



PLEASE NOTE:

The Virginia Premier Quality Improvement Committee approved the Attention-Deficit/Hyperactivity Disorder (ADHD) summary guidelines of the American Academy of Child and Adolescent Psychiatry (AACAP). In an effort to enhance the Pharmacotherapy section, the VPHP Quality Committee, supplemented the guidelines with the current stimulant and non-stimulant medication used for ADHD. The New England Journal of Medicine January 15, 2005 352; pp. 165-173 Table 4 and the American Journal Health Sys Pharm Vol 62 July 15, 2005, pp. 1502-1509, Table 2 were chosen for the references and use for this section. VPHP suggest that discussions of medication(s) in the text of the PHARMACOTHERAPY section of the guideline should be compared to the attached tables.

SUMMARY OF THE PRACTICE PARAMETERS FOR THE ASSESSMENT AND TREATMENT OF CHILDREN, ADOLESCENTS, AND ADULTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Principal Authors: Mina Dulcan, M.D. and R. Scott Benson, M.D. This Summary was developed by the Work Group on Quality Issues: John E. Dunne, M.D., Chair; Valerie Arnold, M.D., R. Scott Benson, M.D., William Bernet, M.D., Oscar Bukstein, M.D., Joan Kinlan, M.D., and Jon McLellan, M.D. AACAP Staff: L. Elizabeth Sloan, L.P.C. The full text of the Practice Parameters for the Assessment and Treatment of Children, Adolescents, and Adults with Attention-Deficit/Hyperactivity Disorder is available to Academy members on the World Wide Web (www.aacap.org) and appears in the October 1997 supplement to the JAACAP. The full text of the parameters was reviewed at the 1996 Annual Meeting of the American Academy of Child and Adolescent Psychiatry and approved by Council in February 1997. This summary was approved by Council on March 22, 1997. © 1997 by the American Academy of Child and Adolescent Psychiatry.

ABSTRACT

This summary of the practice parameters describes the assessment, differential diagnosis, and treatment of children, adolescents, and adults who present with symptoms of attention-deficit/hyperactivity disorder. The rationales for specific recommendations are based on a review of the scientific literature and clinical consensus which is contained in the complete document. Assessment includes clinical interviews with the child and parents and standardized rating scales from parent and teachers. Testing of intelligence and academic achievement is usually required. Comorbidity is common. The cornerstones of treatment are support and education of parents, appropriate school placement, and psychopharmacology. The primary medications are psychostimulants, but antidepressants and alpha-adrenergic agonists are used in special circumstances. Other treatments such as behavior modification, school consultation, family therapy, and group therapy address remaining symptoms. Key Words: attention-deficit/hyperactivity disorder, psychopharmacology, methylphenidate, dextroamphetamine, practice parameters.

The recommendations presented in these parameters give clinicians direction in the assessment and treatment of children, adolescents, and adults who present with symptoms of attention-deficit/hyperactivity disorder (ADHD). Recommendations are based on extensive review of the scientific literature and clinical consensus among experts in the subject. The literature review, including references, and the rationale for specific recommendations are contained in the complete document (American Academy of Child and Adolescent Psychiatry, 1997). INTRODUCTION Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common psychiatric disorders of childhood and adolescence. Recent clinical experience and research document the continuation of symptoms into adulthood. These parameters, therefore, cover the full age spectrum, although far more is known about this disorder in children and adolescents. For purposes of these parameters, attention deficit disorder (ADD), attention deficit disorder with hyperactivity

(ADD-H), hyperactivity, and attention-deficit/hyperactivity disorder (ADHD) will be considered to be interchangeable. The terms ADD without hyperactivity, undifferentiated ADD, and ADHD, predominantly inattentive type, are not identical, but are roughly equivalent.

DIAGNOSTIC CRITERIA

Two groups of symptoms define three types: predominantly inattentive, predominantly hyperactive-impulsive, and combined (both sets of symptoms). At least some symptoms must have been present before the age of seven years. By definition, the diagnosis of ADHD can not be made if the symptoms occur exclusively in the presence of a pervasive developmental disorder, schizophrenia, or other psychotic disorder or if they are better accounted for by another psychiatric disorder. Signs of ADHD may not be observable when the patient is in highly structured or novel settings, engaged in an interesting activity, receiving one-to-one attention or supervision, or in a situation with frequent rewards for appropriate behavior. Conversely, symptoms typically worsen in situations that are unstructured, minimally supervised, boring, or require sustained attention or mental effort. Core deficits include impairment in rule-governed behavior across a variety of settings and relative difficulty for age in inhibiting impulsive response to internal wishes or needs or external stimuli.

