson, and relevant changes were incorporated into the draft, which was then reviewed by the full committee.

ABOUT THIS GUIDELINE

Key Action Statements

In light of the concerns highlighted previously and informed by the available evidence, the AAP has developed 6 action statements for the evaluation, diagnosis, and treatment of ADHD in children. These action statements provide for consistent and quality care for children and families with concerns about or symptoms that suggest attention disorders or problems.

Context

This guideline is intended to be integrated with the broader algorithms developed as part of the mission of the AAP Task Force on Mental Health.⁷

Implementation: A Process-of-Care Algorithm

The AAP recognizes the challenge of instituting practice changes and adopting new recommendations for care. To address the need, a process-of-care algorithm has been devel-

oped and has been used in the revision of the AAP ADHD toolkit.

Implementation: Preparing the Practice

Full implementation of the action statements described in this guideline and the process-of-care algorithm might require changes in office procedures and/or preparatory efforts to identify community resources. The section titled “Preparing the Practice” in the process-of-care algorithm and further information can be found in the supplement to the Task Force on Mental Health report.⁷ It is important to document all aspects of the diagnostic and treatment procedures in the patients’ records. Use of rating scales for the diagnosis of ADHD and assessment for comorbid conditions and as a method for monitoring treatment as described in the process algorithm (see Supplemental Fig 2), as well as information provided to parents such as management plans, can help facilitate a clinician’s accurate documentation of his or her process.

Note

The AAP acknowledges that some primary care clinicians might not be confident of their ability to successfully diagnose and treat ADHD in a child because of the child’s age, co-existing conditions, or other concerns. At any point at which a clinician feels that he or she is not adequately trained or is uncertain about making a diagnosis or continuing with treatment, a referral to a pediatric or mental health subspecialist should be made. If a diagnosis of ADHD or other condition is made by a subspecialist, the primary care clinician should develop a management strategy with the subspecialist that ensures that the child will continue to receive appropriate care consistent with a medical home model wherein the pediatrician part-

ners with parents so that both health and mental health needs are integrated.

KEY ACTION STATEMENTS FOR THE EVALUATION, DIAGNOSIS, TREATMENT, AND MONITORING OF ADHD IN CHILDREN AND ADOLESCENTS

Action statement 1: The primary care clinician should initiate an evaluation for ADHD for any child 4 through 18 years of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity (quality of evidence B/strong recommendation).

Evidence Profile

- **Aggregate evidence quality:** B.
- **Benefits:** In a considerable number of children, ADHD goes undiagnosed. Primary care clinicians' systematic identification of children with these problems will likely decrease the rate of undiagnosed and untreated ADHD in children.
- **Harms/risks/costs:** Children in whom ADHD is inappropriately diagnosed might be labeled inappropriately, or another condition might be missed, and they might receive treatments that will not benefit them.
- **Benefits-harms assessment:** The high prevalence of ADHD and limited mental health resources require primary care pediatricians to play a significant role in the care of their patients with ADHD so that children with this condition receive the appropriate diagnosis and treatment. Treatments available have shown good evidence of efficacy, and lack of treatment results in a risk for impaired outcomes.
- **Value judgments:** The committee considered the requirements for establishing the diagnosis, the prevalence of ADHD, and the efficacy and adverse effects of treatment as well as the long-term outcomes.

- **Role of patient preferences:** Success with treatment depends on patient and family preference, which has to be taken into account.
- **Exclusions:** None.
- **Intentional vagueness:** The limits between what can be handled by a primary care clinician and what should be referred to a subspecialist because of the varying degrees of skills among primary care clinicians.
- **Strength: strong recommendation.**

The basis for this recommendation is essentially unchanged from that in the previous guideline. ADHD is the most common neurobehavioral disorder in children and occurs in approximately 8% of children and youth^{8–10}; the number of children with this condition is far greater than can be managed by the mental health system. There is now increased evidence that appropriate diagnosis can be provided for preschool-aged children¹¹ (4–5 years of age) and for adolescents.¹²

Action statement 2: To make a diagnosis of ADHD, the primary care clinician should determine that *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR)* criteria have been met (including documentation of impairment in more than 1 major setting), and information should be obtained primarily from reports from parents or guardians, teachers, and other school and mental health clinicians involved in the child's care. The primary care clinician should also rule out any alternative cause (quality of evidence B/strong recommendation).

Evidence Profile

- **Aggregate evidence quality:** B.
- **Benefits:** The use of DSM-IV criteria has led to more uniform categorization of the condition across professional disciplines.

- **Harms/risks/costs:** The DSM-IV system does not specifically provide for developmental-level differences and might lead to some misdiagnoses.
- **Benefits-harms assessment:** The benefits far outweigh the harm.
- **Value judgments:** The committee took into consideration the importance of coordination between pediatric and mental health services.
- **Role of patient preferences:** Although there is some stigma associated with mental disorder diagnoses resulting in some families preferring other diagnoses, the need for better clarity in diagnoses was felt to outweigh this preference.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength: strong recommendation.**

As with the findings in the previous guideline, the DSM-IV criteria continue to be the criteria best supported by evidence and consensus. Developed through several iterations by the American Psychiatric Association, the DSM-IV criteria were created through use of consensus and an expanding research foundation.¹³ 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 current guideline. The diagnostic criteria have not changed since the previous guideline and are presented in Supplemental Table 2. An anticipated change in the DSM-V is increasing the age limit for when ADHD needs to have first presented from 7 to 12 years.¹⁴

Special Circumstances: Preschool-aged Children (4–5 Years Old)

There is evidence that the diagnostic criteria for ADHD can be applied to preschool-aged children; however, the subtypes detailed in the DSM-IV might not be valid for this population.^{15–21} A review of the literature, including the multisite study of the efficacy of methylphenidate in preschool-aged children, revealed that the criteria could appropriately identify children with the condition.¹¹ However, there are added challenges in determining the presence of key symptoms. Preschool-aged children are not likely to have a separate observer if they do not attend a preschool or child care program, and even if they do attend, staff in those programs might be less qualified than certified teachers to provide accurate observations. Here, too, focused checklists can help physicians in the diagnostic evaluation, although only the Conners Comprehensive Behavior Rating Scales and the ADHD Rating Scale IV are DSM-IV–based scales that have been validated in preschool-aged children.²²

When there are concerns about the availability or quality of nonparent observations of a child's behavior, physicians may recommend that parents complete a parent-training program before confirming an ADHD diagnosis for preschool-aged children and consider placement in a qualified preschool program if they have not done so already. Information can be obtained from parents and teachers through the use of validated DSM-IV–based ADHD rating scales. The parent-training program must include helping parents develop age-appropriate developmental expectations and specific management skills for problem behaviors. The clinician may obtain reports from the parenting class instructor about the parents' ability to manage their children, and if the children are

in programs in which they are directly observed, instructors can report information about the core symptoms and function of the child directly. Qualified preschool programs include programs such as Head Start or other public prekindergarten programs. Preschool-aged children who display significant emotional or behavioral concerns might also qualify for Early Childhood Special Education services through their local school districts, and the evaluators for these programs and/or Early Childhood Special Education teachers might be excellent reporters of core symptoms.

Special Circumstances: Adolescents

Obtaining teacher reports for adolescents might be more challenging, because many adolescents will have multiple teachers. Likewise, parents might have less opportunity to observe their adolescent's behaviors than they had when their children were younger. Adolescents' reports of their own behaviors often differ from those of other observers, because they tend to minimize their own problematic behaviors.^{23–25} Adolescents are less likely to exhibit overt hyperactive behavior. Despite the difficulties, clinicians need to try to obtain (with agreement from the adolescent) information from at least 2 teachers as well as information from other sources such as coaches, school guidance counselors, or leaders of community activities in which the adolescent participates. In addition, it is unusual for adolescents with behavioral/attention problems not to have been previously given a diagnosis of ADHD. Therefore, it is important to establish the younger manifestations of the condition that were missed and to strongly consider substance use, depression, and anxiety as alternative or co-occurring diagnoses. Adolescents with ADHD, especially when untreated, are at greater risk of substance abuse.²⁶ In addition, the risks of

mood and anxiety disorders and risky sexual behaviors increase during adolescence.¹²

Special Circumstances: Inattention or Hyperactivity/Impulsivity (Problem Level)

Teachers, parents, and child health professionals typically encounter children with behaviors relating to activity level, impulsivity, and inattention who might not fully meet DSM-IV criteria. The DSM-PC³ provides a guide to the more common behaviors seen in pediatrics. The manual describes common variations in behavior as well as more problematic behaviors at levels of less impairment than those specified in the DSM-IV.

The behavioral descriptions of the DSM-PC have not yet been tested in community studies to determine the prevalence or severity of developmental variations and problems in the areas of inattention, hyperactivity, or impulsivity. They do, however, provide guidance to clinicians regarding elements of treatment for children with problems with mild-to-moderate inattention, hyperactivity, or impulsivity. The DSM-PC also considers environmental influences on a child's behavior and provides information on differential diagnosis with a developmental perspective.

Action statement 3: In the evaluation of a child for ADHD, the primary care clinician should include assessment for other conditions that might coexist with ADHD, including emotional or behavioral (eg, anxiety, depressive, oppositional defiant, and conduct disorders), developmental (eg, learning and language disorders or other neurodevelopmental disorders), and physical (eg, tics, sleep apnea) conditions (quality of evidence B/strong recommendation).

Evidence Profile

- **Aggregate evidence quality:** B.
- **Benefits:** Identifying coexisting conditions is important for developing the most appropriate treatment plan.
- **Harms/risks/costs:** The major risk is misdiagnosing the conditions and providing inappropriate care.
- **Benefits-harms assessment:** There is a preponderance of benefit over harm.
- **Value judgments:** The committee members took into consideration the common occurrence of coexisting conditions and the importance of addressing them in making this recommendation.
- **Role of patient preferences:** None.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength: strong recommendation.**

A variety of other behavioral, developmental, and physical conditions can coexist in children who are evaluated for ADHD. These conditions include, but are not limited to, learning problems, language disorder, disruptive behavior, anxiety, mood disorders, tic disorders, seizures, developmental coordination disorder, or sleep disorders.^{23,24,27–38} In some cases, the presence of a coexisting condition will alter the treatment of ADHD. The primary care clinician might benefit from additional support and guidance or might need to refer a child with ADHD and coexisting conditions, such as severe mood or anxiety disorders, to subspecialists for assessment and management. The subspecialists could include child psychiatrists, developmental-behavioral pediatricians, neurodevelopmental disability physicians, child neurologists, or child or school psychologists.

