

Diagnosis and Treatment Issues In Adult ADHD

Intended Audience

This activity has been designed for psychiatrists, primary care physicians, and other health care professionals involved in the management of adolescents and adults with attention-deficit/hyperactivity disorder (ADHD).

Activity Overview

Adult ADHD is a complex disorder that is often masked by comorbid psychiatric conditions and plagued by an uncertain identity that has only recently begun to shift diagnostic and therapeutic paradigms. A patient with ADHD requires a multifactorial assessment for an appropriate diagnosis as well as a highly individualized treatment plan that may include a stimulant or nonstimulant compound. Each regimen must be based on a process of initiation, titration, and monitoring of the patient for safety and efficacy. This is of particular concern during the management of a patient transitioning from adolescence to adulthood, as well as for the management of an adult who may have a comorbidity such as substance abuse, which can significantly impede a physician's ability to manage the patient. Clinicians are wise to systematically screen for all conditions with the belief that full results are obtained when comprehensive assessment and intervention plans are applied.

This CME activity is intended to help overcome existing barriers to effective treatment as a means to improve patient outcomes.

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1 hour and 15 minutes

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Educational Objectives

At the completion of this educational activity, participants should be better able to:

- 1 Evaluate diagnostic approaches for adult ADHD.
- 2 Recognize and manage impairments associated with ADHD over the life span.
- 3 Incorporate existing knowledge into decision making when planning treatment strategies.
- 4 Develop treatment strategies for adult patients with complicated cases of ADHD.

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Introduction

Until the mid-1980s, attention-deficit/hyperactivity disorder (ADHD) was thought to be primarily a pediatric disorder. However, studies conducted between then and now have consistently found that the symptoms of ADHD can persist into adulthood. A 2006 iteration of the National Comorbidity Survey Replication (NCSR) estimated that the prevalence of ADHD among adults in the United States is 4.4% (or between 8-9 million individuals). Approximately 75% of these individuals have never been given a diagnosis and only 11% of them are receiving or have received treatment.¹ During the last few years, both research and treatment strategies have begun to focus more intensely on adult patients because they experience challenges related to ADHD that are different from those of children; they are also more likely to self-medicate with alcohol or illicit drugs, and their condition may be misdiagnosed and incorrectly treated with prescription drugs.

Psychiatric comorbidities of ADHD include depressive disorders, anxiety, substance abuse disorders (SUDs), and bipolar disease—any of which can hinder diagnosis. The costs to the individual with untreated or incorrectly treated ADHD are great because the condition can erode personal relationships, negatively affect job performance and overall career goals, and lead to erratic behaviors that can endanger society, such as automobile accidents. In a study by Biederman and colleagues, adults with diagnosed ADHD were significantly less likely to have graduated from high school (83% vs 93% of controls; $P \leq 0.001$) or to have obtained a college degree (19% vs 26%; $P < 0.01$), were less likely to be currently employed (52% vs 72%; $P \leq 0.001$), and were significantly more likely to have changed jobs over a 10-year period (5.4 vs 3.4 jobs; $P \leq 0.001$).² An investigation of adolescents and young adults with ADHD showed that they were more likely than their non-ADHD peers to receive traffic citations and have their licenses suspended, and that they were involved in a greater number of automobile accidents.³

The etiology of ADHD is not known but recent studies suggest both a strong genetic link⁴ and environmental factors, such as history of preterm delivery⁵ and maternal smoking during pregnancy.⁶ The rate of familial transmission in ADHD is known to be high, with estimates of its inheritability hovering around 75%.⁷ The combined subtype of ADHD is characterized by symptoms of inattention, impulsivity, and hyperactivity with a childhood onset, although the condition may not have been diagnosed in childhood.⁸ Hyperactivity symptoms tend to wane in adults, as the hyperactivity is more often felt than manifested.⁹ Compared with children who may act out in a classroom environment by fidgeting (hyperactivity) and interrupting others (impulsivity), adults with ADHD may have learned to compensate, keeping such cues under control, but they may still exhibit symptoms of inattention that ultimately erode their quality of life.