ADHD IN CHILDREN AND ADOLESCENTS

ASSESSMENT

The parent interview is the core of the assessment process. It is often difficult to confirm the diagnosis of ADHD by the interview with the child or adolescent alone, since some children and most adolescents with ADHD are able to maintain attention and behavioral control in the office setting. Both parent and child interviews are used to rule out other psychiatric or environmental causes of symptoms. Standardized interviews of children and adolescents are less useful for ADHD symptoms, but may aid in discovering alternative or comorbid diagnoses. Queries about family history of ADHD, other psychiatric disorders, and psychosocial adversity (e.g., poverty, parental psychopathology or absence, family conflict) are especially important because of their relationship to prognosis.

SCHOOL-RELATED ASSESSMENT

It is essential to obtain reports of behavior, learning, and attendance at school, as well as grades and test scores. Psychoeducational testing is indicated to assess intellectual ability and to search for learning disabilities that may be masquerading as ADHD or may coexist with ADHD. An informal clinical observation of the classroom and a less structured situation can provide important data regarding the child's behavior, the teacher's management style, and other characteristics of the academic environment.

RATING SCALES

Parent and teacher rating scales yield valuable information efficiently. The most commonly used are the parent-completed Child Behavior Checklist, the Teacher Report Form (TRF) of the Child Behavior Checklist, the Conners Parent and Teacher Rating Scales, the ADD-H: Comprehensive Teacher Rating Scale (ACTeRS), and the Barkley Home Situations Questionnaire and School Situations Questionnaire.

MEDICAL EVALUATION

Medical evaluation should include a complete medical history and a physical examination within the past 12 months. History should include the patient's use of prescribed, over-the-counter, and illicit drugs. Vision or hearing deficits should be ruled out. If clinical or environmental risk factors are present, lead level should be measured. Thyroid function tests are indicated only in the presence of clinical findings. There are no data to support the use of hair analysis or the routine measurement of zinc.

TESTS

ADHD is a clinical diagnosis; there is no test for ADHD. Neuropsychological tests are useful to evaluate specific deficits, but are not sufficiently helpful to be routinely performed. EEG or neurological consultation are indicated only in the presence of focal signs or clinical suggestions of seizure disorder or degenerative condition. There are insufficient data to support the usefulness of computerized EEG measures (neurometrics or brain mapping), event-related potentials, or neuroimaging. Computerized tests of attention and vigilance (CPTs) are not generally useful in diagnosis.

CLINICAL FEATURES

Children with ADHD suffer from various combinations of impairments in functioning at school, at home, and with peers. School-based problems include lower than expected or erratic grades, achievement test scores, and intelligence test scores, caused by gaps in learned material, poor organizational and study skills, difficulty with taking tests due to inattention and impulsivity, or failure to complete or turn in homework assignments. Behavioral difficulties related to ADHD often lead to constant friction among the student, peers, the teacher, and the parents. The result may be special class placement, suspension, or expulsion. Peers often quickly reject ADHD children, due to their aggression, impulsivity, and noncompliance with rules.

The DSM-IV estimates the prevalence of ADHD in school-aged children is between 3% and 5%. Although early research suggested that clinically referred girls and boys with ADHD had different risk factors and characteristics, more recent studies have found few differences related to gender. Teachers identify more boys than girls with ADHD symptoms.

The evidence from family genetic studies converges to suggest that there is a substantial genetic contribution to the etiology of ADHD. Siblings of children with ADHD have two to three times the risk of having ADHD. There is an increased risk of ADHD in the parents of ADHD children. Families with ADHD children are likely to have more stress, feelings of parental incompetence, marital discord, marital disruption, and social isolation than controls.

Overall, as many as 80% of diagnosed hyperactive children continue to have features of ADHD persisting into adolescence and up to 65% into adulthood. A family history of ADHD, psychosocial adversity, and comorbidity with conduct, mood, and anxiety disorders increase the risk of persistence of ADHD symptoms. Delinquent behavior or antisocial personality is seen on adolescent or adult follow-up in as many as 25% to 40% of clinically referred ADHD children, especially boys with early conduct problems.