Given the likelihood that another condition exists, primary care clinicians should conduct assessments that determine or at least identify the risk of coexisting conditions. Through its Task Force on Mental

Health, the AAP has developed algorithms and a toolkit³⁹ for assessing and treating (or comanaging) the most common developmental disorders and mental health concerns in children. These resources might be useful in assessing children who are being evaluated for ADHD. Payment for evaluation and treatment must cover the fixed and variable costs of providing the services, as noted in the AAP policy statement “Scope of Health Care Benefits for Children From Birth Through Age 26.”⁴⁰

Special Circumstances: Adolescents

Clinicians should assess adolescent patients with newly diagnosed ADHD for symptoms and signs of substance abuse; when these signs and symptoms are found, evaluation and treatment for addiction should precede treatment for ADHD, if possible, or careful treatment for ADHD can begin if necessary.²⁵

Action statement 4: The primary care clinician should recognize ADHD as a chronic condition and, therefore, consider children and adolescents with ADHD as children and youth with special health care needs. Management of children and youth with special health care needs should follow the principles of the chronic care model and the medical home (quality of evidence B/strong recommendation).

Evidence Profile

- **Aggregate evidence quality:** B.
- **Benefits:** The recommendation describes the coordinated services most appropriate for managing the condition.
- **Harms/risks/costs:** Providing the services might be more costly.
- **Benefits-harms assessment:** There is a preponderance of benefit over harm.
- **Value judgments:** The committee members considered the value of medical

home services when deciding to make this recommendation.

- **Role of patient preferences:** Family preference in how these services are provided is an important consideration.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength: strong recommendation.**

As in the previous guideline, this recommendation is based on the evidence that ADHD continues to cause symptoms and dysfunction in many children who have the condition over long periods of time, even into adulthood, and that the treatments available address symptoms and function but are usually not curative. Although the chronic illness model has not been specifically studied in children and youth with ADHD, it has been effective for other chronic conditions such as asthma,²³ and the medical home model has been accepted as the preferred standard of care.⁴¹ The management process is also helped by encouraging strong family-school partnerships.⁴²

Longitudinal studies have found that, frequently, treatments are not sustained despite the fact that long-term outcomes for children with ADHD indicate that they are at greater risk of significant problems if they discontinue treatment.⁴³ Because a number of parents of children with ADHD also have ADHD, extra support might be necessary to help those parents provide medication on a consistent basis and institute a consistent behavioral program. The medical home and chronic illness approach is provided in the process algorithm (Supplemental Fig 2). An important process in ongoing care is bidirectional communication with teachers and other school and mental health clinicians involved in the child’s care as well as with parents and patients.

Special Circumstances: Inattention or Hyperactivity/Impulsivity (Problem Level)

Children with inattention or hyperactivity/impulsivity at the problem level (DSM-PC) and their families might also benefit from the same chronic illness and medical home principles.

Action statement 5: Recommendations for treatment of children and youth with ADHD vary depending on the patient's age.

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).

Evidence Profile

- **Aggregate evidence quality:** A for behavior; B for methylphenidate.
- **Benefits:** Both behavior therapy and methylphenidate have been demonstrated to reduce behaviors associated with ADHD and improve function.
- **Harms/risks/costs:** Both therapies increase the cost of care, and behavior therapy requires a higher level of family involvement, whereas methylphenidate has some potential adverse effects.
- **Benefits-harms assessment:** Given the risks of untreated ADHD, the benefits outweigh the risks.
- **Value judgments:** The committee mem-

bers included the effects of untreated ADHD when deciding to make this recommendation.

- **Role of patient preferences:** Family preference is essential in determining the treatment plan.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength:** strong recommendation.

Action statement 5b: For elementary school-aged children (6–11 years of age), the primary care clinician should prescribe FDA-approved medications for ADHD (quality of evidence A/strong recommendation) and/or evidence-based parent- and/or teacher-administered behavior therapy as treatment for ADHD, preferably both (quality of evidence B/strong recommendation). The evidence is particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended-release guanfacine, and extended-release clonidine (in that order) (quality of evidence A/strong recommendation). The school environment, program, or placement is a part of any treatment plan.

Evidence Profile

- **Aggregate evidence quality:** A for treatment with FDA-approved medications; B for behavior therapy.
- **Benefits:** Both behavior therapy and FDA-approved medications have been demonstrated to reduce behaviors associated with ADHD and improve function.
- **Harms/risks/costs:** Both therapies increase the cost of care, and behavior therapy requires a higher level of family involvement, whereas FDA-approved medications have some potential adverse effects.
- **Benefits-harms assessment:** Given the risks of untreated ADHD, the benefits outweigh the risks.
- **Value judgments:** The committee members included the effects of untreated

ADHD when deciding to make this recommendation.

- **Role of patient preferences:** Family preference, including patient preference, is essential in determining the treatment plan.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength:** strong recommendation.

Action statement 5c: For adolescents (12–18 years of age), the primary care clinician should prescribe FDA-approved medications for ADHD with the assent of the adolescent (quality of evidence A/strong recommendation) and may prescribe behavior therapy as treatment for ADHD (quality of evidence C/recommendation), preferably both.

Evidence Profile

- **Aggregate evidence quality:** A for medications; C for behavior therapy.
- **Benefits:** Both behavior therapy and FDA-approved medications have been demonstrated to reduce behaviors associated with ADHD and improve function.
- **Harms/risks/costs:** Both therapies increase the cost of care, and behavior therapy requires a higher level of family involvement, whereas FDA-approved medications have some potential adverse effects.
- **Benefits-harms assessment:** Given the risks of untreated ADHD, the benefits outweigh the risks.
- **Value judgments:** The committee members included the effects of untreated ADHD when deciding to make this recommendation.
- **Role of patient preferences:** Family preference, including patient preference, is essential in determining the treatment plan.
- **Exclusions:** None.
- **Intentional vagueness:** None.
- **Strength:** strong recommendation/recommendation.

Medication

Similar to the recommendations from the previous guideline, stimulant medications are highly effective for most children in reducing core symptoms of ADHD.⁴⁴ One selective norepinephrine-reuptake inhibitor (atomoxetine^{45,46}) and 2 selective α_2 -adrenergic agonists (extended-release guanfacine^{47,48} and extended-release clonidine⁴⁹) have also demonstrated efficacy in reducing core symptoms. Because norepinephrine-reuptake inhibitors and α_2 -adrenergic agonists are newer, the evidence base that supports them—although adequate for FDA approval—is considerably smaller than that for stimulants. None of them have been approved for use in preschool-aged children. Compared with stimulant medications that have an effect size [effect size = (treatment mean – control mean)/control SD] of approximately 1.0,⁵⁰ the effects of the nonstimulants are slightly weaker; atomoxetine has an effect size of approximately 0.7, and extended-release guanfacine and extended-release clonidine also have effect sizes of approximately 0.7.

The accompanying process-of-care algorithm provides a list of the currently available FDA-approved medications for ADHD (Supplemental Table 3). Characteristics of each medication are provided to help guide the clinician's choice in prescribing medication.

As was identified in the previous guideline, the most common stimulant adverse effects are appetite loss, abdominal pain, headaches, and sleep disturbance. The results of the Multimodal Therapy of ADHD (MTA) study revealed 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 com-

pensatory rebound effects were found.⁵¹ However, diminished growth was in the range of 1 to 2 cm. An uncommon additional significant adverse effect of stimulants is the occurrence of hallucinations and other psychotic symptoms.⁵² Although concerns have been raised about the rare occurrence of sudden cardiac death among children using stimulant medications,⁵³ 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.^{54–56} It is important to expand the history to include specific cardiac symptoms, Wolf-Parkinson-White syndrome, sudden death in the family, hypertrophic cardiomyopathy, and long QT syndrome. Preschool-aged children might experience increased mood lability and dysphoria.⁵⁷ For the nonstimulant atomoxetine, the adverse effects include initial somnolence and gastrointestinal tract symptoms, particularly if the dosage is increased too rapidly; decrease in appetite; increase in suicidal thoughts (less common); and hepatitis (rare). For the nonstimulant α_2 -adrenergic agonists extended-release guanfacine and extended-release clonidine, adverse effects include somnolence and dry mouth.

Only 2 medications have evidence to support their use as adjunctive therapy with stimulant medications sufficient to achieve FDA approval: extended-release guanfacine²⁶ and extended-release clonidine. Other medications have been used in combination off-label, but there is currently only anecdotal evidence for their safety or efficacy, so their use cannot be recommended at this time.

Special Circumstances: Preschool-aged Children

A number of special circumstances support the recommendation to initi-

ate ADHD treatment in preschool-aged children (ages 4–5 years) with behavioral therapy alone first.⁵⁷ These circumstances include:

- The multisite study of methylphenidate⁵⁷ was limited to preschool-aged children who had moderate-to-severe dysfunction.
- The study also found that many children (ages 4–5 years) experience improvements in symptoms with behavior therapy alone, and the overall evidence for behavior therapy in preschool-aged children is strong.
- Behavioral programs for children 4 to 5 years of age typically run in the form of group parent-training programs and, although not always compensated by health insurance, have a lower cost. The process algorithm (see Supplemental pages s15–16) contains criteria for the clinician to use in assessing the quality of the behavioral therapy. In addition, programs such as Head Start and Children and Adults With Attention Deficit Hyperactivity Disorder (CHADD) (www.chadd.org) might provide some behavioral supports.

Many young children with ADHD might still require medication to achieve maximum improvement, and medication is not contraindicated for children 4 through 5 years of age. However, only 1 multisite study has carefully assessed medication use in preschool-aged children. Other considerations in the recommendation about treating children 4 to 5 years of age with stimulant medications include:

- The study was limited to preschool-aged children who had moderate-to-severe dysfunction.
- Research has found that a number of young children (4–5 years of age) experience improvements in symptoms with behavior therapy alone.
- There are concerns about the possi-

ble effects on growth during this rapid growth period of preschool-aged children.

- There has been limited information about and experience with the effects of stimulant medication in children between the ages of 4 and 5 years.

Here, the criteria for enrollment (and, therefore, medication use) included measures of severity that distinguished treated children from the larger group of preschool-aged children with ADHD. Thus, before initiating medications, the physician should assess the severity of the child's ADHD. Given current data, only those preschool-aged children with ADHD who have moderate-to-severe dysfunction should be considered for medication. Criteria for this level of severity, based on the multisite-study results,⁵⁷ are (1) symptoms that have persisted for at least 9 months, (2) dysfunction that is manifested in both the home and other settings such as preschool or child care, and (3) dysfunction that has not responded adequately to behavior therapy. The decision to consider initiating medication at this age depends in part on the clinician's assessment of the estimated developmental impairment, safety risks, or consequences for school or social participation that could ensue if medications are not initiated. It is often helpful to consult with a mental health specialist who has had specific experience with preschool-aged children if possible. 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 in force when the medication was approved rather than on empirical evidence of its safety and efficacy in this age group. Most of the evidence for the safety and efficacy of treating preschool-aged children with stimulant medications has been

from methylphenidate.⁵⁷ Methylphenidate evidence consists of 1 multisite study of 165 children and 10 other smaller single-site studies that included from 11 to 59 children (total of 269 children); 7 of the 10 single-site studies found significant efficacy. It must be noted that although there is moderate evidence that methylphenidate is safe and efficacious in preschool-aged children, its use in this age group remains off-label. Although the use of dextroamphetamine is on-label, the insufficient evidence for its safety and efficacy in this age group does not make it possible to recommend at this time.

