Implementing the Key Action Statements of the American Academy of Pediatrics' Attention-Deficit/Hyperactivity Disorder (ADHD) Clinical Practice Guidelines: An Algorithm and Explanation for Process of Care for the Evaluation, Diagnosis, Treatment, and Monitoring of ADHD in Children and Adolescents

I. INTRODUCTION

Practice guidelines provide a broad outline of the requirements for high-quality, evidence-based care. The American Academy of Pediatrics' (AAP) "Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) in Children and Adolescents" provides the evidence-based processes for caring for children and adolescents with ADHD symptoms or diagnosis. This document supplements that guideline. It provides a process-of-care algorithm that details processes to implement the guidelines; describes procedures for the evaluation, treatment, and monitoring of children and adolescents with ADHD; and addresses practical issues related to the provision of ADHD-related care within a typical, busy pediatric practice. The algorithm is entirely congruent with the guidelines and is based on the practical experience and expert advice of clinicians who are experienced in the diagnosis and management of children and adolescents with ADHD. Unlike the guidelines, this algorithm is based primarily on expert opinion and has a less-robust evidence base because of the lack of clinical studies specifically addressing this approach. Understanding that providing appropriate care to children with ADHD in a primary care setting faces a number of challenges and barriers, the subcommittee has also provided an additional paper describing needed changes to address barriers to care (found in the supplemental files of this article online).

This algorithm describes a continuous process; as such, its constituent steps are not intended to be completed in a single office visit, or in a specific number of visits. Evaluation, treatment, and monitoring are ongoing processes, to be addressed throughout the

child/adolescent's care within the practice, and in transition planning as the adolescent moves into the adult care system. Many factors will influence the pace of the process—including the experience of the primary care clinician (PCC), the practice's volume, the longevity of the relationship between the PCC and family, the severity of concerns, the availability of academic records and school input, the family's schedule, and the payment structure.

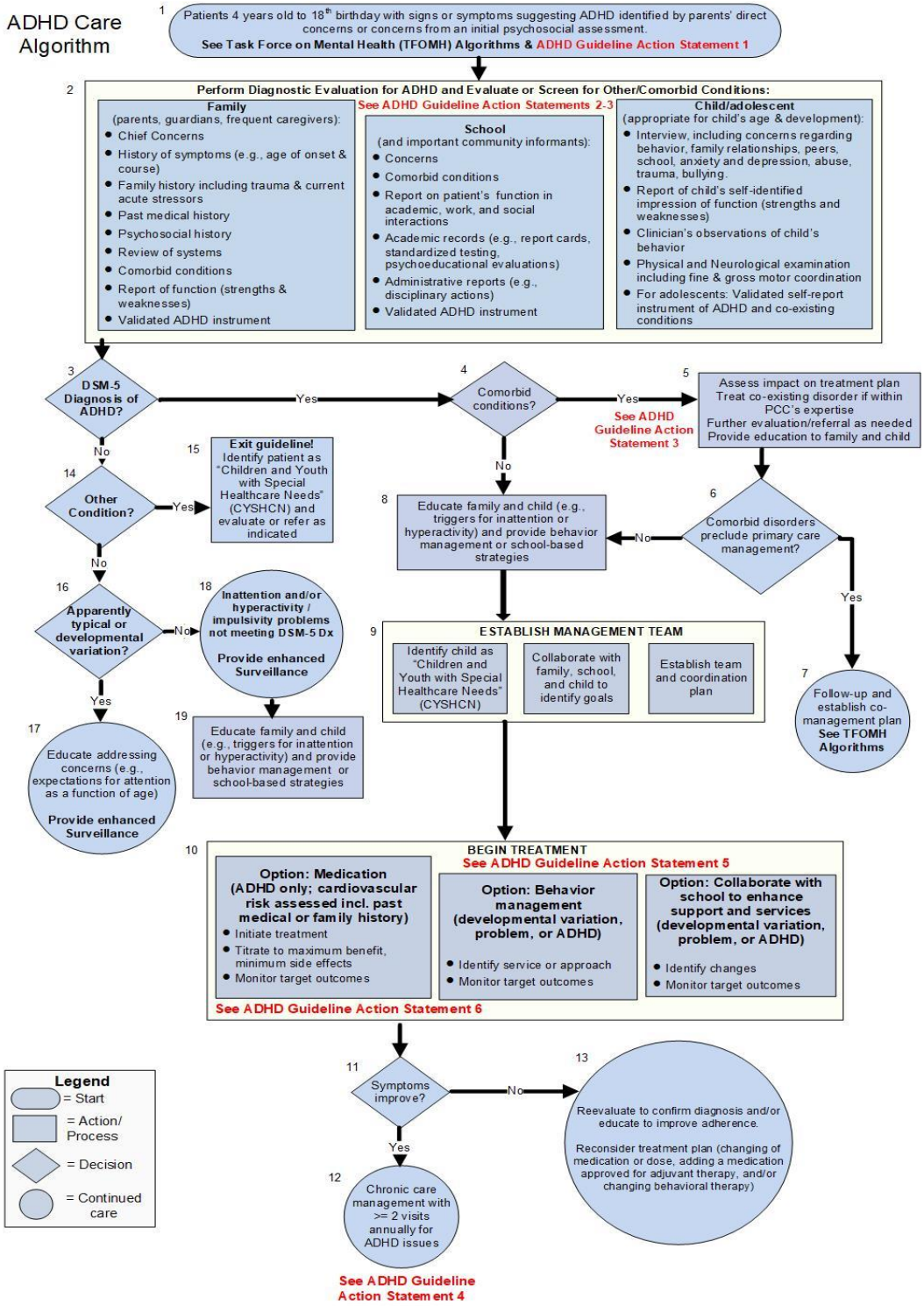
An awareness of the AAP "Primary Care Approach to Mental Health Care Algorithm," which is available on the AAP Mental Health Initiatives website—will enhance the integration of the procedures described in this document (http://www.aap.org/mentalhealth). That algorithm describes the process to integrate an initial psychosocial assessment at well visits and a brief mental health update at acute and chronic care visits. Mental health concerns, including symptoms of inattention and impulsivity, may present when:

- Elicited during the initial psychosocial assessment at a routine well visit;
- Elicited during a brief mental health update at an acute or chronic visit; or
- Presented during a visit triggered by a family or school concern.

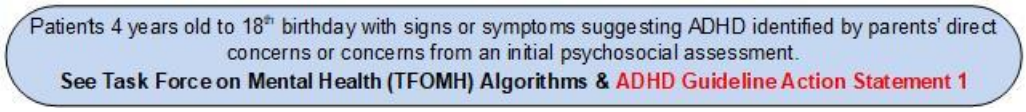
When concerns are identified, the algorithm describes the process of conducting a brief primary care intervention, secondary screening, diagnostic assessment, treatment, and follow-up. Like this document, the mental health algorithm is intended to present a process that may involve more than one visit and may be completed over time.

This algorithm assumes that the primary care practice has adopted the initial psychosocial assessment/mental health update, as described by the AAP Mental Health Initiatives.[1] It begins with steps paralleling the secondary assessment of the general mental health algorithm. Both algorithms focus on the care team and include the family as a part of that team.

In light of the prevalence of ADHD, the severe consequences of untreated ADHD, and the availability of effective ADHD treatments, the AAP recommends that *every* child/adolescent identified with signs or symptoms suggestive of ADHD be evaluated for ADHD or other conditions that may share its symptomatology. Documenting all aspects of the diagnostic and treatment procedures in the patient's records will improve the ability of the pediatrician to best treat children with ADHD.



II. EVALUATION FOR ADHD



II a. A Child or Adolescent Presents with Signs and Symptoms Suggesting ADHD

The algorithm's steps can be implemented when a child or adolescent presents to a PCC for an assessment for ADHD. This may occur in a variety of ways.

Pediatricians and other PCCs traditionally have longstanding relationships with the child and family, which foster the opportunity to identify concerns early on. The very young child may have a history of known ADHD risks, such as having parents who have been diagnosed with ADHD, or having extremely low birth weight. In those instances, the PCC would monitor for emerging issues.

Many parents bring their child/adolescent to the PCC with specific concerns about the child/adolescent's ability to sustain attention; curb activity levels; and/or inhibit impulsivity at home, school, or in the community. In many instances, the parents may express concerns about behaviors and characteristics that are associated with ADHD, but may not mention the core ADHD symptoms. For example, parents may report that their child is getting poor grades, does not perform well in team sports (despite being athletic), has very few friends, or is moody and quick to anger. These children and adolescents may have difficulty remaining organized; planning activities; or inhibiting their initial thoughts, actions, or emotions—behaviors that fall under the umbrella of executive functioning (ie, planning, prioritizing, and producing) or cognitive control. Problems with executive functions may be correlated with ADHD and are common among children and adolescents with ADHD. As recommended by *Bright Futures* (a national health promotion and prevention initiative led by the AAP[2]), routine psychosocial screening at preventive visits may identify concerns on the part of parent or another clinician. (See below for more information on co-occurring conditions.)

Finally, parents may bring a child to a PCC for ADHD evaluation based on the recommendation of a teacher, tutor, coach, etc.

(See the ADHD Guideline's Key Action Statement #1.)

II b. Perform a Diagnostic Evaluation for ADHD and Evaluate or Screen for Comorbid Disorders

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Perform Diagnostic Evaluation for ADHD and Evaluate or Screen for Other/Comorbid Conditions:

Family
(parents, guardians, frequent caregivers):
- Chief Concerns
- History of symptoms (e.g., age of onset & course)
- Family history including trauma & current acute stressors
- Past medical history
- Psychosocial history
- Review of systems
- Comorbid conditions
- Report of function (strengths & weaknesses)
- Validated ADHD instrument

See ADHD Guideline Action Statements 2-3

School
(and important community informants):
- Concerns
- Comorbid conditions
- Report on patient's function in academic, work, and social interactions
- Academic records (e.g., report cards, standardized testing, psychoeducational evaluations)
- Administrative reports (e.g., disciplinary actions)
- Validated ADHD instrument

Child/adolescent
(appropriate for child's age & development):
- Interview, including concerns regarding behavior, family relationships, peers, school, anxiety and depression, abuse, trauma, bullying.
- Report of child's self-identified impression of function (strengths and weaknesses)
- Clinician's observations of child's behavior
- Physical and Neurological examination including fine & gross motor coordination
- For adolescents: Validated self-report instrument of ADHD and co-existing conditions

When a child or adolescent presents with concerns about ADHD, as described above, the clinician should initiate an evaluation for ADHD. (See the ADHD Guideline's Key Action

Statements #2 and #3.)

II c. Gather Information From the Family

As noted previously, the recommendations in the accompanying guideline are intended to be integrated with the broader mental health algorithm developed as part of the AAP Mental Health Initiatives.[1,3,4] It is also important for pediatricians and other PCCs to be aware of health disparities and social determinants that may affect patient outcomes and to provide culturally appropriate care to all children and adolescents in their practice, including during the initial evaluation and assessment of the patient's condition.[5-9]

Ideally, the PCC's office staff obtains information from the family about the visit's purpose at scheduling so that an extended visit or multiple visits can be made available for the initial ADHD evaluation. This also increases the efficiency of an initial evaluation. Data on the child/adolescent's symptoms and functioning can be gathered from parents, school personnel, and other sources prior to the visit. Parents can be given rating scales that are to be completed prior to the visit, by teachers, coaches, and others who interact with the child. This strategy allows the PCC to focus on the most pertinent issues for that child/adolescent and family at the time of the visit. (See later discussion for more information on rating scales.) Note that schools will not release data to pediatric providers without written parental consent.

During the office evaluation session, the PCC reviews the patient's medical, family, and psychosocial history. Developmental history is presumed to be part of the patient's medical history. Family members (including parents, guardians and other frequent caregivers) are asked to identify their chief concerns and provide a history of the onset, frequency, and duration of problem behaviors; situations that increase or decrease the problems; previous treatments and their results; and the caregivers' understanding of the issues. It is important to assess behaviors and conditions that are frequent side effects of stimulant medication (ie, sleep difficulties, tics, nail-biting, skin-picking, headaches, stomachaches, or afternoon irritability) and preexisting conditions, so they are not confused with the frequent side effects of stimulants. This enables the PCC to compare changes if medication is initiated later.

A sound assessment of symptoms and functioning in major areas can be used to construct an educational and behavioral profile that *includes the child's strengths and talents*. Many children with ADHD exhibit enthusiasm, exuberance, creativity, flexibility, the ability to detect and quickly respond to subtle changes in the environment, a sense of humor, a desire to please, etc. The most common areas of functioning affected by ADHD include academic achievement; relationships with peers, parents, siblings, and adult authority figures; participation in recreational activities, such as sports; and behavior and emotional regulation, including risky behavior.

The *child and family's histories* can provide information about the status of symptoms and functioning, and help determine age of onset and other factors that may be associated with the presenting problems. It also identifies any potential traumatic events that the child may have experienced, such as a family death, separation from the family, or physical or mental abuse.

The child/adolescent's *medical history* can help identify factors associated with ADHD, such as prenatal and perinatal complications and exposures (eg, preterm delivery, maternal hypertension, prenatal alcohol exposure), childhood exposures, and head trauma.

The *family history* includes any medical syndromes, developmental delays, cognitive limitations, learning disabilities, trauma or toxic stress, or mental illness in the patient and family members, including ADHD, mood, anxiety, and bipolar disorders. Ask what the family has already tried, what works, and what does not work, to avoid wasting time on interventions that have already been attempted unsuccessfully. Parental tobacco and substance use, including their use prenatally, are relevant risk factors for, and correlate with, ADHD.[10] ADHD is highly heritable and is often seen in other family members, who may or may not have been formally diagnosed with ADHD. For this reason, asking about family members' school experience—including time and task management, grades, and highest grade level achieved—can aid in treatment decisions.

