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Institute for Clinical Systems Improvement

Health Care Guideline

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- physicians, nurses, and other health care professional and provider organizations;
- health plans, health systems, health care organizations, hospitals and integrated health care delivery systems;
- medical specialty and professional societies;
- researchers;
- federal, state and local government health care policy makers and specialists; and
- employee benefit managers.

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This *ICSI Health Care Guideline* is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. An *ICSI Health Care Guideline* rarely will establish the only approach to a problem.

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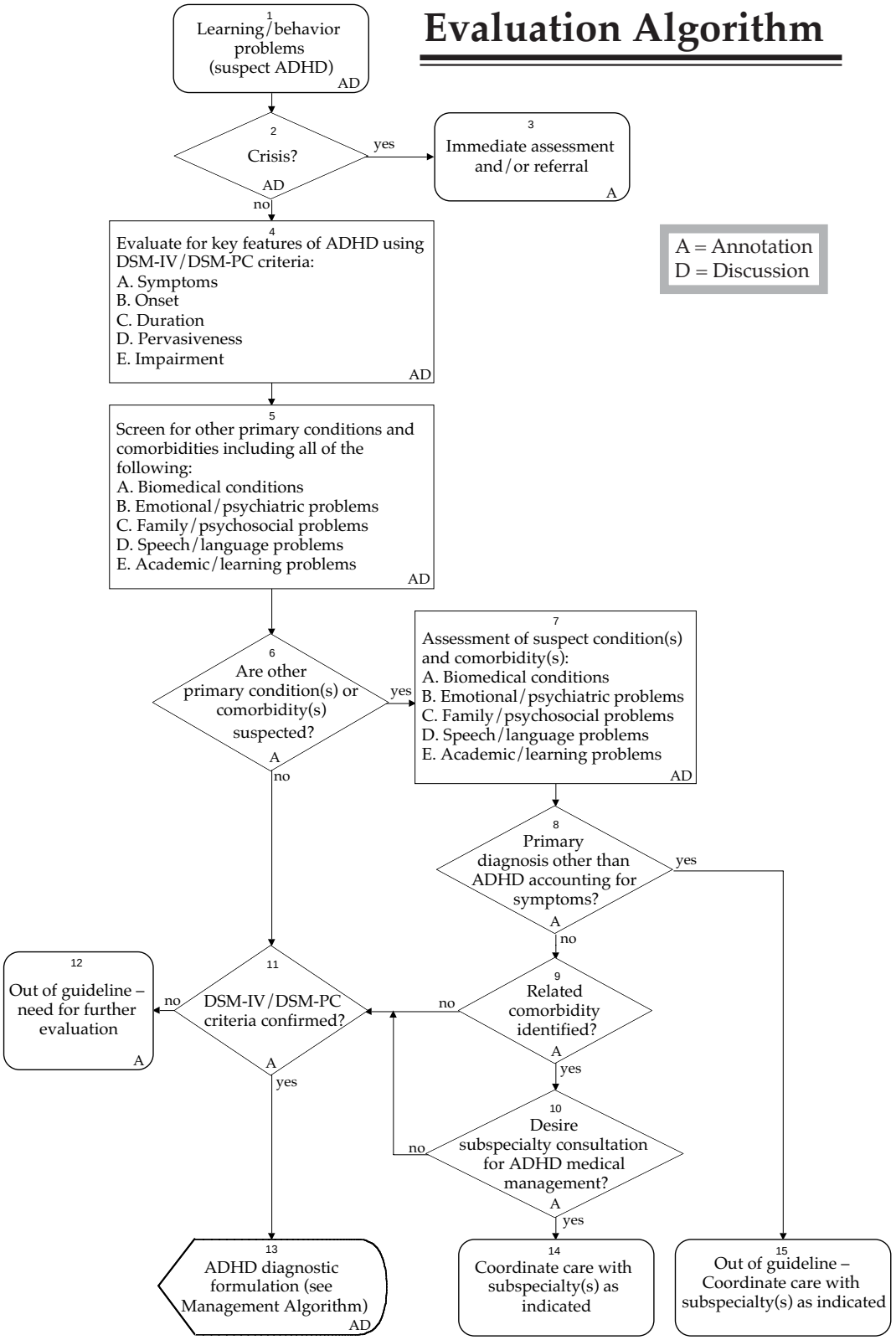
INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

Health Care Guideline

Diagnosis and Management of Attention Deficit Hyperactivity Disorder in Primary Care for School Age Children and Adolescents

Evaluation Algorithm



Fifth Edition
March 2003

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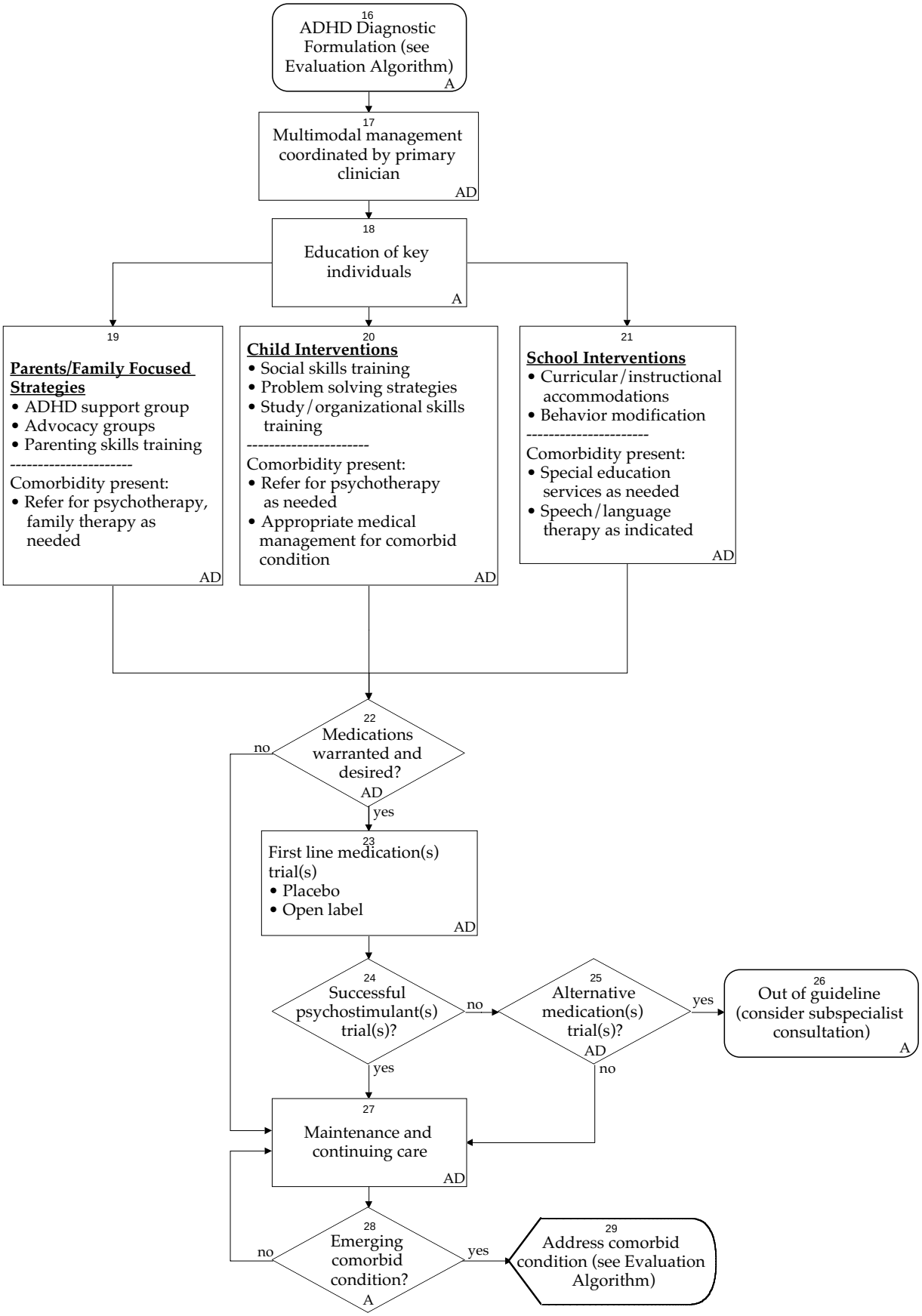
16
ADHD Diagnostic Formulation (see Evaluation Algorithm)
A
17
Multimodal management coordinated by primary clinician
AD
18
Education of key individuals
A
19
Parents/Family Focused Strategies
• ADHD support group
• Advocacy groups
• Parenting skills training
Comorbidity present:
• Refer for psychotherapy, family therapy as needed
AD
20
Child Interventions
• Social skills training
• Problem solving strategies
• Study/organizational skills training
Comorbidity present:
• Refer for psychotherapy as needed
• Appropriate medical management for comorbid condition
AD
21
School Interventions
• Curricular/instructional accommodations
• Behavior modification
Comorbidity present:
• Special education services as needed
• Speech/language therapy as indicated
AD
22
Medications warranted and desired?
AD
no
yes
23
First line medication(s) trial(s)
• Placebo
• Open label
AD
24
Successful psychostimulant(s) trial(s)?
no
yes
25
Alternative medication(s) trial(s)?
AD
yes
no
26
Out of guideline (consider subspecialist consultation)
A
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Address comorbid condition (see Evaluation Algorithm)

Table of Contents

Attention Deficit Hyperactivity Disorder (ADHD) is a high prevalence condition with many potential medical, emotional-behavioral, social, and academic consequences for a child or adolescent. In addition, its presentation to the primary care clinician may range from straightforward to very complex. The guideline work group feels that many patients presenting with learning or behavior problems and suspected of ADHD can be adequately evaluated and managed in the primary care setting, allowing for subspecialty or multidisciplinary consultation in more complex cases. It also recognizes the need for variable implementation models depending on specific medical, mental health, and educational systems to ensure accuracy of diagnosis and appropriateness of management.

This guideline is intended to provide information helpful to the primary clinician. Details in the annotation and discussion sections are provided for this purpose; however, it is recognized that the degree of usefulness for each clinician will vary according to each individual's experience with and prior knowledge of ADHD.

It is expected that the primary care clinician making the initial diagnosis of attention deficit hyperactivity disorder will not only evaluate the primary symptoms described in the DSM-IV or DSM-PC criteria, but also will screen for other primary conditions and comorbidities using multiple data sources. Some patients will require further specialized evaluation based on information learned in this process. From these findings the primary clinician may choose to manage the patient or to utilize subspecialty consultation for ADHD management. It should be understood that at any point within the evaluation or management algorithm, the primary clinician may choose to seek subspecialty consultation from various disciplines.

The overall goal of this guideline is to ensure that all patients diagnosed with ADHD are accurately evaluated and appropriately managed, whether by the primary clinician or through subspecialty consultation.

Scope and Target Population

This guideline pertains to diagnosis and management of attention deficit hyperactivity disorder in the primary care setting for children and adolescents from kindergarten through 12th grade.

Related ICSI Scientific Documents

There are no other ICSI guidelines whose scope and/or recommendations are closely related to the content of this guideline at this time.

Clinical Highlights for Individual Clinicians

1. Evaluate children/adolescents suspected of having ADHD based on DSM-IV/DSM-PC diagnostic criteria using consistent and appropriate diagnostic tools. *(Annotation #4)*
2. Screen all patients for other primary conditions or comorbidities and appropriately refer to subspecialty consultation for further evaluation. *(Annotation #5)*
3. Coordinate a simultaneous multimodal management plan that involves parent, child, and school-focused interventions. *(Annotation #17)*
4. Establish communication and intervention linkages with related systems (e.g. schools, mental health, etc.) *(Annotations #19, 20, 21)*
5. Establish appropriate use of psychostimulants in both initial and ongoing management of patients with ADHD. *(Annotation #23)*

6. Provide consistent and comprehensive monitoring and care coordination for all patients with ADHD including pharmacologic and non-pharmacologic interventions, identification and management of emerging comorbidities, and the impact of ADHD condition on patients, their families, and schools. *(Annotation #27)*

Priority Aims and Suggested Measures for Health Care Systems

1. Increase the use of DSM-IV or DSM-PC criteria and screening for other primary conditions and comorbidities for patients newly diagnosed with attention deficit hyperactivity disorder.

   Possible measures of accomplishing this aim:

   a. Percentage of patients newly diagnosed with ADHD whose medical record contains documentation of DSM-IV or DSM-PC criteria.

   b. Percentage of patients newly diagnosed with ADHD whose medical record contains documentation of screening for other primary conditions and comorbidities, as defined in the guideline.

2. Improve the primary care use of psychostimulant medications through a systematic, uniform approach.

   Possible measures of accomplishing this aim:

   a. Percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician performed an open label or placebo-controlled stimulant medication trial.

   b. Percentage of patients diagnosed with ADHD and on psychostimulant medication whose medical record contains documentation of a follow-up visit at least twice a year.

3. Increase the number of clinicians who are utilizing a multimodality approach in treatment planning for children with ADHD.

   Possible measures of accomplishing this aim:

   a. Percentage of patients diagnosed with ADHD whose medical record contains documentation that they discussed parental resources for managing children with ADHD (e.g., parent training groups, videos, books, psychology referral).

   b. Percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician discussed the need for school-based supports and educational service options for children with ADHD.

Evidence Grading

Individual research reports are assigned a letter indicating the class of report based on design type: A, B, C, D, M, R, X.

A full explanation of these designators is found in the Discussion and References section of the guideline.

Attention Deficit Hyperactivity Disorder (ADHD)

A. Either (1) or (2):

1. Six or more of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

   Inattention

   a. often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
   b. often has difficulty sustaining attention in tasks or play activities
   c. often does not seem to listen when addressed directly
   d. often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
   e. often has difficulty organizing tasks and activities
   f. often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
   g. often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books or tools)
   h. is easily distracted by external stimuli
   i. is often forgetful in daily activities

2. Six or more of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

   Hyperactivity

   a. often fidgets with hands or feet or squirms in seat
   b. often leaves seat in classroom or in other situations in which remaining seated is expected
   c. often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
   d. often has difficulty playing or engaging in leisure activities quietly
   e. is often "on the go" or often acts as if "driven by a motor"
   f. often talks excessively

   Impulsivity

   g. often blurts out answers before questions have been completed
   h. often has difficulty awaiting turn
   i. often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive symptoms or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia or other psychotic disorder, and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, or personality disorder).

Code based on type:

314.00 Attention Deficit Hyperactivity Disorder, Predominantly Inattentive Type: if criterion A(1) is met but criterion A(2) is not met for the last 6 months.