If children do not experience adequate symptom improvement with behavior therapy, medication can be prescribed, as described previously. Evidence suggests that the rate of metabolizing stimulant medication is slower in children 4 through 5 years of age, so they should be given a lower dose to start, and the dose can be increased in smaller increments. Maximum doses have not been adequately studied.⁵⁷

Special Circumstances: Adolescents

As noted previously, before beginning medication treatment for adolescents with newly diagnosed ADHD, clinicians should assess these patients for symptoms of substance abuse. When substance use is identified, assessment when off the abusive substances should precede treatment for ADHD (see the Task Force on Mental Health report⁷). Diversion of ADHD medication (use for other than its intended medical purposes) is also a special concern among adolescents⁵⁸; clinicians should monitor symptoms and prescription-refill requests for signs of misuse or diversion of ADHD medication and consider prescribing medications with no abuse potential, such as atomoxetine (Strattera [Ely Lilly Co, Indianapolis, IN]) and

extended-release guanfacine (Intuniv [Shire US Inc, Wayne, PA]) or extended-release clonidine (Kapvay [Shionogi Inc, Florham Park, NJ]) (which are not stimulants) or stimulant medications with less abuse potential, such as lisdexamfetamine (Vyvanse [Shire US Inc]), dermal methylphenidate (Daytrana [Noven Therapeutics, LLC, Miami, FL]), or OROS methylphenidate (Concerta [Janssen Pharmaceuticals, Inc, Titusville, NJ]). Because lisdexamfetamine is dextroamphetamine, which contains an additional lysine molecule, it is only activated after ingestion, when it is metabolized by erythrocyte cells to dexamphetamine. The other preparations make extraction of the stimulant medication more difficult.

Given the inherent risks of driving by adolescents with ADHD, special concern should be taken to provide medication coverage for symptom control while driving. Longer-acting or late-afternoon, short-acting medications might be helpful in this regard.⁵⁹

Special Circumstances: Inattention or Hyperactivity/Impulsivity (Problem Level)

Medication is not appropriate for children whose symptoms do not meet DSM-IV criteria for diagnosis of ADHD, although behavior therapy does not require a specific diagnosis, and many of the efficacy studies have included children without specific mental behavioral disorders.

Behavior Therapy

Behavior therapy represents a broad set of specific interventions that have a common goal of modifying the physical and social environment to alter or change behavior. Behavior therapy usually is implemented by training parents in specific techniques that improve their abilities to modify and

TABLE 1 Evidence-Based Behavioral Treatments for ADHD

Intervention Type	Description	Typical Outcome(s)	Median Effect Size ^a
Behavioral parent training (BPT)	Behavior-modification principles provided to parents for implementation in home settings	Improved compliance with parental commands; improved parental understanding of behavioral principles; high levels of parental satisfaction with treatment	0.55
Behavioral classroom management	Behavior-modification principles provided to teachers for implementation in classroom settings	Improved attention to instruction; improved compliance with classroom rules; decreased disruptive behavior; improved work productivity	0.61
Behavioral peer interventions (BPI) ^b	Interventions focused on peer interactions/relationships; these are often group-based interventions provided weekly and include clinic-based social-skills training used either alone or concurrently with behavioral parent training and/or medication	Office-based interventions have produced minimal effects; interventions have been of questionable social validity; some studies of BPI combined with clinic-based BPT found positive effects on parent ratings of ADHD symptoms; no differences on social functioning or parent ratings of social behavior have been revealed	

^a Effect size = (treatment median — control median)/control SD.

^b The effect size for behavioral peer interventions is not reported, because the effect sizes for these studies represent outcomes associated with combined interventions. A lower effect size means that they have less of an effect. The effect sizes found are considered moderate.

Adapted from Pelham W, Fabiano GA. *J Clin Child Adolesc Psychol.* 2008;37(1):184–214.

shape their child's behavior and to improve the child's ability to regulate his or her own behavior. The training involves techniques to more effectively provide rewards when their child demonstrates the desired behavior (eg, positive reinforcement), learn what behaviors can be reduced or eliminated by using planned ignoring as an active strategy (or using praising and ignoring in combination), or provide appropriate consequences or punishments when their child fails to meet the goals (eg, punishment). There is a need to consistently apply rewards and consequences as tasks are achieved and then to gradually increase the expectations for each task as they are mastered to shape behaviors. Although behavior therapy shares a set of principles, individual programs introduce different techniques and strategies to achieve the same ends.

Table 1 lists the major behavioral intervention approaches that have been demonstrated to be evidence based for the management of ADHD in 3 different types of settings. The table is based on 22 studies, each completed between 1997 and 2006.

Evidence for the effectiveness of behavior therapy in children with ADHD is

derived from a variety of studies^{60–62} and an Agency for Healthcare Research and Quality review.⁵ The diversity of interventions and outcome measures makes meta-analysis of the effects of behavior therapy alone or in association with medications challenging. The long-term positive effects of behavior therapy have yet to be determined. Ongoing adherence to a behavior program might be important; therefore, implementing a chronic care model for child health might contribute to the long-term effects.⁶³

Study results have indicated positive effects of behavior therapy when combined with medications. Most studies that compared behavior therapy to stimulants found a much stronger effect on ADHD core symptoms from stimulants than from behavior therapy. The MTA study found that combined treatment (behavior therapy and stimulant medication) was not significantly more efficacious than treatment with medication alone for the core symptoms of ADHD after correction for multiple tests in the primary analysis.⁶⁴ However, a secondary analysis of a combined measure of parent and teacher ratings of ADHD symptoms revealed a significant advantage

for the combination with a small effect size of $d = 0.26$.⁶⁵ However, the same study also found that the combined treatment compared with medication alone did offer greater improvements on academic and conduct measures when ADHD coexisted with anxiety and when children lived in low socioeconomic environments. In addition, parents and teachers of children who were receiving combined therapy were significantly more satisfied with the treatment plan. Finally, the combination of medication management and behavior therapy allowed for the use of lower dosages of stimulants, which possibly reduced the risk of adverse effects.⁶⁶

School Programming and Supports

Behavior therapy programs coordinating efforts at school as well as home might enhance the effects. School programs can provide classroom adaptations, such as preferred seating, modified work assignments, and test modifications (to the location at which it is administered and time allotted for taking the test), as well as behavior plans as part of a 504 Rehabilitation Act Plan or special education Individualized Education Program (IEP) under the "other health impairment" designation as part of the Individuals With

Disability Education Act (IDEA).⁶⁷ It is helpful for clinicians to be aware of the eligibility criteria in their state and school district to advise families of their options. Youths documented to have ADHD can also get permission to take college-readiness tests in an untimed manner by following appropriate documentation guidelines.⁶⁸

The effect of coexisting conditions on ADHD treatment is variable. In some cases, treatment of the ADHD resolves the coexisting condition. For example, treatment of ADHD might resolve oppositional defiant disorder or anxiety.⁶⁸ However, sometimes the co-occurring condition might require treatment that is in addition to the treatment for ADHD. Some coexisting conditions can be treated in the primary care setting, but others will require referral and co-management with a subspecialist.

Action statement 6: Primary care clinicians should titrate doses of medication for ADHD to achieve maximum benefit with minimum adverse effects (quality of evidence B/strong recommendation).

Evidence Profile

- **Aggregate evidence quality:** B.
- **Benefits:** The optimal dose of medication is required to reduce core symptoms to or as close to the levels of children without ADHD.
- **Harms/risks/costs:** Higher levels of medication increase the chances of adverse effects.
- **Benefits-harms assessment:** The importance of adequately treating ADHD outweighs the risk of adverse effects.
- **Value judgments:** The committee members included the effects of untreated ADHD when deciding to make this recommendation.
- **Role of patient preferences:** The families' preferences and comfort need to be taken into consideration in developing a titration plan.
- **Exclusions:** None.

- **Intentional vagueness:** None.
- **Strength: strong recommendation.**

The findings from the MTA study suggested that more than 70% of children and youth with ADHD respond to one of the stimulant medications at an optimal dose when a systematic trial is used.⁶⁵ Children in the MTA who were treated in the community with care as usual from whomever they chose or to whom they had access received lower doses of stimulants with less frequent monitoring and had less optimal results.⁶⁵ Because stimulants might produce positive but suboptimal effects at a low dose in some children and youth, titration to maximum doses that control symptoms without adverse effects is recommended instead of titration strictly on a milligram-per-kilogram basis.

Education of parents is an important component in the chronic illness model to ensure their cooperation in efforts to reach appropriate titration (remembering that the parents themselves might be challenged significantly by ADHD).^{69,70} The primary care clinician should alert parents and children that changing medication dose and occasionally changing a medication might be necessary for optimal medication management, that the process might require a few months to achieve optimal success, and that medication efficacy should be systematically monitored at regular intervals. Because stimulant medication effects are seen immediately, trials of different doses of stimulants can be accomplished in a relatively short time period. Stimulant medications can be effectively titrated on a 3- to 7-day basis.⁶⁵

It is important to note that by the 3-year follow-up of 14-month MTA interventions (optimal medications management, optimal behavioral management, the combination of the 2, or community treatment), all differences among the initial 4

groups were no longer present. After the initial 14-month intervention, the children no longer received the careful monthly monitoring provided by the study and went back to receiving care from their community providers. Their medications and doses varied, and a number of them were no longer taking medication. In children still on medication, the growth deceleration was only seen for the first 2 years and was in the range of 1 to 2 cm.

CONCLUSION

Evidence continues to be fairly clear with regard to the legitimacy of the diagnosis of ADHD and the appropriate diagnostic criteria and procedures required to establish a diagnosis, identify co-occurring conditions, and treat effectively with both behavioral and pharmacologic interventions. However, the steps required to sustain appropriate treatments and achieve successful long-term outcomes still remain a challenge. To provide more detailed information about how the recommendations of this guideline can be accomplished, a more detailed but less strongly evidence-based algorithm is provided as a companion article.

AREAS FOR FUTURE RESEARCH

Some specific research topics pertinent to the diagnosis and treatment of ADHD or developmental variations or problems in children and adolescents in primary care to be explored include:

- identification or development of reliable instruments suitable to use in primary care to assess the nature or degree of functional impairment in children/adolescents with ADHD and monitor improvement over time;
- study of medications and other therapies used clinically but not approved by the FDA for ADHD, such as

electroencephalographic biofeedback;

- determination of the optimal schedule for monitoring children/adolescents with ADHD, including factors for adjusting that schedule according to age, symptom severity, and progress reports;
- evaluation of the effectiveness of various school-based interventions;
- comparisons of medication use and effectiveness in different ages, including both harms and benefits;
- development of methods to involve parents and children/adolescents in their own care and improve adherence to both behavior and medication treatments;
- standardized and documented tools that will help primary care providers in identifying coexisting conditions;
- development and determination of effective electronic and Web-based systems to help gather information to diagnose and monitor children with ADHD;
- improved systems of communication with schools and mental health professionals, as well as other community agencies, to provide effective collaborative care;
- evidence for optimal monitoring by

some aspects of severity, disability, or impairment; and

- long-term outcomes of children first identified with ADHD as preschool-aged children.