The *psychosocial history* is important in any ADHD evaluation and usually includes queries about environmental factors, such as family stress and problematic relationships, which sometimes contribute to the child/adolescent's overall functioning. The caregivers' current and past approaches to parenting and the child's misbehavior can provide important information that may explain discrepancies between reporters. For example, parents may reduce their expectations for their child with ADHD as a means to relieve parenting stress. When these expectations are reduced (eg, eliminating chores, not monitoring homework completion, etc), parents may experience far fewer problems with the child than do teachers, who may have maintained expectations for the child to complete tasks and follow rules. Knowing the parents' approach to parenting may help the PCC understand differences in ratings completed by parents versus teachers.

Further evidence for an ADHD diagnosis includes an inability to independently complete daily routines in an age-appropriate manner as well as multiple and short-lasting friendships; trouble keeping and/or making friends; staying up late to complete assignments; and late, incomplete, and/or lost assignments. Somatic symptoms and school avoidance are more common among girls and may mask an ADHD diagnosis. With information obtained from the parents and school personnel, the PCC can make a clinical judgment about the effect of the core—and associated—ADHD symptoms on academic achievement, classroom performance, family and social relationships, independent functioning, and safety/unintentional injuries.

If other issues exist, such as self-injuries, comorbid mental health issues also need to be evaluated. Possible areas of functional impairment that require evaluation include domains such as self-perception, leisure activities, and self-care (ie, bathing, toileting, dressing, and eating). Additional guidance regarding functional assessment is available through the AAP ADHD Toolkit[3] and the AAP Mental Health Initiatives.[4,11] The ADHD Toolkit[3] is being revised concurrently with the development of these updated guidelines. Upon publication, the toolkit may be accessed at: https://www.aap.org/en-us/professional-resources/quality-improvement/Pages/Quality-Improvement-Implementation-Guide.aspx. Additionally, a new EQIPP Module was developed based on the new clinical recommendations and can also be accessed using the same link above.

The patient needs to be screened for hearing and/or visual problems, because these can mimic inattention. A full review of systems may reveal other symptoms or disorders, such as sleep disturbances, absence seizures, or tic disorders, which may assist in formulating a differential diagnosis and/or developing management plans. Internal feelings such as anxiety and depression can occur but may not be noticeable to parents and teachers, so it is important to elicit feedback about them from the patient as well.

The information gathered from this diagnostic interview, combined with the data from the rating scales (see below), provides an excellent foundation for determining the presence of symptoms and impairment criteria needed to diagnose ADHD.

II d. Use Parent Rating Scales and Other Tools

Rating scales that use the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* criteria for ADHD can help obtain the information that will contribute to making a diagnosis. Rating scales for parents that use *DSM-5* criteria for ADHD are helpful in obtaining the core symptoms required to make a diagnosis based on *DSM-5*.[12] Because changes in the 18 core symptoms are essentially unchanged from *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* criteria, *DSM-IV*-based rating scales can be used if *DSM-5* rating scales are not readily available. Some of these symptom rating scales include symptoms of commonly comorbid conditions and measures of impairment in a variety of domains that are also required for a diagnosis.[13,14] Some available measures are limited, because they provide only a global rating.[15,16]

Caregiver and teacher endorsement of the requisite number of ADHD symptoms on the rating scales is not sufficient for diagnosis. A rating scale documents the presence of inattention, hyperactivity, and impulsivity symptoms, but not whether these symptoms are actually attributable to ADHD versus a mimicking condition. Caregivers may misread or misunderstand some of the behaviors. Furthermore, rating scales do not inform the PCC about contextual influences that may account for the symptoms and impairment. Likewise, broadband rating scales that assess general mental health functioning do not provide reliable and valid indications of ADHD diagnoses, although they can help to screen for concurrent behavioral conditions.[17]

Nevertheless, parent ratings provide valuable information on their perspective of the child's symptoms and impairment and add information about normative levels of the parents' perspectives, which help the PCC determine the degree with which the problems are or are not in the typical range for the child's age and sex. Finally, broad rating scales that assess general mental health functioning do not provide sufficient information about all the ADHD core symptoms but may help screen for the concurrent behavioral conditions.[17]

To address the rating scales' limitations, pediatricians and other PCCs need to interview parents and may need to review documents such as report cards and results of standardized test results and historical records of detentions, suspensions, and/or expulsions from school, which can serve as evidence of functional impairment. Further evidence may include difficulty developing and maintaining lasting friendships. This information is discussed below.

II e. Gather Information from School and Community Informants

Information from parents is not the only source that informs diagnostic decisions for children and adolescents, because a key criterion for an ADHD diagnosis is the display of symptoms and impairments in multiple settings. Gathering data from other adults who regularly interact with the child or adolescent being evaluated provides rich additional information for the evaluation.

The information from various sources may be inconsistent, because parents and teachers observe the children at different times and under different circumstances, as described previously.[18] Disagreement may result from differences in students' behavior and performance in different classrooms, their relationship with the teachers, or variations in teachers' expectations, as well as training in or experience with behavior management. Classes with high homework demands or classes with less structure are often the most problematic for students with ADHD. Investigating these inconsistencies can lead to hypotheses about the child that help inform the eventual clinical diagnoses and treatment decisions.[19]

Teachers and Other School Personnel

Teachers and other school personnel can provide critically important information as they develop a rich sense of the typical range of behaviors within a specific age group over time. School and classrooms settings provide the greatest social and performance expectations that potentially tax children and adolescents with ADHD. Parents and older children may be the best sources for identifying the school personnel who can best complete rating scales for an ADHD evaluation.

The value of school ratings increases as children age, because parents often have less-detailed information about their child's behavior and performance at school as the student moves into the higher grades. With elementary and middle school children, the classroom teacher is usually the best source; he or she may be the only source necessary. Other school staff, such as a special education teacher or school counselor, may be valuable sources of information. Direct communication with school psychologist and/or school counselor may provide additional information on child's functioning within the context of the classroom and school.

In secondary schools, students interact with many teachers who often instruct more than 100 students daily. As a result, high school teachers may not know the students as well as elementary and middle school teachers do. Parents and students may be encouraged to choose the 2 or 3 teachers who they believe know the student best, and solicit their input (eg, math and English teachers or, for children or adolescents with learning disabilities, a teacher in an area of strong function and a teacher in an area of weak function). Regardless of the presence of a learning disability, it is helpful to obtain feedback from the teacher of the class in which the child or adolescent is having the most difficulty. The ADHD Toolkit provides materials relevant to school data collection.

Teachers may communicate their major concerns using questionnaires or verbally in person, via secure email (if available), or over the telephone. It is important to ask an appropriate school representative to complete a validated ADHD instrument or behavior scale based on the *DSM-5* criteria for ADHD. A school representative's report might include information about any comorbid or alternative conditions, including disruptive behavior disorders, depression and anxiety disorders, tics, or learning disabilities. As noted, some parent rating scales have a version

for teachers, and assess symptoms and impairment in multiple domains.[13] Teacher rating scales exist that specifically target behavior and performance at school,[20] which provide a comprehensive and detailed description of a student's school functioning relative to normative data.

In addition to the academic information, it is important to request information characterizing the child/adolescent's level of functioning with regards to peer, teacher, and other authority figure relationships; ability to follow directions; organizational skills; history of classroom disruption; and assignment completion.

Academic Records

In addition to ratings from teachers and other school staff, academic records are sometimes available to inform a PCC's evaluation. These records include report cards; results from reading, math, and written expression standardized tests; and other assessments of academic competencies. If a child was referred for an evaluation for special education services, his or her file is likely to contain a report on the evaluation, which can be very useful during an ADHD evaluation. School records pertaining to office discipline referrals, suspensions, absences, and detentions can provide valuable information about social function and behavioral regulation. Parents often keep report cards from early grades, which can provide valuable information about age of onset for children older than 12 years. Teachers in primary grades often provide information pertaining to important information about the history of the presenting problems.

Other Community Sources

It can be helpful to obtain information not only from school professionals but also from additional sources, such as grandparents, faith-based organization group leaders, scouting leaders, sports coaches, and others. Depending on the areas in which the child or adolescent exhibits impairment, these adults may be able to provide a valuable perspective on the nature of the presenting problems, although the accuracy of their reporting has not been studied.

II f. Gather Information From the Child or Adolescent

Another source of information is the child or adolescent himself or herself. This information is often collected, but carries less weight than information from other sources because of children's and adolescents' limited ability to accurately report their strengths and weaknesses—including those associated with ADHD.[21] As a result, information gathered from the child about specific ADHD behaviors may do little to inform the presence or absence of symptoms and impairments, as evidence suggests that children tend to minimize their problems and blame others for concerns.[22]

Nevertheless, self-report may provide other values. First, self-report is the primary means by which one can screen for internalizing conditions such as depression and anxiety. The AAP Mental Health Initiatives[4] and the *Guidelines for Adolescent Depression in Primary Care (GLAD-PC)*[23-25] recommend the use of validated diagnostic rating scales for adolescent mood and anxiety disorders for clinicians who wish to use this format.[26-30] As measures of internal mental disorders, these data are likely to be more valid than the reports of adults about their children's behaviors.

Second, youth with ADHD are prone to talk impulsively and excessively when adults show an interest in them. They may share useful information about the home or classroom that parents and teachers do not know or impart. In addition, many share their experience with risky and dangerous behaviors that may be unknown to the adults in their lives. This information can be critical in both determining a diagnosis and designing treatment.

Third, even if little information of value is obtained, the fact that the PCC takes the time to meet alone and ask questions of the child or adolescents demonstrates respect and lays the foundation for collaboration in the decision-making and treatment process to follow. This relationship building is particularly important for adolescents.

Fourth, by gaining an understanding of the child's perspective, the PCC can anticipate the likely acceptance or resistance to treatment.

Interviewing the child or adolescent provides many important benefits beyond the possibility of informing the diagnosis and warrants its inclusion in the evaluation. For example, part of this interview includes asking the child or adolescent to identify personal goals (for example, what do you want to be when you grow up? What do you think that requires? How can we help you get there?). It is helpful when children perceive the pediatrician and other PCCs as seeking to help them achieve their goals rather than arbitrarily labeling them as deficient, defective, or needing to be fixed in some way.

II g. Clinical Observations and Physical Examination of the Child or Adolescent

The physical and neurologic examination needs to be comprehensive to determine whether further medical or developmental assessments are indicated. Baseline height, weight, blood pressure, and pulse measurements are required to be recorded in the medical record. It is important to look for behaviors that are consistent with ADHD's symptoms—including the child's level of attention, activity, and impulsivity during the encounter. Yet, ADHD is context dependent, and for this reason, behaviors and core symptoms that are seen in other settings are often not observed during an office visit.[31] Although the presence of hyperactivity and inattention during an office visit may provide supporting evidence of ADHD symptoms, their absence is not considered evidence that the child does not have ADHD.

Observations of a broad range of behaviors can be important for considering their contribution to the presenting problems and the potential diagnosis of other conditions. Careful attention to these various behaviors can provide useful information when beginning the next step involving making diagnostic decisions. For example, hearing and visual acuity problems can often lead to inattention and overactivity at school. Attending to concerns about anxiety is also important, given that young children may become overactive when they are in anxiety-provoking situations like a clinic visit.

In addition, observing the child's language skills is important, because difficulties with language can be a symptom of a language disorder and predictor of subsequent reading problems. This observation is particularly important with very young children, given that language disorders may present as problems with sustaining attention and impulsivity. A language disorder may also involve pragmatic usage or the social use of language, which can

contribute to social impairment. If the PCC, family, and/or school have concerns about receptive, expressive, or pragmatic language, it is important to make a referral for a formal speech and language evaluation. Dysmorphic features also need to be noted, because symptoms of ADHD are similar to characteristics of children with some prenatal exposures and genetic syndromes (eg, fetal alcohol exposure,[32,33] fragile X syndrome).

Many children with ADHD have poor coordination, which may be severe enough to warrant a diagnosis of developmental coordination disorder and referral to occupational and/or physical therapy. Findings of poor coordination can affect how well the child performs in competitive sports, a frequent source of social interactions for children, and can adversely affect the child's writing skills. Detecting any motor or verbal tics is important as well, particularly because the use of stimulant medications may cause or exacerbate tics.

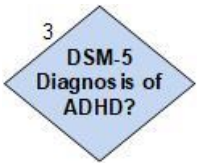
Finally, it is important to evaluate the child's cardiovascular status, because cardiovascular health must be considered if ADHD medication becomes an option. Cardiac illness is very rare, and more evidence is required to determine whether children or adolescents with ADHD are at increased risk when taking ADHD medications. Nevertheless, before initiating therapy with stimulant medications, it is important to obtain the child or adolescent's history of specific cardiac symptoms, as well as the family history of sudden death, cardiovascular symptoms, Wolf-Parkinson-White syndrome, hypertrophic cardiomyopathy, and long QT syndrome. If any of these risk factors are present, clinicians should obtain additional evaluation with an electrocardiogram (EKG) and possibly consult with a pediatric cardiologist.

II h. Gather Information About Conditions That Mimic or are Comorbid With ADHD

It is important for the PCC to obtain information about the status and history of conditions that may mimic or are comorbid with ADHD, such as depression, anxiety disorders, and post-traumatic stress disorder. Several validated rating scales are within the public domain and can help identify comorbid conditions. Examples include the Pediatric Symptom Checklist-17 (PSC-17) as a screen for depression and anxiety[34]; the Screen for Child Anxiety Related Emotional Disorders (SCARED), more specifically for anxiety disorders[28]; and the Patient Health Questionnaire modified for adolescents (PHQ-A), the Screening to Brief Intervention (S2BI) tool[35,36]; and the Child and Adolescent Trauma Screen (CATS) for exposure to trauma.[37] All include questionnaire forms for both parents and patients.[3] The results help the PCC assess the extent to which reported impairment and/or distress are associated with ADHD versus comorbid conditions. These conditions are described in greater detail later.