314.01 Attention Deficit Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type: If criterion A(2) is met but criterion A(1) is not met for the last 6 months.

314.01 Attention Deficit Hyperactivity Disorder, Combined Type: If both criterion A(1) and criterion A(2) are met for the last 6 months.

Coding note: for individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, "In Partial Remission" should be specified.

314.9 Attention Deficit Hyperactivity Disorder Not Otherwise Specified: This category is for disorders with prominent symptoms of inattention or hyperactivity-impulsivity that do not meet the criteria for Attention Deficit Hyperactivity Disorder.

Evaluation Algorithm Annotations

1. Learning/Behavior Problems (Suspect ADHD)

Children may be referred for an ADHD evaluation by a variety of individuals for a variety of reasons. ADHD can present in many fashions either at home or in the school setting. Furthermore, presenting symptoms may vary depending on the age of the child, evolve predictably with development, and change relative to academic demands at different grade levels. Although the core symptoms of inattention, impulsivity and hyperactivity are characteristic, their severity and pattern are highly variable across individuals.

Some possible presenting problems identified by parents:

* Noncompliance
* Aggression
* Anger management problems
* Impulsivity
* Engaging in physically dangerous activity
* Task completion difficulty
* Disorganized, messy
* Appearing "spaced out" or "zoned out"
* Mood lability
* Absentmindedness
* Social/emotional "immaturity"
* "Hyper," "in constant motion"

Some possible presenting problems identified by school personnel:

* Hyperactivity
* Fidgety, restless behavior
* Inattention, off-task behavior, distractibility
* Social interaction problems (impulsivity and intrusiveness)
* Underachievement, school failure
* Disruptive classroom behavior
* Talks excessively, blurting out answers
* Doesn't listen well
* Incomplete, missing homework
* Messy, disorganized work

Some possible presenting problems identified by children/adolescents:

* Dislike of school
* Lack of close or long-term friendships
* Frustration with certain teachers or subjects
* Excessive conflict with parents
* Low self-esteem

Evidence supporting this recommendation is of classes: B, C, R

2. Crisis?

Although the initial concern may be presented as ADHD, one must be able to rule out a crisis that requires immediate attention and which precludes the initiation of the guideline.

These questions can be answered in an office visit, by phone call or other means of encounter.

A. Life Threatening:

- Is there a threat of suicide?
- Is there a threat of harm/violence to others?
- Is there a threat of violence/abuse to the child?

B. Life Disruptive

- Is there a threat of school expulsion?
- Is there a threat of arrest/legal action?

3. Immediate Assessment and/or Referral

This may vary depending on available resources and the location of the patient at the time of the crisis. For example: Appointment with mental health provider, social services, physician, or 911.

4. Evaluate for Key Features of ADHD Using DSM-IV/DSM-PC Criteria

The evaluation of primary symptoms should include information from multiple sources such as parents, the child, and school personnel. A comprehensive interview with parents or caregivers including current symptoms and their previous history, past medical and developmental history, school and educational history, family and psychosocial history is most important. There is no single evaluation tool available to make a definitive diagnosis of ADHD. The diagnosis is based on a clinical picture of early onset, significant duration and pervasiveness, and causing functional impairment within the life of the child or adolescent. This can be facilitated through the use of a semistructured interview or questionnaire (Barkley, Behavioral Assessment System for Children [BASC], etc.) with behavior rating scales (ADHD-IV Rating Scale, Child Attention Profile, Conners, etc.) completed by the parents, other caregivers and school personnel. The American Academy of Pediatrics (AAP) has developed a tool kit, supported by this guideline to assist clinicians in providing quality care for children with ADHD. This resource provides a basis for a coordinated multidisciplinary system of care including primary care professionals, school personnel, parents and children. Ordering information may be obtained by accessing their web site: www.aap.org/bookstore or calling 1-888-227-1770.

The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*, is recognized as the most widely used resource for diagnosis of mental disorders, including ADHD. Alternatively, a

manual designed for use in primary care practice, the *Diagnostic and Statistical Manual for Primary Care (DSM-PC): Child and Adolescent Version*, is now available. The DSM-PC is designed to bridge the gap between pediatric primary care and mental health services. It contains the DSM-IV criteria for childhood mental health disorders including ADHD and related conditions, but also contains useful information on the developmental continuum of behavior, from normal variations to mental disorders. Other components of the evaluation will be described at subsequent points within the guideline.

A. Symptoms

ADHD is categorized by the following core symptoms:

- inattention
- hyperactivity
- impulsivity

Please refer to DSM-IV/DSM-PC criteria (included after the algorithms) for specific behavioral symptoms.

There are 3 subtypes of the disorder based upon the "often" occurrence of at least 6 of 9 behaviors within the inattention dimension, and 6 of 9 behaviors within the combined hyperactivity/impulsivity dimension:

- predominantly inattentive type (meeting criteria for the inattention dimension)
- predominantly hyperactive/impulsive type (meeting criteria for the hyperactive/impulsive dimension)
- combined type (meeting criteria for both dimensions).

B. Onset

Some behavioral symptoms typically have begun prior to the age of 7 years in most children (see DSM-IV/DSM-PC criteria). These symptoms may not be obvious in children who are predominantly inattentive without significant hyperactivity or impulsivity. Previous history must be reviewed carefully, especially in older children and adolescents, for the presence of symptoms not previously recognized or identified.

C. Duration

The presence of behavioral symptoms is typically of long duration (at least 6 months - see DSM-IV/DSM-PC criteria) and previously recognized by parents, teachers, or the patient. Careful review of previous symptoms is critical for evaluation of the presence or absence of symptoms not otherwise identified by parents, school personnel or other caregivers. It is also helpful to assess the characteristics of previous observers with respect to the validity of information (e.g., specific teacher qualities, home and classroom environment, etc.).

D. Pervasiveness

Due to the relationship of ADHD symptoms to the external environment, specific interest and motivation, individual demands on attention and focus, and day-to-day influences, there can be significant variability within a given child. Nevertheless, ADHD behaviors are typically present in more than one setting (e.g., home, school, play or work – see the DSM-IV/DSM-PC criteria).

E. Impairment

ADHD symptoms present in varying degrees of severity and impairment, depending upon individual characteristics and demands. It is important to assess the degree of impairment as the

ADHD symptoms relate to the child's or adolescent's social, academic or family functioning (see DSM-IV/DSM-PC criteria).

A word about behavior rating scales:

At least one standardized rating scale (see the Discussion and References section) is recommended for reviewing observations from those persons in direct contact with the child/adolescent (parents, day care providers, teachers, etc.) These observations/ratings should be used as part of the overall historical data base, and should not be the sole criteria used to include or exclude the diagnosis of ADHD. Caution should be used in interpreting these due to observer bias, threshold of problem identification, and lack of observer knowledge (especially true of older children/adolescents in middle or upper grades). **The ADHD Rating Scale IV is normed based on DSM-IV/DSM-PC criteria and available for current use.**

A word about continuous performance tasks:

Various continuous performance tasks (CPT's) have been developed to attempt to objectively measure sustained and selective attention: for example, Test of Variables of Attention (TOVA), Gordon Diagnostic System, Conners CPT, etc. These tasks involve the rapid presentation of stimuli where subjects are asked to respond to specific targets. The results measure certain variables of attention related to errors of omission and commission. Although these instruments appear to discriminate between children with ADHD and their normal counterparts at a group level, the usefulness of these measures in assessing individual children is limited. Due to significant false negative rates (estimated at 15-30%), these instruments are not considered pathognomonic of ADHD and are of limited utility in screening and evaluation. They are most useful in research settings and the complex individual patient where more extensive data may be useful.

Evidence supporting this recommentation is of classes: C, R

5. Screen for Other Primary Conditions and Comorbidities

Many children can exhibit symptoms of ADHD at some point in their development, but it is important to note that common symptoms (inattention, hyperactivity, disruptive behavior, academic difficulty), can be caused by a number of other difficulties. At this stage of the process the clinician must consider diagnoses other than ADHD in one of two paradigms. Some patients will meet the criteria for ADHD but will also have a **comorbid diagnosis or diagnoses ("primary ADHD" with comorbidity)**. Other patients will have a diagnosis other than ADHD that largely accounts for the behavioral symptoms of inattention, impulsivity, and/or hyperactivity. The latter instance can be conceptualized with an **alternative diagnosis as "primary" with secondary features that mimic ADHD**.

In screening children and adolescents for other diagnoses, it is important to emphasize the need to include information from as many sources as possible: the patient, parents, teachers, coaches, and health care professionals.

Screening patients for other diagnoses falls into the five basic domains defined in Annotations 5A-5E.

There are a number of possible strategies to consider in the comprehensive screening of the ADHD patient for other problems. One is for the primary care provider to utilize his or her ongoing familiarity and relationship with the family and patient over time to get a sense of any primary or comorbid problems identifiable in the five areas defined in Annotations #5A-5E.

A second strategy would be to use a semi-structured interview format with some "key" questions designed to get at the disorders identified in the five previously described domains.

Another strategy includes the use of "screening" questionnaires which, although not diagnostic, can offer a general sense of potential areas for concern. Examples of utilized instruments are the **Achenbach Child Behavior Checklist (CBCL), Teacher Report Form (TRF), Youth Self-report, Devereux Scales of Mental Disorders (DSMD), and the Behavioral Assessment System for Children (BASC).** These forms are scored across a number of behavioral domains. Clients who receive scores above a certain cutoff point in any given domain might then be considered for more intensive evaluation around that problem area. Using the instrument properly requires some training. Consultation with a psychologist for assistance in interpretation may be helpful. For additional information, please refer to Discussion and Reference #5.

Differential Diagnosis and Assessment of Comorbidity in Children with ADHD

- Biomedical Problems
  - Perinatal complications
  - Neurological (e.g., Tourette Syndrome, seizure disorder)
  - Chromosomal abnormality (fragile X syndrome)
  - Metabolic/Endocrine (e.g., hypothyroidism)
  - Toxins/medications (e.g., lead)
  - Iron deficiency
  - Sensory impairment
  - Chronic illness associated
  - Sleep disorder
- Emotional/Psychiatric Problems
  - Developmentally normal variation
  - Anxiety disorder
  - Depression/dysthymia/childhood mania-bipolar disorder
  - Pervasive Developmental Disorder/Autism
  - Oppositional Defiant Disorder/Conduct Disorder
  - Substance abuse
  - Adjustment disorder
  - Psychosis
- Family/Psychosocial Problems
  - Disruptive/chaotic home environment
  - Mismatch of behavioral style & environmental expectations
  - Family stresses/transitions
  - Abuse/neglect
  - Cultural factors
  - Parental psychopathology and/or chemical dependency
  - Social skills deficits
- Speech/Language Problems
  - Expressive/receptive language disorder
  - Phonological disorder
  - Dysfluency
  - Apraxia
  - Central auditory processing disorder

Differential Diagnosis and Assessment of Comorbidity in Children with ADHD (cont)

Academic/Learning Problems
- Cognitive impairment
- Specific learning disability
- Giftedness
- Other learning style variations & dysfunction (e.g., memory, auditory discrimination problems)

Please refer to Annotations #6 and 7 for concurrent assessment of suspected condition(s) and comorbidity(s).

Evidence supporting this recommentation is of classes: C, R

5A. Screen Biomedical Conditions

Note: the screening for the 5 domains (Annotations #5A-5E) will provide data to suspect a differential diagnosis or data to suspect a diagnosis of ADHD.

A. General Health History and Physical Examination, including:

- growth parameters: height, weight
- vital signs: blood pressure, pulse
- screening of vision and hearing

Special emphasis on:

1. Overall physical appearance
   - minor physical anomalies may signal genetic abnormalities (low-set ears, large or undescended testicles, high-arched palate, etc.)
2. Signs and symptoms of abuse
3. Neurological examination
   - Abnormalities (e.g., motor or vocal tics, asymmetry or abnormality of reflexes or motor tone, tremors)
   - "Soft signs"

     Subtle neurological signs including difficulty with sequencing, dysrhythmia, mirroring, motor overflow, and clumsiness. "Clumsiness" refers to the performance of fine and/or gross motor tasks in an immature, slow, irregular or inconsistent fashion. Skills are imprecise rather than grossly impaired. "Soft" neurological signs are present in many children with learning and behavioral disorders.
4. Assessment of developmental status
   a. Observation of child's activity level in examination room, ability to converse appropriately, ability to follow directions, and cooperativeness.
   b. History of delays or questionable areas:
      - Auditory perception
      - Expressive language

- Visual and sequential processing
- Memory
- Fine and gross motor function

c. Cognitive Screening Tools

The provider may find the following helpful. Responses are age dependent.

- Ask the child to tell about a recent event - birthday, sports event, etc. (Note whether language is fluent, coherent, and organized.)
- Ask parent if child has difficulty taking telephone messages or retaining classroom instructions, if age appropriate. (Short-term memory)
- Observe the child using a pencil to copy symbols and words. (Visual perceptual-motor)
- Ask the child to perform a three-step command. (Sequencing)
- Ask the child to repeat four words, remember them, and repeat them again when asked in 5 minutes or 10 minutes. (Memory, attention)
- Ask the child to repeat three, then four digits forward; then repeat three, then four digits backward. (Concentration)

5B. Screen Emotional/Psychiatric Problems

The diagnosis of ADHD may be complicated by either the presence of another coexisting psychiatric condition or the existence of a psychiatric condition which has symptoms suggestive of the diagnosis of attention deficit hyperactivity disorder. It is clear that children with attention deficit hyperactivity disorder are at risk for the coexistence of depression, anxiety disorders, conduct disorders, and substance abuse. The prevalence of these conditions in children with ADHD ranges from 15 to 30 percent. At the same time it is those same four diagnostic entities which may most often be misdiagnosed as ADHD due to the commonality of many of the symptoms. Therefore, it behooves the clinician to screen for those four conditions when evaluating a child for whom the diagnosis of ADHD is being considered. The following may be considered as a starting point in evaluating the possible presence of depression, anxiety disorders, conduct disorders, and substance abuse.

A. Depression

- Consistent depressed or irritable mood for nearly every day which has lasted for at least two weeks.
- Significantly diminished interest or pleasure in all or almost all activities.
- Undeniable decline in school or work performance.
- Recurrent suicidal ideation without a specific plan or recurrent thoughts of death.
- Persistent depressed mood associated with almost daily insomnia or hypersomnia.