SUBCOMMITTEE ON ATTENTION DEFICIT HYPERACTIVITY DISORDER (OVERSIGHT BY THE STEERING COMMITTEE ON QUALITY IMPROVEMENT AND MANAGEMENT, 2005–2011)

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**ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment
of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents**
SUBCOMMITTEE ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER,
STEERING COMMITTEE ON QUALITY IMPROVEMENT AND
MANAGEMENT

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American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Attention Deficit Hyperactivity Disorder
Performance Measurement Set

Supported by AHRQ/CHIPRA-PQMP

Proposed by the ADHD Expert Work Group (listed in *Appendix A*)

***In collaboration with the Pediatric Measurement Center of Excellence (PMCoE),
comprising the following organizations:***

Medical College of Wisconsin
American Academy of Pediatrics (AAP)
American Board of Medical Specialties
American Board of Pediatrics
American Medical Association (AMA)
Chicago Pediatric Quality and Safety Consortium
Northwestern University Feinberg School of Medicine

These performance Measures are not clinical guidelines and do not establish a standard of medical care, and have not been tested for all potential applications. The PMCoE measure development team shall not be responsible for any use of the Measures. The PMCoE measure development team encourages use of these Measures by health care professionals to whom these measures are relevant.

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ADHD

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Executive Summary:

Toward Improving Outcomes for ADHD

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. An Initial Core set of 25 pediatric measures were developed 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 of pediatric quality measures as part of the CHIPRA PQMP. The Pediatric Measurement-Center of Excellence (PMCoE) comprised of the Medical College of Wisconsin (Lead), Northwestern University, Feinberg School of Medicine (NU-FSM), the American Medical Association (AMA), the American Academy of Pediatrics (AAP), the American Board of Pediatrics (ABP), and the American Board of Medical Specialties (ABMS) 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™) (AMA-PCPI) methodology.

Reasons for Prioritizing Improvement in ADHD

High Impact Topic Area

An article in the Journal of Consulting and Clinical Psychology (2011) outlines the results of a study by Bruchmuller et al, in which the researchers examine trends in diagnosis of ADHD. The researchers utilized a 2 series of 4 different case vignettes for the study design. Though the research was carried out in Germany, this study may have relevant implications to the understanding of whether ADHD is over-diagnosed in the United States. For the first vignette, where all criteria were met for ADHD diagnosis, approximately 79% of the therapists diagnosed ADHD. Nearly 10% stated they did not have enough information and just over 4% indicated 'suspected ADHD'. The remaining 7% of clinicians assigned a diagnosis other than ADHD, most often an adjustment disorder. The researchers also suggest that misdiagnosis of ADHD can lead to inappropriate medication recommendations, and this study provided evidence that medication was far more likely to be a recommended treatment when the diagnosis of ADHD was assigned.¹²

According to the statistics provided by the Centers for Disease Control and Prevention (CDC)¹, for children ages 3-17 years of age:

- 5 million children (9% of this age group) have ADHD.
- Boys (12%) continue to be more than twice as likely than girls (5%) to have ADHD.
- When compared with children who have excellent or very good health, children who have fair or poor health status are more than twice as likely to have ADHD (8% vs. 21%).

ADHD has a multidimensional effect on an individual's daily life functioning, and can culminate 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 might be associated with side effects and symptoms effecting morbidity.²

About 50% of children with ADHD seen in practice settings obtain care that matches guidelines of the American Academy of Child and Adolescent Psychiatry. Physicians identify critical barriers to service provision for these children, namely lack of pediatric specialists, insurance coverage, and waiting lists. The aforementioned trends in treatment and physician variations in service delivery suggest there may be major gaps between the research base and clinical practice.³

A survey by Gardner, et al suggests that children treated for ADHD require additional follow-up visits to measure the impact of medication and support ongoing treatment. The survey included families of children 4 to 15 years of age who had been diagnosed with ADHD. In the initial office visit, parents and clinicians completed questionnaires, and six months after the initial visit, parents completed a second questionnaire. Children identified with ADHD, including those prescribed medication, had a median of

only one follow-up visit with a health specialist. Researchers noted that this is too few visits to allow for medication adjustment or promote adherence to treatment.⁴

ADHD Work Group Recommendations

Measure #1: Accurate ADHD Diagnosis
Measure #2: Follow Up and Symptom Management (Composite)
Measure #3: Behavior Therapy as First-Line Treatment for Preschool Aged Children

Other Potential Measures

The Work Group considered several other potential measures, though ultimately determined that they were not appropriate for inclusion in the measure set.

Technical Specifications

There are several data sources available for collecting performance measures; generally different data sources require different sets of measure specifications, due to the structure of the systems storing the data. The American Medical Association (AMA)- convened Physician Consortium for Performance Improvement (the PCPI™), recognizes that Electronic Health Records (EHRs) are the state of the art for clinical encounters and is focusing significant resources and expertise toward specifying and testing measures within EHRs, as they hold the promise of providing the relevant clinical data for measures and for providing feedback to physicians and other health care providers that is timely and actionable.

The type of specifications provided for this measurement set are aligned with the PCPI plans to focus on the development of EHR specifications for new measure development projects.

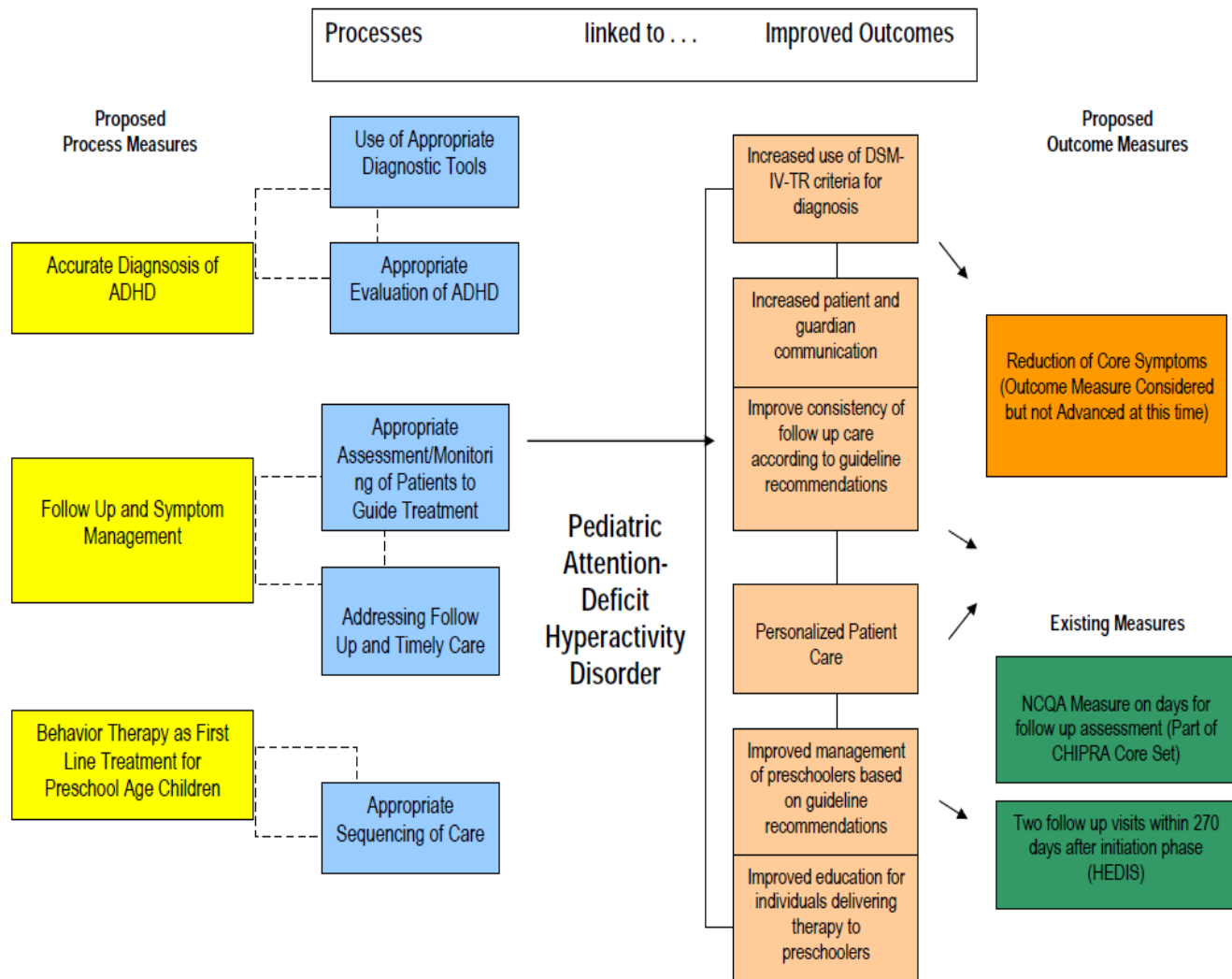
Additional detailed information regarding PCPI Specifications Methodology is included in the Technical Specifications section of this document.

Another venue for advancing this work in EHR data measurement is the AMA/NCQA/HIMSS Electronic Health Record Association (EHRA) Collaborative (see www.ama-assn.org/go/collaborative).

Testing and Implementation of the Measurement Set While these measures were not fully tested as part of an electronic health record, these measures were tested to determine initial feasibility and guidance for implementation using Electronic Medical Record data sources.

The testing was completed within the Chicago Pediatric Quality and Safety Consortium, a testing network comprised of 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, Mount Sinai Children’s Hospital, and Northwestern Memorial’s Prentice Women’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. 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.

Settings: Ambulatory Care, Behavioral Health Care, Community Health Care



Purpose of Measurement Set

The PMCoE was assigned, among other measures, to develop and extend pediatric quality measures for Attention Deficit Hyperactivity Disorder (ADHD). An ADHD Measures Leadership Team was established handled by Donna Woods, EdM, PhD from NU-FSM and included Mark Antman, DDS, and Molly Siegel, MS from the AMA; Fan Tait, MD, 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 AAP 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. The Work Group aimed to develop a comprehensive set of measures that support the efficient delivery of high quality health care in each of the Institute of Medicine's (IOM) six aims for quality improvement (safe, effective, patient centered, timely, efficient, and equitable).