Children with ADHD are more likely to experiment with drugs and to develop significant substance abuse problems. Specific predictors of poor prognosis include adult-directed oppositional and aggressive behavior, low IQ, poor peer relations, and continuing ADHD symptoms.

DIFFERENTIAL DIAGNOSIS AND COMORBIDITY

Some children may be at the high end of the normal range of activity, or have a difficult temperament. A variety of disorders can be mistaken for ADHD or can co-occur. Physical causes of poor attention may include impaired vision or hearing, seizures, sequelae of head trauma, acute or chronic medical illness, poor nutrition, or insufficient sleep. Anxiety disorders or realistic fear, depression, or the sequelae of abuse or neglect may interfere with attention. Mental retardation, borderline intellectual functioning, and learning disabilities are commonly mislabeled ADHD although they often co-occur. Various drugs (including phenobarbital) may interfere with attention. Early-onset mania or bipolar mixed state may be particularly difficult to distinguish from ADHD, or may be comorbid. Helpful distinguishing features of ADHD may be earlier age of onset, sustained clinical course, and family history. Comorbidity is present in as many as two-thirds of clinically referred children with ADHD, with high rates for oppositional defiant disorder, conduct disorder, mood disorders, and anxiety disorders. Tourette's syndrome and chronic tic disorder are often comorbid with ADHD. Substance abuse may be comorbid in adolescents. Speech and language delays are also common.

TREATMENT

Comorbidity, specific target symptoms, and the strengths and weaknesses of the patient, family, school, and community enter into the choice of intervention strategies. Parents, school personnel, and patients are included in the discussion of treatment options. The most crucial aspect of treatment planning is to establish a sufficient therapeutic alliance with the parents, the patient, and the school to permit specific treatment interventions to be implemented consistently. This may require individual, family, and parent sessions, as well as consultation to the school. Treatment plans should be individualized, according to the pattern of target symptoms and strengths identified in the evaluation. One way to conceptualize treatment planning is to consider core symptoms of inattention, impulsivity, and hyperactivity that are likely to require and respond to medication; behavioral symptoms to be addressed by environmental

modification; and skills deficits in academic, social, or sports domains, which require specific remediation and do not respond to either medication or behavior modification. Schools must provide appropriate educational curricula, student-to-teacher ratios, or other environmental accommodations. In addition, psychotherapy may be required to address secondary relationship problems resulting from the core ADHD deficits. Severe cases of ADHD require an ongoing highly structured environment with contingencies that supplement the effects of pharmacotherapy and psychosocial treatments. Psychoeducational treatment, providing information to patients, parents, and teachers, is considered standard practice. Content includes the symptoms of the disorder, areas of impairment in individual and family functioning resulting from the disorder, etiology (including heritability), treatment options, medication effects and side effects, expected course and prognostic features, basic principles of behavior management, legal rights within the public school system, and how to work with the child's school. It is useful to address persistent myths regarding ADHD and its treatment. For example, ADHD does not vanish with puberty and stimulant medications do not act paradoxically, do not cause drug abuse, and do not stop working at puberty. Parent counseling may be done with individual parents or couples, or in groups. The goal is to help parents understand their child and his or her problems, and to modify practices that may exacerbate the patient's difficulties. The therapist's understanding of the parents' point of view and of the hardships of living with a hyperactive child or adolescent is crucial. The most troubling difficulty with both psychosocial and pharmacologic treatments of ADHD is the lack of maintenance of effects once treatment is discontinued and failure of generalization to settings in which treatment has not been active. Situations where symptoms cause the most impairment should be targeted for treatment. Rating scales such as the CAP, the Home and School Situations Questionnaires, the IOWA Conners, the Academic Performance Rating Scale or custom-designed target symptom scales or daily behavioral report cards may be useful in monitoring treatment progress.

PHARMACOTHERAPY

The decision to medicate is based on the presence of a diagnosis of ADHD and persistent target symptoms that are sufficiently severe to cause functional impairment. The careful clinician balances the risks of medication, the risks of the untreated disorder, and the expected benefits of medication relative to other treatments.