Safety and serious mental illness concerns: PCCs may be asked to complete mental health or safety assessments, particularly for adolescents. Assessment requests may come from schools or other settings after a behavioral crisis, aggressive behavior, or destructive behaviors have occurred. With patient or guardian consent, information may be shared regarding diagnosis and current treatment strategies. Pediatricians and other PCCs are encouraged to exercise caution when asked to predict the likelihood of future behaviors in the absence of detailed understanding of the environment in which the behaviors occurred. *Self-injurious behaviors or threats of self-harm are serious concerns that, when possible, should immediately be referred to community mental health crisis services or experienced child mental health professionals. PCCs are encouraged to provide further monitoring of the child or adolescent with these comorbidities.*

III. MAKING DIAGNOSTIC DECISIONS



After gathering all of the relevant available information, the PCC will consider an ADHD diagnosis as well as a diagnosis of other related and/or comorbid disorders. The primary decision-making process involves comparing the information obtained to the *DSM-5* criteria for ADHD. Although this assessment is straightforward, there are some issues the PCC needs to consider, including development, sex, and other disorders that may fit the presenting problems better than ADHD (see below for more on these issues).

III a.* DSM-5 *Criteria for ADHD

The *DSM-5* criteria define 4 dimensions of ADHD:

1. ADHD primarily of the *Inattentive* presentation (ADHD/I) (314.00 [F90.0]);
2. ADHD primarily of the *Hyperactive-Impulsive* presentation (ADHD/HI) (314.01 [F90.1]); and
3. ADHD *Combined* presentation (ADHD/C (314.01 [F90.2]).
4. ADHD *Other Specified*, and *Unspecified* ADHD (314.01 [F90.8])

To make a diagnosis of ADHD, the PCC needs to establish that **6** or more (5 or more if the adolescent is 17 years or older) core symptoms are present in either or both of the "Inattention Dimension" and/or the "Hyperactivity-Impulsivity Dimension" and occur inappropriately often. The core symptoms and dimensions are presented in **Table 1**, below.

- ADHD/I: having at least 6 of 9 *Inattention* behaviors, and less than 6 *Hyperactive-Impulsive* behaviors.
- ADHD/HI: having at least 6 of 9 *Hyperactive-Impulsive* behaviors, and less than 6 *Inattention* behaviors.
- ADHD/C: having at least 6 of 9 behaviors in both the *Inattention* and *Hyperactive-Impulsive* dimensions.
- *ADHD Other Specified*, and *Unspecified ADHD*: These categories are meant for children who meet many of the criteria, for ADHD, but not the full criteria, and who have significant impairment. "ADHD Other Specified" is used if the PCC specifies those criteria that have not been met; "Unspecified ADHD" is used if the PCC does not specify these criteria.

Table 1. Core Symptoms of ADHD From the *DSM-5*

Inattention Dimension	**Hyperactivity-Impulsivity Dimension**	
	Hyperactivity	**Impulsivity**
▪ Careless mistakes ▪ Difficulty sustaining attention ▪ Seems not to listen ▪ Fails to finish tasks ▪ Difficulty organizing	▪ Fidgeting ▪ Unable to stay seated ▪ Moving excessively (restless) ▪ Difficulty engaging in leisure activities quietly	▪ Blurting answers before questions completed ▪ Difficulty awaiting turn

▪ Avoids tasks requiring sustained attention ▪ Loses things ▪ Easily distracted ▪ Forgetful	▪ "On the go" ▪ Talking excessively	▪ Interrupting/intruding upon others

Source: DSM-5.[38]

In school-aged children and adolescents, diagnostic criteria for ADHD include documentation of the following criteria:

- At least 6 of the 9 behaviors described in the *Inattentive* domain occur *often* and to a degree that is inconsistent with the child's developmental age. (For adolescents 17 years and older, documentation of at least 5 of the 9 behaviors.)
- At least 6 of the 9 behaviors described in the *Hyperactive-Impulsive* domain occur *often* and to a degree that is inconsistent with the child's developmental age. (For adolescents 17 years and older, documentation of at least 5 of the 9 behaviors.)
- Several *Inattentive* or *Hyperactive–Impulsive* symptoms were present before age 12 years.
- There is clear evidence that the child's symptoms interfere with, or reduce the quality of his/her social, academic, and/or occupational functioning.
- Symptoms have persisted for at least 6 months.
- Symptoms are not attributable to another physical, situational, or mental health condition.

Clear evidence exists that these criteria are appropriate for preschool-aged children (ie, age 4 years to the 6th birthday), elementary- and middle-school-aged children (ie, age 6 years to the 12th birthday), and adolescents (ie, age 12 years to the 18th birthday).[39,40] *DSM-5* criteria have also been updated to better describe how *Inattentive* and *Hyperactive-Impulsive* symptoms present in older adolescents and adults.

DSM-5 criteria require evidence of symptoms before age 12 years. In some cases, however, parents and teachers may not recognize ADHD symptoms until the child is older than 12 years, when school tasks and responsibilities become more challenging and exceed the child's ability to perform effectively in school. For these children, history can often identify an earlier age of onset of some ADHD symptoms. Delayed recognition may also be seen more often in ADHD/I, which is more commonly diagnosed in girls.

If symptoms arise suddenly without prior history, the PCC needs to consider other conditions, including mood or anxiety disorders, substance use, head trauma, physical or sexual abuse, neurodegenerative disorders, sleep disorders (including sleep apnea), or a major psychological stress in the family or school (such as bullying). In adolescents and young adults, PCCs are encouraged to consider the potential for false reporting and misrepresentation of symptoms in order to obtain medications for other than appropriate medicinal use (ie, diversion, secondary gain). The majority of states now require prescriber participation in Prescription Drug Monitoring Programs, which can be helpful in identifying and preventing diversion activities. Pediatricians and other PCCs may consider prescribing nonstimulant medications that minimize abuse potential, such as atomoxetine and extended-release guanfacine or extended-release clonidine.

In the absence of other concerns and findings on prenatal or medical history, further diagnostic testing will not help to reach an ADHD diagnosis. Compared with clinical interviews, standardized psychological tests, such as computerized attention tests, have not been found to reliably differentiate between youth with and without ADHD.[41,42] Appropriate further assessment is indicated, if an underlying etiology is suspected. Imaging studies or screening for high lead levels and abnormal thyroid hormone levels can be pursued if they are suggested by other historic or physical information, such as history or symptoms of a tumor or significant brain injury. When children experience trauma, their evaluation needs to include the consideration of both the trauma and ADHD, because they can co-occur and can exacerbate ADHD symptoms. Toxic stress has shown to be associated with the incidence of pediatric ADHD, but the conclusion that ADHD is a manifestation of this stress has not been demonstrated.[43]

Patients with ADHD commonly have comorbid conditions, such as oppositional defiant disorder, anxiety, depression, and language and learning disabilities. These conditions may present with ADHD symptoms and need evaluation, because their treatment may relieve symptoms. Additionally, some conditions may present with ADHD symptoms and respond to treatment of the primary condition, such as sleep disorders, absence seizures, and hyperthyroidism. (Comorbid conditions are discussed later in this document.)

In addition, the behavioral characteristics specified in the *DSM-5* remain subjective and may be interpreted differently by various observers. Rates of ADHD and its treatment have been found to be different for different racial/ethnic groups.[44,45] Cultural norms and the expectations of parents or teachers may influence reporting of symptoms. Hence, the clinician benefits from being sensitive to cultural differences about the appropriateness of behaviors and perceptions of mental health conditions.[7,8]

After the diagnostic evaluation, a PCC will be able to answer the following questions:

- How many inattentive and hyperactive/impulsive behavior criteria for ADHD does the child/adolescent manifest across major settings of his or her life?
- Have these criteria been present for 6 months or longer?
- Was the onset of these or similar behaviors present before the child's 12th birthday?
- What functional impairments are caused by these behaviors?
- Could any other condition be a better explanation for the behaviors?
- Is there evidence of comorbid problems or disorders?

On the basis of this information, the clinician is usually able to arrive at a preliminary diagnosis of whether the child or adolescents has ADHD or not. (For children and adolescents who do not receive an ADHD diagnosis, see below.)

III b. Developmental Considerations

Considerations About the Child or Adolescent's Age

Although the diagnostic criteria for ADHD are the same for children up to age 17 years, developmental considerations affect the interpretation of whether a symptom is present. Prior to school age, the primary set of distinguishing symptoms involve hyperactivity—although this can be difficult to identify as outside of the normal range given the large variability in this young age

group. Similarly, difficulties sustaining attention are difficult to determine with young children because of considerable variability in presentation and the limited demands for children in this age group to sustain attention over time. (See below for more information on developmental delays.)

Some children demonstrate hyperactivity and inattention that are clearly beyond the normal range. They may experience substantial impairment to an extent that babysitters or child care agencies refuse to care for them, parents are unable to take them shopping or to restaurants, or they routinely engage in dangerous or risky behaviors. In these extreme cases, the PCC may be able to make the decision for an ADHD diagnosis more quickly than other scenarios that require a thorough assessment. For other young children, the diagnosis will be less obvious, and developmental and environmental issues may lead the PCC to be cautious in making an ADHD diagnosis. In these situations, monitoring for the emergence or clarification of ADHD symptoms and/or providing a diagnosis of *Other Specified ADHD* or *Unspecified ADHD* are appropriate options.

Adolescence is another developmental period when developmental considerations are warranted. Beginning at age 17 years, there are only 5 symptoms of inattention and/or 5 symptoms of hyperactivity/impulsivity required for an ADHD diagnosis. Hyperactivity typically diminishes for most children during adolescence, but problems associated with impulsivity can be dangerous and can include impaired driving, substance use, risky sexual behavior, and suicide. Disorganization of time and resources can be associated with substantial academic problems at school. Parent-child conflict and disengagement from school can provide a context that contributes toward poor long-term outcomes. Comorbid depression and conduct disorder are common but do not negate the importance of diagnosing ADHD when the developmental path warrants it and the ADHD symptoms exacerbate problems associated with the comorbid conditions.

Adolescence is the first developmental period for which age of onset of symptoms must be documented prior to 12 years. School records and parent reports are often the richest source for making this determination. It is important to try to identify adolescents (or their parents) who are pursuing a diagnosis of ADHD for secondary gains such as school accommodations, standardized testing accommodations, and/or stimulant prescriptions. In addition, impairment sometimes emerges when expectations for the adolescent markedly increase or when accommodations are removed. The teenager's level of functioning may stay the same, but when faced with the expectations of advanced placement courses or a part-time job, failure to keep pace with increasing expectations may lead to concerns that warrant an evaluation for ADHD. These examples emphasize the importance of determining an early age of onset.

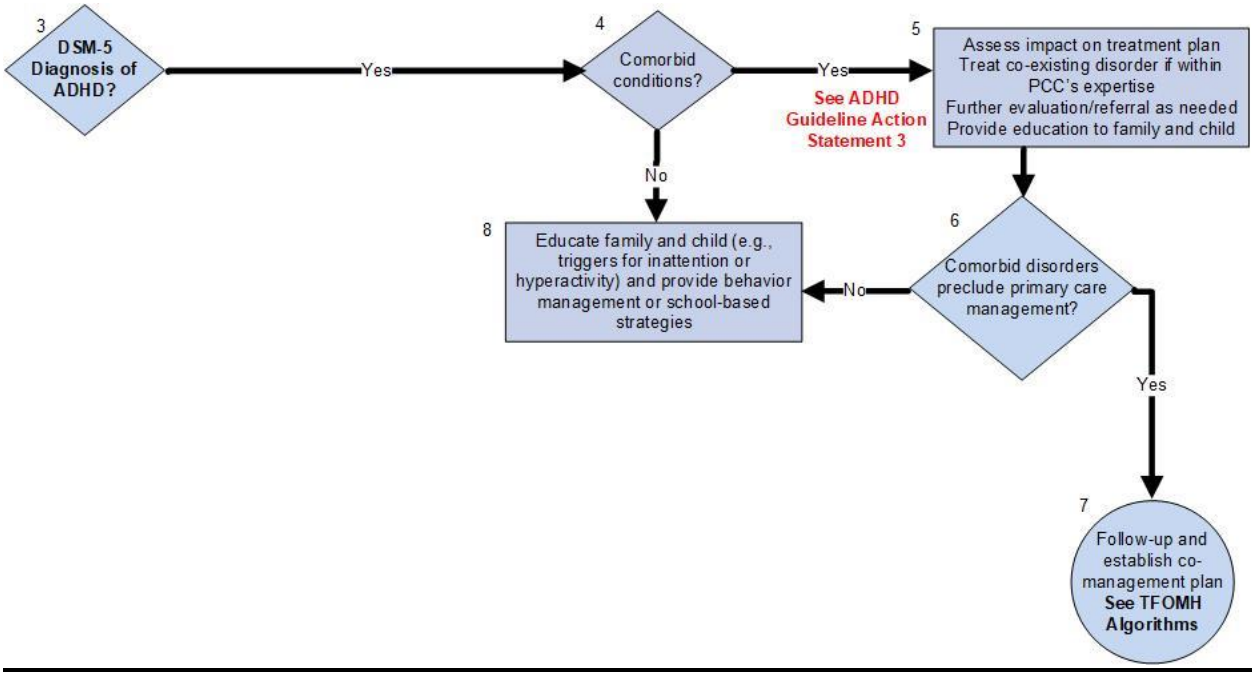
Considerations About the Child or Adolescent's Sex

ADHD is diagnosed in boys about twice as often as it is diagnosed in girls. There are many hypotheses about reasons for this difference; the primary reason appears to simply be that the disorder is more common in boys than girls. Some have raised concerns that the difference may be attributable to variances in society's expectations for boys versus girls or underdiagnosis in girls, but these reasons are unlikely to account for the large difference in diagnoses. Hence, no adjustment is needed in terms of the standards for girls to meet the criteria for an ADHD diagnosis compared with boys.