B. Childhood Mania-Juvenile Bipolar Disorder

Recent experience suggests an overlap between ADHD and juvenile mania-bipolar disorder. The following are characteristics of childhood mania that may aid the clinician in differentiating the 2 conditions:

- Mania-bipolar disorder is extremely rare when compared to ADHD.
- Patient experiences pressured speech, racing thoughts, grandiosity, reduced need for sleep.
- Symptoms include rapid onset affective storms, prolonged severe temper outbursts, violent furious aggression, irritability, erratic interpersonal behavior.
- Usually mixed presentation with depression.

C. Anxiety Disorder

The diagnosis of post traumatic stress disorder, which falls under the anxiety spectrum, may be the most common diagnosis that mimics ADHD. The most likely areas of post traumatic stress disorder are those that fall in the spectrum of physical or sexual abuse. Those areas should have been screened by taking a psychosocial history as part of the overall assessment. The remaining diagnoses that are likely to present themselves in childhood include those of separation anxiety disorder and generalized anxiety disorder. Screening which may be useful in identifying those conditions is listed below.

- Developmentally inappropriate and excessive anxiety concerning separation from home or from those to whom the child is attached.
- Persistent and excessive worry about losing or about possible harm befalling major attachment figures.
- Repeated complaints of physical symptoms when separation from major attachment figures occurs or is anticipated.
- Consistent excessive dissatisfaction with less than perfect performances (e.g., school assignments).
- The child finds it difficult to control or stop his or her worrying/anxiety.

D. Conduct Disorder

- Presence of negativistic, hostile and defiant behaviors which may include losing temper, arguing with adults, refusing to comply with adults' requests, deliberately annoying people, consistent anger and resentment expressed toward others.
- Presence of a history of physical aggression toward people or animals.
- History of deliberate involvement in theft from others.
- History of violation of rules with potential serious consequences (e.g., running away from home, truancy from school).

E. Substance Abuse

- History of use of alcohol or illicit drugs of any kind.
- Use of alcohol or drugs to alter mood state or to escape a mood state.

- Consequences at school, in the home, or with legal authorities related to the patient's use of alcohol or drugs.
- History of a peer expressing concern regarding the patient's use of alcohol or drugs.
- History of feeling guilty about use of alcohol or drugs.
- Behaviors suggestive of drug or alcohol use (increasing isolation from family/friends, presence of drug paraphernalia).

F. Pervasive Developmental Disorders (e.g., Autistic Disorder, Asperger's Disorder)

Although it is uncommon for ADHD to be confused with autism spectrum disorders, it is not uncommon for children with autism spectrum disorders to present with ADHD features. Typical problem areas for these children include:

- qualitative impairment in social interaction (e.g., reciprocity, non-verbal gesture, sharing, peer relationships).
- qualitative impairment in communication (e.g., language delay, conversational speech, idiosyncratic/stereotyped language, symbolic/imitative play).
- restrictive, repetitive patterns of behavior (e.g., preoccupations, rituals, self-stimulatory motor mannerisms).

5C. Screen Family/Psychosocial Problems

In addition to the evaluation of comorbid psychiatric or learning conditions, it is important to consider the psychosocial context in which the child's symptoms and concerns arise. Identified below are factors to consider and some ideas for interview questions. A thorough assessment of the family's functioning will assist in understanding both the nature and severity of the child's symptoms and the family's ability to make use of education and treatment recommendations.

A. Psychosocial stressors

The experience of chronic or acute stress may manifest in a child's functioning in a variety of ways; common symptoms include anxiety, dysphoria, and behavioral acting out. Any of these difficulties may result in changes in academic performance or behavior in the home environment.

Sample question: Has your family been coping with other difficulties or stressors during the past year or two?

Stressful life events may include:

- major life transitions or changes (move, change of school);
- loss (death of loved one, parental separation or divorce);
- abuse (sexual or physical, domestic violence); or
- traumatic events (e.g., car accident).

B. Family History

Sample question: Has anyone in your family been treated for...?

Evaluate **all** the following for parents, siblings, and extended family:

- anxiety disorder
- depressive disorders (including bipolar disorder)
- learning/attention problems
- developmental delay, mental retardation, autism
- chemical dependency
- conduct problems
- other mental health problems

C. Quality of Caregiving

Consider the family's strengths and resources for coping as well as their beliefs and attributions concerning their child's difficulties. Also examine the effects of the child's symptoms on the family as a whole.

Interview caregivers for evidence of family dysfunction or vulnerability. In particular, evaluate for problems which may affect the parents' ability to manage behavior consistently and appropriately, to provide adequate nurturance and structure, and to accurately (meaningfully) evaluate the child's functioning.

These problems may include:

- parental psychiatric disorder or chemical abuse/dependency
- cultural differences
- lack of education or information
- low intellectual functioning
- the absence of family/community supports
- psychosocial stressors (see A above)
- limited nurturance of child

Sample questions:

- What is a typical day like at your home?
- Do you feel supported by the child's school and the community?
- Who provides help with your child when you need it?
- Is there any use of alcohol or illicit drugs in your home?
- Tell me what you've heard or learned about ADHD?
- What kind of discipline works (or doesn't work) with your child?
- When do you enjoy being with your child?

5D. Screen Speech/Language Problems

A. Children with ADHD are more likely than non-disordered children to evidence difficulties in speech and language development, particularly difficulties with expressive language. Any history of speech or language delay or services should be discussed and reviewed. Common difficulties include:

- historical or current problems with dysfluencies
- disorganized speech on tasks that require verbal explanations
- excessive, tangential, or rapid speech
- problems with volume modulation
- fragmented sentences with pauses

B. Receptive language problems may also be present in children with ADHD or may be a comorbid condition. These children may mimic primary problems with attention and have problems following directions and retaining verbally presented material.

C. Many children with ADHD manifest "pragmatic language dysfunction" in social situations – namely, an inability to read essential verbal, nonverbal, and situational cues. This can lead to a tendency to make socially unacceptable choices. Over 50% of children with ADHD are likely to have communication/interaction problems that manifest themselves as social skills deficits. The clinician should inquire about evidence of aggressive, domineering, and intrusive social interaction styles as well as difficulty in initiating and maintaining friendships, or even outright rejection by peers.

D. Children with hearing impairment may also present with symptoms of inattention, problems with task completion, disruptive behavior, noncompliance, speech and language problems or a need for frequent repetition of information. All children being evaluated for ADHD should have had their hearing screened within the previous 12 months. If questions arise, they should be referred to an audiologist for formal evaluation.

5E. Screen Academic/Learning Problems

A. Children with ADHD are at increased risk of struggling academically and are frequently reported as underachieving. The history should include information from parents and teachers to assess common performance areas of difficulty in children with ADHD, which include:

- completion of independent work in a timely fashion
- attention to detail
- studying for exams
- taking notes on classroom lectures
- organizational skills
- time management
- self-monitoring

B. Empirical evidence indicates a consistent relationship between ADHD and learning disorders. One in every three to four children with ADHD has a specific academic skill deficit or "learning disability" in a traditionally defined area such as reading, written language, or mathematics. A

learning disability is formally identified by comparing a student's IQ score to his or her scores in achievement areas and identifying a significant discrepancy (usually defined as 1.75 to 2 standard deviations) between the two.

Learning disabilities or disorders as currently defined in the DSM-IV/DSM-PC include:

- Reading disorder
- Mathematics disorder
- Disorder of written expression
- Developmental Coordination Disorder

C. Children with subnormal intelligence may appear inattentive, due to their lack of understanding of and tracking with material that is too difficult for them. However, it is also important to note that children with cognitive impairment are three to four times more likely to have ADHD than children with intelligence scores in the normal range. Therefore, an IQ assessment and individual achievement testing may often be essential components of an ADHD evaluation. It is important to note that these children may be misdiagnosed as having a primary attentional problem when in fact their symptoms are secondary to an inappropriate level of difficulty or stimulation in academic programming.

D. It is important to review school concerns with the patient, parents, teachers and other school professionals. "Red-flags" or common presenting symptoms of concern for children with learning disabilities or cognitive impairment could include:

- apparent apathy or hostility toward school
- avoidance of or failure in specific subject areas
- disruptive or negative behaviors in certain classes
- historical evidence of difficulty in specific skill areas
- history of special educational programming, "Chapter 1" assistance, etc.
- history of early childhood service

E. A sample of possible questions directed at children and their parents for assessing academic performance issues presenting in the context of an ADHD evaluation might include:

- What subject is your favorite/easiest?
- What subject is hardest/least favorite?
- How do you get along with your teachers?
- How much homework do you do on an average night? How does this compare to the amount of homework classmates are doing? How much do your parents help you with your homework?
- What grades are you receiving in each of your classes? How does this compare to your grades in previous years? Have you ever failed or are you currently failing any classes?
- Do you receive any special help in school?
- What are your interests outside of school?
- Does your son/daughter have any trouble with study/organizational skills?

- What do you see as your son/daughter's learning style strengths? weaknesses?
- Do you think your child feels positively about school?
- Has anyone from school ever contacted you with specific academic or behavioral concerns about your child?
- Are you pleased with your child's grades?
- Do you feel your son/daughter is working up to his/her potential?

F. Students functioning at the "gifted" end of the cognitive spectrum may also manifest signs or symptoms of ADHD such as inattention, disruptive behavior, and apparent lack of motivation or engagement in classroom activities. It is important to note that these children can be misdiagnosed as having a primary attentional problem when in fact their symptoms are secondary to the lack of an appropriate level of challenge and stimulation in academic programming. Giftedness and ADHD may coexist, however.

6. Are Other Primary Condition(s) or Comorbidity(s) Suspected?

Suspected Alternative Primary Condition

If an alternative primary diagnosis is suspected, the clinician is advised to proceed to step 7 and assist the patient in completion of appropriate evaluation prior to proceeding further in the guideline. In this instance, if an alternative primary diagnosis is identified which accounts for the presenting symptoms, the patient would be "out of guideline" and would be managed or referred as appropriate to the condition. (See Annotation #8, "Primary Diagnosis Other Than ADHD Accounting for Symptoms?") Possible examples might include anxiety disorders, depression, cognitive impairment, etc.

Suspected ADHD with Comorbid Condition

If ADHD is the likely primary diagnosis but a comorbid condition is also suspected, the clinician may choose to proceed to step 11 while concurrent evaluation of the suspected comorbid problem is completed. This would allow the clinician to continue to move into appropriate management strategies in a time-efficient manner. It is important to consider some degree of caution here in that comorbid issues can be of equal importance to the diagnosis of ADHD. Therefore they must be fully evaluated and the overlapping nature of the conditions (e.g., ADHD and learning disabilities) must be considered prior to moving fully into the management plan. Possible examples might include oppositional defiant disorder, learning disability, etc.

7. Assessment of Suspect Condition(s) and Comorbidity(s)

For those patients suspected of other conditions or comorbidities, continued assessment is necessary to confirm or exclude such conditions. In these cases further investigation, including subspecialty consultation, may be needed.

Evidence supporting this recommentation is of classes: C, R

7A. Assess Biomedical Conditions

Address Biomedical Conditions

Based on the history and physical examination, further work-up may be indicated in areas such as:

1. Genetic or chromosomal
   - Fragile X syndrome
   - Mental retardation
   - Tourette syndrome
   - Neurofibromatosis
2. Neurological
   - Seizure disorder
   - Choreiform disorder
   - CNS trauma
   - Neurodegenerative conditions
   - CNS infection
3. Biomedical
   - Toxins [lead, fetal alcohol syndrome, prenatal cocaine exposure]
   - Allergy
   - Auditory or visual impairment
   - Metabolic/endocrine
   - Anemia
   - Sleep disorders

7B. Assess Emotional/Psychiatric Problems

If the clinician identifies sufficient positive symptomology after completion of these screening questions to raise the clinical suspicion of a psychiatric diagnosis, then referral to a mental health professional is indicated.

7C. Assess Family/Psychosocial Problems

If significant family pathology is present, then referral to a mental health professional, family therapist, or social services is appropriate.

7D. Assess Speech/Language Problems

If screening indicates concerns in these areas, referral to a speech and language pathologist for formal evaluation can be accomplished through a clinical speech/language pathologist or the student's school district.

7E. Assess Academic/Learning Problems

If screening indicates concerns about academic and/or cognitive functioning and appropriate testing has not been done, the patient should be referred for individual evaluation. Parents and primary care providers should communicate first with the classroom teacher and share concerns. Teachers often have similar concerns and welcome the opportunity to discuss these with the child's parents and physician. Testing and needs assessment are the responsibility of the special educational staff and/or school psychologist for each district. Parents may make a request for evaluation at any time. All requests for evaluations should be made in writing and dated with a copy of the request kept. Licensed child psychologists are also capable of providing this type of educational testing and cognitive assessment.

IQ and Educational Testing

Individual testing:

The IQ test most frequently used to assess school age children is the Wechsler Intelligence Scale for Children-Third Edition (WISC-III). The age range for administration is 6 years through 16 years 11 months. The WISC-III involves 12 subtests and yields a Verbal IQ Score, Performance IQ Score and Full Scale IQ Score with a Mean score of 100 and a standard deviation of 15 points. IQ scores range from 40-160; scores 130 and above are considered very superior, those 120-129 superior, 110-119 high average, 90-109 average, 80-89 low average, 70-79 borderline, and 69 and below cognitively deficient. Other intelligence tests include the Kaufman Assessment Battery for Children (K-ABC), the Stanford-Binet Fourth Edition (SB-4), and Woodcock Johnson Psychoeducational Battery (WJ-R): Tests of Cognitive Ability.

The Woodcock Johnson Psychoeducational Battery-Revised (WJ-R): Tests of Achievement are often used to in schools to look at academic achievement and yields scores in five clusters: Broad Reading, Broad Written Language, Broad Math, Broad Knowledge and Skills. Age and grade equivalent scores are available with a mean standard score of 100 and SD of 15. Other achievement tests include the Peabody Individual Achievement Test (PIAT-R), the Wide Range Achievement Test (WRAT-R), the Wechsler Individual Achievement Test (WIAT), and Key Math.

Group testing:

Group tests are also commonly administered, but results of group tests must be interpreted with caution and are not adequate for formal assessment purposes. Group tests include the Iowa Tests of Basic Skills, the Metropolitan Achievement Test, and the California Achievement Test. Scoring for these tests is based on national norms. Alternatively, some schools are utilizing "curriculum-based" measures which compare performance of students to district-defined learning goals.