ADMINISTRATION OF MEDICATIONS

Faithful adherence to a prescribed regimen requires the cooperation of the parents, the patient, and school personnel. Medications may be administered incorrectly because of parental factors such as lack of perceived need for drug, carelessness, inability to afford medication, misunderstanding of instructions, complex schedules of administration, and family dynamics.

Children and adolescents should not be responsible for administering their medication. They will often avoid, "forget," or outright refuse medication. Apparent tolerance or decreased drug effect may also be due to a reaction to a change at home or school. Lower efficacy of a generic preparation is another possibility, although supporting data are only anecdotal.

MONITORING MEDICATION EFFICACY

Multiple outcome measures are essential. The clinician should work closely with parents on dose adjustments and obtain annual academic testing and frequent reports from teachers. If symptoms are not severe outside of the school setting, a medication-free trial may be arranged for all or part of the summer. The purposes are to assess continuing efficacy of and need for medication, as well as to minimize side effects. If school behavior and academic performance are stable, a carefully monitored trial off medication during the school year (but not at the beginning) will provide useful data. Stimulants. In most cases, a stimulant is the first choice medication. Stimulants are clearly effective, at least in the short term, and, from large numbers of research studies and sixty years of clinical experience in very large numbers of patients, more is known about stimulant use in children than about any other drug. In addition, most side effects are mild and easily reversed, the onset of action is rapid, the dose is easy to titrate, and positive response often can be predicted from a single dose. The majority of hyperactive children improve on stimulants. Although actual response rates vary, a recent study using a wide range of doses of methylphenidate and dextroamphetamine found that 96% improved behaviorally in response to one or both drugs. Stimulant effects on attentional, academic, behavioral, and social domains are highly variable. In general, both behavioral and cognitive measures improve with increasing dose, within the usual therapeutic range. Whether an individual patient is considered a positive responder depends on the balance of improvement in target symptoms with severity of side effects. No patient characteristics are helpful in suggesting which stimulant drug is best for a particular child. Methylphenidate is the most commonly used and best studied and may be more effective in reducing motor activity than other stimulants.

Dextroamphetamine often has a longer duration of action than methylphenidate, permitting less frequent doses or reducing gaps in medication effect between doses. Dextroamphetamine is less expensive, but it is not included in many third party formularies. Dextroamphetamine may be more likely to cause appetite suppression and compulsive behaviors. If one stimulant is insufficiently effective, another should be tried before using another drug class. Long-acting preparations are appealing for children for whom the standard formulations act briefly (2 ½ to 3 hours), who experience severe rebound, or for whom administering medication every four hours is inconvenient, stigmatizing, or impossible. Stimulant medication is typically initiated with a low dose and titrated weekly according to response and side effects. Giving medication after meals minimizes anorexia. Patients without hyperactivity, or with ADHD and comorbid mental retardation, may benefit from and tolerate lower doses of stimulants. Starting with only a morning dose may be useful in assessing drug effect, by comparing morning and afternoon school performance. Stimulants have an extremely high margin of safety. Side effects are similar for all stimulants and increase linearly with dose. In the individual patient, however, side effect severity may differ among the stimulants. Often waiting for a few weeks or decreasing the dose eliminates or reduces common side effects such as irritability, headaches, abdominal pain, and loss of appetite. Mild appetite suppression is almost universal, and may be addressed by giving medication after breakfast. Persistent or severe side effects may require changing drugs. Rebound effects, consisting of increased excitability, activity, talkativeness, irritability, and insomnia, may be seen as the last dose of the day wears off, or for up to several days after sudden withdrawal of high daily doses of stimulants. Although rebound has not been convincingly demonstrated in controlled trials, it is frequently encountered by clinicians. Management strategies include increased structure after school, a dose of medication in the afternoon that is smaller than the morning and midday doses, use of a long-acting formulation, and the addition of clonidine or guanfacine to the regimen. Using a short-acting stimulant TID does not increase sleep problems over BID use. Difficulty falling asleep may be due to ADHD symptoms, oppositional behavior or separation anxiety, stimulant drug effect,