Girls are less likely to exhibit hyperactivity symptoms, which are the most easily observable of all ADHD symptoms, particularly in younger patients. This fact may account for a portion of the difference in diagnosis between girls and boys. As a result, it is important to fully consider a diagnosis of ADHD, predominantly inattentive presentation, when evaluating girls.

Symptoms of inattention alone can complicate the diagnosis, because inattention is one of the most common symptoms across all disorders in *DSM-5*. After puberty, it is more common for depression and anxiety to be diagnosed in girls than in boys, and symptoms of inattention may be a result of these disorders as well as ADHD. Examining the age of onset and considering other distinguishing features, such as avoidance and anhedonia, can help the PCC clarify this challenging differential when evaluating girls for ADHD. For example, does the inattention occur primarily in anxiety-provoking situations or when the child or adolescent is experiencing periods of low mood, and then remit when the anxiety or mood improves?

III c. Consideration of Comorbid Conditions



If other disorders are suspected or detected during the diagnostic evaluation, an assessment of the urgency of these conditions and their impact on the ADHD treatment plan should be made. Comorbid conditions provide unique challenges for treatment planning. *Urgent conditions need to be addressed immediately with services capable of handling crisis situations. These conditions include suicidal thoughts or acts and other behaviors with the potential to severely injure the child, adolescent, and/or other people, including severe temper outbursts or child abuse.* Note that adolescents are potentially more likely to provide honest answers if the PCC asks sensitive questions in the absence of the parents and may respond more readily to rating scales that assess mood or anxiety. In addition, substance use disorders require *immediate* attention and may precede or coincide with beginning treatment for ADHD. Additional information is available in the complex ADHD guideline published by the Society for Developmental and Behavioral Pediatrics (SDBP).[46]

Evidence shows that comorbid conditions may improve with treatment of ADHD, including oppositional behaviors and anxiety.[47] For example, children with ADHD and comorbid anxiety disorders may find that addressing the ADHD symptoms with medications also decreases anxiety or mood symptoms. Other children may require additional therapeutic treatments to treat the ADHD adequately and treat comorbid conditions, including cognitive behavioral therapy (CBT), academic interventions, or different and/or additional medications.

The PCC may evaluate and treat the comorbid disorder if it is within his or her training and expertise. In addition, the PCC can provide education to family and child or adolescent about triggers for inattention and/or hyperactivity. If the PCC requires the advice of a subspecialist, the clinician is encouraged to consider carefully when to initiate treatment for ADHD. In some cases, it may be advisable to delay the start of medication until the role of each member of the treatment team is established (see below). Integrated care models can be helpful (see www.integratedcareforkids.org).

Following are brief discussions of sleep disorders, psychiatric disorders, emotion dysregulation, exposure to trauma, and learning disabilities—all of which can manifest in manners similar to ADHD and can complicate making a diagnosis.

(See ADHD Guideline's Key Action Statement #3.)

Sleep Disorders

Sleepiness impairs most people's ability to sustain attention and often leads to caffeine consumption to counter these effects. In the same way, sleep disturbance can lead to symptoms and impairment that mimic or exacerbate ADHD symptoms. A child with ADHD may have difficulty falling asleep because of the busy thoughts caused by ADHD. Some sleep disorders are frequently associated with ADHD or present as symptoms of inattention, hyperactivity, and impulsivity, such as obstructive sleep apnea syndrome (OSAS) and restless legs syndrome/periodic limb movement disorder (RLS/PLMD).[48-51]

The differential diagnosis of insomnia in children and adolescents with ADHD includes:

- *Inadequate sleep hygiene* (eg, inconsistent bedtimes and wake times, absence of a bedtime routine, electronics in the bedroom, caffeine use).[52]
- *ADHD medication* (stimulant and nonstimulant) effects:
    - Direct effects on sleep architecture: prolonged sleep onset, latency, and decreased sleep duration, increased night wakings.[53-55]
    - Indirect effects: inadequate control of ADHD symptoms in the evening, and medication withdrawal or rebound symptoms.[56,57]
- *Sleep problems associated with comorbid psychiatric conditions* (eg, anxiety and mood disorders, disruptive behavior disorders).[58]
- *Circadian-based phase delay in sleep-wake patterns*, which have been shown to occur in some children with ADHD, resulting in both prolonged sleep onset and difficulty waking in the morning.[59]
- *Intrinsic deficit associated with ADHD*. Numerous studies have reported that nonmedicated children with ADHD without comorbid mood or anxiety disorders have significantly greater

bedtime resistance, more sleep onset difficulties, and more frequent night awakenings when compared with typically developing controls.[60] In addition, some children with ADHD appear to have evidence of increased daytime sleepiness, even in the absence of a primary sleep disorder.[60-62]

For this reason, *all* children and adolescents who are evaluated for ADHD need to be systematically screened for symptoms of primary sleep disorders, such as frequent snoring, observed breathing pauses, restless sleep, urge to move one's legs at night, and excessive daytime sleepiness. (Issues of access to these services are discussed in the accompanying supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD.") In addition, screenings generally include primary sleep disorders' risk factors, such as adenotonsillar hypertrophy, asthma and allergies, obesity, a family history of RLS/PLMD, and iron deficiency.[57] Sleep assessment measures that have been shown to be useful in the pediatric primary care practice setting include brief screening tools[63] and parent-report surveys.[64,65] Overnight polysomnography is generally required for children who have symptoms suggestive of and/or risk factors for OSAS and RLS/PLMD.[66,67]

If the results suggest the presence of a sleep disorder, the PCC needs to obtain a comprehensive sleep history, including assessment of the environment where the child sleeps, the cohabitants in the room; the bedtime routine, including its initiation, how long it takes for the child fall asleep, sleep duration, and any night-time awakenings; and what time the child wakes up in the morning, and his/her state when awakening. It is important to determine sleep interventions attempted and their results. Even when no primary sleep disorders occur, modest reductions in sleep duration or increases in sleep disruption may be associated with increased, detectable problems with attention in children and adolescents with ADHD.[68] Although fully disentangling sleep disruption from ADHD may not be possible because significant sleep problems and their associated impairment are often comorbid with ADHD, sleep disruptions often warrant consideration as an additional target for treatment. In addition, some children with ADHD appear to show evidence of increased daytime sleepiness, even in the absence of a primary sleep disorder.[61,62] Significant sleep problems and their associated impairment are often comorbid with ADHD and, for many children, are considered as an additional target for treatment.

A variety of issues need to be considered when determining whether sleep problems constitute an additional diagnosis of insomnia disorder or are linked to ADHD-related treatment issues. First, a child's sleep can be affected if he or she is already taking stimulant medication or regularly consuming caffeine. The dosage and timing of this consumption needs to be tracked and manipulated to examine its effects; simple modifications of timing and dosage of stimulant consumption can improve sleep onset, duration, and quality. Second, sleep problems can occur from inadequate sleep health/hygiene[52] or from other disorders, such as anxiety and mood disorders, when the rumination and worry associated with them impairs or disrupts the child's sleep. Restructuring behavior preceding and at bedtime can dramatically improve sleep and diminish associated impairments. These potential causes of sleep disturbance and the related impairments that mimic or exacerbate ADHD symptoms need to be considered before diagnosing ADHD, related problems, or insomnia disorder.

Trauma

Children with ADHD are at higher-than-normal risk of experiencing some forms of trauma including corporal punishment and accidents (often because of their risk-taking behaviors). In addition, post-traumatic stress disorder may manifest some similar symptoms. Depending on the child, the trauma may have been a one-time event or one to which they are consistently exposed. Exposure to trauma may exacerbate or lead to symptoms shared by trauma disorders and ADHD (eg, inattention). As a result, when evaluating a child for ADHD, obtaining a brief trauma history and screening for indicators of impairing responses to trauma can be helpful. Although a trauma history does not inform the diagnosis of ADHD, it may identify an alternative diagnosis and inform treatment and other interventions, including referral for trauma-focused therapy and reporting suspected abuse.

Mental Health Conditions

In children or adolescents who have coexisting mild depression, anxiety, or obsessive-compulsive disorder, the PCC may undertake the treatment of *all* disorders, if doing so is within his or her abilities. Another option is to collaborate with a mental health clinician to treat the coexisting condition, while the PCC oversees the ADHD treatment. As a third option, the consulting specialists may advise about the treatment of the coexisting condition to the extent that the PCC is comfortable treating both ADHD and the coexisting problems. With some coexisting psychiatric disorders—such as severe anxiety, depression, autism, schizophrenia, obsessive-compulsive disorder, oppositional defiant disorder, conduct disorder, and bipolar disorder—a comanaging developmental-behavioral pediatrician or child and adolescent psychiatrist might take responsibility for treatment of both ADHD and the coexisting illness.

Many children with ADHD exhibit emotion dysregulation, which is considered to be a common feature of the disorder and one that is potentially related to other executive functioning deficits.[69] A child exhibiting emotion dysregulation with either or both positive (eg, exuberance) or negative (eg, anger) emotions along with symptoms of ADHD can be considered as a good candidate for an ADHD diagnosis. Sometimes behavior related to emotion dysregulation can lead the PCC to consider other diagnoses such as disruptive mood dysregulation disorder, intermittent explosive disorder, and bipolar disorder. All 3 may be diagnosed with ADHD. Intermittent explosive disorder and bipolar disorder are rare in children and data are currently inadequate to know the prevalence of disruptive mood dysregulation disorder. Given the base rates, these other diagnoses are unlikely, although they do occur in childhood. If the PCC has any uncertainty about making these distinctions, referring the child to a clinical child psychologist or child mental health professionals may be warranted.

Learning Disabilities

Learning disabilities frequently co-occur with ADHD and can lead to symptoms and impairment that are similar to those in children with ADHD. As a result, screening for learning disabilities' presence, such as via the Vanderbilt ADHD Rating Scale,[70] is important, given that treatment for ADHD and learning disabilities differ markedly.

Learning disabilities involve impairment related to learning specific academic content—usually reading or math, although there is increased awareness about disorders of written expression. The impairment is not attributable to difficulties with sustaining attention; however, some children with learning disabilities have trouble sustaining attention in class because they

cannot keep up and then disengage. A careful evaluation for learning disabilities includes achievement testing, cognitive ability testing, and measures of the child's learning in response to evidence-based instruction. Such thorough evaluations are typically not available in a PCC practice. If screening suggests the possibility of learning disabilities, the PCC can help advise parents on how to obtain school psychoeducational evaluations or refer to a psychologist or other specialist trained in conducting these evaluations.

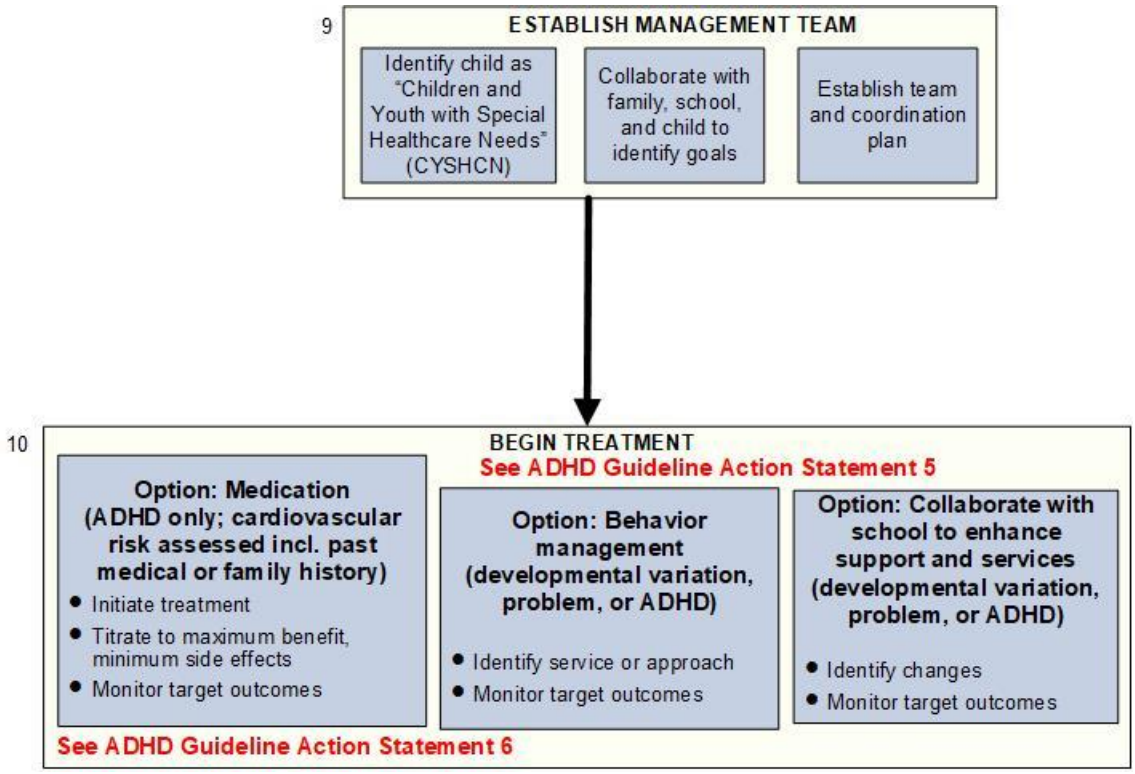
The PCC's attention is directed to language skills in preschool-aged and young school-aged children, because difficulties in language skills can be a symptom of a language disorder and predictor of subsequent reading problems. Language disorders may present as problems with attention and impulsivity. Likewise, social interactions need to be noted during the examination, because they may be impaired when the child or adolescent's language skills are delayed or disordered.