Importance of Topic

Prevalence

- According to the statistics provided by the Centers for Disease Control and Prevention (CDC)¹, for children ages 3-17 years of age:
 - 5 million children (9% of this age group) have ADHD.
 - Boys (12%) continue to be more than twice as likely than girls (5%) to have ADHD.
 - When compared with children who have excellent or very good health, children who have fair or poor health status are more than twice as likely to have ADHD (8% vs. 21%).
- In a study by Visser et al, researchers found that in 2007, the estimated prevalence of parent-reported ADHD (ever) among children aged 4--17 years was 9.5%, representing 5.4 million children. Of those with a history of ADHD, 78% (4.1 million, or 7.2% of all children aged 4--17 years) were reported to currently have the condition. Of those with current ADHD, nearly half (46.7%) had mild ADHD, with the remainder having moderate (39.5%) or severe (13.8%) ADHD. ADHD (ever) was more than twice as common among boys as girls (13.2% versus 5.6%). High rates of ADHD (ever) were noted among multiracial children (14.2%) and children covered by Medicaid (13.6%).²
- Nearly one in 10 children aged 4--17 years 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% of children aged 6--17 years) based on annual data from the 2004--2006 National Health Interview Survey (NHIS) (2). The NHIS report documented an average annual increase in diagnosed ADHD (ever) of 3% from 1997 to 2006; this present report documents a greater average annual increase (5.5%) over a slightly later period (2003--2007).²
- A study by Rowland et al estimated the prevalence of medication treatment for attention deficit-hyperactivity disorder (ADHD) among elementary school children in a North Carolina county. The method was Parents of 7333 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 6099 children (83%) 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.⁵

Morbidity

- ADHD has a multidimensional effect on an individual's daily life functioning, and can culminate 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 might be associated with side effects and symptoms effecting morbidity.²

Costs

- Each child with ADHD costs \$1954 per year, and there are potential medical and work-time cost savings achievable by eliminating disparities, which would equal \$660 million in savings per year.⁶
- Reductions in reading and math test scores for children with ADHD can lead to an increase in the probability of dropping out of high school. This would in turn have an effect on wages impacting the entire direct cost of ADHD. Mental health problems are 1 of the leading causes of days lost in the workplace. Therefore, mental health problems beginning in childhood may have a significant effect on productivity in society.⁷

Medication Use

- In 2000, a survey conducted among school nurses in Maryland reported that 3.7% of all public elementary school children took ADHD medication at school.⁵

Disparities

- In the aforementioned study by Visser, et al comparing ADHD prevalence data between 2003 and 2007, rates of increase were highest among older teens, multiracial and Hispanic children, in addition to children with a primary language other than English. A notable correlation was identified for age and survey year, with the rate of ADHD diagnosis increasing more for the oldest age group, namely 15-17 years.²

Opportunity for Improvement:

Disparities

- A parent survey by Rowland et al evaluated the prevalence of ADHD medication treatment in a population of children grades 1-5 in 17 public elementary schools in a North Carolina county. Parents were asked if 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 6099 children (83%) responded to the survey. Results showed that Hispanic children were the least likely to have been given an ADHD diagnosis or to be receiving medication treatment for ADHD. This was true also for African American children, compared to white children with ADHD who were receiving medication treatment. This suggests barriers to care for specific populations, including less access to medical providers, less health insurance coverage, and less

ability to pay for medication. Language and cultural differences may also impact treatment decisions.⁵

Prescribing habits

- The use of stimulant medications in the United States has risen and as a result there is concern over the potential for over diagnosis of ADHD and the potential for overuse of medications. A study by Sheffler et al reveal that the United States is the world's largest consumer of ADHD medications. Factors which may influence this finding are direct to consumer advertising and the number of U.S. medical specialists who are able to diagnose and treat ADHD. Notably, little difference exists in the rates of ADHD between the United States and other countries. However, the rates of "diagnostic prevalence" (namely, cases actually diagnosed by clinicians) fall behind true prevalence outside the United States.⁶

Physician opinion on treating ADHD

- A study by Stein, et al aims to evaluate physician opinion on identifying and/or treating children with mental illness. The results showed that pediatricians are least likely to agree on identifying and treating learning problems. Of the physicians surveyed, 66% think pediatricians should treat or manage ADHD. In practice few usually inquire about conditions surveyed except for ADHD. Few report they usually treat, except ADHD 54%. Lastly and notably, more recently trained physicians were not more likely to treat mental health conditions.⁸

Variations in Care

- A cross sectional survey by Froehlich et al evaluates a nationally representative sample of the US population from 2001 to 2004. The participants more specifically included 8 to 15-year-old children in the National Health and Nutrition Examination Survey. The Diagnostic Interview Schedule for Children was used to measure the presence of ADHD in the past year based on The DSM-IV-TR criteria. The results showed that **those lacking The DSM-IV-TR ADHD data were significantly more likely to be younger (mean age, 9.9 years vs 12.1 years), poorer (lowest income quintile, 24.9% vs 18.9%), and African American (17.0% vs 14.7%)**. Additionally, less than half of children who met The DSM-IV-TR criteria for ADHD had reportedly had their conditions diagnosed or been treated with ADHD medications. Thus, it seems the case that even when children are diagnosed with ADHD there is not always the appropriate follow up of treatment. Lastly, the researchers noted a lower likelihood of consistent medication use in the poorest children, suggesting inequity across ADHD diagnosis and treatment.⁹
- A study by Hoagwood et al examines knowledge on treatment services for children and adolescents with ADHD between 1989 to 1996. The researchers found that increases in stimulant prescriptions have taken place since 1989. Particularly, prescriptions now represent three fourths of all visits to physicians by children with ADHD. Between 1989 and 1996, services including health counseling grew 10-fold, and diagnostic services grew 3-fold. By contrast, psychotherapy decreased from 40% of pediatric visits to 25%. Notably, follow-up care diminished from more than 90% of visits to 75%. Family practitioners were more likely than either pediatricians or psychiatrists to prescribe stimulants and less likely to utilize diagnostic services, engage in follow-up care and mental health counseling.³
- About 50% of children with ADHD seen in practice settings obtain care that matches guidelines of the American Academy of Child and Adolescent Psychiatry. Physicians identify critical

barriers to service provision for these children, namely lack of pediatric specialists, insurance coverage, and waiting lists. The aforementioned trends in treatment and physician variations in service delivery suggest there may be major gaps between the research base and clinical practice.³

- A study by Gardner, et al suggests that children treated for ADHD require additional follow-up visits to measure the impact of medication and support ongoing treatment. The survey included families of children 4 to 15 years of age who had been diagnosed with ADHD. In the initial office visit, parents and clinicians completed questionnaires, and six months after the initial visit, parents completed a second questionnaire. Children identified with ADHD, including those prescribed medication, had a median of only one follow-up visit with a health specialist. Researchers noted that this is too few visits to allow for medication adjustment or promote adherence to treatment.⁴
- The MTA or Multimodal Treatment Study of Children With ADHD looks at the longer term outcomes for ADHD treatment of 579 children from age 7-9.9. years. The aforementioned children had a diagnosis of ADHD and for the purpose of the trial were randomly assigned to one of four intervention groups: intensive multicomponent behavior therapy (Beh), intensive medication management (MedMgt), the combination (Comb), and routine community care (CC).
- Results were recorded over several years. According to Jensen, et al, at 24 months, the primary (intent to treat) analyses illustrated modest improvements, and after 36 months there was little difference in comorbid conditions and rates of diagnosis. However, at 36 months 71% of Comb and MedMgt participants were using medication at high levels compared to 62% and 45% of CC and Beh participants, respectively.
- Jensen, et al also point out that both medication and educational services for 24 and 36 months were indicators of poorer outcome at 36 months. This poses the question of whether those who are doing poorly get more treatment yet still do not improve compared to the patients for whom treatment is necessary.¹¹

Clinical Evidence Base

Evidence-based clinical practice guidelines are available for the diagnosis, evaluation and treatment of ADHD. This measurement set is based on guidelines from:

- American Academy of Pediatrics

These guidelines meet all of the required elements and many, if not all, of the preferred elements outlined in a recent PCPI position statement establishing a framework for consistent and objective selection of clinical practice guidelines from which work groups may derive clinical performance measures. Clinical practice guidelines serve as the foundation for the development of performance measures. Performance measures, however, are not clinical practice guidelines and cannot capture the full spectrum of care for all patients with ADHD. The guideline principles with the strongest recommendations and often the highest level of evidence (well designed randomized controlled trials) served as the basis for measures in this set.

Intended Audience, Care Setting and Patient Population

These measures should be used on the level of plan or practice, by physicians and other healthcare professionals where appropriate, and healthcare systems, where appropriate, to manage the care for patients aged 18 years and younger with ADHD. These measures are meant to be used to calculate

performance and/or reporting primarily at the practitioner level. Performance measurement serves as an important component in a quality improvement strategy but performance measurement alone will not achieve the desired goal of improving patient care. Measures can have their greatest effect when they are used judiciously and linked directly to operational steps that clinicians, patients, and health plans can apply in practice to improve care.

Other Potential Measures

The Work Group considered several potential measures, which were ultimately not included in the measurement set. The scope was confined to 3 measures because the grant provided by CHIPRA through which this measure development activity is being conducted, gave the Work Group only 1 year to develop and test the measures if they are to be included for review for use by CMS.

We also discussed creating an outcome measure on symptom reduction but the work group was limited to a certain time frame and deadline requirements. Additionally, we discussed forming a measure on prescribing first line therapy for children other than preschool age but chose to limit the measure to reflect the AAP guidelines.

Because measure three was deemed to be complex and lengthy to implement, we have decided to present it but not include it in the testing project as of now. We wanted to show all the hard work invested in developing this measure.

Technical Specifications: Overview

There are several data sources available for collecting performance measures; generally different data sources require different sets of measure specifications, due to the structure of the systems storing the data. The American Medical Association (AMA)-convened Physician Consortium for Performance Improvement® (the PCPI™), recognizes that Electronic Health Records (EHRs) are the state of the art for clinical encounters and is focusing significant resources and expertise toward specifying and testing measures within EHRs, as they hold the promise of providing the relevant clinical data for measures and for providing feedback to physicians and other health care providers that is timely and actionable.

The type of specifications provided for this measurement set are aligned with the PCPI plans to focus on the development of EHR specifications for new measure development projects. Additional detailed information regarding PCPI Specifications Methodology is included in the Technical Specifications section of this document.

Another venue for advancing this work in EHR data measurement is the AMA/NCQA/HIMSS Electronic Health Record Association (EHRA) Collaborative (see www.ama-assn.org/go/collaborative).

Measure Exclusions and Exceptions

Exclusions arise when patients who are included in the initial patient or eligible population for a measure do not meet the denominator criteria specific to the intervention required by the numerator. Exclusions are absolute and apply to all patients and therefore are not part of clinical judgment within a measure.

Exceptions are used to remove patients from the denominator of a performance measure when a patient does not receive a therapy or service AND that therapy or service would not be appropriate due to specific

reasons for which the patient would otherwise meet the denominator criteria. Exceptions are not absolute, and are based on clinical judgment, individual patient characteristics, or patient preferences.