rebound, or a preexisting sleep problem. Stimulants may either worsen or improve irritable mood. Persistent stimulant-related dysphoria may resolve with a lower dose, or may require switching to a different stimulant or to an antidepressant medication. The use of stimulants in patients with tics has been controversial because of concern that new, persistent tics might be precipitated. As many as 60% of children with ADHD develop transient, usually subtle tics when one of the stimulant medications is initiated. For children who already have Tourette's syndrome or chronic tics, low to moderate doses of methylphenidate often improve attention and behavior without significantly worsening tics. Stimulants should be used with caution when there is patient or family history of tics. In some cases, a stimulant may be the first choice medication, even with a history of tics. If tics appear or worsen, the usual response is to observe for a few days to a few weeks. If tics remain problematic, dose reduction or a different stimulant may be tried. Clinical judgment is required to balance the relative impairment from tics and from ADHD symptoms. The possibility of growth retardation resulting from stimulant use has been a concern. Decrease in expected weight gain is actually small, although it may be statistically significant. Effect on height is rarely clinically significant, and can be minimized by establishing drug-free periods. There are few adverse cardiovascular effects of stimulants but caution and clearance by a cardiologist is advisable for patients with heart disease, or strong family history of heart disease. There is no evidence that stimulants produce a decrease in the seizure threshold.

Bupropion. Bupropion may be effective in children with ADHD and conduct disorder. However, research data on this drug in children and adolescents are limited. The most serious side effect is a decrease in the seizure threshold, which necessitates divided doses to reduce this risk.

Tricyclic Antidepressants (TCAs). Although far less studied than stimulants, controlled trials of TCAs in both children and adolescents demonstrate efficacy in the treatment of ADHD. Despite their narrower margin of safety, they may be indicated as second line drugs for those patients who do not respond to stimulants or who develop significant depression or other side effects on stimulants, or for the treatment of ADHD symptoms in patients with tics or Tourette's disorder. TCAs have a longer duration of action than stimulants and rebound is not a problem. Drawbacks include serious potential cardiac side effects (especially in prepubertal children), the danger of accidental or intentional overdose, sedating and anticholinergic side effects, and possible declining efficacy over time. Desipramine has fewer anticholinergic side effects than imipramine, and has immediate and sustained efficacy in both children and adolescents, although less than methylphenidate. In trials with children and adolescents nortriptyline produced improved attitude, increase in attention span, and a decrease in impulsivity. Five cases of unexplained sudden death during desipramine treatment have been reported. A causal relationship between the medication and the deaths has not been established. The evidence suggests that treatment with desipramine in usual doses is associated with only slightly added risk of sudden death beyond that occurring naturally. Desipramine may represent a greater risk than other TCAs, however. TCAs should be used only for clear

indications and with careful monitoring of therapeutic efficacy and of baseline and subsequent vital signs and ECG. **Selective Serotonin Reuptake Inhibitors (SSRIs).** Anecdotal reports do not support efficacy of the SSRIs for the core symptoms of ADHD.

Alpha-adrenergic Agonists. Clonidine may be useful in modulating mood and activity level and improving cooperation and frustration tolerance in a subgroup of children with ADHD, especially those who are very highly aroused, hyperactive, impulsive, defiant, and labile. Although clonidine is not effective in treating inattention per se, it may be used alone to treat behavioral symptoms of ADHD in children with tics or those who are nonresponders or negative responders to stimulants. It is most commonly used as an adjunct to

treatment with a stimulant, although concerns have been raised about the safety of combining methylphenidate and clonidine. Before starting a patient on clonidine, the clinician should perform a thorough cardiovascular evaluation. Guanfacine hydrochloride has recently begun to be used alone for children with ADHD and Tourette's disorder whose tics worsen on a stimulant, or in combination with a stimulant in the treatment of children with ADHD who cannot tolerate the sedative side effects of clonidine or in whom clonidine has too short a duration of action, leading to rebound effects.

Neuroleptics. These drugs should be used only in the most unusual circumstances because of lesser effectiveness, excess sedation and potential cognitive dulling, and risk of tardive dyskinesia or neuroleptic malignant syndrome. Consultation with a psychiatrist is advisable if this drug class is a consideration.