Children who have intellectual or other developmental disabilities may have ADHD, but assessment of these patients is more difficult, because a diagnosis of ADHD would only be appropriate if the child or adolescent's level of inattention or hyperactivity/impulsivity is disproportionate to his or her *developmental* rather than *chronological* age. Therefore, assessment of ADHD in individuals with intellectual disabilities requires input from the child or adolescent's education specialists, school psychologists, and/or independent psychologists. Although it is important to attempt to differentiate whether the presenting problems are associated with learning disabilities, ADHD, or something else, it is important to consider the possibility that a child has multiple disorders. Pediatricians and other PCCs who are involved in assessing ADHD in children with intellectual disabilities will need to collaborate closely with school or independent psychologists.

Summary

Overall, there are many factors that influence a diagnostic decision. Frequently, these decisions must be made without the benefit of all of the relevant information described. Family and cultural issues that affect parents' expectations for their child and perceptions about mental health can further complicate this process. Poverty, family history, access to care, and many other factors that a PCC will probably not know when making the diagnosis can also be formative in the child's presenting problems.[5-9] The PCC will wisely remain sensitive to individual variations in parents' beliefs, values and perception of their culture and community when completing the assessment and determining a diagnosis. These factors add complexities to the assessment and diagnostic process and make a good evaluation and diagnosis a function of clinical experience, judgment, and a foundation in science.

IV. TREATMENT



If the child meets the *DSM-5* criteria for ADHD, including commensurate functional disabilities, progress through the process of care algorithm.

(See AHDH Guideline's Key Action Statements #5 and #6.)

IV a. Establish Management Team: Identify the Patient as a "Child With Special Health Care Needs"

Any child who meets the criteria for ADHD is considered a "child or youth with special health care needs"; these children are best managed in a medical home.[71-75] In addition, the AAP encourages clinicians to develop systems to allow the medical home to meet all needs of children with chronic illnesses. These needs—and strategies for meeting them—are discussed in further detail in AAP resources such as The Building Your Medical Home Toolkit and Addressing Concerns in Primary Care: A Clinician's Toolkit. Care in the medical home is reviewed in the AAP publication *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, 4th Edition. Pediatricians and other PCCs who provide effective medical homes identify family strengths and recognize the importance of parents in the care team.[76-79] The PCC may provide education about the disorder and treatment options, medication, and/or psychosocial treatment and monitor response to treatments over time as well as the child's development.

IV b. Establish Management Team: Collaborate With Family, School, and Child to Identify Target Goals

ADHD is a chronic illness; hence, education for both the child or adolescent and other family members is a critical element in the care plan. Family education involves *all* members of

the family, including the provision of developmentally age-appropriate information for the affected child or adolescent and any siblings. Topics may include: the disorder's potential causes and typical symptoms; the assessment process; common coexisting disorders; ADHD's effect on school performance and social participation; long-term sequelae; and treatment options and their potential benefits, adverse effects, and long-term outcomes. It is important to address the patient's self-concept and clarify that having ADHD does not mean that the child is less smart than others. At every stage, education must continue in a manner consistent with the child/adolescent's level of understanding.

The emphasis for parental education is on helping parents understand the disorder, how to obtain additional accurate information about ADHD and treatments, and how to effectively advocate for their child. This may include addressing parental concerns about labeling the child or adolescent with a disorder by providing information on the benefits of diagnosis and treatment.

Some guidance about effective parenting strategies may be helpful, but Parent Training in Behavior Management (PTBM) is likely to be most beneficial for most parents (see the section on psychosocial treatments). Pediatricians and other PCCs are encouraged to be cognizant of the challenges families may face in order to attend such training, including taking time off from work and covering the costs associated with the intervention.

Parents may benefit from learning about optimal ways to partner with schools, particularly their child's teachers, and become part of the educational and intervention teams. Educating parents about special education and other services can be helpful, but school interventions and advocacy may be best aided by partnering closely with an advocate or clinician experienced in working with schools (see the psychosocial treatment section). With the parent's permission, the clinician may provide educators at the school with information from the evaluation that will help the school determine eligibility for special education services or accommodations and/or develop appropriate services.

In addition, it is helpful to provide assistance to the parent or other caregiver in understanding and using any relevant electronic health record (EHR) system. Sometimes, the health literacy gap around electronic health records can lead to confusion and frustration on the family's side. Also, providing information on community resources, such as other health care providers or specialists, can be beneficial in addressing fragmentation and communication barriers.

Family education continues throughout the course of treatment, and includes anticipatory guidance in areas such as transitions (eg, from elementary to middle school, middle to high school, and high school to college or employment); working with schools; and developmental challenges that may be affected by ADHD, including driving, sexual activity, and substance use and abuse. For parents who are interested in understanding the developmental aspects of children's understanding about ADHD (ie, causes, manifestations, treatments), several AAP publications may be useful.[80-82]

Although having a child diagnosed with ADHD can sometimes provide relief for families, it is important to check on the parents' well-being. Having a disruptive child who has trouble interacting with others can be very stressful for parents, and learning that their child has a

disorder sometimes gives them something to blame other than themselves. Helping families cope with parenting challenges or making referrals for services to address their stress or depression can be an important part of care. These concerns are particularly relevant when a parent has ADHD or associated conditions. Parents may require support balancing the needs of their child with ADHD and their other children's needs. Advocacy and support groups such as The National Resource on ADHD (a program of Children and Adults with Attention-Deficit/Hyperactivity Disorder [CHADD], https://chadd.org/about/about-nrc/) and the Attention Deficit Disorder Association (www.add.org) can provide information and support for families. There also may be local support organizations. The ADHD Toolkit provides lists of educational resources, including Internet-based resources, organizations, and books that may be useful to parents and children.

IV c. Establish Management Team: Establish Team and Coordination Plan

Treatment Team

The optimal treatment team includes everyone involved in the care of the child: the child, parents, teachers, PCC, therapists, subspecialists, and other adults (such as coaches or faith leaders) who will be actively engaged in supporting and monitoring the treatment of ADHD.[76-79] It is helpful for the PCC or another assigned care coordinator to make each team member aware of his or her role, the process and timing of routine and as-needed communication strategies, and expectations for reports (ie, frequency, scope). Collaboration with school personnel goes beyond the initial report of diagnosis and is best facilitated by agreement on a standardized, reliable communication system. Although there are obstacles to achieving this level of coordination, if successful, it enhances care and improves outcomes for the child. (See supplemental paper "Systemic Barriers to the Care of Children and Adolescents With ADHD*"* for a discussion of systemic challenges.)

Treatment Goals

Management plans include the establishment of treatment goals for the areas of concern, such as those most commonly affected by ADHD: academic performance; relationships with peers, parents, and siblings; and safety. It is not necessary to develop goals in every area at once. Families might be encouraged to identify up to 3 of the most impairing areas to address initially. Parents and the child or adolescent can add other targets as indicated by their relative importance. Other goals may be identified using the International Classification of Function (ICF) analysis conducted in the diagnostic phase of the clinical pathway. This process increases the understanding of ADHD's effects on each family member and may lead to improved collaboration in developing a few specific and measurable outcomes. It is helpful to incorporate a child's strengths and resilience when considering target goals and generating the treatment plan. Academic or school goals require the input of teachers and other personnel for both identification and measurement.

Establishing measurable goals in interpersonal domains and improving behavior in unstructured settings may be particularly important. Wherever possible, progress should be quantifiable to monitor the frequency of behaviors. The number of achieved and missed goals per day can be recorded by the parent, child, and/or teacher. Charts may be suggested as strategies to record events so that parents, teachers, children, and PCCs can agree on how much

progress has been made building success in a systematic and measurable way. Keeping the focus on progress toward the identified goals can keep all family members engaged, provide a rubric for measuring response to various treatments, and offer a vehicle for rewarding success. Such strategies can help a family accurately assess and see progress of behavior changes. A single page daily report card can be utilized to identify and monitor 4 or 5 behaviors that affect function at school and the card can be shared with parents. Other strategies and tools are available to clinicians in the AAP ADHD Provider Toolkit (3rd Edition),[83] and for parents, *ADHD: What Every Parent Needs to Know*.[84]

As treatment proceeds, in addition to utilizing a *DSM-5*-based ADHD rating scale to monitor core symptom changes, formal and informal queries can be made in the areas affected by ADHD. At every visit, it is helpful for the PCC to gradually further empower children/adolescents so they are able to be full partners in the treatment plan by adolescence. Data from school are helpful at these visits—including rating scales completed by the child or adolescent's teacher, grades, daily behavior ratings (when available), and formal test results.

Management Plan

In addition to educating the family, the PCC can consider developing a management plan that, over time, addresses the following questions:

- Does the family need further assistance in understanding the core symptoms of ADHD and the child/adolescent's target symptoms and coexisting conditions?
- Does the family need support in learning how to establish, measure, and monitor target goals?
- Have the family's goals been identified and addressed in the care plan?
- Does the family have an understanding of effective behavior management techniques for responding to tantrums, oppositional behavior, and/or poor compliance with requests or commands?
- Does the family need help on normalizing peer and family relationships?
- Does the child need help in academic areas? If so, has a formal evaluation been performed and reviewed to distinguish work production problems secondary to ADHD or attributable to coexisting learning or language disabilities?
- Does the child or adolescent need assistance in achieving independence in self-help or schoolwork?
- Does the child or adolescent or family require help with optimizing, organizing, planning, or managing schoolwork?
- Does the family need help in recognizing, understanding, or managing coexisting conditions?
- Does the family have a plan to educate the child or adolescent systematically about ADHD and its treatment, as well as the child's own strengths and weaknesses?
- Does the family have a plan to empower the child or adolescent with the knowledge and understanding that will increase their adherence to treatments? Has that plan been initiated and is it pitched at the child or adolescent's developmental level?
- Does the family have a copy of a care plan that summarizes the evaluation findings and treatment recommendations?
- Does the follow-up plan provide comprehensive, coordinated, family-centered, and culturally competent ongoing care?

- Does the family have any needed referrals to specialists to provide additional evaluations, treatments, and support?
- Does the family have a plan for the transition from pediatric to adult care that provides the transitioning youth with the necessary ADHD self-management skills, understanding of health care and educational privacy laws, identified adult clinician to continue his or her ADHD care, and health insurance coverage?

IV d. Treatment: Medication, Psychosocial Treatment, and Collaboration With the School to Enhance Support Services

The decision about the most acceptable treatment for the child rests with the family and its decisions about treatment. The PCC needs to encourage that this decision is based on accurate and adequate information, which often involves correcting misinformation or unwarranted concerns about medication. If the family still declines medication treatment, the PCC can encourage all other types of effective treatment and provide appropriate monitoring (families who decline medication are discussed in more detail below).

Pediatricians and other PCCs need to educate families about the benefits and characteristics of evidence-based ADHD psychosocial treatment and explicitly communicate that play therapy and sensory-related therapies have *not* been demonstrated to be effective. Likewise, for children younger than 7 years, individual CBT lacks demonstrated effectiveness; CBT has some, but not strong, evidence for children 7 to 17 years of age. Families should be made aware that for psychosocial treatments to be effective, the therapist needs to work with the family (not just the child or adolescent) on setting and maintaining routines, discipline and reward-related procedures, training programs, and creating a home environment that will bring out the best in the child and minimize ADHD-related dysfunction.

(See ADHD Guideline Key Action Statements #5 and #6.)

Treatment: Medication

This treatment option is restricted to children and adolescents who meet diagnostic criteria for ADHD.

The US Food and Drug Administration (FDA) has approved stimulant medications (ie, methylphenidate and amphetamines) and several nonstimulant medications for the treatment of ADHD in children and adolescents. New brands of methylphenidate and amphetamines continue to be introduced, including longer-acting products, various isomeric products, and delayed-release products. Hence, it is increasingly unlikely that pediatricians and other PCCs need to consider the off-label use of other medications. A free and continually updated list of medications is available at www.ADHDMedicationGuide.com. (See the ADHD guideline for information on off-label use.)

With the expanded choices and considerations of the clinical effects comes the reality that clinical choices are often heavily restricted by insurance coverage. Some, but not all, of the problems include changes in insurance and formulary that preclude the use of certain medications or force a stable patient to change medications, step therapy requirements that may delay effective treatment, and financial barriers that preclude a patient's use of newer drugs or

those not preferred by the payer. (See the supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for a discussion of this issue.)

The choice of stimulant medication formulation depends on such factors as the efficacy of each agent for a given child, the preferred length of coverage, whether or not a child can swallow pills or capsules, and out-of-pocket costs. The extended-release formulations are generally more expensive than the immediate-release formulations. Families and children may prefer them, however, because of the benefits of consistent and sustained coverage with fewer daily administrations. Long-acting formulations usually avoid the need for school-based administration of ADHD medication. Better coverage with fewer daily administrations leads to greater convenience to the family and is linked with increased adherence to the medication management plan.[85]

Some patients, particularly adolescents, may require more than 12 hours of coverage daily to ensure adequate focus and concentration during the evening, when they are more likely to be studying and/or driving. In these cases, a nonstimulant medication or short-acting preparation of stimulant medication may be used in the evening in addition to a long-acting preparation in the morning. Of note, stimulant medication treatment of individuals with ADHD has been linked to better driving performance and a significant reduced risk of motor vehicle crashes.[86]

The ease with which preparations can be administered and the minimization of adverse effects are key quality-of-life factors and are important concerns for children, adolescents, and their parents. When making medication recommendations, PCCs has to consider the time of day when the targeted symptoms occur, when homework is usually done, whether medication remains active when teenagers are driving, whether medication alters sleep initiation, and risk status for substance use or stimulant misuse or diversion.