8. Primary Diagnosis Other Than ADHD Accounting for Symptoms?

Patients undergoing further assessment for biomedical, emotional/psychiatric, family/psychosocial, speech/language, and academic/learning problems may be identified as having a primary diagnosis other than ADHD which accounts for their symptoms. For these patients, symptoms are not due to ADHD; therefore, these patients do not fall within the scope of this guideline. The primary clinician is encouraged to coordinate care with multidisciplinary subspecialty consultation as indicated.

9. Related Comorbidity Identified?

Patients undergoing assessment for biomedical, emotional/psychiatric, family/psychosocial, speech/language, and academic/learning problems may be identified as having a related comorbidity to the primary ADHD condition.

10. Desire Subspecialty Consultation for ADHD Medical Management?

For those patients with ADHD and a comorbid condition identified, the primary clinician is faced with the option of medically managing the ADHD component or utilizing medical subspecialty consultation. This decision depends on the complexity of the comorbid condition and its relationship to the ADHD symptoms, as well as on the individual clinician's own threshold of expertise and knowledge.

The type of medical subspecialty consultation may include the following:

Child-Adolescent Psychiatry

Developmental-Behavioral Pediatrics

Pediatric Neurology

The primary care clinician is encouraged to coordinate care between medical and non-medical (e.g., mental health, school/educational, speech/language) subspecialty consultation as indicated.

11. DSM-IV/DSM-PC Criteria Confirmed?

Only after careful evaluation of the patient's primary symptoms and complete screening for any co-morbidity or other primary condition is the clinician able to confirm the diagnosis of ADHD.

12. Out of Guideline - Need for Further Evaluation

For those patients not meeting DSM-IV/DSM-PC criteria and not having another condition identified, close monitoring and further evaluation of their learning or behavior problem is indicated. Subspecialty consultation may be helpful due to the nature and complexity of such cases. Such patient(s) would no longer be within the scope of this guideline.

13. ADHD Diagnostic Formulation

A comprehensive diagnostic formulation for a child with ADHD is critical so that parents clearly understand their child's attentional difficulties as part of an inclusive picture of his or her functioning. Findings should be presented to families within a biopsychosocial framework. Discussion of the ADHD diagnosis should be presented within the context of associated comorbid mental health diagnoses and issues, academic performance issues, learning disabilities, developmental concerns, medical diagnoses, social concerns, family issues and stressors. It is crucial to discuss the child's and the family's strengths as well as their vulnerabilities.

Adequate and appropriate treatment planning should then follow from a comprehensive and accurate diagnostic formulation.

Management Algorithm Annotations

16. ADHD Diagnostic Formulation

The patient has been diagnosed with attention deficit hyperactivity disorder with or without comorbidity. This diagnosis is based on the previous evaluation algorithm.

17. Multimodal Management Coordinated by Primary Clinician

After accurate diagnosis of attention deficit hyperactivity disorder, the underlying principle of successful management includes multiple treatment modalities begun simultaneously to address the multidimensional nature of the disorder. The primary clinician is in a unique position to coordinate these interventions from initial diagnosis through ongoing monitoring and continuing care. Subspecialty consultation at any point along this continuum may occur depending on the knowledge and expertise of the primary clinician as well as the complexity of the patient. Despite the need for individualized

approaches, there are several general interventions and strategies which effectively address many of the common primary features of ADHD.

Evidence supporting this recommentation is of classes: A, C, M

18. Education of Key Individuals

Upon initial diagnosis of ADHD, education of key individuals including the parents, the child and school personnel is imperative.

For the parents, this should include information on neurologic mechanisms, common features of ADHD and how they relate to the child's previous and current problems, and future expectations of clinical course and intervention strategies. The importance of individual teacher selection each year should be emphasized.

For the child, a developmentally appropriate explanation and demystification of ADHD using specific metaphors and examples is especially helpful. This should include not only explanation of related difficulties, but also discussion of the child's strengths and attributes.

For school personnel in contact with the child, one should not assume teacher knowledge of ADHD. It is important to provide specific teacher-focused information for the parents to share with all appropriate individuals. This information not only should explain ADHD related to the child's classroom difficulties, but also should address appropriate intervention strategies and modifications as described in Annotation #7, "Assessment of Suspect Condition(s) and Comorbidity(s)."

Please refer to the Support for Implementation section for specific recommended educational materials and resources directed to parents, children and adolescents, and teachers.

19. Parents/Family Focused Strategies

ADHD Support Groups

These groups help parents learn more about ADHD through lectures or reading material and can help parents cope emotionally by communicating with other parents of ADHD children in a supportive setting. The Attention Deficit Disorder Association (ADDA) and Children and Adults with Attention Deficit Disorder (CHADD) are two such groups and have local chapters in many areas. A children's or community hospital in the area may also have a support group.

Advocacy Groups

Groups exist to help parents learn about what rights their children have in the educational setting and what special services are available for their needs. These groups can also aid in parent interactions with the school system and can give parents some direction in finding services for their children. One such group is Parent Advocacy for Children's Educational Rights (PACER).

Parenting Skills Training

One of the most useful strategies a parent can undertake to improve harmony in the home is to learn ways to modify the child's behavior in a manner consistent with school-focused behavior modification. This serves to give the child direction, goals and limits in hopes of improving compliance, behavior, self-esteem, etc. This training can be obtained through formal classes, books or counseling.

Suggestions for Parents

- Note problem behaviors and make notations of frequency and severity to help make the problems more objective and to aid in monitoring improvements as behavioral changes are made.
- Try to spend 10-15 minutes daily focusing on this child alone to listen and let them know they are important.
- Consistent schedules and routines with forewarning of any upcoming changes.
- One or two simple, clear instructions should be given at a time. The child should repeat the instructions back to ensure comprehension.
- Clear, concise rules should be provided for the behavior of all family members, with consistent follow-through of appropriate consequences and rewards.
- Decrease inappropriate behavior by allowing:
  - natural consequences to the child's actions;
  - logical consequences linked to the offending behavior; and
  - time-outs.
- Have a special quiet spot with few distracting influences for doing homework or working on projects.
- Allow the child choices within set limits so that the child has a sense of some control.
- Have the parent take a break or time-out from the child if he or she is becoming too frustrated or angry.
- Make sure the child knows his or her behavior is the issue or problem, not the child himself or herself.

The references in the discussion section contain a more detailed approach to parent skills training.

Comorbidity Present

In cases with significant family dysfunction or other stresses (e.g., financial, health problems, chemical dependency issues, etc.) individualized family therapy may be more appropriate. In-home counseling may be available through county services.

Evidence supporting this recommentation is of classes: A, R

20. Child Interventions

The following interventions do not have solid empirical support for the treatment of ADHD and may be more appropriate to address deficits that often co-occur or develop secondarily in individuals with ADHD.

Social Skills Training

The child's social skills are resources for solving the specific problems that arise from ADHD. Interpersonal problems and difficulties with peers may occur secondary to impulsivity (i.e., unpredictable behavior). As a child gets older, unpredictable behavior is less tolerated by peers and within the family.

Social skills building is meant to offer immediate practical skills in a safe setting. Sometimes this can be a way to have several people (family, school, friends) offering the same message about appropriate behavior and may have a better chance of being generalized to a larger setting.

Social skills training (group or individual) instructs children in the execution of specific prosocial behaviors. It is appropriate for children who exhibit difficulties in initiating and maintaining positive peer interactions. Children with ADHD often show deficient use of functional, pragmatic language in social situations. This type of training is designed to increase knowledge about appropriate and inappropriate social behaviors. The various target skills may include maintaining eye contact, initiating and maintaining conversation, sharing, and cooperating. Role-playing exercises with group feedback are commonly used.

Social skills building groups may be available through the school. These may be recognized as "friendship groups" or "social skills groups." Early childhood family education, which may include children older than the preschool aged child, is also available. Some other community resources may include the YMCA, Community Education or local health organizations.

Evidence supporting this recommendation is of classes: A, D, R

Problem Solving Strategies/Cognitive Behavioral Therapy

The goal of self-instructional problem solving training is to help children who have ADHD "stop and think" before acting. This therapeutic modality falls under the general category of cognitive-behavioral therapies. Designed to facilitate self-control and reflective problem solving, it is appropriate for children who exhibit impulsive, non-self-controlled behavior and/or manifest deficits in problem solving. This can be accomplished through the use of various resources: family therapy, in-home therapy, an individual therapist or county services (if available). All options should be coordinated with school efforts.

Evidence supporting this recommendation is of classes: A, R

Study/Organizational Skills Training

Study and organizational skills building should be offered in conjunction with curriculum intervention. The curriculum should be concrete and sequential with only essential information as a requirement. Specific interventions can address issues, such as:

A.	Behavior:	Difficulty sequencing and completing steps to accomplish specific tasks (e.g., writing a book report or term paper, organizing paragraphs; solving division problems)
	Accommodation:	Break task into workable and manageable component tasks. Provide examples to accomplish task.
B.	Behavior:	Difficulty prioritizing from most to least important.
	Accommodation:	Prioritize assignments and activities. Provide a model to help students. Post the model and refer to it often.

Evidence supporting this recommendation is of class: R

Comorbidity Present

In children or adolescents with comorbid anxiety, depression/dysthymia, chemical abuse, oppositional or conduct disorder, medical comorbidity appropriate medical management should be implemented.

21. School Interventions

A. Even at optimal doses of medication, most children with ADHD have residual difficulties at school. Physicians and other primary health care providers are often in a good position to assist parents in advocating for appropriate school programming for children with ADHD. Several classroom strategies are listed in the table below. Although it is not expected that the primary care provider will act as an expert "consultant" in this area, it is important for him or her to have enough background familiarity with these issues to be an effective advocate and to be able to educate and empower parents on these issues.

Studies clearly demonstrate that combination therapy of medication and behavioral interventions for ADHD is superior to medication alone. The primary care provider can emphasize the fact that regardless of the decision to utilize or not utilize medication (e.g., stimulants); the literature supports the fact that children with ADHD clearly benefit from appropriate behavioral management and educational accommodations/modifications in the classroom.

B. Classroom Strategies for Children with ADHD

- a high degree of order and predictability to the classroom
- clear and consistent rules and expectations
- classroom organizational strategies such as a posted daily work schedule, written notices for homework assignments, quiet work areas, seating close to teacher and near positive peer models
- training for students in study skills and time management
- regularly scheduled, frequent breaks
- creation of multisensory learning activities that are engaging and use various attention-getting devices
- reduction of the amount of work assigned or other modifications of assignments
- liberal use of positive reinforcers immediately and continually for desired behaviors
- establishment of a school–home daily note card system to maintain parent–teacher contact with regard to academic and behavioral progress and problem areas
- working with the student on self-monitoring, self-reinforcement and development of compensatory/adaptive strategies

C. Ongoing collaboration and communication between teachers and primary care providers is desirable in order to discuss and implement effective treatment strategies for each child. It is also important for the primary care provider to communicate with school staff about their perceptions of the child's diagnosis (or diagnoses) with particular attention to any medical/neurologic problems (e.g., Tourette Syndrome, mental retardation, seizures, hearing impairment, chronic medical conditions) that might be important for the teachers to understand. They may also want to discuss the perceived role of psychotropic medication and answer any questions about expected benefits, side effects, etc.

D. The severity of the child's ADHD and its adverse impact on academic performance will determine whether the child qualifies for special education services. The three educational service categories most commonly identified for children with ADHD (in school terminology) are Learning Disability (LD), Emotional/Behavioral Disorder (EBD) and Other Health Impaired (OHI). Students with ADHD who do not meet eligibility criteria for the specific programs described (LD,

EBD, OHI) may still need some level of assistance to be successful and may still receive specialized instruction and accommodations in the regular classroom. This is stated in section 504 of the Rehabilitation Act of 1973 and is intended to insure a "free and appropriate education in the least restrictive environment" for all students including those with a physical or mental impairment that limits learning. **In these cases, parents should be encouraged to formally request a "section 504 plan" for their child from school administration. Adequate documentation of the child's impairment (e.g., ADHD or other diagnosis) will be required from the physician.**

Comorbidity Present

Specific learning disabilities comorbid to ADHD must be treated concurrently with appropriate special educational programming. Primary care providers should develop a basic understanding of the Individualized Educational Plan (IEP), the document which details the student's direct and indirect special educational services.

Speech and language related difficulties must also be treated and supported across the curriculum and can have an impact on a number of subject areas and tasks. Children with ADHD who are also hearing impaired may require special assistance such as an "auditory trainer" device and other classroom accommodations. Most districts have the availability of a hearing impairment specialist to consult on these clients.

Evidence supporting this recommentation is of classes: A, R

22. Medications Warranted and Desired?

Medication is frequently effective as part of a multimodal treatment plan for ADHD. The decision to use medication to alter behavior should be preceded by thorough deliberation and consideration of expected benefits and potential risks. The decision is influenced by factors such as the child's age, severity of symptoms, presence of comorbidity, and negative or ambivalent parental attitudes regarding medication. A careful and thorough explanation of medications addressing fears, myths, or misconceptions that parents might have may be necessary for an informed consent.

23. First Line Medication(s) Trial(s)

Stimulant medications are considered first-line therapy as they are effective in 70-80% of children with ADHD. It is theorized that stimulants increase the availability of neurotransmitters at the presynaptic terminals. This allows the child to exhibit more purposeful, goal-oriented behavior by focusing attention, lessening impulsiveness, and decreasing motor activity.

Absolute contraindications to the use of stimulants include psychosis, certain cardiovascular conditions, or previous untoward reactions to stimulant medication. Occasionally a comorbid condition may warrant the consideration of alternative medications. In the presence of comorbidity, the primary symptoms of concern should influence the medication decision.

Treatment with psychostimulants is often safe and effective in managing many children with ADHD with mild to moderate tics. Nevertheless, frequency and severity of tics should be carefully monitored in these patients. No routine blood work is necessary before or during psychostimulant therapy.

The three types of stimulant medication most commonly used are:

- Methylphenidate (MPH);
- Dextroamphetamine; and
- Amphetamine salts.

Response to one stimulant does not predict response to the others. Studies indicate a 70-80% response rate to each stimulant independent of one another; therefore, if a child is a non-responder to one stimulant, it is advisable to attempt a second or third trial with other stimulants.

Each of these stimulant medications has the common adverse effects of decreased appetite, insomnia, headache, stomachaches, and irritability.

Dosages should be adjusted for each child depending on body weight, degree of impairment, and specific symptoms targeted for improvement. Children with ADHD of the predominantly inattentive type have been shown to respond well to low doses of methylphenidate. Children with ADHD, combined-type or predominantly hyperactive, have shown more positive response at moderate to high doses of methylphenidate. Please refer to Table I, Summary of First Line ADHD Medications for Use in Children and Adolescents, for information on dosing, titration, and adverse effects of specific medications and Annotation #27, "Maintenance and Continuing Care" for information on maintenance and continuing care.