PSYCHOSOCIAL INTERVENTIONS

Behavior Modification. In the short term, behavioral interventions improve targeted behaviors, social skills, and academic performance in specific settings, but are less useful in reducing inattention, hyperactivity, or impulsivity. Hyperactive children often require both instruction to remedy deficits in social or academic skills and contingency management to induce them to use the skills. The greatest weaknesses of behavior therapy are lack of maintenance of improvement over time and failure of changes to generalize. Maximally effective programs benefit from home and school cooperation, focus on specific target behaviors, provide contingencies that follow behavior quickly and consistently, and incorporate novelty to maintain interest. In general, behavior modification alone is less effective than medication alone. Most controlled studies demonstrate little additional benefit when behavior modification is added to medication.

Behavioral techniques in school settings. Techniques for use in schools include token economies, class rules, and attention to positive behavior, as well as time-out and response cost programs. Reinforcers may be dispensed through the use of daily report cards. The homework notebook is useful in improving completion of assignments.

Parent training. Parents are taught to give clear instructions, to positively reinforce good behavior, to ignore some behaviors, and to use punishment effectively. The most powerful parent training programs use a combination of written materials, verbal instruction in social learning principles and contingency management, modeling by the clinician, and behavioral rehearsal of specific skills. The high prevalence of ADHD among parents of children with ADHD often makes compliance with training programs and execution of interventions difficult. Family therapy. Family psychotherapy may be indicated to address family dysfunction stemming either from the difficulty of raising and managing an ADHD child or from primary parental or marital pathology. Referral to a parent support group such as CHADD is a cost-effective intervention that is well accepted by families. Individual psychotherapy. The lack of insight and failure to generalize therapeutic effects that are characteristic of ADHD mitigate against usefulness of individual psychotherapy for ADHD symptoms per se. Supportive therapy may be useful for children and adolescents who do not have satisfying relationships with adults because parents are unavailable or unsuitable, or the patient's symptoms make it very difficult to establish a positive relationship.

Multimodal treatment. Although clinical wisdom and the need to address multiple problems favor multimodal treatment of ADHD, there are very limited research data to support it. In the clinical setting, multimodal treatments may be indicated to address comorbid conditions or ADHD target symptoms that are not sufficiently improved by medication. The combination of classroom behavior therapy (token economy, time-out, and daily report card) with a low dose of methylphenidate is able to produce the same result as a high dose of medication alone. An ongoing four-year study has not found intensive multimodal treatment to be additive to stimulant medication in improving functioning. Following multimodal treatment, a greater proportion of children with ADHD are not able to function adequately without medication. At the two-year evaluation, medication has not been able to be withdrawn without clinical relapse. "Medication only" in this study entailed a detailed evaluation prior to treatment, individualized titration of three times daily doses (seven days per week) using weekly feedback from parents, teachers, and the children, and monthly 30 to 45 minute sessions to evaluate medication efficacy and side effects and to provide clinical management, education, and support. This model of medication management bears little resemblance to routinized prescription of medication with 15 minute "medication checks" monthly or even less frequently.

Dietary interventions. Since the mid 1970's, the advocates of dietary treatment of behavioral problems have been remarkably persistent despite the lack of scientific evidence. Families who insist on trying a diet should be permitted to do so, provided the diet is nutritionally sound, because initial attempts to dissuade them may disrupt the therapeutic alliance. Controlled studies have been unable to demonstrate that ingestion of sugar has an effect on activity or aggression in normal or hyperactive children, even those identified by their parents as sugar responsive.

SPECIAL ASPECTS OF ADHD IN PRESCHOOL CHILDREN

Parent training in a group setting for families of preschoolers with ADHD can improve child compliance, parental style of interaction, and parental management skills. In this age group, stimulants have more side effects and lower efficacy and therefore should be used only in more severe cases or when parent training and placement in a highly structured, well-staffed preschool program have been unsuccessful or are not possible.

SPECIAL ASPECTS OF ADHD IN ADOLESCENTS

The clinical picture in adolescents tends to include restlessness rather than gross hyperactivity. Impairment in adolescents results in diminished school performance, low self-esteem, poor peer relations, and erratic work record. Stimulants remain effective in the treatment of adolescents with cognitive or behavioral symptoms of ADHD. Youngsters who are positive responders as children do not require a change in drug at puberty, and newly diagnosed adolescents may be started on a stimulant. Non-compliance with medication and the risk of misuse of stimulants is increased. Giving or selling medication to peers is more common than abuse by the patients themselves.