All FDA-approved stimulant medications are methylphenidate or amphetamine compounds and have similar desired and adverse effects. Given the extensive evidence of efficacy and safety, these drugs remain the first choice in medication treatment. The decision about what compound a PCC prescribes first should be made on the basis of individual clinician and family preferences and the child's age. Some children will respond better to, or experience more adverse effects with, 1 of the 2 stimulants groups (ie, methylphenidate or amphetamine) over another. Because this cannot be determined in advance, medication trials are appropriate. If a trial with 1 group is unsuccessful because of poor efficacy or significant adverse effects, a medication trial with medication from the other group should be undertaken. At least half of children who fail to respond to 1 stimulant medication have a positive response to the alternative medication.[89]

Of note, recent meta-analyses have documented some subtle group-level differences in amphetamine/dextroamphetamine and methylphenidate response. One such analysis found that, on average, youth with ADHD who were treated with either amphetamine- or methylphenidate-based medications showed improvement in ADHD symptoms.[87] There was a marginally larger improvement in clinicians' ADHD symptom ratings for amphetamine-based versus methylphenidate-based preparations.[87] This meta-analysis indicated that overall adverse effects (including sleep problems and emotional side effects) were more prominent among those using amphetamine-based preparations. The findings were corroborated by a 2018 meta-analysis,

which found that amphetamine/dextroamphetamine worsened emotional lability compared with the premedication baseline. The meta-analysis found there was a tendency for methylphenidate to reduce irritability and anxiety, compared with the patients' premedication ratings.[88] Among individual patients, medication's efficacy and adverse effects can vary from these averages.

Families who are concerned about the use of stimulants or the potential for their abuse and/or diversion may choose to start with atomoxetine, extended-release guanfacine or extended-release clonidine. In addition, those not responding to either stimulant group may still respond to atomoxetine, extended-release guanfacine, or extended-release clonidine.

Atomoxetine is a selective norepinephrine reuptake inhibitor that may demonstrate maximum response after approximately 4 to 6 weeks of use, although some patients experience modest benefits after 1 week of atomoxetine treatment. Extended-release guanfacine and extended-release clonidine are alpha-2A adrenergic agonists that may demonstrate maximum response in about 2 to 4 weeks. It is worth making families aware that symptom change is more gradual with atomoxetine and alpha-2A adrenergic agonists than the rapid effect seen with stimulant medications. Atomoxetine may cause gastrointestinal tract symptoms and sedation early on, so it is recommended to prescribe half the treatment dose (0.5 mg/kg) for the first week. Appetite suppression can also occur. Both alpha-2A agonists can cause the adverse effect of somnolence. It is recommended that alpha-2A agonists be tapered when discontinued to prevent possible rebound hypertension.

There is a Black Box warning on atomoxetine about the possibility of suicidal ideation when initiating medication management. Early symptoms of suicidal ideation may include thinking about self-harm and increasing agitation. If there are any concerns about suicidal ideation in children prescribed atomoxetine, further evaluation (ie, using the Patient Health Questionnaire-9 rating scale, asking about suicidal ideation, reviewing presence of firearms in the home, determining whether there is good communication between the patient and parents or trusted adults, etc), reconsideration about the use of atomoxetine, and more frequent monitoring should be considered; referral to a mental health clinician may be necessary.

In patients who only respond partially to stimulant medications, it is possible to combine stimulant and nonstimulant alpha-2 agonist medications to obtain better efficacy (see the clinical practice guideline). It is helpful to ask the family if they have any prior experience with any of the medications, because a prior good or bad experience in other family members may indicate a willingness or reluctance to use one type or a specific stimulant medication. When there is concern about possible use or diversion of the medication, or a strong family preference against stimulant medication, an FDA-approved nonstimulant medication may be considered as the first choice of medication.

Medications that utilize a microbead technology can be opened and sprinkled on food and are, therefore, suitable for children who have difficulty swallowing tablets or capsules. For patients who are unable to swallow pills, alternative options include immediate- and extended-release methylphenidate and amphetamine in a liquid and chewable form, a methylphenidate transdermal patch, and an orally disintegrating tablet.

It is often helpful to inform families that the initial medication titration process may take several weeks to complete and medication changes can be made on a weekly basis, and subsequent changes in medication may be necessary. Completion of ADHD rating scales prior to dose adjustment helps promote measurement-based treatment. The usual procedure is to begin with a low dose of medication and titrate to the dose that provides maximum benefit and minimal adverse effects. Core symptom reduction can be seen immediately with stimulant medication initiation, but improvements in function require more time to manifest. Stimulant medications can be effectively titrated with changes occurring in a 3- to 7-day period. During the first month of treatment, the medication dose may be titrated with a weekly or biweekly follow-up. The increasing doses can be provided either by prescriptions that allow dose adjustments upward or, for some of medications, by one prescription of tablets/capsules of the same strength with instructions to administer progressively higher amounts by doubling or tripling the initial dose.

Another approach, similar to the one used in the Multimodal Treatment of ADHD (MTA) study,[89] is for parents to be directed to administer different doses of the same preparation, each for 1 week at a time (eg, Saturday through Friday). At the end of each week, feedback from parents and teachers, and/or *DSM-5*-based ADHD rating scales, can be obtained through a phone interview, fax, or a secure electronic system. In addition to the ADHD rating scale, parents and teachers can be asked to review adverse effects and progress on target goals.

Follow-up Visits

A face-to face follow-up visit is recommended at about the fourth week after starting the medication. At this visit, the PCC reviews the child or adolescent's responses to the varying doses and monitors adverse effects, pulse, blood pressure, and weight. To promote progress in controlling symptoms is maintained, PCCs will continue to monitor levels of core symptoms and improvement in specified target goals. ADHD rating scales should be completed at each visit, particularly before any changes in medication and/or dose.

In the first year of treatment, face-to-face visits to the PCC are recommended to occur on a monthly basis until consistent and optimal response has been achieved, then every 3 months. Subsequent face-to-face visits will be dependent on the response; they typically occur quarterly but need to occur at least twice annually until it is clear that target goals are progressing and symptoms have stabilized. Thereafter, visits occur periodically as determined by the family and the PCC. After several years, if the child or adolescent is doing well and wants to attempt a trial off of the medication, this can be initiated.

Results from the MTA study suggest that there are some children who, after 3 years of medication treatment, continue to improve even if the medication is discontinued.[90] These findings suggest that children who are stable in their improvement of ADHD symptoms may be given a trial off medication after extended periods of use to determine whether medication is still needed. This process is best undertaken with close monitoring of the child's core symptoms and function at home, in school, and in the community. If pharmacologic interventions do not improve the child or adolescent's symptoms, the diagnosis needs to be reassessed (see treatment failure section).

Whenever possible, improvements in core symptoms and target goals should be monitored in an objective way (eg, an increase from 40% goal attainment to 80% per week; see

the ADHD Toolkit for more information). Core symptoms can be monitored with one of the *DSM-5*-based ADHD rating scales.

Pediatricians and other PCCs are encouraged to educate parents that, although medications can be effective in facilitating schoolwork, they have not been shown to be effective in addressing learning disabilities or a child's level of motivation. A child or adolescent who continues to experience academic underachievement after attaining some control of his or her ADHD behavioral symptoms needs to be assessed for a coexisting condition. Such coexisting conditions include learning and language disabilities, other mental health disorders, and other psychosocial stressors. This assessment is part of the initial assessment in children who present with difficulties in keeping up with their schoolwork and grades and who are rated as having problems in the 3 academic areas (ie, reading, writing, and math).

Treatment: Psychosocial Treatment

Two types of psychosocial treatments are well-established for children and adolescents with ADHD, including some behavioral treatments and training.[91]

Behavioral Treatments

There is a great deal of evidence supporting the use of behavioral treatments for preschool and elementary and middle school-aged children, including several types of PTBM and classroom interventions (see the clinical practice guideline for more information). There are multiple PTBM programs available, which are reviewed in the ADHD Toolkit.[83]

Evidence-based PTBM training typically begins with 7 to 12 weekly group or individual sessions with a trained or certified therapist. Although PTBM treatments differ, the primary focus is on helping parents improve the methods they use to reward and motivate their child in order to reduce the behavioral difficulties posed by ADHD and improve their children's behavior. Therapists help parents establish consistent relationships or contingencies between the child's specific behaviors and the parents' use of rewards or logical consequences for misbehavior. These treatments typically use specific directed praise, point systems, time outs, and privileges to shape behavior. Parents learn how to effectively communicate expectations and responses to desirable and undesirable behaviors.

PTBM programs offer specific techniques for reinforcing adaptive and positive behaviors and decreasing or eliminating inappropriate behaviors, which alter the motivation of the child/adolescent to control attention, activity, and impulsivity. These programs emphasize establishing positive interactions between parents and children, shaping children's behaviors through praising and strengths-spotting, giving successful commands, and reinforcing positive behaviors. They help parents to extinguish inappropriate behaviors through ignoring, to identify behaviors that are most appropriately handled through natural consequences, and to use natural consequences in in a responsible way.

These programs all emphasize teaching self-control and building positive family relationships. If parents strongly disagree about behavior management or have contentious relationships, parenting programs will likely be unsuccessful. Depending on the severity of the child/adolescent's behaviors and the capabilities of the parents, group or individual training

programs will be required. Programs may also include support for maintenance and relapse prevention.

Although all effective parenting uses behavioral techniques, applying these strategies to children or adolescents with ADHD requires additional rigor, adherence, and persistence, compared with children without the disorder. Some PTBM programs include additional components such as education about ADHD, development and other related issues, motivational interviewing, and support for parents coping with a child with ADHD.

PTBM training has been modified for use with adolescents to incorporate a family therapy approach that includes communication, problem-solving, and negotiation. Initially developed for adolescents with a wide range of problems,[94] this approach has been modified for adolescents with ADHD.[93,94] The approach's effects are not as large as with PTBM training with children, but clear benefits have been reported; this is a feasible clinic-based approach that warrants a referral, if available.

Although PTBM training is typically very effective, such programs may not be available in many areas (see supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for further discussion of this issue[1]). Factors that may diminish PTBM's effects and/or render them ineffective include the time commitment required to attend sessions and practice the recommendations at home, particularly given other competing demands for the family's time. Parental disagreements about implementing the PTBM program, conflicts between parents, and separated parents who share caretaking responsibilities can adversely affect the results. Careful monitoring of progress and follow-up by the therapist or PCC can reduce the likelihood of these risks. PTBM training may not be covered by health insurance (insurance issues are discussed in the supplemental barriers paper).

Training Interventions

Training interventions are likely to be effective with children and adolescents with ADHD. These interventions involve targeting specific deficiencies in skills such as study, organization, and interpersonal skills. Effective training approaches involve targeting a set of behaviors that are useful to the child in daily life, and providing extensive training, practice, and coaching over an extended period of time. For some children, the combination of behavioral treatments and training may be most effective. Psychosocial treatments are applicable for children who have problems with inattentive or hyperactive/impulsive behaviors but do not meet the *DSM-5* criteria for a diagnosis of ADHD.

Many of the behavioral and training treatments described above can be provided at school. Coaching, which has emerged as a treatment modality over the last decade, can be a useful alternative to clinic- or school-based treatments. There has yet to be rigorous studies to support its benefits, although it has good face validity. Currently, there is no standardized training or certification for coaches.

Other Considerations

PCCs can make recommendations about treatments that are most likely to help a child or adolescent with ADHD and discourage the use of nonmedication treatments that are unlikely to

be effective. Pediatricians and other PCCs are encouraged to discuss what parents have tried in the past, and what has been beneficial for the child and his or her family.

Treatments for which there is insufficient evidence include large doses of vitamins and other dietary alterations; vision/visual training; chelation; electroencephalographic (EEG) biofeedback; and working memory (ie, cognitive training) programs.[91] To date, there is insufficient evidence to determine that these therapies lead to changes in ADHD's core symptoms or functioning. There is a lack of information about the safety of many of these alternative therapies. Although there is some minimal information that significant doses of essential fatty acids may help with ADHD symptoms, further study on effectiveness, negative impacts, and adverse effects is needed before it can be considered a recommended treatment.[95]

As noted, some therapies that are effective for other disorders are *not* supported for use with children or adolescents with ADHD. These include CBT (which has documented effectiveness for the treatment of anxiety and depressive disorders), play therapy, social skills training, and interpersonal talk therapy. Although it is possible that these treatments may improve ADHD symptoms in a *specific* child or adolescent, they are less likely to do so compared with evidence-based treatments. As a result, the PCC should discourage use of these approaches. If these ineffective treatments are attempted before evidence-based modalities, parents may erroneously conclude that *all* mental health treatments are ineffective. For example, if CBT or play therapy does not help their child's ADHD, parents may dismiss other treatments, like PTBM, which could be helpful. Parents also may discount CBT if it subsequently is recommended for an emerging anxiety disorder.

Pediatricians and other PCCs are unlikely to be effective in providing psychosocial treatment unless they are specifically trained, have trained staff, are co-located with a therapist, or dedicate multiple visits to providing this treatment. Clinicians may have difficulty determining whether the therapists listed in the patient's health insurance plan have the requisite skills to provide evidence-based, psychosocial ADHD-related treatment. This determination is important, because many therapists focus on a play therapy or interpersonal talk therapy, which have *not* been shown to be effective in treating the impairments associated with ADHD.

Pediatricians and other PCCs may want to develop a resource list of local therapists, agencies, and other mental health clinicians who can treat these impairments. Clinicians might request references from other parents of children with ADHD, professional organizations (eg, the Association for Behavior and Cognitive Therapies), and ADHD advocacy organizations (eg, CHADD). Parents who have read authoritatively written books about psychosocial treatment may be in a better position to know what they are looking for in a therapist. Some of these resources are available in the ADHD Toolkit[83] and in *ADHD: What Every Parent Needs to Know*[84] as well as other online sources.[84,96-98] Unfortunately, lack of insurance coverage, availability, and accessibility of effective services may limit the implementation of this process (see supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for further discussion).