Table I: Summary of First Line ADHD Medications for Use in Children and Adolescents *

Medications	Starting Dose**	Titration & Timing of Doses	Predominant Adverse Effects	Comments
Immediate Release				
Methylphenidate • Ritalin® short-acting 5 mg, 10 mg, 20 mg tabs, Methylin® short acting 5 mg, 10 mg, 20 mg tabs Dosage Range: 0.3-0.7 mg/kg/dose. (Total daily dose usually does not exceed 60 mg/day)	< 8yrs (< 25 kg) start with 5 mg/dose bid > 8yrs (> 25 kg) start with 10 mg/dose bid	Increase by 2.5 – 5 mg/dose (depending on wt) a.m. & noon; add 4 p.m. dose as needed	Decreased appetite, insomnia, headaches, increased HR	Adjust doses every 1-2 weeks as needed and tolerated
Dextroamphetamine • Dexedrine® short-acting 5 mg tabs, Dextrostat® short-acting 5 mg, 10 mg tabs Dosage Range: 0.2-0.4 mg/kg/dose. (Total daily dose usually does not exceed 30 mg/day)	Usually 5 mg tablets bid	Increased with 2.5 – 5 mg tab/dose; a.m. & noon; add 4 p.m. dose as needed	Decreased appetite, insomnia, headaches, increased HR	Typical dextroamphetamine dose is approximately half of the equivalent methylphenidate dose
Sustained Release/Long Acting* **				
Methylphenidate • Ritalin SR®: 20 mg tabs	20 mg SR in a.m. only (considered for use in children tolerating 10 mg/dose a.m. and noon)	Add 5 mg – 10 mg tablet in a.m. and/or at 4 p.m.	Decreased appetite, insomnia, headaches, increased HR	In general, switching to long acting formulation dose is equivalent to previous total daily dose
• Ritalin LA® 20 mg, 30 mg, 40 mg	Children ≥ 6 years old and Adults: 20 mg once daily in the a.m.	May be increased 10 mg daily at weekly intervals	Decreased appetite, insomnia, headaches, increased HR	
• Metadate ER 10 mg, 20 mg tabs, Methylin ER 10 mg, 20 mg tabs	20 mg SR in a.m. only (considered for use in children tolerating 10 mg/dose a.m. and noon)	Add 5 mg – 10 mg tablet in a.m. and/or at 4 p.m.	Decreased appetite, insomnia, headaches, increased HR	
• Metadate CD® 20 mg	Children ≥ 6 years old and Adults: 20 mg once daily in the a.m.	May be increased 20 mg daily at weekly intervals	Decreased appetite, insomnia, headaches, increased HR	
• Concerta® 18 mg, 27 mg, 36 mg, 54 mg	Children ≥ 6 years old and Adults: 18 mg once daily in the a.m.	May be increased 18 mg daily at weekly intervals	Decreased appetite, insomnia, headaches, increased HR	Inert components of tablet (ghosts) can be seen in stool
Dextroamphetamine (Dexedrine) Long-acting spansules: 5 mg, 10 mg, 15 mg	Start at twice regular bid tablet dose (e.g., calculated by adding first 2 doses of the day together and administering an equal spansule amount in the a.m.)	Increased with 5 mg Spansule in a.m. only or add 5 mg tablets to a.m. dose	Decreased appetite, insomnia, headaches, increased HR	Typical dextroamphetamine dose is approximately half of the equivalent methylphenidate dose
Mixture of amphetamine salts (Adderall® 5 mg, 7.5 mg, 10 mg, 12.5 mg, 15 mg, 20 mg, 30 mg tablets)	Start at 2.5 – 5 mg dose in a.m.	Increase by 2.5 mg increments. Range for length of action is typically 5-8 hrs, depending on dose; can add second dose 6-7 hrs after a.m. dose. Consider using tapered dose (smaller p.m. dose than a.m. dose)	Decreased appetite, insomnia, headaches, increased HR	Unique property – as dose increases, Adderall® will last longer
• Adderall XR® 5 mg, 15 mg and 25 mg	Children ≥ 6 years old: 10 mg once daily in the a.m.	May be increased 10 mg daily at weekly intervals	Decreased appetite, insomnia, headaches, increased HR	

* Bioavailability differences resulting in unpredictable patient response should be considered when using generics. Consider prescribing trade name product or evaluate the ANDA (Abbreviated New Drug Application) generic product data with the pharmacy when using a particular generic agent.

** The notion that stimulants are primarily dosed by weight of the patient (e.g., 0.3 to 0.5 mg/kg/dose) is not entirely accurate. Studies would suggest that each individual's unique metabolic capacity for stimulants determines how they will respond. Therefore, in general, it may be wise to start at low doses for most patients (2.5-5 mg) and then titrate the dose upward instead of starting larger children on higher doses automatically. The starting dose of stimulant medications during adolescence is often lower, on a mg/kg basis, than during elementary school children although gradual dosage titration is the same. (See Table I.) Slow release formulation can often lessen school-related drug administration problems and patient resistance to taking medications.

*** Extemporaneous Preparation of Adderall® - For patients unable to swallow tablets there is the possibility of making a suspension. The formulation information is found in the following article: Justice J, Kupiec TC, Matthews P, Cardona P. "Stability of Adderall® in extemporaneously compounded oral liquids." *Am J Health Syst Pharm* 58:1418-21, 2001.

Atomoxetine (strattera), the non-stimulant, presynaptic norepinephrine transporter inhibitor is now available for use. Clinical studies, however, are limited. This medication may be helpful for patients who cannot tolerate stimulants. It has the advantage of not being a controlled substance.

Pharmacological treatment should be initiated by means of a trial, either placebo-controlled or open label. Trial should incorporate teacher and parent rating scales of performance.

Placebo Controlled Methylphenidate (MPH) Trial

A placebo trial using FDA approved drugs and FDA recommended dosing is not a drug study and is not a legal issue. Placebo trials in this case are done to assist the provider in determining patient response. The use of placebo trials is a policy issue for each medical organization to determine within its own setting. Although placebo trials may not constitute a "study," clinicians are encouraged to discuss these trials with their respective Institutional Review Board (IRB). It is advisable to obtain written parent/guardian consent before trials begin. It is also recommended that the child (at an age of understanding) be informed of the trial. Each medical group should determine its policy and procedure before implementation.

Placebo-controlled trials for adolescents may utilize either methylphenidate or dextroamphetamine in the sustained release formulations. (See Table I.)

For selected patients (e.g. equivocal MPH response, parent reluctance to initiate stimulant therapy, etc.) the practitioner may elect to perform a placebo-controlled medication trial.

Up to 20% of all children being considered for the diagnosis of ADD/ADHD may show a clinical response to a placebo. In order to avoid medicating children with MPH unnecessarily, and to help establish the proper treatment regimen, a blinded placebo trial may be helpful.

The use of a 3 or 4 week trial using a placebo and MPH doses of approximately 0.3 mg/kg and possibly 0.5 mg/kg, rounded to the nearest 2.5 mg, is recommended. Doses should be randomly distributed over a 3 or 4 week period. A dosage changeover may be important in identifying those children who respond to MPH only at higher doses.

Suggested Trial Formats:

(1 week of each dosage in randomized order, given twice daily, approximately 4 hours apart)

3 Week Trial	3 Week Trial
MPH 5 mg	MPH 5 mg
MPH 5 mg	MPH 10 mg
Placebo	Placebo

Randomized order of dosages may be predetermined by the provider (single-blind) or by the pharmacist (double-blind).

Considerations in determining the best trial format include age and weight of patient, severity of symptoms, reluctance to continue medication in the event of adverse side affects, and expected compliance of parents and teachers.

Trial Instructions

Instruction sheets should be provided to the pharmacist, parents, and teachers.

Pharmacists should be instructed to place MPH tabs (5 mg) in appropriate amounts in placebo capsules. This ensures that the placebo will not be distinguished from MPH by taste or appearance. The medication is then dispensed in bottles labeled A, B, and C and given to the child twice daily.

It is advisable to have 24 hour access to pharmacy records during placebo trials.

Teachers should be requested to complete weekly questionnaires regarding ADHD symptoms and school performance. Additional comments should be encouraged from both teachers, parents, and older children. Completed questionnaires and comments should be returned to the provider at the completion of the trial.

Baseline questionnaire data, pre- or post- trial, may be obtained if a concern exists regarding patient as a placebo responder (responding to nonspecific effects of the medication).

Follow-up

The pharmacist should provide the code for dosage distribution to the treating provider, who may then make appropriate therapeutic decisions based on the above information.

At the completion of the trial, questionnaire responses should be tabulated and parents should return to the clinic to discuss trial results and recommendations for ongoing treatment.

The purpose of the placebo-controlled trial may be to determine if the medication is effective, not necessarily to determine the optimal dosage. Dosage may be further adjusted post -trial if it has been determined that the patient responds positively to medication.

Open Label Trial

Methylphenidate

- Dosage range (0.2 - 0.7 mg/kg/dose)
- Typical dose range (5 - 25 mg/dose)
- Frequency (1-2 doses per day initially)

1. Start at low end of dosage/dose range (usual starting dose 5 mg < 8 yrs. old, 10 mg > 8 yrs old), and increase weekly or biweekly in increments of 2.5 - 5.0 mg/dose.
2. Monitor dosing intervals with behavioral observations (e.g. rating scales, self report in adol.) from as many observers as possible (at least parent, teacher). Observe for positive clinical response and adverse effects.

3. Once adequate clinical response has been determined without prohibitive adverse effects, discuss with parent overall priorities of medication coverage (e.g. classroom, homework, activities, family, etc.) and determine dose frequency and timing (2-3 doses/day, +-weekends).
4. Schedule follow-up visit 4-8 weeks post-trial to review care plan and adjustment as needed.

- Dextroamphetamine may be used at approximately 1/2 the calculated MPH dose.

Evidence supporting this recommentation is of classes: A, C, R

25. Alternative Medication(s) Trial(s)?

When adequate stimulant trial is unsuccessful due to either poor response or side effects in spite of adjustment, or if associated comorbidity, alternative medication trials may be considered. Second line medications for ADHD therapy in these situations commonly include tricyclic antidepressants (imipramine, desipramine), alpha adrenergic agonist (clonidine) and a nontricyclic antidepressant (bupropion). At this point, due to increased side effects and more intense monitoring, the primary clinician is directed out of guideline and may consider subspecialty consultation depending upon individual knowledge and expertise. The table on the following page is provided for those clinicians considering alternative medication options.

Table II: Summary of Second Line ADHD Medications for Use in Children and Adolescents

Medication	Starting Dose	Titration & Timing of Doses	Predominant Adverse Effects	Comments
Bupropion (Wellbutrin®) 75 mg, 100 mg regular tablets 100 mg SR, 150 mg SR extended release tablets	6-12 yr; usually 37.5 mg BID or 50 mg BID 3 mg/kg/day up to 150 mg/day	6-12 yr; gradually increase over 2 weeks to 6 mg/kg/day up to 250 mg/day in divided doses (300 mg to 400 mg/day for adolescents)	Sedation, constipation, dryness of mouth, may lower seizure threshold	Further controlled studies needed. Some studies shows Bupropion may decrease hyperactivity and aggression, and improve cognitive performance of children with ADHD and CD. To reduce seizure risk, space regular tablets at least 4-6 hours apart and sustained release tablets 8 hours apart. Maximum single dose 150 mg and maximum daily dose 450 mg.
Clonidine (Catapres®) tablets 0.1 mg, 0.2 mg & Transdermal Patch Catapres-TTS (transdermal therapeutic system) 1,2,3 = 0.1 mg, 0.2 mg, 0.3 mg	Start with 0.05 mg QD	Increased dose by 0.05 mg/day every 3 days to a max of 4 - 5 µg/kg/day (usually 0.05 mg QID)	Sedation, rashes with skin patch, orthostatic hypotension (< 5% of those treated)	Possibly more effective for tics or marked impulsivity/aggression. Do not abruptly discontinue therapy. Clinical effect may not be evident for up to 6-8 weeks.
Guanfacine (Tenex®) tablets 1 mg, 2 mg	0.5-1 mg QD	Increase dose by 0.5 mg q 3-4 days to maximum of 4 mg/day in divided daily dose	Fatigue, headache, insomnia	Has longer life, less sedation than clonidine. May provide a safe alternative therapy for children with ADHD in the presence of tics. Do not abruptly discontinue therapy. Clinical effect may not be evident for up to 6-8 weeks.
Imipramine (Tofranil®) tablets 10 mg, 25 mg, 50 mg	0.5-1 mg/kg/day in divided doses	Increased 1 mg/kg/wk up to 4 mg/kg/day. Doses usually do not exceed 5 mg/kg/day. (Divided doses are preferred.)	Cardiac conduction disturbances, dry mouth, urinary retention, headache	Therapy is usually reserved for older children or adolescents not responding to stimulants. Obtain baseline EKG and periodically monitor during therapy *
Desipramine*, + (Norpramine®) tablets 10 mg, 25 mg, 50 mg	0.5-1.0 mg/kg/day in divided doses	Increased 1mg/kg/wk up to 4 mg/kg/day. Doses usually do not exceed 5 mg/kg/day. (Divided doses are preferred.)	Cardiac conduction disturbances, dry mouth, urinary retention, headache	Therapy is usually reserved for older children or adolescents not responding to stimulants. Obtain baseline EKG and periodically monitor during therapy *

Table continued on following page.

\+ EKG Monitoring Guidelines (imipramine, desipramine):

- HR < 130 at rest
- QRS < 30% over baseline
- PR < 210 msec
- QTc < 450 msec
- BP < 130/85

* Cases of sudden death have been reported with desipramine, but a cause and effect relationship has not been established. Despite the uncertainty of the role of desipramine in these cases, it is prudent to exercise a heightened level of caution when instituting and monitoring therapy.

Table II (cont): Summary of Second Line ADHD Medications for Use in Children and Adolescents

Medication	Starting Dose	Titration & Timing of Doses	Predominant Adverse Effects	Comments
Pemoline (Cylert®) ** long-acting tablets: 18.75, 37.5, 75 mg, (37.5 mg chewable tab), + Dosage range: 37.5 mg to 75 mg; usually does not exceed a maximum dose of 112.5 mg/day.	Usually 37.5 mg in am only	Observe for 1-2 weeks before increasing by 18.75 mg per dose once in am only; add a 4pm dose as needed	Decreased appetite, insomnia, headaches, increased HR	Has longest duration of action (half life = 12 hours) Obtain baseline LFT's, repeat during first 3 months and every 6 months thereafter

** Recent issues related to the occurrance, severity and incidence of liver complications associated with pemoline (Cylert®) use suggest that this agent may not be an appropriate first line therapy in ADHD. Although the occurrance of complications appears infrequent, practitioners should exercise caution when using this agent and ensure ongoing assessment and monitoring of liver function. These complications appear to be idiosyncratic and not particularly dose-related.