Childhood ADHD Persisting into Adulthood

As a child with ADHD enters adulthood, does he or she recover from the condition, or does it transform into another psychiatric condition? Early studies of children with ADHD concluded that all ADHD symptoms decline with age. For example, a longitudinal study reported in 1996 by Hill and Schoener found that the rate of ADHD in a given age group, based on *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* criteria, starts at 4% in childhood and declines by 50% every 5 years.¹⁰ By extrapolating this figure into adulthood, the researchers estimated that the rate of adult ADHD is 0.8% at age 20 and 0.05% at age 40.

Follow-up studies have shown that ADHD does indeed persist into adulthood. A study reported by Biederman et al in 1996 followed children with ADHD for 4 years and found that 85% of them continued to manifest the disorder through the end of the follow-up period¹¹; only for a minority of children was ADHD a transient disorder that remitted early in its development. The results of the

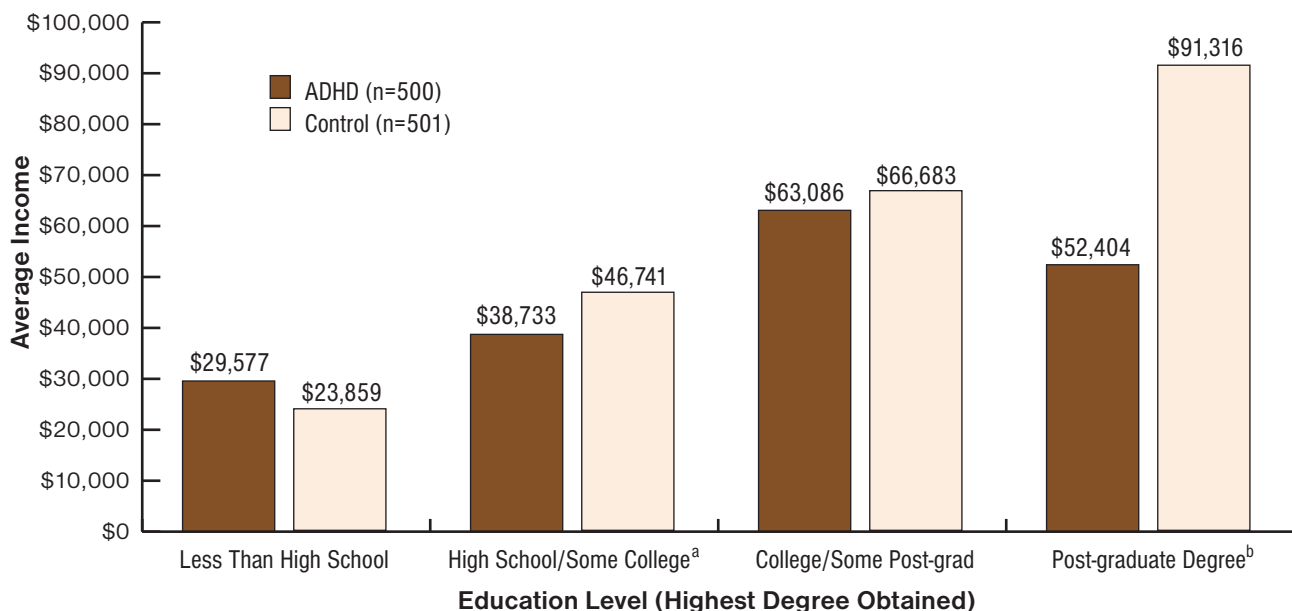


Figure 1. Average household income by level of education attained in adults with and without ADHD.