Treatment: Collaborate With School to Enhance Support and Services

School-based approaches have demonstrated both short- and long-term benefits for at least 1 year beyond treatment.[99,100] Schools can implement behavioral or training interventions

that directly target ADHD symptoms and interventions to enhance academic and social functioning. Schools may use strategies to enhance communication with families, such as daily behavior report cards. All schools should have specialists (eg, school psychologists, counselors, special educators) who can observe the child or adolescent, identify triggers and reinforcers, and support teachers in improving the classroom environment. School specialists can recommend accommodations to address ADHD symptoms, such as, untimed testing, testing in less distracting environments, and routine reminders. As children and adolescents get older, their executive functioning skills continue developing. So, their delays may decrease and they may no longer need the accommodations. Alternatively, further intervention may be indicated to facilitate the development of these independent skills.

It is helpful for PCCs to be aware of the eligibility criteria for 504 Rehabilitation Act and the Individuals with Disabilities Education Act (IDEA) support in their state and local school districts.[101] It is helpful to understand the process for referral and the specific individuals to contact about these issues. Providing this information to parents will support their efforts to secure classroom adaptations for their child or adolescent, including the use of empirically supported academic interventions to address the achievement difficulties that are often associated with ADHD symptoms.

Educate Parents About School Services

School is often the place where many of a child or adolescent with ADHD's problems occur. Although services are available—through special education, IDEA, and Section 504 plans—classroom teachers can help students with ADHD. Students with ADHD are most likely to succeed in effectively managed classrooms in which teachers provide engaging instruction, support their students, and implement rules consistently. School staff can sometimes consult with classroom teachers to help them improve their skills in these areas. In many schools, parents can ask the principal for a specific teacher for their child the following academic year.

In some schools, teachers may implement activities to help a student before he or she is considered for special services, including a daily report card, organization interventions, behavioral point systems, and coordinating with the parents—such as by using websites or portal systems for communication. Individualized behavioral interventions, if implemented well and consistently, are some of the most effective interventions for children with ADHD. In addition to individualized interventions, encouraging parents to increase communication with the teacher can help parents reinforce desirable behavior at school.

If these approaches are not adequate—or teachers are unwilling to provide them—parents can be encouraged to write to the principal or the director of special education requesting an evaluation for special education services. An evaluation from a PCC can help this evaluation process but is unlikely to replace it. A child who has an ADHD diagnosis may be eligible for special education services in the category of "other health impaired." Depending on the specific nature of a child's impairment at school, he or she may be eligible for the categories of "emotional and behavioral disorders" or "specific learning disability." The category of eligibility does not affect the services available to the child but usually reflect the nature of the problems that resulted in his or her eligibility for special education services.

Although a PCC may recommend that a child is eligible for special education and

specific services, these are only recommendations, as specific evaluation procedures and criteria for eligibility are determined by each school district within federal guidelines. If the ADHD is severe and interfering with school performance, services are usually provided under the "other health impaired" category. It is important for PCCs to avoid using language in the report that could alienate people in the school or create conflict between the parents and school staff. After school staff complete the evaluation, a meeting will be held to review the results of all evaluation information (including the PCC report) and determine the student's eligibility for an Individualized Education Program (IEP) or a 504 plan. The parents may invite others to attend the meeting, if they wish. Some communities have individuals who are trained to help parents effectively advocate for services; being aware of existing resources can help the PCC refer parents to them, if they exist. Additional details about eligibility are usually available on the school district's and the state department of education's websites.

A PCC can help educate the parents about the types of services they can request at the meeting. There are generally 2 categories of services. Some of the most common services are often referred to as "accommodations," including extending time on tests; reducing homework; or providing a child with class notes from the teacher or a peer. These services reduce the expectations for a child and can quickly eliminate school problems. For example, if a child is failing classes because he or she is not completing homework and the teacher stops assigning the child homework, then the child's grade in the class is likely to improve quickly. Similarly, parent-child conflict regarding homework will quickly cease. Although these outcomes are desirable, if discontinuing the expectation for completing homework results does not help improve the student's ability to independently complete tasks outside school—which is an important life skill—it may not be beneficial. Although appealing, these services may not improve and in some cases may decrease the child's long-term competencies. They need to be considered with this in mind.

The second set of services consists of interventions that enhance the student's competencies. These take much more work to implement than the services described above and do not solve the problem nearly as quickly. Although appealing, these services may decrease the child's long-term competencies if they are not combined with interventions that are aimed at improving the student's skills and behaviors. Accommodations need to be considered with this broader context in mind. The advantage of interventions is that, over time, many students improve their competencies and become able to independently meet age-appropriate expectations (for more information on this approach, see the Life Course Model[102]).[103] Interventions include organization interventions, daily report cards, and training study skills. The following school-based interventions have been found to be effective in improving academic and interpersonal skills for students with ADHD: Challenging Horizons Program,[99] Child Life and Attention Skills,[104] and Homework and Organization Planning Skills.[105] If these are available in area schools, it is important to encourage their use.

V. AGE-RELATED ISSUES

V a. Preschool-Aged Children (Age 4 Years to the 6th Birthday)

Clinicians can initiate treatment of preschool-aged children with ADHD (ie, children age 4 years to the 6th birthday) with PTBM training and assess for other developmental problems, especially with language. If children continue to have moderate to severe dysfunction, the PCC needs to

reevaluate the extent to which the parents can implement the therapy; the PCC can also consider prescribing methylphenidate, as described previously. Titration should start with a small dose of immediate-release methylphenidate, because preschool-aged children metabolize medication at a slower rate. They have shown lower optimal mg/kg daily doses than older children and may be more sensitive to emotional side effects such as irritability and crying.[106,107]

Currently, dextroamphetamine is the only FDA-approved ADHD medication to treat preschool-aged children. However, when dextroamphetamine received FDA approval, the criteria were less stringent than they are now, so there is only sparse evidence to support its safety and efficacy in this age group. There is more abundant evidence that methylphenidate is safe and efficacious for preschool-aged children with ADHD. For this reason, methylphenidate is the first-line recommended ADHD medication treatment for this age group, despite not having FDA approval.[108]

The Preschool Attention-Deficit/Hyperactivity Disorder Treatment Study (PATS),[107] the landmark trial documenting methylphenidate's safety and efficacy in this age group, included children with moderate to severe dysfunction. Therefore, the recommendation for methylphenidate treatment is reserved for children with significant, rather than mild, ADHD-related impairment. In the Preschool Attention-Deficit/Hyperactivity Disorder Treatment Study trial, moderate to severe impairment was defined as having symptoms present for at least 9 months and clear impairment in both the home and child care/preschool settings that did not respond to an appropriate intervention.

There is limited published evidence of the safety and efficacy for the preschool-aged group of atomoxetine, extended-release guanfacine, or extended-release clonidine. None of these nonstimulant medications have FDA approval for this age group.[109]

V b. Adolescents (Age 12 Years to the 18th Birthday)

Pediatricians and other PCCs may increase medication adherence and engagement in the treatment process by closely involving adolescents (age 12 years to the 18th birthday) in medication treatment decisions. Collaborating with the adolescent to determine whether the medication is beneficial can help align outcome measures with the adolescent's own goals. Special attention ought to be paid to provide medication coverage at times when the adolescent may exhibit risky behaviors, such as when he or she is driving or spending unsupervised time with friends. Longer-acting or late-afternoon administration of nonstimulant medications or short-acting medications may be helpful.

If pediatricians and other PCCs begin transitioning children to be increasingly responsible for treatment decisions during early adolescence, then transitioning to a primary care physician who specializes in care for adults will be a natural continuation of that process when the adolescent reaches the highest grades in high school. Preparation for the transition to adulthood is an important step that includes planning for transferring care, adapting treatment to new activities and schedules, and educating the patient about effective ways to obtain insurance and engage in services.

Counseling for adolescents around medication issues needs to include dealing with resistance to treatment and empowering the patient to take charge of and own his or her

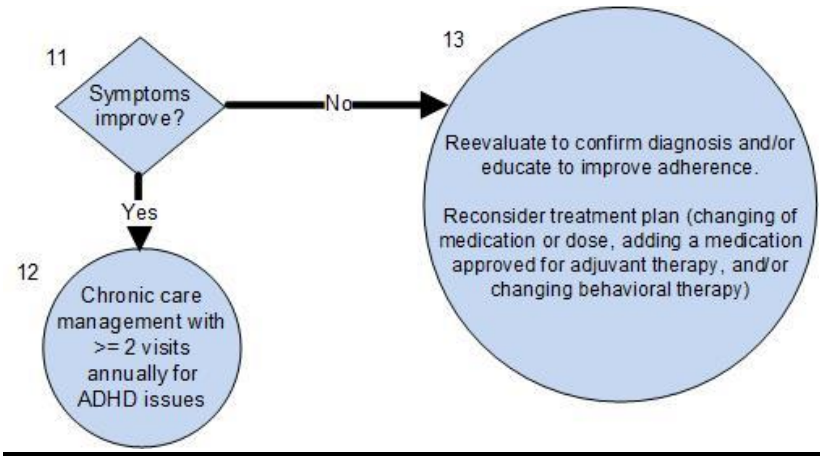
medication management as much as possible. Techniques of motivational interviewing may be useful in improving adherence.[110]

In addition to the numerous developmental changes encountered when working with adolescents, PCCs should assess adolescent patients with ADHD for symptoms of substance use or abuse before beginning medication treatment. If substance use is revealed, the patient should stop the use. Referral for treatment for substance use must be provided before beginning treatment for ADHD (see the clinical practice guideline). Pediatricians and other PCCs should pay careful attention to potential substance use and misuse and diversion of medications. Screening for signs of substance use is important in the care of all adolescents and, depending on the amount of use, may lead a PCC to recommend treatment for substance use. Extensive use or abuse may result in concerns about continuing medication treatment for ADHD until the abuse is resolved. Similar concerns and consideration of discontinuing medication treatment for ADHD could emerge if there is evidence that the adolescent is misusing or diverting medications for other than its intended medical purposes. Pediatricians and other PCCs are encouraged to monitor symptoms and prescription refills for signs of misuse or diversion of ADHD medication. Diversion of ADHD medication is a special concern among adolescents.[111]

When misuse or diversion is a concern, the PCC might consider prescribing nonstimulant medications with much less abuse potential, such as atomoxetine, extended-release guanfacine, or extended-release clonidine. It is more difficult but not impossible to extract the methylphenidate or amphetamine for abuse from the stimulant medications lisdexamfetamine, dermal methylphenidate, and OROS methylphenidate, although these preparations still have some potential for abuse or misuse.

PCCs should be aware that short-acting, mixed amphetamine salts are the most commonly misused or diverted ADHD medication. It is important to note that diversion and misuse of ADHD medications may be committed by individuals who have close contact with, or live in the same house as, the adolescent—not necessarily by the adolescent him or herself; this is especially true for college-aged adolescents. Pediatricians and other PCCs are encouraged to discuss safe storage practices, such as lockboxes for controlled substances, when used by college-aged adolescents.

VI. MONITORING



Pediatricians and other PCCs should regularly monitor *all* aspects of ADHD treatment including:

- Systematic reassessment of *core symptoms and function*;
- Regular reassessment of *target goals*;
- *Family satisfaction with the care* it is receiving from other clinicians and therapists, if applicable;
- Provision of *anticipatory guidance,* further *child/adolescent and family education,* and *transition planning* as needed and appropriate;
- Occurrence and quality of *care coordination* to meet the needs of the child or adolescent and family;
- Confirmation of *adherence* to any prescribed medication regimen, with adjustments made as needed;
- *Heart rate, blood pressure, height, and weight monitoring*; and
- *Furthering the therapeutic relationship* with the child or adolescent and empowering families and children or adolescents to be strong, informed advocates.

Some treatment monitoring can occur during general health care visits if the PCC enquires about the child or adolescent's progress toward target goals, adherence to medication and behavior therapy, concerns, and changes. This extra time and evaluation effort may generate an E/M along with the well-child care code and may result in an additional cost to the family (see the supplemental paper on barriers, specifically the compensation section[1]). Monitoring of a child or adolescent with inattention or hyperactivity/impulsivity problems can help to ensure prompt treatment should symptoms worsen to the extent that a diagnosis of ADHD is warranted.

As treatment proceeds, in addition to using a *DSM-5*-based ADHD rating scale to monitor core symptom changes, the PCC can make formal and informal queries in the areas of function most commonly affected by ADHD: academic achievement; peer, parent, or sibling relationships; and risk-taking behavior. Progress can be measured by monitoring the target goals established in collaboration with the child and family. Checklists completed by the school can facilitate medication monitoring. Data from the school—including ADHD symptom ratings completed by the teacher as well as grades and any other formal testing—are helpful at these visits. Screening for substance use and sleep problems is best continued throughout treatment, because these problems can emerge at any time. At every visit, it is helpful to gradually further empower children to become full partners in their treatment plan by adolescence.

In the early stages of treatment, following a successful titration period, the frequency of follow-up visits will depend on adherence, coexisting conditions, family willingness, and persistence of symptoms. As noted, a general guide for visits to the primary care clinician is for these visits to occur initially on a monthly basis, then at least quarterly for the first year of treatment. More frequent visits may be necessary if comorbid conditions are present. Visits then need be held preferably quarterly but at least twice each year, with additional phone contact monitoring at the time of medication refill requests. Ongoing communication with the school regarding medication and services is needed.

There is little evidence establishing the optimal, practical follow-up regimen. It is likely that the regimen will need to be tailored to the individual child/adolescent and family needs based on clinical judgment. Follow-up may incorporate electronic collection of rating scales,

telehealth, or use of remote monitoring of symptoms and impairment. The time-intensive nature of this process, insurance restrictions, and lack of payment may be significant barriers to adoption (see supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for more information on this issue).