26. Out of Guideline (Consider Subspecialist Consultation)

Adverse effects of alternative ADHD medications may be more common and potentially more serious than with the stimulants. In addition, fewer studies are available documenting their benefit and safety in children or adolescents compared to the stimulants. The primary clinician may decide to continue management based on individual knowledge and expertise or may refer for subspecialty consultation. In either case the patient would no longer be within the scope of this guideline.

27. Maintenance and Continuing Care

Attention Deficit Hyperactivity Disorder may have an evolving impact on a child or adolescent's learning or behavioral success. It is a condition that is significantly related to each child's environment (home, school, etc.) as well as to the specific demands placed upon the child or adolescent. The ability of the individual to develop compensation skills and success over time is related to these factors, as well as the presence or absence of comorbid conditions.

Recent evidence suggests that worsening clinical status during adolescence may more likely be due to environmental and/or comorbid causes, instead of inadequate psychostimulant medication dosage. The clinician should evaluate these possibilities before prescribing higher doses of stimulants to adolescents. For these reasons, close monitoring and follow-up is recommended for all children and adolescents diagnosed with ADHD, whether or not medication is utilized.

Frequency: closely by phone during trial and first several weeks
clinic visit after trial to review care plan
2 times per year depending on individual case (preferably during school year)

These visits allow for review and management of the following areas:

Medical:

- measurement

  - height, weight, blood pressure, pulse

- medication
  - dosage, timing, coverage priorities, duration
  - before making dosage adjustments or switching medications, the patient's adherence to current regimen should be addressed

Common management situations might include:

- breakthrough symptoms
  - evaluate for environmental/comorbid causes, especially in adolescents
  - increase dose
  - shorten frequency of dose (overlap)
  - long-acting preparation or alternative
- homework coverage
  - add dose late afternoon and weekend timed with homework
- impaired with family, peers
  - consider weekend/holiday/summer dosing in a proactive, planned manner (must not be reactive to specific behaviors)

Discontinuing medications:

1. Consider annually when stable and doing well.
2. Best when there are few transitions or demands (e.g., mid-school year).
3. Avoid at beginning of any school year, especially the start of junior/senior high school.
4. Trial off meds 2-4 weeks with close monitoring follow-up.

- positive attributes of medication
- side effects and their management (**see Table III**)
- laboratory as indicated
- behavior rating scales
  - especially if problems and anticipated medication adjustment
- alternative/complimentary medicine

  Increasingly, parents are considering the use of alternative/complimentary therapies for children with ADHD. Certain therapeutic interventions, such as the use of herbal, botanical and other nutraceutical agents, have the capacity to interact with psychotropic medications including stimulants SSRI's and TCA's, among others. Therefore, it is important for pediatric health care providers to inquire about the use of these agents by children under their care in a non-judgmental fashion. Parents can then be educated appropriately about potential risks, benefits, side effects and drug interaction possibilities associated with a certain therapy

Psychosocial:

- family functioning
- home behavior management

- peer relationships
- outside activities

Educational:

- ADHD symptoms
- child-teacher relationships, social functioning, general attitude
- academic performance, homework and study skills
- current interventions and supports
- review IEP or section 504 plan if appropriate

Psychological:

- perception of ADHD and treatment
- self esteem issues
- personal strengths and successes

Anticipatory Guidance:

- immediate and long-term expectations
- study/organizational skills
- behavior management
- updated reading materials and advocacy issues

Transitioning to Adulthood:

- identify adult health care provider for care transfer (this may require coordination with college health service)
- prioritize treatment to address target symptoms, level of impairment, and available resources (multiple modalities frequently useful), patient participation necessary
- emphasize vocational evaluation, counseling, and training as well as time management skills, organization, and study skills
- discuss relationship issues
- high index of suspicion for comorbidity
- address risk of medication abuse by patient and peers
- stimulants may be less effective, consider alternative medications if indicated

Revise multimodal care management plan as needed.

Evidence supporting this recommentation is of classes: A, C, D, R

Table III: Management of Common Adverse Effects Associated with Stimulant Use

ADVERSE EFFECT	MANAGEMENT
Anorexia, weight loss, stomachache	• administer dose with/after meals • high caloric breakfast and snacks after school/bedtime • limit stimulant to high priority needs • check liver function tests with pemoline • consider dietitian referral for nutrition evaluation/counseling
Insomnia	• low stress "wind down time" after school • administer dose earlier in day • discontinue afternoon/evening dose • change to short-acting preparation • consider adjunctive medications (e.g. clonidine, antidepressants)
Rebound irritability/moodiness (usually 4-5 hours after last dose)	• overlap stimulant dosing • step down dosing • try long-acting or combination short/long-acting preparations
Generalized irritability, dysphoria, agitation	• assess timing of symptoms (e.g. peak withdrawal) • consider comorbid condition • reduce dose or change to long acting preparation • consider alternative/adjunctive medication (e.g. another stimulant, antidepressant)
Tics (simple vocal, motor)	• monitor if mild, infrequent • weigh benefit-risk and discuss with parents • consider alternative medication (e.g. clonidine, guanfacine) • see Discussion #27 "Maintenance and Continuing Care" for further information
Headache	• assess timing • reduce dose with gradual return to therapeutic dose • try long-acting preparation • consider alternative medication
Linear growth impairment	• limit stimulant to high priority needs (e.g., try weekend/vacation drug "holidays") • if significant, consider alternative medication • see Discussion #27 "Maintenance and Continuing Care" for further information

28. Emerging Comorbid Condition?

In the course of ongoing maintenance and continuing care the patient may develop features suggestive of an emerging comorbid condition such as depression or dysthymia, anxiety, chemical abuse, conduct problems or antisocial behavior, family stress or dysfunction, etc. In these situations the primary clinician is directed to Algorithm Annotation #5, "Screen for Other Primary Conditions and Comorbidities."

ICSI

INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

Discussion and References:

Diagnosis and Management of Attention Deficit Hyperactivity Disorder in Primary Care for School Age Children and Adolescents

Document Drafted Feb – Jun 1996
First Edition Oct 1997
Second Edition Jan 1998
Third Edition Feb 2000
Fourth Edition Aug 2001
Fifth Edition Begins Apr 2003

Released in March 2003 for General Implementation.
The next scheduled revision will occur within 18 months.

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In the interest of full disclosure, ICSI has adopted a policy of revealing relationships work group members have with companies that sell products or services that are relevant to this guideline topic. It is not assumed that these financial interests will have an adverse impact on guideline content. They simply are noted here to fully inform users of the guideline.

All work group members: none declared.

I. CLASSES OF RESEARCH REPORTS

A. Primary Reports of New Data Collection:

Class A: Randomized, controlled trial

Class B: Cohort study

Class C: Non-randomized trial with concurrent or historical controls
Case-control study
Study of sensitivity and specificity of a diagnostic test
Population-based descriptive study

Class D: Cross-sectional study
Case series
Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M: Meta-analysis
Systematic review
Decision analysis
Cost-effectiveness analysis

Class R: Consensus statement
Consensus report
Narrative review

Class X: Medical opinion

Evaluation Algorithm Discussion and References

1. Learning/Behavior Problems (Suspect ADHD)

The developmental changes in the characteristic symptoms of ADHD over time influence the presenting symptom profile. For example, problems with excessive motor behavior tend to decrease with increasing age and there is commonly spontaneous improvement in attention with advancing development as well. Environmental demands and changes, evolving social roles and associated problems such as poor self-image, anti-social behavior, and learning difficulties also have an influence on the ongoing course and prominence of certain symptoms.

DSM-IV/DSM-PC - based field trial data suggest that in the preschool age group, the hyperactive/impulsive subtype predominates with the comorbid type being seen most often in the school age child.

The impact of ADHD symptoms on functioning of individuals in the adolescent age group can be particularly confusing. Not uncommonly, the hyperactivity/impulsivity dimension diminishes with age. Behavioral manifestations of ADHD in adolescence include insatiability and restlessness, behavioral impulsivity, risk taking behaviors, low self-esteem, weak reinforcibility, loss of motivation, social failure, antisocial behavior, alcohol or drug abuse, motor vehicle accidents, and school drop-out. ADHD may impact the academic performance of the adolescent, with associated difficulties such as memory problems, cognitive fatigue, fine motor dysfunction, or ineffective self-monitoring resulting in "careless" errors, performance inconsistency, task impersistence, and inattention to detail.

Applegate B, Lahey BB, Hart EL, et al. "Validity of the age-of-onset criterion for ADHD: a report from the *DSM-IV* field trials." *J Am Acad Child Adolesc Psychiatry* 36:1211-21, 1997. (Class C)

Barkley RA, Fischer M, Edelbrock CS, et al. "The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8-year prospective follow-up study." *J Am Acad Child Adolesc Psychiatry* 29: 546-57, 1990. (Class B)

Reiff MI. "Adolescent school failure: failure to thrive in adolescence." *Pediatr Rev* 19:199-207, 1998. (Class R)

Werry JS. "History, terminology, and manifestations at different ages." *Child Adolesc Psychiatry Clin North Am* 1:297-310, 1992. (Class R)

2. Crisis?

Because ADHD is not seen as a crisis, it is important to ask questions which rule out an immediate need for attention. Crisis management may be dealt with immediately. Although ADHD may also be present, it can be evaluated at a later date.

4. Evaluate for Key Features of ADHD Using DSM-IV/DSM-PC Criteria

Attention deficit hyperactivity disorder (ADHD) may have an impact on a child's/adolescent's experience within school, family, play or work. It is a high prevalence condition ranging in school aged children from 3-5%, based on previous diagnostic criteria, to 11-12%, based on more recent DSM-IV/DSM-PC criteria. It is a chronic condition which may be variably expressed depending on the child's environment as well as on the specific demands placed upon the child within that environment. The DSM-IV/DSM-PC classifies ADHD into 3 subtypes depending on the prevalence of specific behaviors – Predominantly Inattentive, Predominantly Hyperactive/Impulsive, and Combined Types. A summary of this information is presented immediately following the Evaluation algorithm.

Evaluation of the primary symptoms of ADHD requires multiple sources of information, including: a careful review of past medical and developmental history, current and previous school history, family history, and psychosocial history. Various semistructured interviews, questionnaires, and behavior rating scales are available to aid in this process. Continuous Performance Tasks have not proven to be reliable pathognomonic evaluation instruments in individual cases to diagnose or exclude ADHD at this point (see Annotations section).

The Diagnostic and Statistical Manual for Primary Care (DSM–PC) Child and Adolescent Version was developed to enhance communication between primary care and mental health clinicians. This manual describes children's symptoms along a continuum from normal developmental variations to problem behaviors to mental "disorders." It is fully compatible with the DSM-IV manual but provides a vocabulary that primary care providers may find more useful to describe mental health, behavioral and developmental phenomena seen in their daily practices. The DSM-PC Child and Adolescent Version describes ADHD and related disorders under the section heading "Impulsive/Hyperactive or Inattentive Behaviors." It also provides a section on differential diagnosis and related conditions (pp. 93-110).

Wolraich ML, Felice ME, Drotar DE, eds. The Classification of Child and Adolescent Mental Diagnoses in Primary Care: Diagnosis and Statistical Manual for Primary Care (DSM-PC) Child and Adolescent Version. Elk Grove Village, IL: American Academy of Pediatrics, 1996. (Class R)

Suggested Behavior Rating Scales:

ADHD-IV Rating Scale

- Based on DSM-IV/DSM-PC criteria for ADHD
- Normed by age and sex
- Separates inattention and hyperactive/impulsive factors

Child Attention Profile (available in Barkley reference below)

- Based on inattention and overactive items from the Achenbach Child Behavior Check List
- Normed by sex
- Separates inattention and overactive factors

Conners Parent and Teacher Rating Scale

- Multiple scales assessing conduct, learning, psychosomatic, impulsive/hyperactive, and anxiety dimensions
- Some concern present over few items focusing on cognitive (inattention) vs. behavioral (hyperactive/impulsive) features of ADHD.

Numerous other rating scales are available which are multidimensional and more complex to score and interpret [Achenbach Child Behavior Checklist (CBCL) and Teacher Report Form (TRF), Youth Self Report, Devereaux Scales of Mental Disorders (DSMD), Behavioral Assessment System for Children (BASC), etc.] These may be helpful in evaluation of comorbid conditions. (Please refer to Discussion #5/7, "Screen/Assessment for Other Primary Conditions and Comorbidities.")

Cantwell DP. "Attention deficit disorder: a review of the past 10 years." *J Am Acad Child Adolesc Psychiatry* 35:978-87, 1996. (Class R)

DuPaul GJ, Anastopoulos AD, Shelton TL, et al. "Multimethod assessment of attention deficit hyperactivity disorder: the diagnostic utility of clinic-based tests." *J Clin Child Psychol* 21:394-402, 1992. (Class C)

DuPaul GJ, Power TJ, Anastopoulos AD, et al. ADHD Rating Scale - IV. New York: Guilford Press, 1998. (Class not assignable)

Eiradi RB, Power TJ, Karustis JL, et al. "Assessing ADHD and comorbid disorders in children: the Child Behavior Checklist and the Devereux Scales of Mental Disorders." *J Clin Child Psychol* 29:3-16, 2000. (Class C)

Lahey BB, Applegate B, McBurnett K, et al. "DSM-IV field trials for attention deficit hyperactivity disorder in children and adolescents." *Am J Psychiatry* 151:1673-85, 1994. (Class C)

Matier-Sharma K, Perachio N, Newcorn JH, et al. "Differential diagnosis of ADHD: are objective measures of attention, impulsivity, and activity level helpful?" *Child Neuropsychol* 1:118-27, 1995. (Class C)

Spitzer RL, ed. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington DC: American Psychiatric Press, 63-65, 1994. (Class R)

Wolraich ML, Felice ME, Drotar DE, eds. The Classification of Child and Adolescent Mental Diagnoses in Primary Care: Diagnosis and Statistical Manual for Primary Care (DSM-PC) Child and Adolescent Version. Elk Grove Village, IL: American Academy of Pediatrics, 1996. (Class R)

Sources for the suggested semistructured interview questionnaires and rating scales are listed below.