For **process measures**, the PCPI provides three categories of reasons for which a patient may be excluded from the denominator of an individual measure that were used in this work group:

- **Medical reasons**

Includes:

- not indicated (absence of organ/limb, already received/performed, other)
- contraindicated (patient allergic history, potential adverse drug interaction, other)

- **Patient reasons**

Includes:

- patient declined
- social or religious reasons
- other patient reasons

- **System reasons**

Includes:

- resources to perform the services not available
- insurance coverage/payor-related limitations
- other reasons attributable to health care delivery system

These measure exception categories are not available uniformly across all measures; for each measure, there must be a clear rationale to permit an exception for a medical, patient, or system reason. For some measures, examples have been provided in the measure exception language of instances that would constitute an exception. Examples are intended to guide clinicians and are not all-inclusive lists of all possible reasons why a patient could be excluded from a measure. The exception of a patient may be reported by appending the appropriate modifier to the CPT Category II code designated for the measure:

- **Medical reasons**: modifier 1P
- **Patient reasons**: modifier 2P
- **System reasons**: modifier 3P

Although this methodology does not require the external reporting of more detailed exception data, the PCPI recommends that physicians document the *specific* reasons for exception in patients' medical records for purposes of optimal patient management and audit-readiness. The PCPI also advocates the systematic review and analysis of each physician's exceptions data to identify practice patterns and opportunities for quality improvement. For example, it is possible for implementers to calculate the percentage of patients that physicians have identified as meeting the criteria for exception.

Please refer to documentation for each individual measure for information on the acceptable exception categories and the codes and modifiers to be used for reporting.

DRAFT Measure #1: Accurate ADHD Diagnosis

Attention Deficit Hyperactivity Disorder (ADHD)

Measure Description

Percentage of patients aged 4 through 18 years whose diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) was based on a clinical exam with a physician or other healthcare professional, as appropriate which includes:

Confirmation of functional impairment in two or more settings

AND

Assessment of core symptoms of ADHD including inattention, hyperactivity, and impulsivity, either through use of a validated diagnostic tool based on DSM-IV-TR criteria for ADHD or through direct assessment of the patient

Measure Components

Numerator Statement	<p>Patients whose diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) was based on a clinical exam with a physician or other healthcare professional, as appropriate which includes:</p> <p>Confirmation of functional impairment in two or more settings²</p> <p>AND</p> <p>Assessment of core symptoms of ADHD including inattention, hyperactivity, and impulsivity, either through use of a validated diagnostic tool² based on DSM-IV-TR criteria for ADHD or through direct assessment of the patient</p> <hr/> <p><u>Definitions:</u></p> <p>¹ Settings: Includes home, school and community</p> <p>² Validated diagnostic tool used may include any of the following examples, all of which are based on the DSM-IV criteria for ADHD. Other validated diagnostic tools based on the DSM-IV criteria may be available and would be acceptable for this measure; this list is not intended to be all-inclusive.</p> <p>Conners Rating Scales Barkley ADHD Rating Scale Vanderbilt Parent and Teacher Assessment Scales</p>
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	ADHD Rating Scale-IV (DuPaul) Swanson, Nolan, and Pelham-IV (SNAP IV) Questionnaire
Denominator Statement	All patients aged 4 through 18 years with a diagnosis of ADHD
Denominator Exceptions	This measure has no exceptions
Supporting Guideline & Other References	<p>The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:</p> <p>To make a diagnosis of ADHD, the primary care clinician should determine that Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria have been met (including documentation of impairment in more than one major setting), with information obtained primarily from reports of parents or guardians, teachers, and other school and mental health clinicians involved in the child’s care. The primary care clinician should also rule out any alternative cause and should include assessment for other conditions that might coexist or be comorbid with or consequent to ADHD, including emotional or behavioral (eg anxiety, mood, oppositional defiant, and conduct disorders), and physical (eg tics, sleep apnea) conditions.¹³</p> <p>Primary Care Clinicians should evaluate children 4 -18 years of age for ADHD who presents with academic or behavioral problems and symptoms of inattention, hyperactivity or impulsivity.¹³</p> <p>Parent and teacher rating scales that use DSM-IV criteria for ADHD are helpful in obtaining the information required to make a DSM-IV diagnosis. Broad band rating scales that assess mental health functioning in general do not provide reliable and valid indications of ADHD diagnoses. Multiple informants are required for clinicians to determine nature and severity of symptoms, their impact on function in two or more settings, and whether the child/adolescent meets DSM IV criteria for diagnosis of ADHD. In most cases the teacher provides those reports. It is also stated that interviews with the parents/guardians and with the children are also essential in the diagnostic process.¹³</p>

Measure Importance

Relationship to desired outcome	Accurate ADHD diagnosis requires assessment based on the DSM-IV-TR criteria. Because these criteria are not always used, this measure provides two options for diagnosis of ADHD utilizing DSM-IV criteria, including the use of a validated diagnostic tool and assessment of core symptoms with functional impairment.
Opportunity for Improvement	There is a need for accurate evidence-based diagnosis of ADHD with documentation of all relevant elements assessed and use of evidence-based validated instruments in diagnostic process. A cross sectional survey by Froehlich et al evaluates a nationally representative sample of the US population from 2001 to 2004. The participants more specifically included 8 to 15-year-old children in the

National Health and Nutrition Examination Survey. The Diagnostic Interview Schedule for Children was used to measure the presence of ADHD in the past year based on DSM-IV criteria. The results showed that those lacking DSMIV ADHD data were significantly more likely to be younger (mean age, 9.9 years vs 12.1 years), poorer (lowest income quintile, 24.9% vs 18.9%), and African American (17.0% vs 14.7%).

IOM Domains of Health Care Quality Addressed	<ul style="list-style-type: none"> • Effective • Timely • Equitable • Safe • Efficient
Harmonization with Existing Measures	The PMCoE measure development team attempts to harmonize measures with other existing measures to the extent feasible.

Measure Designation

Measure purpose	<ul style="list-style-type: none"> • Quality improvement • Accountability
Type of measure	<ul style="list-style-type: none"> • Process
Level of Measurement	<ul style="list-style-type: none"> • Practice/Plan Level
Care setting	<ul style="list-style-type: none"> • Any inpatient or outpatient care
Data source	<ul style="list-style-type: none"> • Electronic health record (EHR) data

DRAFT Measure #2: Behavior Therapy as First-Line Treatment for Preschool-Aged Children

Attention Deficit Hyperactivity Disorder (ADHD)

Measure Description

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 first line treatment.

Measure Components

Numerator Statement	<p>Patients for whom ADHD-focused evidence-based behavior therapy* was prescribed as first line treatment**</p> <p>*Evidence-based behavior therapy:</p> <ol style="list-style-type: none"> 1. Treatment is directed to parent or caregiver (guardian, teacher, child care worker) AND 2. Training is provided in parent or caregiver-administered behavior modification AND 3. Treatment does not involve child-directed play therapy <p>**First line treatment: Prior to any ADHD medication prescribed</p>
Denominator Statement	All patients aged 4 through 5 years with a diagnosis of ADHD
Denominator Exceptions	<p>Documentation of medical reason(s) for not prescribing behavior therapy as first line treatment (eg, (eg patient with multiple psychiatric conditions referred to other provider), or patient determined to be at risk for harming themselves or others)</p> <p>Documentation of system reason(s) for not prescribing behavior therapy as first line treatment (eg, lack of access to behavior therapy)</p>
Supporting Guideline & Other References	<p>The following clinical recommendation statements are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure:</p> <p>For <u>preschool aged children (4 through 5 years of age)</u>, 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</p>

of delaying diagnosis and treatment (Quality of Evidence: B/Recommendation).¹³

Measure Importance

Relationship to desired outcome The overall evidence for behavior therapy in preschool-aged children is strong. The multisite study of methylphenidate (Gardner, et al) supports the recommendation to require behavior therapy as first line treatment in preschool-aged children (ages 4-5 years) because the researchers found that many children experience improvements in symptoms with behavior therapy alone. (Appendix B).

Opportunity for Improvement There is a need to follow up on adherence to the new AAP ADHD Guideline recommendation for behavior therapy as first-line treatment for 4 and 5 year old patients with an ADHD diagnosis, to reduce the practice of immediately starting 4 and 5 year old patients with an ADHD diagnosis on medications, which is not necessarily supported by guideline recommendations.

In a research study by Chai, et al, looking at outpatient prescription drug utilization between 2002-2010, 20% of cases in which a product was used off-label in children, the product was found not to be effective at the dose used when finally studied in children. Additional information showed that children often manifest a new more frequent, or severe form of adverse events described in adults.¹⁴

IOM Domains of Health Care Quality Addressed

- Effective
- Timely
- Equitable
- Safe
- Efficient

Harmonization with Existing Measures The PMCoE measure development team attempts to harmonize measures with other existing measures to the extent feasible.

Measure Designation

Measure purpose

- Quality improvement
- Accountability

Type of measure

- Process

Level of Measurement

- Practice/Plan Level

Care setting

- Any inpatient or outpatient care

Data source

- Electronic health record (EHR) data
-

American Academy of Pediatrics: Grading of Evidence:

The recommendations contained in the AAP guideline are based on the best available data. For each recommendation, the AAP subcommittee graded the *quality of evidence* on which the recommendation was based and the *strength* of the recommendation. Grades of evidence were grouped into 3 categories— good, fair, or poor. Recommendations were made at 3 levels. Strong recommendations were based on high-quality scientific evidence or, in the absence of high-quality data, strong expert consensus. Fair and weak recommendations were based on lesser quality or limited data and expert consensus. Clinical options are identified as interventions for which the subcommittee could not find compelling evidence for or against. Clinical options are defined as interventions that a reasonable health care provider might or might not wish to implement in his or her practice.

Appendix A: ADHD Expert Work Group Roster

<i>Name</i>	<i>Specialty</i>	<i>Organization/Affiliation</i>
Abernathy, Ted	Pediatrician	Private Practice of Pediatrics and Adolescent Medicine
Brooks, Betsy	Pediatrician	Holyoke Pediatric Associates
Brown, Lawrence	Pediatric Neurologist	Children's Hospital of Philadelphia
Coleman, Mirean	Social Worker	National Association of Social Workers
Downs, Stephen	Pediatrician	Children's Health Services Research
DuPaul, George	School Psychologist	Lehigh University
Earls, Marian	Developmental-Behavioral Pediatrician	Guilford Child Health
Epstein, Jeff	Clinical Psychologist	Cincinnati Children's Hospital Medical Center
Ganiats, Theodore G.	Family Physician	University of California San Diego
Hannah, Jane	School-based Learning Disability Specialist	Currey Ingram Academy
Hasnain-Wynia, Romana	Healthcare Equity Expert	Northwestern University Institute for Healthcare Studies
Kairys, Steven	Pediatrician	Jersey Shore Medical Center
Kaplanek, Beth	Parent	Children & Adults w/Attention Deficit Disorders (CHADD)
Katerji, M. Ammar	Pediatric Neurologist	Advocate Hope Children's Hospital
Lane, Shelly	Occupational Therapist	Virginia Commonwealth University
Marek, Nancy	Pediatric Nurse	Advocate Hope Children's Hospital
Miles, Paul	Maintenance of Certification Expert	American Board of Pediatrics
Mozee-Russell, Patrice	Teacher	Children & Adults w/Attention Deficit Disorders (CHADD)
Pierce, Karen*	Child and Adolescent Psychiatrist	Children's Memorial Hospital/Northwestern University
Rief, Sandra	School-based Learning Disability Specialist	Children & Adults w/Attention Deficit Disorders (CHADD)
Ross, Clarke	Parent	American Association on Health and Disability
Sandler, Adrian	Developmental-Behavioral Pediatrician	Mission Children's Hospital
Slomowitz, Marcia	Child and Adolescent Psychiatrist	Northwestern Memorial Hospital
Stine, Laurel	Consumer Representative	Bazelon Center for Mental Health Law
Wolraich, Mark*	Developmental-Behavioral Pediatrician	University of Oklahoma Child Study Center

Zima, Bonnie	Child and Adolescent Psychiatrist	UCLA Center for Health Services and Society
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*Co-Chair

Non-Material Interest Disclosures:

None of the members of the Attention Deficit Hyperactivity Disorder (ADHD) Work Group had any disqualifying material interests as defined by applying the the AMA-convened Physician Consortium for Performance Improvement® (PCPI™) Conflict of Interest Policy in light of its rigor. The following is a summary of non-disqualifying interests disclosed on Work Group members' Material Interest Disclosure Statements (not including information concerning family member interests). Completed Material Interest Disclosure Statements are available upon request.