(See ADHD Guideline's Key Action Statement #4.)

VI a. Treatment Failure

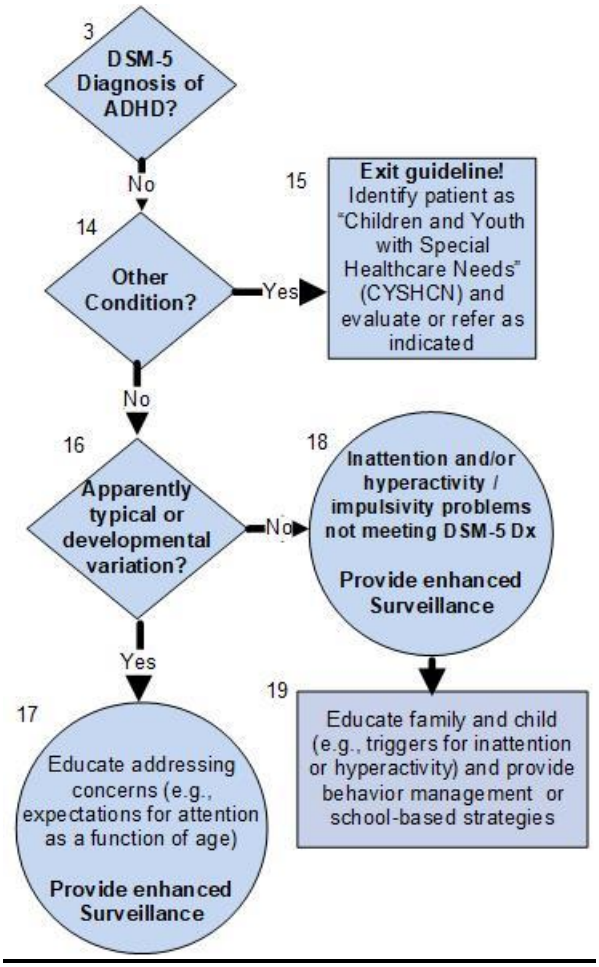
ADHD treatment failure may be a sign of inadequate dosing, lack of patient or family information or compliance, or/and incorrect or incomplete diagnosis. Family conflict and parental psychopathology can also contribute to treatment failure.

In the event of treatment failure, the PCC is advised to repeat the full diagnostic evaluation with increased attention to the possibility of another or comorbid conditions that mimic or are associated with ADHD, such as sleep disorders, autism spectrum disorders, or epilepsy (eg, absence epilepsy or partial seizures). Treatment failure may also arise from a new acute stressor or from an unrecognized or underappreciated traumatic event. A coexisting learning disability may cause an apparent treatment failure. In the case of a child or adolescent previously diagnosed with problem-level inattention or hyperactivity, repeating the diagnostic evaluation may result in a diagnosis of ADHD, which would allow for increased school support and the inclusion of medication in the treatment plan. A forthcoming complex ADHD guideline from the SDBP will provide additional information on diagnostic evaluation and treatment of children and adolescents with ADHD treatment failure and/or ADHD that is complicated by coexisting developmental or mental health conditions.

Treatment failure could result from poor adherence to the treatment plan. Increased monitoring and education, especially by including the patient, may increase adherence. It is helpful to try to identify the issues restricting adherence, including lack of information about, or understanding of, the treatment plan. It is also important to recognize that cultural factors may impact the patient's treatment and outcomes.

If the child continues to struggle despite the school's interventions and treatment for ADHD, further psychoeducational, neuropsychological, and/or language assessments are necessary to evaluate for a learning, language, or processing disorder. The clinician may recommend evaluation by an independent psychologist or neuropsychologist.

VII. CHILDREN AND ADOLESCENTS FOR WHOM AN ADHD DIAGNOSIS IS NOT MADE



If the evaluation identifies or suggests another disorder is the cause of the concerning signs and symptoms, it is appropriate to exit this algorithm.

VII a. Other Condition

The subsequent approach is dictated by the evaluation's results. If the PCC has the expertise and ability to evaluate and treat the other or comorbid condition, he or she may do so. Many collaborative care models exist to help facilitate a pediatrician's comfort with comorbidity, as well as programs that teach pediatricians to manage comorbidities. It is important for the PCC to frame the referral questions clearly, if a referral is made. A co-management plan must be established that addresses the families' and child/adolescent's ongoing needs for education and general and specialty health care. Resources from the AAP Mental Health Initiatives and the forthcoming complex ADHD clinical practice guideline from the SDBP may be helpful.[4,46,112]

VII b. Apparently Typical or Developmental Variation

Evaluation may show that the child or adolescent's inattention, activity level, and impulsivity are within the typical range of development; mildly or inconsistently elevated in comparison to his or her peers; or is not associated with any functional impairment in behavior, academics, social skills, or other domains. The clinician can probe further to determine whether the parents' concerns are attributable to other issues in the family, such as parental tension or drug use by a family member; whether they are caused by other issues in school, such as social pressures or bullying; or whether they are within the spectrum of typical development.

In talking with parents, it may help to explain that ADHD differs from a condition like pregnancy, which is a "yes" or "no" condition. With ADHD, behaviors follow a spectrum from variations on typical behavior to atypical behaviors that cause problems but are not severe enough to be considered a disorder, to consistent behaviors that are severe enough to be considered a disorder. With problematic behaviors, it is helpful for the PCC to provide education about both the range of typical development and strategies to improve the child or adolescent's behaviors. A schedule of enhanced surveillance absolves the family of the need to reinitiate contact if the situation deteriorates. If a recommendation for continued routine systematic surveillance is made by the PCC, it is important to provide reassurance that ongoing concerns can be revisited in at future primary care visits.

VII c. Children and Adolescents With Inattention or Hyperactivity/Impulsivity (Problem Level)

Children and adolescents whose symptoms do not meet the criteria for diagnosis of ADHD may still encounter some difficulties or mild impairment in some settings, as described in the *Diagnostic and Statistical Manual for Primary Care* (*DSM-PC*), *Child and Adolescent Version*.[113] For these patients, enhanced surveillance is recommended. PCCs are encouraged to provide education for both the patient and his or her family, specifically about triggers for inattention and/or hyperactivity as well as behavior-management strategies.

Medication is not appropriate for children/adolescents whose symptoms do not meet *DSM-5* criteria for diagnosis of ADHD, but PTBM does not require a diagnosis of ADHD to be recommended.

VIII. COMPLEMENTARY AND ALTERNATIVE THERAPIES/INTEGRATIVE MEDICINE

Families of children and adolescents with ADHD increasingly ask their pediatrician and other PCCs about complementary and alternative therapies. These include megavitamins and other dietary alterations, vision/visual training, chelation, EEG biofeedback, and working memory (eg, cognitive training) programs.[114] As noted, there is insufficient evidence to suggest that these therapies lead to changes in ADHD's core symptoms or function. For many complementary and alternative therapies, limited information is available about their safety. Both chelation and megavitamins have been proven to cause adverse effects and are contraindicated.[115,116] For these reasons, complementary and alternative therapies are not recommended.

Pediatricians and other PCCs can play a constructive role in helping families make thoughtful treatment choices by reviewing the goals and/or effects claimed for a given treatment,

the state of evidence to support or discourage use of the treatment, and known or potential adverse effects. If families are interested in trying complementary and alternative treatments, it is helpful to have them define specific measurable goals to monitor the treatment's impact. Families also need to be strongly encouraged to use evidence-based interventions while they explore complementary and alternative treatments. PCCs have to respect families' interests and preferences while they address and answer questions about complementary and alternative therapies.

Pediatricians and other PCCs should ask about additional therapies that families may be administering to adequately monitor for drug interactions. Parents and children or adolescents who do not feel that their choices in health care are respected by their PCCs may be less likely to communicate about complementary or alternative therapies/integrative medicine.

IX. IMPLEMENTATION ISSUES: PREPARING THE PRACTICE

Implementation of the process described in this algorithm can be enhanced with preparation of the practice to meet the needs of children and adolescents with ADHD. This preparation includes both internal practice characteristics and relationships within the community. (More detail can be found in the AAP Mental Health Initiatives' resources.[4,117])

The following office procedures and resources will help practices facilitate the steps in this algorithm:

- Developing a packet of ADHD questionnaires and rating scales for parents and teachers to complete before a scheduled visit.
- Allotting adequate time for ADHD-related visits.
- Determining billing and documentation procedures and monitoring insurance payments to appropriately capture the services rendered to the extent possible.
- Implementing methods to track and follow patients (see supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for more information on this issue).
- Asking questions during clinical encounters and promoting patient education materials (ie, brochures and posters) alerting parents and patients that problem behaviors, school problems, and ADHD are appropriate issues to discuss with the PCC.
- Developing an office system for monitoring and titrating medication, including communication with parents and teachers. For stimulant medications—which are controlled substances requiring new, monthly prescriptions—it is necessary to develop a monitoring and refill process including periodic review of the state's database of controlled substance prescriptions. (Any such system is based on the PCC's assessment of family organization, phone access, and parent-teacher communication effectiveness.)
- Using the ADHD Toolkit resources.

Establishing relations with schools and other agencies can facilitate communication and establish clear expectations when collaborating on care for a child. A community-level system that reflects consensus among district school staff and local PCCs for key elements of diagnosis, interventions, and ongoing communication can help to provide consistent, well-coordinated, and cost-effective care. A community-based system with schools relieves the individual PCC from negotiating with each school about care and communication regarding each patient. Offices that

have incorporated medical home principles are ideal for establishing this kind of community-level system. Although achieving the level of coordination described below is ideal and takes consistent effort over the years—especially in areas with multiple separate school systems—some aspects may be achieved relatively quickly and will enhance services for children.

The key elements for a community-based collaborative system include consensus on:

- A clear and organized process by which an evaluation can be initiated when concerns are identified either by parents or school personnel;
- A packet of information completed by parents and teachers about each child/adolescent referred to the PCC;
- A contact person at the practice to receive information from parents and teachers at the time of evaluation and during follow-up;
- An assessment process to investigate coexisting conditions;
- A directory of evidence-based interventions available in the community;
- An ongoing process for follow-up visits, phone calls, teacher reports, and medication refills;
- Availability of forms for collecting and exchanging information;
- A plan for keeping school staff and PCCs up to date on the process; and
- Awareness of the network of mental health providers in your area and establishments of collaborative relationships with them.

The PCC may face challenges to developing such a collaborative process. For example, a PCC is typically caring for children from more than one school system, a school system may be large and not easily accessed, schools may have limited staff and resources to complete assessments, or scheduling may make it difficult for the PCC to communicate with school personnel. Further complicating these efforts is the fact that many providers encounter a lack of recognition and payment for the time involved in coordinating care. These barriers may hamper efforts to provide the internal resources within a practice and coordination across schools and other providers that are described above; nevertheless, some pediatricians and other PCCs have found ways to lessen some of these obstacles (see supplemental paper "Systemic Barriers to the Care of Children and Adolescents with ADHD" for more information on overcoming challenges).

In the case of multiple or large school systems in a community, the PCC may want to begin with 1 school psychologist or principal, or several practices can initiate contact collectively with a community school system. Agreement among the clinicians on the components of a good evaluation process facilitates cooperation and communication with the school toward common goals. Agreement on behavior rating scales used can facilitate completion by school personnel. Standard communication forms that monitor progress and specific interventions can be exchanged among the school and the pediatric office to share information. Collaborative systems can extend to other providers, who may comanage care with a PCC. Such providers may include a mental health professional who sees the child or adolescent for psychosocial interventions, or a specialist to address difficult cases, such as a developmental-behavioral pediatrician, child and adolescent psychiatrist, child neurologist, neurodevelopmental disability physician, or psychologist. The AAP Mental Health Initiatives provides a full discussion of collaborative relationships with mental health professionals, including colocation and integrated models, in its Chapter Action Kit and PediaLink Module.[4,118]

Achieving this infrastructure in the practice and the coordination across schools and other providers will enhance the PCC's ability to implement the treatment guidelines and this algorithm. Achieving these ideals is not necessary for providing care consistent with these practices, however.

X. CONCLUSION

ADHD is the most common neurobiological disorder of children/adolescents. Untreated or undertreated ADHD can have far-reaching and serious consequences for the child or adolescent's health and well-being. Fortunately, effective treatments are available, as are methods for assessing and diagnosing ADHD in children/adolescents. The AAP is committed to supporting primary care physicians in providing quality care to children/adolescents with ADHD and their families. This algorithm represents a portion of that commitment and an effort to assist pediatricians and other PCCs to deliver care that meets the quality goals of the practice guideline. This paper, in combination with the guideline and barriers supplemental paper, is intended to provide support and guidance in what is currently the best evidence-based care for their patients with ADHD. Additional support and guidance can be obtained through the work and publications of the AAP Mental Health Initiatives.[4,112]

ABBREVIATIONS:

- AAP, American Academy of Pediatrics
- ADHD, attention-deficit/hyperactivity disorder
- ADHD/I, ADHD primarily of the inattentive presentation
- ADHD/HI, ADHD primarily of the hyperactive-impulsive presentation
- ADHD/C, ADHD of the combined presentation
- CBT, Cognitive Behavioral Therapy
- CHADD, Children and Adults with Attention-Deficit/Hyperactivity Disorder
- *DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*
- EEG, electroencephalography
- FDA, US Food and Drug Administration
- IDEA, Individuals with Disability Education Act
- MTA, Multimodal Therapy of ADHD
- OSAS, obstructive sleep apnea syndrome
- PTBM, Parent Training in Behavior Management
- PCC, primary care clinician
- RLS/PLMD, restless legs syndrome/periodic limb movement disorder
- SDBP, Society for Developmental and Behavioral Pediatrics

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