^a $P < 0.05$; ^b $P < 0.001$

ADHD, attention-deficit/hyperactivity disorder

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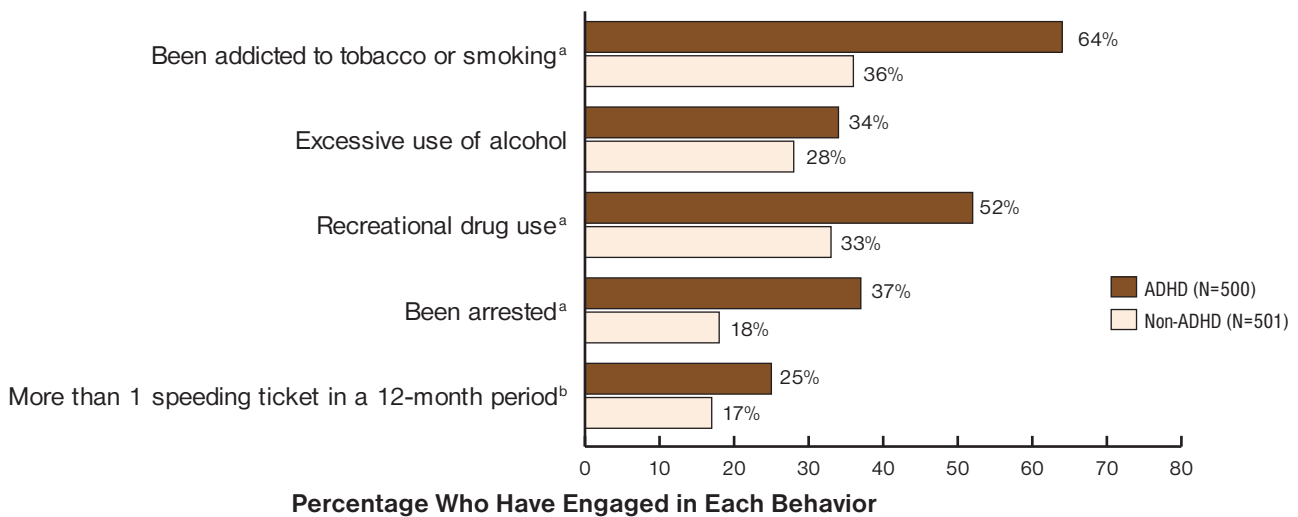


Figure 2. Prevalence of addiction and antisocial or destructive behaviors in adults with and without ADHD.

^a $P \leq 0.001$; ^b $P \leq 0.01$

ADHD, attention-deficit/hyperactivity disorder

Biederman J, Faraone SV, Spencer TJ, Mick E, Monuteaux MC, Aleardi M. Functional impairments in adults with self-reports of diagnosed ADHD: A controlled study of 1001 adults in the community. *J Clin Psychiatry*. 2006;67(4):524-540. Copyright 2008, Physicians Postgraduate Press. Adapted or Reprinted by permission.

NCSR in 2006, which included a large subset of 3,199 respondents ranging in age from 18 to 44 years, revealed that the estimated current prevalence of adult ADHD is 4.4%—more than 80 times the predicted longitudinal prevalence suggested by the 1996 study of Hill and Schoener.¹⁰

The discrepancy among study results in terms of the prevalence of ADHD may be a consequence of the fact that researchers now look at correlates of ADHD that are outside the criteria set forth in *DSM-IV*, which are based on symptoms of impulsivity, hyperactivity, and/or inattention that emerge prior to the age of 7 years, specifically examining the adult presentation of ADHD symptoms.¹² In a study of 128 boys divided into 6 age groups (<6, 6-8, 9-11, 12-14, 15-17, and 18-20 years), researchers assessed the symptoms of ADHD and symptom clusters 5 times during a period of 4 years. The results showed that age was significantly associated with a decline in overall symptoms of ADHD (ie, hyperactivity, impulsivity, and inattention) as it is defined by *DSM-IV*.⁸ In the oldest age group (18-20 years), the rate of syndromic ADHD remission (loss of full diagnostic status) was greater than 60%, whereas the rate of functional ADHD remission was 10%; the patients no longer qualified for a *DSM-IV* diagnosis of ADHD even though some symptoms of the disorder remained. With regard to specific symptoms, it is notable that the rate of remission of inattentiveness was lower than the rate of remission of either hyperactivity or impulsivity, with inattentiveness persisting past age 20 and most likely well into adulthood.⁸

Life Impairments Associated With Adult ADHD

Impairments associated with adult ADHD include distress resulting from the symptoms, reduced ability to function at work and in academic settings, problems maintaining stable relationships, and difficulty participating in social activities. The disorder is commonly associated with volatile moods, antisocial behavior, and drug and alcohol misuse. Adults with ADHD also have an increased risk for the development of comorbid anxiety, depression, personality

disorders, and substance abuse disorders. If left untreated, adult ADHD can cause significant personal, social, and economic burdens that have a negative effect on overall quality of life.