<u>Work Group Member</u>	<u>Disclosures</u>
Pierce, Karen (Co-chair)	Receipt of Speaking Honoraria: \$250 Service on a Quality Committee: American Psychological Association (no longer active)
Wolraich, Mark (Co-chair)	None
Abernathy, Ted	None
Brooks, Betsy	None
Brown, Lawrence	Researcher whose institution receives research funding but is not involved in the research: University of Pennsylvania Service on Editorial Board of a Peer Reviewed Journal: Pediatric Neurology
Coleman, Mirean	None
Downs, Stephen	Consulting Services: Consultant, WellPoint, Inc. – National Medicaid Advisory Panel Board Membership: Board of Directors – Indiana University Medical Group Primary Care
DuPaul, George	Royalties: Guilford Press, American Psychological Association Research Grant: Shire Pharmaceuticals
Earls, Marian	None
Epstein, Jeff	Royalties: myadhdportal.com – Physician Improvement Program
Ganiats, Theodore G.	None
Hannah, Jane	None

Hasnain-Wynia, Romana

Research/Grant Support: Robert Wood Johnson Foundation, Agency for Healthcare Research and Quality

Oversight of Department/Institution: Board Member, Academy Health (2010-2014 Board of directors), Steering Committee – National Quality Forum (2011-2012 Health care disparities and cultural competency)

Payment for Consulting Services: Health Affairs, Health Services Research

Work group member: Academy Health
Committee participant: National Quality Forum, Agency for Healthcare Research and Quality

Kairys, Steven
Kaplanek, Beth

None
Service on a Committee: Subcommittee for Attention Deficit Hyperactivity Disorder assessment and treatment – updated guidelines (completed in 2010)

Katerji, M. Ammar
Lane, Shelly
Marek, Nancy
Miles, Paul

None
None
None
Fiduciary Relationship: PCPI Executive Committee

Prior Work Group Member: Director - PCPI Executive Committee

Service on a Quality Committee: National Association of Childrens Hospitals and Related Institutions Quality Council

Moze-Russell, Patrice
Rief, Sandra

None
Service on a Quality Committee: National Initiative for Childrens Healthcare Quality

Consultant services for Shire Pharmaceuticals

Ross, Clarke

2000-2010: worked for , Children and Adults with Attention Deficit/Hyperactivity Disorder as CEO

Sandler, Adrian
Slomowitz, Marcia
Stine, Laurel
Zima, Bonnie

None
None
None
Research/Grant Support: National Institute of Mental Health, Agency for Healthcare Research and Quality

Other payments: Elaine Schlosser Lewis Fund for Best ADHD Research in Journal of The American Academy of Child and Adolescent Psychiatry - \$4,500

Work Group Member: Nominated for National Quality Forum Behavioral Health Committee; Past Member of Child Health Steering Committee

Employment as Physician of a Payor: County of Los Angeles Department of Mental Health

Appendix B: Citations

¹ Centers for Disease Control and Prevention (CDC), *Vital and Health Statistics* (PDF; December 2010; Series 10, Number 247).

² Visser M S, Bitsko R H, Danielson M L, et al. Increasing Prevalence of Parent-Reported Attention Deficit/Hyperactivity Disorder Among Children; United States, 2003 and 2007 November 12, 2010 / 59(44);1439-1443SN.

³ Hoagwood K, et al. Changes in ADHD Treatment Services: Treatment Services for Children with ADHD: A National Perspective, *J. Am. Acad. Child Adolesc. Psychiatry* 2000, 39(2):198-206.

⁴ Gardner W, Kelleher K J, Pajer K. Follow-up Care of Children Identified with ADHD by Primary Care Clinicians: A Prospective Cohort Study. *The Journal of Pediatrics* December 2004.

⁵ Rowland, A S, Umbach D M, Stallone L, et al. Prevalence of Medication Treatment for Attention Deficit–Hyperactivity Disorder Among Elementary School Children in Johnston County, North Carolina.

⁶ Scheffler R M, Hinshaw S P, Modrek S, et al. The Global Market for ADHD Medications

⁷ Janet Currie, et al. Policy Interventions to Address Child Health Disparities: Moving Beyond Health Insurance. *Journal of the American Academy of Pediatrics*.

⁸ Stein R E K, McCue Horwitz S, Penfold R B, et al. Do Pediatricians Think They Should Care For Patients with New Morbidity? Results of the AAP Periodic Survey.

⁹ Froehlich T E, Lanphear B P, Epstein J N, et al. Prevalence, Recognition, and Treatment of Attention-Deficit/Hyperactivity Disorder in a National Sample of US Children. *Arch Pediatr Adolesc Med.* 2007;161(9):857-864.

¹¹ Jensen PS, Arnold E, Swanson JM, et al. 3-Year Follow-up of the NIMH MTA Study. *J . Am. Acad. Child Adolesc. Psychiatry,* 46:8, August 2007.

¹² Bruchmüller, K; Margraf, J; Schneider, S. Is ADHD diagnosed in accord with diagnostic criteria? Overdiagnosis and influence of client gender on diagnosis. *Journal of Consulting and Clinical Psychology,* Vol 80(1), Feb 2012, 128-138

¹³ American Academy of Pediatrics, Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management. ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics.* 2011;128(5):1007-1022.

¹⁴ Chai G, Governale L, McMahon A W, et al. Trends of Outpatient Prescription Drug Utilization in US Children, 2002-2010. *Journal of the American Academy of Pediatrics.* DOI: 10.1542/peds.2011-2879.

Attachment 5.3 ADHD Guidelines Review

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
Screening	American Academy of Child Adolescent Psychiatry	<p>Recommendation 1. Screening for Attention-Deficit/Hyperactivity Disorder (ADHD) Should Be Part of Every Patient's Mental Health Assessment.</p> <p>In any mental health assessment, the clinician should screen for ADHD by specifically asking questions regarding the major symptom domains of ADHD (inattention, impulsivity, and hyperactivity) and asking whether such symptoms cause impairment. These screening questions should be asked regardless of the nature of the chief complaint. Rating scales or specific questionnaires containing the Diagnostic and Statistical Manual (DSM) symptoms of ADHD can also be included in clinic/office registration materials to be completed by parents before visits or in the waiting room before the evaluation. If a parent reports that the patient suffers from any symptoms of ADHD that induce impairment or if the patient scores in the clinical range for ADHD symptoms on a rating scale, then a full evaluation for ADHD as set out in the next recommendation is indicated.</p>	MS
Diagnosis and Evaluation	American Academy of Pediatrics	<p>Action Statement 1: The primary care clinician should evaluate children 4 through 18 years of age for ADHD if they present with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity.</p>	Level B
Diagnosis and Evaluation	American Academy of Pediatrics	<p>Action Statement 2: To make a diagnosis of ADHD, the primary care clinician should determine that Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria have been met (including documentation of impairment in more than one major setting), with information obtained primarily from reports of parents or guardians, teachers, and other school and mental health clinicians involved in the child's care. The primary care clinician should also rule out any alternative cause and should include assessment for other conditions that might coexist or be comorbid with or consequent to ADHD, including emotional or behavioral (eg anxiety, mood, oppositional defiant, and conduct disorders), and physical (eg tics, sleep</p>	Level B

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
		apnea) conditions.	
Diagnosis and Evaluation	American Academy of Child Adolescent Psychiatry	<p>Recommendation 2. Evaluation of the Preschooler, Child, or Adolescent for ADHD Should Consist of Clinical Interviews with the Parent and Patient, Obtaining Information about the Patient's School or Day Care Functioning, Evaluation for Comorbid Psychiatric Disorders, and Review of the Patient's Medical, Social, and Family Histories.</p> <p>Recommendation 3. If the Patient's Medical History Is Unremarkable, Laboratory or Neurological Testing Is Not Indicated.</p> <p>Recommendation 4. Psychological and Neuropsychological Tests Are Not Mandatory for the Diagnosis for ADHD, but Should Be Performed if the Patient's History Suggests Low General Cognitive Ability or Low Achievement in Language or Mathematics Relative to the Patient's Intellectual Ability.</p> <p>Recommendation 5. The Clinician Must Evaluate the Patient with ADHD for the Presence of Comorbid Psychiatric Disorders.</p>	<p>MS</p> <p>NE</p> <p>OP</p> <p>MS</p>
Diagnosis and Evaluation	Scottish Intercollegiate Guidelines Network (SIGN)	<p>Parental report of their children's symptoms is an essential component of the diagnostic assessment.</p> <p>A history should be obtained of obstetric and perinatal complications.</p> <p>A developmental history should be obtained to show a chronological development of difficulties.</p> <p>Laboratory assessments should not be used routinely.</p> <p>An assessment of the child's presentation in their educational placement is important for confirming diagnosis and identifying educational underachievement.</p>	<p>D</p> <p>D</p> <p>C</p> <p>C</p> <p>D</p>

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
Diagnosis and Evaluation	American Academy of Pediatrics	<p>Action Statement 3: In the evaluation of a child for ADHD, the primary care clinician should include assessment for other conditions that might coexist with ADHD, including emotional or behavioral (eg anxiety, depressive, oppositional defiant, and conduct disorders), developmental (eg, learning and language disorders or other neurodevelopmental disorders), and physical (eg, tics, sleep apnea) conditions.</p> <p>Action Statement 4: The primary care clinician should recognize ADHD as a chronic condition and, therefore, consider children and adolescents with ADHD as children and youth with special health care needs. Management of children and youth with special health care needs should follow the principles of the chronic care model and the medical home.</p>	<p>Level B</p> <p>Level B</p>
Treatment	American Academy of Pediatrics	<p>Action Statement 5: Recommendations for treatment of children and youth with ADHD varies depending on their age:</p> <p>5a. For <u>preschool aged children (4 through 5 years of age)</u>, 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/Recommendation).</p> <p>5b. For <u>elementary school-age children (6 through 11 years of age)</u>, the</p>	<p>A for behavior. B for methylphenidate</p> <p>A for treatment with FDA</p>