ADHD IN ADULTS ASSESSMENT

ADHD is often missed in adults, particularly if the disorder was not identified when the patient was a child. Adults often seek evaluation and treatment after their child has been diagnosed with ADHD and the parent recognizes the symptoms. Clues to the diagnosis include a school history of underachievement, and childhood labels of undisciplined, unmotivated, immature, "space cadet," "spacey," or daydreamer. Assessment of ADHD in adults includes a complete psychiatric evaluation with particular attention to the core symptoms of ADHD. Childhood history is absolutely essential. Due to the high prevalence of comorbid substance abuse, focused inquiry regarding drugs and alcohol and a urine drug screen are often indicated. Standardized rating scales may be useful.

CLINICAL FEATURES

ADHD adults suffer from impairment in attention, impulse control, problem-solving strategies, school performance, academic attainment, self-esteem, peer relations, and work record. Marital disruption is increased. The differential diagnosis of ADHD in adults includes agitated depression, hypomania, dissociative disorders, borderline or antisocial personality disorder, alcohol and drug abuse or withdrawal (especially cocaine), and a variety of primary medical conditions and cognitive brain syndromes.

TREATMENT

As with child and adolescent patients, education about ADHD is a core feature of the treatment plan. Involvement of the patient's significant others may be useful in obtaining feedback about the efficacy of treatments and in improving cooperation with treatment. The same medications used for children are effective in adults, although ADHD adults appear to have more variability in drug response than do ADHD children. As with child patients, target symptoms should be identified, with clear baselines and repeated reevaluation in order to assess progress. Medications appear to have qualitatively the same therapeutic effects regardless of age. In choosing a medication, consideration should be given to potential abuse of the drug and to comorbid diagnoses.

PSYCHOSOCIAL INTERVENTIONS

The data on psychosocial interventions in the treatment of adults with ADHD are entirely anecdotal. Psychotherapy is unlikely to be successful without pharmacotherapy, but this is not a unanimous opinion. Without appropriate medication, cognitive therapies may be ineffective and psychodynamic psychotherapy even harmful. Family therapy may be helpful in addressing the chaotic relationships that often result from ADHD.

REFERENCE

American Academy of Child and Adolescent Psychiatry (1997), Practice parameters for the assessment and treatment of children, adolescents, and adults with attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry* 36(10suppl)

RECOMMENDED MEDICATIONS FOR ADHD

<u>Medication*</u>	<u>Initial Dose</u>	<u>Usage Dose</u>	<u>Doses per Day</u>	<u>Side Effects/Comments</u>	<u>Contraindications</u>
Methylphenidate**					
		mg			
Ritalin, Methylin	5-10	10-20	2-3 }	<i>Appetite suppression, stomachaches, headaches, irritability, weight loss, deceleration in rate of growth, exacerbation of psychosis, exacerbation of tics, mild increase in blood pressure and pulse.</i>	<i>Marked anxiety, tension, agitation, glaucoma, use of monoamineoxidase inhibitors, seizures, tics.</i>
Concerta	18-27	27-54	1 }		
Metadate ER, Metadate CD, Methylin ER	10	10-20	1 }		
Ritalin LA	20	20-40	1 }		
Focalin***	2.5-5	2.5-5	2-3 }		
Focalin XR caps	5	5-20	1 }		
Methylphenidate Patch	1 Daily	1 applied daily for up to 9 hrs			
Dextroamphetamine (sulfate alone and in combination with amphetamine salts)**					
Dexedrine	5	5-20	2-3	<i>Appetite suppression, weight loss, stomachaches, headaches, irritability, possible growth</i>	<i>Cardiovascular disease, hypertension, hyperthyroidism, glaucoma, drug dependence,</i>
Dexedrine Spansule	5-10	5-15	1-2		
Adderall	5-10	5-30	1-2	<i>inhibition, exacerbation of psychosis, exacerbation of tics, mild increase in blood pressure and pulse.</i>	<i>use of monoamine oxidase inhibitors.</i>
Adderall XR	5-10	10-30	1		
Vyvanse Caps	30 mg	30-90	1		
Atomoxetine*****					
Strattera	10-25	18-100	1-2	<i>Appetite suppression, nausea, vomiting, fatigue, weight loss, deceleration in rate of growth, mild increase in blood pressure and pulse.</i>	<i>Jaundice or other clinical or laboratory evidence of liver injury, use of monoamine oxidase inhibitors, narrow-angle glaucoma.</i>
Bupropion*****					
Wellbutrin SR	100-150	150	1-2	<i>Weight loss, insomnia, agitation, anxiety, dry mouth, seizures, others.</i>	<i>Seizures, bulimia, anorexia nervosa, abrupt discontinuation of alcohol or benzodiazepines.</i>
Wellbutrin XL	150	150-300	1		

or other bupropion products (e.g., zyban).