Barkley Clinical Interview (available in Barkley reference below).

Barkley RA. Attention Deficit Hyperactivity Disorder: a Clinical Workbook. New York: Guilford Press, 1991. (Class not assignable)

Behavior Assessment System for Children (BASC) (available from Reynolds and Kamphaus reference).

Reynolds CR, Kamphaus RW. Behavior Assessment System for Children (BASC). Circle Pines, MN: American Guidance Service, 1992. (Class not assignable)

Other Consensus Guidelines on ADHD:

American Academy of Pediatrics Committee on Quality Improvement Subcommittee on Attention Deficit Hyperactivity Disorder. "Clinical practice guideline: diagnosis and evaluation of the child with Attention Deficit Hyperactivity disorder." *Pediatr* 105:1158-70, 2000. (Class R)

Dulcan M. "Practice parameters for the assessment and treatment of children, adolescents, and adults with attention deficit hyperactivity disorder." *J Am Acad Child Adolesc Psychiatry* 36(10 Supplement): 085S-121S, 1997. (Class R)

National Institutes of Health Consensus Statement. "Diagnosis and treatment of attention deficit hyperactivity disorder (ADHD)." 16:1-37, 1998. (Class R)

5. 7. Screen/Assessment for Other Primary Conditions and Comorbidities

Children who have attentional problems represent a very diverse, heterogeneous population, and exhibit a broad range of symptom severity and a wide range of associated diagnoses. Up to 44% of children who have ADHD have at least one other psychiatric disorder, 32% have two other disorders, and 11% have three other disorders. Because of this extensive comorbidity, the evaluation of children referred for problems with attention, impulse control, or hyperactivity should include biobehavioral, developmental, psychological, psychosocial, educational and speech/language components.

If issues comorbid to ADHD are not identified and addressed they may complicate and worsen the child's level of functional impairment and lead to higher morbidity with a poorer prognosis. Research suggests that ADHD subgroups might be delineated based on patterns of comorbidity. These distinct subgroups may have different clinical courses, pharmacologic responses and risk factors. Proper identification of comorbid conditions can lead to appropriate refinements in treatment planning.

One way to get at comorbidity is by using standardized screening instruments such as the Child Behavior Checklist. It is important to note that this instrument serves a screening function and is not meant to be diagnostic for any specific condition. Training is recommended to effectively and appropriately score and interpret these instruments. Other, more specific, instruments including the Children's Depression Inventory, the Revised Children's Manifest Anxiety Scale and the Academic Performance Rating Scale may best be utilized in consultation with a qualified mental health professional.

Differentiating ADHD from an alternative primary condition such as oppositional-defiant disorder, generalized anxiety disorder, or a specific learning disability can be difficult even for seasoned clinicians. Therefore the diagnosis of ADHD should be applied with care and caution, only after an appropriately thorough evaluation.

Barkley RA, DuPaul GJ, McMurray MB. "Comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria." *J Consult Clin Psychol* 58:775-89, 1990. (Class C)

Biederman J, Newcorn J, Sprich S. "Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders." *Am J Psychiatry* 148:564-77, 1991. (Class R)

Biederman J, Faraone SV, Lapey K. "Comorbidity of diagnosis in attention deficit hyperactivity disorder." *Child Adolesc Psychiatr Clin North Am* 1:335-60, 1992. (Class R)

Cantwell DP, Baker L. "Differential diagnosis of hyperactivity." *J Dev Behav Pediatr* 8:159-65, 1987. (Class R)

Reiff MI. "Adolescent school failure: failure to thrive in adolescence." *Pediatr Rev* 19:199-207, 1998. (Class R)

5A.

7A.

Screen/Assess Biomedical Conditions

A health history and a physical/neurological/developmental assessment are necessary to identify or rule out problems in the biomedical realm of the ADHD differential diagnosis. Deficits in sensory areas may result in classroom difficulties and produce restless or inattentive behaviors. Children with neuromaturational delays, or neurological "soft signs" are at risk for learning and behavioral disorders.

Kelly DP, Aylward GP. "Attention deficits in school-aged children and adolescents: current issues and practice." *Pediatr Clin North Am* 39:487-512, 1992. (Class R)

Murphy MA, Hagerman RJ. "Attention deficit hyperactivity disorder in children: diagnosis, treatment, and follow-up." *J Pediatr Health Care* 6:2-11, 1992. (Class R)

Wender EH. "Attention deficit hyperactivity disorders in adolescence." *Dev Behav Pediatr* 16:192-95, 1995. (Class R)

5B.
7B. Screen/Assess Emotional/Psychiatric Problems

The four most likely conditions which may coexist with or complicate the diagnosis of ADHD are depression, anxiety disorders, conduct disorders, and substance abuse. These conditions are found to coexist in 15-30% of patients. Often a primary diagnosis of a psychiatric condition is not made due to the commonality of ADHD symptoms seen in these conditions. It is therefore important to screen for these disorders when evaluating a child for possible ADHD.

Biederman J, Newcorn J, Sprich S. "Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders." *Am J Psychiatry* 148:564-77, 1991. (Class R)

Faraone SV, Biederman J, Wozniak J, et al. "Is comorbidity with ADHD a marker for juvenile-onset mania?" *J Am Acad Child Adolesc Psychiatry* 36:1046-54, 1997. (Class C)

Geller B, Zimerman B, Williams M, et al. "DSM-IV mania symptoms in a prepubertal and early adolescent bipolar disorder phenotype compared to attention deficit hyperactive and normal controls." *J of Child Adol Psychopharmacology* 12:11-24, 2002. (Class C)

Giedd JN. "Bipolar disorder and attention deficit hyperactivity disorder in children and adolescents." *J Clin Psychiatry* 61:31-34, 2000. (Class R)

Jensen VK, Larrieu JA, Mack KK. "Differential diagnosis between attention deficit hyperactivity disorder and pervasive developmental disorder–not otherwise specified." *Clin Pediatr* 36:555-61, 1997. (Class C)

Spitzer RL, ed. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington DC: American Psychiatric Press, 1994: 63-65 (Class R)

Wozniak J, Biederman J, Kiely K, et al. "Mania-like symptoms suggestive of childhood-onset bipolar disorder in clinically referred children." *J Am Acad Child Adolesc Psychiatry* 34:867-76, 1995. (Class C)

5C.
7C. Screen/Assess Family/Psychosocial Problems

A. Psychosocial Stressors

There is some evidence that children with ADHD and a concurrent depressive or anxious condition have higher levels of life stress and maternal psychiatric symptoms.

Jensen PS, Shervette RE, Xenakis SN, et al. "Anxiety and depressive disorders in attention deficit disorder with hyperactivity: new findings." *Am J Psychiatry* 150:1203-1209, 1993. (Class C)

Rostain AL. "Attention deficit disorders in children and adolescents." *Pediatr Clin North Am* 38:607-35, 1991. (Class R)

Simeon JG, Wiggins DM. "Pharmacotherapy of attention deficit hyperactivity disorder." *Can J Psychiatry* 38:443-48, 1993. (Class R)

Spencer T, Biederman J, Wilens T, et al. "Pharmacotherapy of attention deficit hyperactivity disorder across the life cycle." *J Am Acad Child Adolesc Psychiatry* 35:409-32, 1996. (Class R)

B. Family History

There is increasing recognition that the subtypes of ADHD vary not only in patterns of comorbidity, but also with respect to genetic family history. Family history data suggests more ADHD, aggression, and substance abuse in families of children with ADHD-Hyperactive Impulsive subtype, whereas families of children with ADHD-Inattention subtype have more anxiety disorders and learning problems.

Barkley RA, DuPaul GJ, McMurray MB. "Comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria." *J Consult Clin Psychol* 58:775-89, 1990. (Class C)

Biederman J, Newcorn J, Sprich S. "Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders." *Am J Psychiatry* 148:564-77, 1991. (Class R)

5D.
7D. Screen/Assess Speech/Language Problems

Up to 50% of children with ADHD may show evidence of an expressive language problem. Deficits in verbal functioning may be chronic and are particularly common in adolescents with antisocial behavior.

Children with difficulties in the Pervasive Developmental Disorder/Autism spectrum can sometimes present with symptoms similar to ADHD. Identifying features of PDD/autism from the speech/language standpoint include:

- excessive self-talk
- unusual intonation patterns or monotone
- echolalia
- acts as if didn't hear
- socially inappropriate behaviors (e.g., screaming, interrupting)
- loss of previously acquired language skills

Children with ADHD are also at higher risk for "vocal cord abuse" and therefore voice quality (particularly "hoarseness") should be assessed. Children with evidence of vocal cord abuse (e.g., hoarseness of > 6 months duration) may need referral to an otolaryngologist to evaluate for vocal cord nodules.

Patients with ADHD who have comorbid vocal tics or Tourette's may demonstrate speech patterns typical to this disorder including repetitive noises, throat clearing, barking or even coprolalia.

Children with hearing impairments can also have ADHD exclusive of their hearing problems. This can be a complicated differential diagnosis, possibly requiring specialty referral.

Cantwell DP, Baker L, Mattison R. "Prevalence, type, and correlates of psychiatric diagnosis in 200 children with communication disorder." *Dev Behav Pediatr* 2:131-36, 1981. (Class D)

Giddan JJ. "Communication issues in attention deficit hyperactivity disorder." *Child Psychiatry Hum Dev* 22:45-51, 1991. (Class R)

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5E.
7E. Screen/Assess Academic/Learning Problems

One of the goals of assessment is to determine whether a student's academic difficulties are due to ADHD, learning disabilities, or both. A second question would be whether a student presenting with symptoms of ADHD actually has ADHD as the primary condition or whether a learning style issue (e.g., learning disability) might be sufficient to account for the identified problem behaviors. There is a significant overlap between populations of students with ADHD and those with academic skills deficits.

On average, students with ADHD do not differ substantially from the rest of the school age population in terms of overall intellectual functioning. Many of these children, however, show academic ***performance*** problems despite adequate ***abilities*** as measured by standardized tests. These children often exhibit less on-task behavior as compared to peers and have less opportunity to respond to and track with academic instruction. Growing evidence also suggests that the behavioral symptoms of ADHD disrupt academic skill acquisition and performance.

Prospective follow-up studies of children with ADHD into adolescence indicate that this population is at great risk for chronic underachievement and demonstrates higher school drop-out rates. About one-third of children with ADHD in research samples have been held back at least one grade before reaching high school.

One easy-to-use instrument for clinicians to screen academic functioning in students grades 1-6 is the Academic Performance Rating Scale. This instrument consists of 19 teacher-completed items which are scored to yield four subscale scores: Learning Ability, Academic Performance, Impulse Control and Social Withdrawal. A total score of 1.5 standard deviations below the mean for age and gender are considered significant for screening purposes and warrant consideration of referral for formal educational assessment.

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If a child is referred to formal psychoeducational assessment it is important to differentiate the need for IQ testing, achievement testing or both. IQ testing gives a general estimate of personal problem-solving ability based on age norms. It is important to note that verbal and performance (or nonverbal) abilities may differ, and that children with language-based disorders might be penalized for this on a standard IQ test such as the WISC-III, resulting in an underestimation of their true ability. A less language-based instrument such as the Kaufman (K-ABC) may be preferable. A selected set of subtests on the WISC-III called the Freedom from Distractibility Factor (consisting of the scores on the arithmetic, coding and digit span subtests) is no longer felt to be strongly correlative to a diagnosis of ADHD.

Achievement testing on the other hand, looks at a child's actual skill level in specific academic areas such as reading, spelling, or math as compared to either age norms or grade norms. Differences between predicted ability (based on IQ) and actual performance in specific academic skill areas (as defined by individual achievement test scores) are examined to identify learning disabilities, general underachievement, or giftedness.

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13. ADHD Diagnostic Formulation

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MANAGEMENT ALGORITHM DISCUSSION AND REFERENCES

17. Multimodal Management Coordinated by Primary Clinician

The multimodal treatment model for ADHD allows for simultaneous interventions resulting in effective management for the range of problems children with ADHD experience. Several studies have documented that the combination of intervention strategies result in consistently more positive short term results compared to the same strategies used individually. A management plan might include proven treatments such as parent-child education, medication, behavior management training, cognitive training, social skill training, and academic support.

A 1992 large-scale randomized clinical trial sponsored by the National Institute of Mental Health and the U.S. Department of Education examined the efficacy of medication management, intensive behavioral treatment, the two combined, and standard community care for the treatment of children with ADHD Combined Type. Results indicated that for the core symptoms of ADHD, "medication management was superior to behavioral treatment and to routine community care that included medication." Combined treatment of medication management and intensive behavioral treatment did not yield significantly greater benefits than medication management alone. In response to the publication of these data in 1999, a number of authors have published commentary articles regarding possible limitations of this study in terms of methodological concerns and the subsequent interpretation of the results. Thus, the conclusion that medical management alone is sufficient to treat core symptoms of ADHD is still debated.

Klassen A, Miller A, Raina P, et al. "Attention deficit hyperactivity disorder in children and youth: a quantitative systematic review of the efficacy of different management strategies." *Can J Psychiatry* 44:1007-16, 1999. (Class M)

MTA Cooperative Group. "A 14-month randomized clinical trial of treatment strategies for attention deficit hyperactivity disorder." *Arch Gen Psychiatry* 56:1073-86, 1999. (Class A)

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Pelham WE Jr, Carlson C, Sams SE, et al. "Separate and combined effects of methylphenidate and behavior modification on boys with attention deficit hyperactivity disorder in the classroom." *J Consult Clin Psychol* 61:506-15, 1993. (Class A)

19. Parents/Family Focused Strategies

Parents have a unique role in ADHD management as the primary advocates for their children. They see their children in all areas of life and desire to see them function successfully not just in the educational setting but in the home, in sports and socially. They have a long term goal of seeing their children become successful, well-adjusted members of society and are the only people to follow the children over the years into and through adulthood. Schools and physicians will change but the parents will be there to provide continuity in the management of their children as they strive toward adulthood. Through support groups, skills training and advocacy, parents can be more directed and better able to cope with the demanding situations that occur with ADHD children.

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20. Child Interventions

To date, no well-designed studies have been empirically validated to support the use of social skills training, problem solving training, or study/organizational skills training in the direct treatment of ADHD. Anecdotal endorsement of these interventions does exist. Using the same criteria for acceptance of psychosocial treatments for ADHD and those used for acceptance of medication treatments for ADHD is difficult given the methodological limits and complexities of psychosocial research. Thus, the following interventions may be understood and most appropriate for implementation with individuals with ADHD when problems with social skills, problem solving, or organization co-occur with or develop secondarily to ADHD symptoms.