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
		<p>primary care clinician should prescribe FDA-approved medications for ADHD (Quality of Evidence: A/Strong Recommendation) and/or evidence based parent- and/or teacher-administered behavior therapy as treatment for ADHD-preferably both (Quality of Evidence: B/Strong Recommendation). The recommendations are particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended-release guanfacine, and extended release-clonidine, in that order). The school environment, program, or placement is a part of any treatment plan.</p> <p>5c. For adolescents (12 through 18 years of age), the primary care clinician should prescribe FDA-approved medications for ADHD (Quality of Evidence: A/Strong Recommendation) and may prescribe behavior therapy as treatment for ADHD (Quality of Evidence: C/Recommendation) – preferably both.</p>	<p>approved medications; B for behavior therapy.</p> <p>A for medications; C for behavior therapy.</p>
Treatment	American Academy of Child Adolescent Psychiatry	<p>Recommendation 6. A Well-Thought-Out and Comprehensive Treatment Plan Should Be Developed for the Patient with ADHD</p> <p>Recommendation 7. The Initial Psychopharmacological Treatment of ADHD Should Be a Trial with an Agent Approved by the Food and Drug Administration (FDA) for the Treatment of ADHD.</p> <p>The following medications are approved by the FDA for the treatment of ADHD: dextroamphetamine (DEX), D- and D,L-methylphenidate (MPH), mixed salts amphetamine, and atomoxetine.</p> <p>Recommendation 8. If None of the Above Agents Result in Satisfactory Treatment of the Patient with ADHD, the Clinician Should Undertake a Careful Review of the Diagnosis and Then Consider Behavior Therapy and/or the Use of Medications Not Approved by the FDA for the Treatment of ADHD.</p> <p>Recommendation 9. During a Psychopharmacological Intervention for ADHD, the Patient Should Be Monitored for Treatment-Emergent Side</p>	<p>MS</p> <p>MS</p> <p>CG</p> <p>MS</p>

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
		<p>Effects.</p> <p>Recommendation 10. If a Patient With ADHD Has a Robust Response to Psychopharmacological Treatment and Subsequently Shows Normative Functioning in Academic, Family, and Social Functioning, Then Psychopharmacological Treatment of the ADHD Alone Is Satisfactory.</p> <p>Recommendation 11. If a Patient with ADHD Has a Less Than Optimal Response to Medication, Has a Comorbid Disorder, or Experiences Stressors in Family Life, Then Psychosocial Treatment in Conjunction with Medication Treatment Is Often Beneficial.</p> <p>Recommendation 12. Patients Should Be Assessed Periodically to Determine Whether There Is Continued Need for Treatment or If Symptoms Have Remitted. Treatment of ADHD Should Continue as Long as Symptoms Remain Present and Cause Impairment.</p> <p>Recommendation 13. Patients Treated With Medication for ADHD Should Have Their Height and Weight Monitored Throughout Treatment.</p>	<p>OP</p> <p>CG</p> <p>MS</p> <p>MS</p>
Non-pharmacological Treatment	Scottish Intercollegiate Guidelines Network (SIGN)	<p>Behavioural parent training is recommended for parents of pre-school children with symptoms of attention deficit hyperactivity disorder/hyperkinetic disorder (ADHD/HKD). This should be delivered by trained facilitators.</p> <p>In pre-adolescent children with ADHD/HKD and comorbid symptoms of oppositional defiant disorder and/or aggressive behaviour, behavioural programmes are recommended to treat the comorbid problems.</p> <p>In pre-adolescent children with ADHD/HKD and comorbid generalised</p>	<p>B</p> <p>A</p> <p>B</p>

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
		<p>anxiety, behavioural programmes are recommended to treat the comorbid problems.</p> <p>Children with ADHD/HKD require an individualised school intervention programme including behavioural and educational interventions.</p>	<p>A</p>
Pharmacological Treatment	Scottish Intercollegiate Guidelines Network (SIGN)	<p>For school aged children and young people with hyperkinetic disorder (severe ADHD) medication is recommended.</p> <p>For school aged children and young people with ADHD/HKD and comorbid symptoms of oppositional defiant disorder and/or aggressive behaviour a combination of medication and behavioural treatments is recommended.</p> <p>For school aged children and young people with ADHD/HKD and comorbid generalised anxiety disorders, a combination of medication and behavioural treatments is recommended.</p>	<p>A</p> <p>A</p> <p>B</p>
Pharmacological Treatment	Scottish Intercollegiate Guidelines Network (SIGN)	<p>Psychostimulants are recommended as the first choice medication for the core symptoms of ADHD/HKD in children.</p> <p>Psychostimulants should not be first line medication for children with ADHD/HKD where there are known (or where there is a family history of) cardiac abnormalities.</p> <p>Atomoxetine is recommended as treatment for the core symptoms of ADHD/HKD in children where psychostimulant medication is not appropriate, not tolerated or is ineffective.</p> <p>Clonidine can be considered in children unresponsive to or unable to tolerate treatment with psychostimulants or atomoxetine. It may be used on its own or in combination with methylphenidate on an individual</p>	<p>A</p> <p>D</p> <p>A</p> <p>C</p>

* Evidence classification/rating scheme described at end of this document

Aspect of Care	Developer	Guideline Recommendations	Evidence Ranking/Rating*
		<p>case basis.</p> <p>Tricyclic antidepressants should not be routinely used in treatment of ADHD/HKD in children and should only be considered where children have not responded to licensed medications.</p>	B

Table: Evidence Classification/Guidelines Rating Scheme

Developer	Evidence Classification/Guidelines Rating Scheme
American Academy of Pediatrics	<p>A: Well designed RCTs or diagnostic studies on relevant population</p> <p>B: RCTs or diagnostic studies with minor limitations; overwhelmingly consistent evidence from observational studies</p> <p>C: Observational studies (case-control and cohort design)</p> <p>D: Expert opinion, case reports, reasoning from first principles</p> <p>X: Exceptional situations where validating studies cannot be performed and there is a clear preponderance of benefit or harm</p>
American Academy of Child Adolescent Psychiatry	<p>[MS] <i>Minimal standards</i> are recommendations that are based on rigorous empirical evidence (e.g., randomized, controlled trials) and/or overwhelming clinical consensus. Minimal standards are expected to apply >95% of the time (i.e., in almost all cases).</p> <p>[CG] <i>Clinical guidelines</i> are recommendations that are based on empirical evidence and/or strong clinical consensus. Clinical guidelines apply approximately 75% of the time (i.e., in most cases). These practices should almost always be considered by the clinician, but there are significant exceptions to their universal application.</p> <p>[OP] <i>Options</i> are practices that are acceptable, but not required. There may be insufficient empirical evidence and/or clinical consensus to support recommending these practices as minimal standards or clinical guidelines.</p>

* Evidence classification/rating scheme described at end of this document

	<p>[NE] <i>Not endorsed</i> refers to practices that are known to be ineffective or contraindicated.</p>
<p>Scottish Intercollegiate Guidelines Network (SIGN).</p>	<p>A: At least one meta-analysis, systematic review, or randomised controlled trial (RCT) rated as 1++ and directly applicable to the target population; or</p> <p>A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results</p> <p>B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or</p> <p>Extrapolated evidence from studies rated as 1++ or 1+</p> <p>C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or</p> <p>Extrapolated evidence from studies rated as 2++</p> <p>D: Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+</p>

References

American Academy of Pediatrics, Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management. ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics*. 2011;128(5):1007-1022.

Scottish Intercollegiate Guidelines Network (SIGN). Management of attention deficit and hyperkinetic disorders in children and young people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2009 Oct. 52 p. (SIGN publication; no. 112).

Pliszka S, AACAP Work Group on Quality Issues. Practice parameter for the assessment and treatment of children and adolescents with attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry* 2007 Jul;46(7):894-921.

Attachment 5.4 ADHD Chronic Care Follow-up Measure Worksheet

DRAFT Measure #3: ADHD Chronic Care Follow-up
Attention Deficit Hyperactivity Disorder (ADHD)

Measure Description

Percentage of patients aged 4 through 18 years with a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) for whom follow-up care was provided within the calendar year.

Measure Components

Numerator Statement	Patients who attended at least one ADHD follow-up care visit within the calendar year.
Denominator Statement	All patients aged 4 through 18 years with a diagnosis of ADHD
Denominator Exceptions	Documentation of medical reason(s) for not providing follow-up care (eg patient with multiple psychiatric conditions referred to other provider) Documentation of system reason(s) for not providing follow up care (eg patient for whom the follow up visits were not all with the same practice)
Supporting Guideline & Other References	<p>The following clinical recommendation statements are quoted verbatim from the AAP ADHD clinical practice guideline¹ and represent the evidence base for the measure:</p> <p>This recommendation is based on the evidence that ADHD continues to cause symptoms and dysfunction in many children who have the condition over long periods of time, even into adulthood, and that the treatments available address symptoms and function but are usually not curative. Although the chronic illness model has not been specifically studied in children and youth with ADHD, it has been effective for other chronic conditions such as asthma,² and the medical home model has been accepted as the preferred standard of care.³ Longitudinal studies have found that, frequently, treatments are not sustained despite the fact that long term outcomes for children with ADHD indicate that they are at greater risk of significant problems if they discontinue treatment.⁴</p> <p>The primary care clinician should recognize ADHD as a chronic condition and, therefore, consider children and adolescents with ADHD as children and youth with special health care needs. Management of children and youth with special health care needs should follow the principles of the chronic care model and the medical home.</p>

Measure Importance

Relationship to desired outcome	Follow up care and symptom management are essential for monitoring the effectiveness of ADHD treatment and adjusting medications. As the AAP Clinical Guideline specifies, follow-up for ADHD chronic care management should occur at a minimum, two times a year the first year of diagnosis and then annually thereafter. ⁵ Therefore, in order to ensure good ADHD care, it is imperative for patients to receive regular follow-up.
Opportunity for Improvement	There is a need to measure the follow-up care given to ADHD patients in the medical home to ensure proper diagnosis, monitoring, and treatment on an ongoing basis.
IOM Domains of Health Care Quality Addressed	<ul style="list-style-type: none"> • Effective • Timely • Equitable • Safe • Efficient
Exception Justification	
Harmonization with Existing Measures	The PMCoE measure development team attempts to harmonize measures with other existing measures to the extent feasible.

Measure Designation

Measure purpose	<ul style="list-style-type: none"> • Quality improvement • Accountability
Type of measure	<ul style="list-style-type: none"> • Process
Level of Measurement	<ul style="list-style-type: none"> • Practice/Team Level,
Care setting	<ul style="list-style-type: none"> • Ambulatory Care
Data source	<ul style="list-style-type: none"> • Administrative Claims Data

1. Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management. ADHD: clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics*. 2011; 128(5):1-16.
2. Young J. Common comorbidities seen in adolescents with attention-deficit/hyperactivity disorder. *Adolesc Med State Art Rev*. 2008;19(2): 216–228, vii.
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Attachment 5.5 References

1. Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management. ADHD: clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics*. 2011;128:1007-1022.
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7. Barr VJ, Robinson S, Marin-Link B, ..., Salivaras S. The expanded Chronic Care Model: an integration of concepts and strategies from population health promotion and the Chronic Care Model. *Hosp Q*. 2003;7(1):73-82.
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