Adults with undiagnosed and untreated symptoms of ADHD experience *functional disabilities* that can translate into a poorer quality of life. A study by Biederman and colleagues found that patients with ADHD were less likely to be employed regardless of educational level attained: 22% versus 34% among those with a high school education, 30% versus 56% among those with a high school education and some college, 55% versus 72% among those with a college education and some postgraduate study, and 65% versus 77% among those with a postgraduate degree.² Consequently, annual incomes were significantly lower for individuals who had ADHD (Figure 1), with the greatest discrepancy seen among those with a postgraduate degree who earned 43% less per year than individuals with a postgraduate degree who did not have ADHD.¹³ The economic impact can be as devastating and as far-reaching as the destructive behaviors that accompany undiagnosed, untreated adult ADHD.

Individuals with untreated ADHD are also at increased legal risk. Substantial evidence shows that antisocial and destructive behaviors and arrest histories are significantly more prevalent in adults with ADHD than in those without ADHD (Figure 2).² A study of hyperactive children showed them to be at greater risk for antisocial activity and arrest by the time they reached young adulthood, chiefly as the result of illegal drug possession, use, and sale.¹⁴ Compared with their non-ADHD peers, adolescents and young adults who have ADHD are significantly more likely to be arrested (39% vs 20%), convicted (28% vs 11%), and incarcerated (9% vs 1%).¹⁵ Driving ability is also a concern in this population. In a study comparing adults who had ADHD with a cohort of psychology students, the persons in the ADHD group rated themselves as angry ($P=0.05$), risky ($P=0.01$), and unsafe ($P=0.001$) drivers.¹⁶ In the analysis, the ADHD group was significantly less able to concentrate on driving ($P<0.01$) and exhibited more loss of control than the student cohort ($P=0.05$).

Table 1. Psychiatric Disorders With Symptoms Similar to and Different From ADHD

Psychiatric Disorder	Symptoms Shared With ADHD	Distinctive Features
Bipolar disorder	Hyperactivity, difficulty maintaining attention and focus, mood swings	Enduring dysphoric or euphoric mood, insomnia, delusions
Generalized anxiety	Fidgetiness, difficulty concentrating	Exaggerated apprehension and worry, somatic symptoms of anxiety
Major depression	Subjective report of poor concentration, attention, and memory; difficulty completing tasks	Enduring dysphoric mood or anhedonia, sleep and appetite disturbances
Personality disorders, particularly borderline and antisocial personality disorders	Impulsivity, affective instability	History of arrest (antisocial personality); repeated self-injurious or suicidal behaviors (borderline personality); lack of recognition that behavior is self-defeating
Substance abuse or dependence	Difficulties with attention, concentration, and memory; mood swings	Pathologic pattern of substance use with social consequences; physiologic and psychological tolerance and withdrawal

ADHD, attention-deficit/hyperactivity disorder

Based on reference 17.

Comorbidities Associated With ADHD

Adult ADHD is rarely a singular diagnosis—adults with ADHD frequently have 1 or more psychiatric comorbidities that can blur ADHD symptomology, often making a proper diagnosis and effective treatment difficult (Table 1).¹⁷ When attempting to make the differential diagnosis between ADHD and comorbid psychiatric disorders, it is important to look at not only the cross-sectional presentation of symptoms, but also the longitudinal history. ADHD symptoms tend to be more or less present throughout the lifespan. Symptoms of comorbid disorders, such as mood disorders or substance abuse, can be more episodic or have a discreet time of onset.

According to the NCSR study,¹ the following comorbidities were 2 to 3 times more common in adults with ADHD than in adults without ADHD:

- anxiety disorder, typically social phobia (1 in 2 adults);
- mood disorder, mainly depression or bipolar disease (1 in 3 adults);
- impulse control disorder, intermittent explosive disorder (1 in 5 adults);
- SUD, usually abuse of alcohol, cocaine,¹⁸ or tobacco (1 in 6 adults).¹⁹

In addition, adults with ADHD were a 2-fold more likely to be substance abusers: A study found that 55% of adults with ADHD abused 1 or more substances compared with 27% of non-ADHD adults.²⁰ Substance abuse typically begins earlier in life in patients with ADHD, lasts longer before remitting, and is characterized by a more severe course than in patients without ADHD.²¹