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- **For each category the generic drug is given and dosing information for each named marketed drug.*
 - ***The manufacturer states that seizures and tic disorders are contraindications: research supports the use of stimulants in children with seizures that have stabilized with the use of anticonvulsants and in children with tic disorder or Tourette's disorder. With use of a long-acting methylphenidate or dextroamphetamine product, a short-acting product may be added at 4 p.m. to 6 p.m. for homework or special activities: appetite and sleep onset are then carefully monitored..*
 - ****Focalin is a dextro isomer of methylphenidate that is given at a lower dose*
 - *****Younger children may need two doses a day.*
 - ******Bupropion has not been approved by the Food and Drug Administration for pediatric use. Only sustained release (twice daily) or extended release (once a day) are recommended for adolescents. There is a higher incidence of side effects with the immediate release preparation.*
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NON STIMULANTS USED in the TREATMENT of ADHD in CHILDREN

Drug	Brand Name(s)	Place in Therapy	Usage Onset of effect (wk)	Dosage Range	Adverse Effects
Atomoxetine	Strattera	2 nd line (1 st line in Pts, who can not take a Stimulant due to an active Substance abuse disorder Or prior adverse effect)	2-4	<70 kg: 0.5 mg/kg/day, increase after a minimum of 3 days to 1.2 mg/kg/day, >70 kg 20-40 mg/day, increase after a minimum of 3 days as tolerated and p.r.n. up to 100 mg/day.^A	Reduce appetite, stomach pain, nausea, vomiting, weight loss, sedation, dizziness insomnia, monitor for increase in blood pressure and pulse.
Bupropion	Wellbutrin Wellbutrim SR Wellbutrim XL	2 nd line	2-4	3 mg/kg/day at end of week 1; may increase over 3wk to 6 mg/kg/day or 300 mg/day, whichever is smaller bid -tid for immediate acting formulations (divided bid for sustained release formulations)^B	Nausea, insomnia, rash, tics, dry mouth agitation, headache, constipation, tremor, weight gain, increase risk of seizures maximum doses: 150mg imm. release 200mg for SR, and 450 mg for XL.
Tricyclic antidepressant					
Imipramine	Tofranil	2 nd or 3 rd line	2-4	1 mg/kg/day, increase by 1 mg/kg weekly to a maximum of 4mg/kg/day.	Dry mouth, dizziness, constipation, sedation: ECG monitoring required at baseline and follow-up.
Desipramine	Norpramin	2 nd or 3 rd line	2-4	Same as for imipramine.	same as for imipramine; close monitoring if > 3 mg/kg/day.
Nortriptyline	Aventyl, Parnelor	2 nd or 3 rd line	2-4	0.5 mg/kg/day, increase by 0.5 mg/kg Weekly to a maximum of 2.5 mg/kg day.	same as for imipramine.
Alpha-agonists Clonidine	Catapures	Adjunct therapy or 4 th line treatment	2-8	0.05 mg bid-tid increase by 0.05 mg weekly to a target range of 0.1-0.4 mg/Day; clonidine syrup can be compounded.	Sedation, irritability, drop in blood pressure, sleep disturbance, dry mouth, constipation, dizziness, ECG monitoring recommended but controversial, vital sign monitoring recommended
Guanfacine	Tenex	Adjunct therapy or 4 th line treatment	2-8	0.5 mg qd or bid increase by 0.5 mg weekly to a target range of 1-4 mg day.	Same as for Clonidine

^A. Poor metabolizers may require lower dosages.

^B. The typical starting dosage is 37.5 mg b.i.d. for the immediate release formulation and 100 mg for the sustained release formulation. The sustained release formulation can be given once daily or it can be given as 50mg twice a day.