The purpose of education of the child is to provide the basis for further independence. The person with ADHD will be managing their own environment and interpersonal relationships and choosing a vocation. Without insight and specific strategies to address this impairment, long-term consequences may include decreased self-esteem and poor problem solving. Loss of social support from peers has long-lasting consequences. Early intervention can avert the resulting loss of self-esteem and productivity.

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Hinshaw SP, Henker B, Whalen CK. "Cognitive-behavioral and pharmacologic interventions for hyperactive boys: comparative and combined effects." *J Consult Clin Psychol* 52:739-49, 1984. (Class A)

Pelham WE, Sams SE. "Behavior modification." *Child Adolesc Psychiatr Clin North Am* 1:505-18, 1992. (Class R)

Study/Organizational Skills

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21. School Interventions

Studies clearly demonstrate that combination therapy for ADHD (i.e., medication plus behavioral interventions) is superior to medication alone. The primary care provider can emphasize the fact that regardless of the decision to utilize or not utilize medication (e.g., stimulants), the literature would support the fact that children with ADHD clearly benefit from appropriate behavioral management and educational accommodations/modifications in the classroom.

Primary care providers for children with ADHD should explore with school personnel and parents opportunities for services and supports for the child which are available within their school.

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23. First Line Medication(s) Trial(s)

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25. Alternative Medication(s) Trial(s)?

For the few patients where psychostimulants are not effective, result in significant side effects, or where an associated comorbidity is present; several alternative medications have been shown to be more effective than placebo for ADHD symptoms. Included in these are the tricyclic antidepressants imipramine and desipramine, the alpha-adrenergic agonist clonidine, and the non-tricyclic antidepressant bupropion. Various controlled and open studies support the use of these agents in selected children and adolescents depending on clinical presentation and type of comorbid condition.

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Wender EH. "Attention deficit hyperactivity disorders in adolescence." *Dev Behav Pediatr* 16:192-95, 1995. (Class R)

Wilens TE, Biederman J, Baldessarini RJ, et al. "Cardiovascular effects of therapeutic doses of tricyclic antidepressants in children and adolescents." *J Am Acad Child Adolesc Psychiatry* 35:1491-1501, 1996. (Class R)

27. Maintenance and Continuing Care

Adherence to current regimen may be accomplished by asking open-ended non-threatening questions at each office visit. If adherence to medication regimen appears to be lacking, the patient may benefit from adherence interventions. Such interventions include re-educating the patient and family about medications and how they fit into the treatment plan (including side effects and how they may be prevented.) Other ways to help adherence include regimen simplification (e.g. less frequent dosing), use of patient adherence aids (e.g. tablet boxes, alarms), suggesting support group sessions, sending appointment reminders, cueing medication administration to daily activities (e.g. breakfast) and giving positive reinforcement for adherence efforts. Adverse effects of stimulants are not uncommon, but can generally be managed in most cases. The more common side effects include anorexia, insomnia, stomachaches, and headaches; less commonly rebound irritability, dysphoria, agitation, tics, and growth impairment are seen.

It is generally felt that, in individual patients, psychostimulants may unmask or exacerbate tics. However, in two recent studies evidence suggests that psychostimulants may not be associated with tic frequency or severity. Law and Schachar studied 91 children with ADHD, with and without mild to moderate comorbid tics in a randomized, double-blind, placebo-controlled study. They found that doses of methylphenidate in the typical clinical range did not produce significantly more tics in those children than in those who received a placebo. Furthermore, Gadow, et al., studied 34 prepubertal children with ADHD and chronic multiple tic disorder at 6-month and 2-year intervals, again revealing no evidence that motor or vocal tics changed in frequency or severity during maintenance therapy compared with initial evaluation.

Growth suppression has been a concern with long-term use of stimulants. It seems to occur rarely and is likely secondary to reduced caloric intake. Upon discontinuing the stimulant, growth rebound occurs with no significant compromise of ultimate height attained. Findings by Vincent, et al., (in 31 adolescents receiving methylphenidate for 6 mos-6 yrs) suggest that there is no significant adverse effect on early adolescent growth with this treatment.

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ADHD is a chronic condition with features lasting variably throughout childhood, adolescence, and into adulthood in many persons. Current experience reveals that the outcome of adolescents and adults with ADHD is variable as a group and based on individual factors. Most hyperactivity resolves by puberty, with degrees of inattentiveness, restlessness, and impulsivity persisting in about 50-60% of adolescents and young adults.

As expected, patients will be able to discontinue medication variably depending on the severity of ADHD symptoms and their ability to compensate relative to environmental demands. (e.g. school, work, family).

Poor prognostic indicators have included low intelligence, poor academic achievement, early conduct problems, poor social relationships, and family psychopathology. Many individuals, however, learn to compensate well as they rely on their significant strengths to overcome any persisting ADHD symptoms.

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Support for Implementation:

Diagnosis and Management of Attention Deficit Hyperactivity Disorder in Primary Care for School Age Children and Adolescents

This document provides resources, strategies and measurement specifications for use in closing the gap between current clinical practice and the recommendations set forth in the guideline.

Overview

The following aims were identified by the guideline work group as key areas in which medical groups may receive benefits in implementing this guideline.

The measures associated with these aims are presented as possible measures. Measures of aim help medical groups determine progress in achieving that aim. The possible measures listed are suggestions from the work group. However, other approaches may be customized by individual medical groups to ferret out improvement information important to the medical group's individual practice.

Priority Aims and Suggested Measures for Health Care Systems

1. Increase the use of DSM-IV or DSM-PC criteria and screening for other primary conditions and comorbidities for patients newly diagnosed with attention deficit hyperactivity disorder.

   Possible measures of accomplishing this aim:

   a. Percentage of patients newly diagnosed with ADHD whose medical record contains documentation of DSM-IV or DSM-PC criteria.

   b. Percentage of patients newly diagnosed with ADHD whose medical record contains documentation of screening for other primary conditions and comorbidities, as defined in the guideline.

2. Improve the primary care use of psychostimulant medications through a systematic, uniform approach.

   Possible measures of accomplishing this aim:

   a. Percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician performed an open label or placebo controlled stimulant medication trial.

   b. Percentage of patients diagnosed with ADHD and on psychostimulant medication whose medical record contains documentation of a follow-up visit at least twice a year.

3. Increase the number of clinicians who are utilizing a multimodality approach in treatment planning for children with ADHD.

   Possible measures of accomplishing this aim:

   a. Percentage of patients diagnosed with ADHD whose medical record contains documentation that they discussed parental resources for managing children with ADHD (e.g., parent training groups, videos, books, psychology referral).

   b. Percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician discussed the need for school based supports and educational service options for children with ADHD.

Possible Success Measure #1a:

Percentage of patients newly diagnosed with ADHD whose medical record contains documentation of DSM-IV or DSM-PC criteria.

Population Definition

All children and adolescents from kindergarten through 12th grade (ages 5 to 18) diagnosed with ADHD.

Data of Interest

$$\frac{\text{\# of medical records of newly diagnosed ADHD patients with documentation of DSM-IV or DSM-PC criteria}}{\text{Total \# of medical records reviewed}}$$

Numerator/Denominator Definitions

Numerator: ADHD is defined as ICD-9 codes of 314.00 or 314.01. Newly diagnosed is defined as documented ADHD in past 6 months and no documentation of ADHD codes in the previous 6-12 months. Documented is defined as any evidence in the medical record that DSM-IV or DSM-PC criteria were addressed. DSM-IV or DSM-PC criteria include evaluation for :

1) symptoms; 2) onset; 3) duration; 4) pervasiveness; 5) impairment.

Denominator: ADHD is defined as ICD-9 codes of 314.00 or 314.01. Newly diagnosed is defined as documented ADHD in past 6 months and no documentation of ADHD codes in the previous 6-12 months.

Method/Source of Data Collection

Medical groups may identify their patient samples in several ways. One way is to use your own available information systems to identify patients with ADHD from all payers. A minimum sample of 10 charts is suggested.

Time Frame Pertaining to Data Collection

Suggested data collection time frame is monthly.

Notes

Depending upon the size of the medical group's ADHD population, you may choose to collect the data on a less frequent basis.

Possible Success Measure #2b:

Percentage of patients diagnosed with ADHD and on psychostimulant medication whose medical record contains documentation of a follow-up visit twice a year.

Population Definition

All children and adolescents from kindergarten through 12th grade (ages 5 to 18) diagnosed with ADHD.

Data of Interest

$$\frac{\text{\# of medical records of ADHD patients on psychostimulant medication with documentation of a follow-up visit twice a year}}{\text{Total \# of ADHD patients on psychostimulants whose medical records are reviewed}}$$

Numerator/Denominator Definitions

Numerator: ADHD is defined as ICD-9 codes of 314.00 or 314.01. Diagnosed is defined as documented ADHD in the previous 6-12 months. Documented is defined as any evidence in the medical record that a follow-up visit occurs in the past 12 months. A follow-up visit for ADHD includes documentation of the following twice a year: height, weight, a discussion of medication, a discussion of school progress, and a care plan should be identified.

Denominator: ADHD is defined as ICD-9 codes of 314.00 or 341.01. Diagnosed is defined as documented ADHD in the past 6-12 months. Psychostimulant medications include: methylphenidate (Ritalin), Dextroamphetamine (Dexedrine) and Pemoline (Cylert).

Method/Source of Data Collection

Medical groups may identify their patient samples in several ways. One way is to use your own available information systems to identify patients with ADHD from all payers. A minimum sample of 10 charts is suggested. It is recommended that a chart review be done to determine follow-up visits for ADHD.

Time Frame Pertaining to Data Collection

Suggested data collection time frame is monthly.

Notes

Depending upon the size of the medical group's ADHD population, you may choose to collect the data on a less frequent basis.

Possible Success Measure #3a:

Percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician discussed the need for school-based supports and educational service options for children with ADHD.

Population Definition

All children and adolescents from kindergarten through 12th grade diagnosed with ADHD.

Data of Interes

$$\frac{\text{\# of medical records of ADHD patients with documentation of discussion of the need for school based supports and educational service options}}{\text{Total \# of ADHD patients whose medical records are reviewed}}$$

Numerator/Denominator Definitions

Numerator: ADHD is defined as ICD-9 codes of 314.00 or 314.01. Diagnosed is defined as documented ADHD in the previous 6-12 months. Documented is defined as any evidence in the medical record that a clinician discussed school based supports and educational service options.

Denominator: ADHD is defined as ICD-9 codes of 314.00 or 341.01. Diagnosed is defined as documented ADHD in the past 6-12 months.

Method/Source of Data Collection

Medical groups may identify their patient samples in several ways. One way is to use your own available information systems to identify patients with ADHD from all payers. A minimum sample of 10 charts is suggested.

Time Frame Pertaining to Data Collection

Suggested data collection time frame is monthly.

Notes

Depending upon the size of the medical group's ADHD population, you may choose to collect the data on a less frequent basis.

*Recommended Website Resources**

Note: Websites are listed in alphabetical order, not in order of work group preference.

Website Sponsor	Target Audience	Description	Website Address
American Academy of Child and Adolescent Psychiatry	Professionals and Parents of Children with ADHD	Professional organization website addresses wide range of psychiatric conditions in children and adults including ADHD. Includes information on clinical trials, past and upcoming conferences regarding ADHD Family resources includes policy statements and fact sheets on ADHD and related conditions.	www.aacap.org
American Academy of Pediatrics	Professionals	Professional organization website provides information on clinical trials, research findings, consensus statements regarding ADHD diagnosis and management, conferences and seminars	www.aap.org
Attention Deficit Disorder Association	Parents of Children with ADHD	General resource containing comprehensive information on ADHD. Six essays under the ABCs of ADHD may be particularly helpful to parents, educators and others who work with children with ADHD.	www.add.org Email: mail@add.org online support group at www.add.org/content/group1.htm
Children and Adults with Attention Deficit Hyperactivity Disorder	Parents of Children with ADHD	Comprehensive general resource includes fact sheets, resources and contacts for parents of children with ADHD as well as advocacy and legislative initiatives.	www.chadd.org
National Institute of Mental Health	Professionals and Parents of Children with ADHD	General resource for ADHD as well as psychological comorbidities. Includes clinical trial information, fact sheets, brochures and books to be ordered or directly downloaded.	www.nimh.nih.gov/Publications at www.nimh.nih.gov/publicat/adhdmenu.cfm

RECOMMENDED WEBSITE RESOURCES (CONT)*

These websites were reviewed by the ICSI *Diagnosis and Management of ADHD* guideline work group as credible resources. ICSI does not have the authority to monitor the content of these sites. Any health-related information offered from these sites should not be interpreted as giving a diagnosis or treatment.

*** Criteria for Selecting Websites**

The preceding websites were selected by the *Diagnosis and Management of ADHD* guideline work group as additional resources for practitioners and the public. The following criteria were considered in selecting these sites.

- The site contains information specific to the particular disease or condition addressed in the guideline.
- The site contains information that does not conflict with the guideline's recommendations.
- The information is accurate and/or factual. The author of the material or the sponsor of the site can be contacted by means other than email. For example, a nurse line or other support is provided.
- The material includes the source/author, date and whether the information has been edited in any way. The site clearly states revision dates or the date the information was placed on the internet.
- The site sponsor is an objective group without an obvious or possible bias. For example, the site does not promote a product, service or other provider.
- The coverage of the topic is appropriate for the guideline's target audience. It is clearly written, well-organized and easy to read. The site is easy to navigate.

Organizations with Resources for ADHD

Children and Adults with Attention Deficit Disorders (CHADD)
8181 Profession Place, Suite 201
Landover, MD 20785
(800) 223-4050
(301) 306-7070
http://www.chadd.org/

The Council for Exceptional Children
1110 North Globe Road, Suite 300
Arlington, VA 22201-5704
(703)620-3660
(703)264-9494 Fax
(703) 264-9446 TTY
E-Mail: http://www.cec.sped.org

Learning Disabilities Association/MN
400 Selby Avenue, Suite D
St. Paul, MN
(651) 222-2696
(800)488-4395 (in MN)

PACER Center, Inc. (Parent Advocacy for Children's Educational Rights)
8161 Normandale Boulevard
Minneapolis, MN 55437
(952) 838-9000 Voice
(952) 838-0190 TTY
(800) 537-2237 Greater MN
http:// www.pacer.org