Interestingly, the subtype of ADHD might influence which substances are abused. A study by Abrantes demonstrated not only that ADHD is associated with the early onset of substance involvement, but also symptoms of hyperactivity and impulsivity are linked more closely with alcohol and marijuana use, whereas symptoms of inattentiveness are more closely associated with marijuana and nicotine dependence.²²

Diagnosis of Adult ADHD

In the 1990s, Wender developed a set of ADHD symptoms, referred to as the Utah criteria, that reflect the distinct features of the disorder in adults.²³ The diagnosis of ADHD in an adult requires a longstanding history of significant symptoms of ADHD that date

back to at least the age of 7 years. In the absence of treatment, such symptoms should have been consistently present without remission. In addition, hyperactivity and poor concentration should be present in adulthood, along with 2 of 5 additional symptoms: affective lability, hot temper, inability to complete tasks and disorganization, stress intolerance, and impulsivity. Unfortunately, the Utah criteria can be inaccurate for many adults with ADHD for the following reasons:

1. They fail to identify patients with symptoms predominantly of inattentiveness.
2. They exclude some patients with significant comorbid psychopathology.
3. They diverge significantly from the *DSM-IV* concept of what represents a diagnosis of ADHD.

Likewise, there are issues with the application of the *DSM-IV* symptom criteria in adults as they do not include developmentally appropriate symptoms and thresholds for adults, and they fail to identify some significantly impaired adults who would likely benefit from treatment but whose condition does not match all the criteria required by *DSM-IV*.

Diagnostic and Symptoms Rating Scales

Diagnostic instruments are being developed to better identify ADHD in the adult population. The Adult ADHD Clinical Diagnostic Scale version 1.2 (ACDS)²⁴ and the Conners' Adult ADHD Diagnostic Interview for *DSM-IV* (CAADID) can aid in diagnostic evaluations. The Adult ADHD Investigator Symptom Rating Scale (AISRS)²⁵, Attention-Deficit Hyperactivity Disorder Rating Scale (ADHD-RS)²⁶, and the screening version of the Conners' Adult ADHD Rating Scale (CAARS-O:SV)²⁴ are useful for tracking symptoms and progress during treatment. The Brown Attention-Activation Disorder Scale (BAADS) consists of 40 self-report items that measure core symptoms of ADHD.²⁷ The scale assesses 5 symptom clusters: activating and organizing work, sustained attention and concentration, sustained energy and effort, irritability and sensitivity, and memory and recall.

The advantage of using the ACDS or the AISRS is that they include modular probes and prompts that are geared to help the clinician adequately establish the scope and degree of impairment of an adult with ADHD symptomatology. Self-report symptom scales include the Adult ADHD Self-Report Scale (ASRS)²⁸ and the long and short self-report versions of the CAARS-S:S/L.²⁴ The ASRS can be downloaded at www.med.nyu.edu/psych/assets/adhdscreen18.pdf.

Table 2. Summary of FDA-Approved Medications for Adults With ADHD

Medication	Starting (Maximum) Adult Dose
Amphetamine salts-XR	20 mg/d (60 mg/d)
Atomoxetine	40 mg/d, increase to 80 mg/d after 3 d (100 mg/d)
Dexmethylphenidate XR	10 mg/d (20 mg/d)
Lisdexamfetamine	20-70 mg/d (70 mg/d)

ADHD, attention-deficit/hyperactivity disorder

Based on references 38-41.

Conners' instruments are available from Multi-Health Systems at www.mhs.com. A more complete discussion of adult ADHD scales can be found in the article of Adler and Cohen.²⁴

Investigator Ratings May Be More Valid Than Self-Rating in Adult ADHD

The CAARS are one of the more widely used instruments for assessing adult ADHD. In a recent analysis of 2 double-blind, placebo-controlled, parallel studies of adult patients with ADHD, although investigator ratings and patient self-ratings on the CAARS exhibited strong internal consistency and good inter-rater reliability, baseline scores were more predictive of end point scores when both baseline scores and end point scores were determined by investigators rather than by patients.²⁹ Furthermore, the assessments correlated more strongly with other functional and clinical variables when conducted by the same rater.

In this analysis, 536 volunteer patients were randomized to 10 weeks of treatment with atomoxetine or placebo. Strong evidence was observed for internal consistency between baseline and end point scores on all 5 CAARS whether patients were investigator-rated or self-rated (Cronbach's $\alpha \geq 0.74$). The 2 sets of raters agreed on efficacy (defined as a 30% reduction in symptoms) in more than 85% of cases on all 5 CAARS. End point scores for CAARS Total Symptoms, Total *DSM-IV* ADHD Symptoms, and Hyperactive/Impulsive Symptoms were influenced by the interaction between the respective baseline scores and raters, indicating that each baseline score was a better predictor of the corresponding end point score when investigators, rather than subjects, provided the ratings. Further studies will be performed to confirm that CAARS baseline scores derived from investigator ratings have greater predictive power than CAARS baseline scores derived from patient self-ratings.

Therapies for Adult ADHD

The goal of ADHD treatment is to address the symptoms (with either pharmacotherapy or nonpharmacologic forms of therapy) that impair the patient's functioning, without causing intolerable adverse reactions that will prevent the patient from adhering to treatment.

Pharmacotherapy

Psychostimulants, such as methylphenidate and the amphetamines, are effective first-line pharmacotherapy for ADHD when used appropriately in individuals who are not prone to substance abuse disorders. However, diversion and misuse of prescription stimulants are a growing concern among young adults and college students.

Short-acting psychostimulant formulations may have a higher

potential for abuse, misuse, and diversion.³⁰ In an analysis of studies comprising 113,104 subjects, rates of nonprescribed stimulant use were reported to range from 5% to 9% in children of grade school and high school age and from 5% to 35% in persons of college age. Lifetime rates of diversion ranged from 16% to 29% in students with stimulant prescriptions who were asked to give, sell, or trade their medications.³¹

Long-acting stimulants may be less likely to be misused or diverted because of the difficulties encountered extracting methylphenidate or amphetamine from beaded or osmotic extended-release preparations.^{32,33} These include osmotic controlled-release methylphenidate, extended-release mixed salts of a single-entity amphetamine, extended-release dexmethylphenidate, and the methylphenidate transdermal system.

Nonstimulant treatments for ADHD (eg, atomoxetine, a norepinephrine reuptake inhibitor) should be considered for patients who are at high risk for substance abuse or misuse or the diversion of stimulants.³⁴ Lisdexamfetamine mesylate is a therapeutically inactive prodrug, in which *D*-amphetamine is covalently bonded to *L*-lysine; after oral ingestion, the covalently bonded *D*-amphetamine is converted to pharmacologically active *D*-amphetamine.^{35,36} The FDA recently approved this agent for use in adults with ADHD based on data obtained in clinical trials that included adults.³⁷ Table 2 lists the FDA-approved medications for adult ADHD.

Although psychostimulants are essentially safe when used as prescribed, both stimulant and nonstimulant classes carry warnings for potentially serious cardiovascular events.³⁸⁻⁴¹ All patients should have monitoring of blood pressure and pulse during treatment and patients with pre-existing cardiovascular conditions should be monitored more carefully.

The American Heart Association (AHA) recently stated that it is "reasonable and useful" to perform baseline electrocardiography (ECG) before initiating stimulant therapy in a child with ADHD.⁴² The AHA indicated that the assessment of a child with ADHD should include a detailed patient and family history, a physical examination, and baseline ECG, which often can identify cardiovascular abnormalities such as hypertrophic cardiomyopathy, long-QT syndrome, and Wolff-Parkinson-White syndrome. Although the intent of the AHA is not to limit the use of stimulant drugs, which have demonstrated efficacy in relieving the symptoms of ADHD, the organization wants to ensure that the medications are used safely. According to the AHA, if evidence of heart disease is uncovered by ECG, the problem should be treated before the patient receives pharmacologic therapy for ADHD. ECG should be repeated during stimulant treatment. Although the AHA made no comment about performing baseline ECG in adults with newly diagnosed ADHD, the fact that many adults as they enter middle age are prone to a variety of cardiovascular diseases, ranging from hypertension to dyslipidemia, indicates that it would be prudent to conduct this procedure. On the other hand, middle-aged adults are more likely to have had an ECG at some prior point than are children.

The pharmacotherapies for ADHD carry some additional warnings. As mentioned previously, medications from the stimulant class have the potential for abuse, and therefore carry a warning related to use of these medications in patients with a history of drug abuse. The use of stimulant medications has also been associated with the development of tics, glaucoma, agitation, and psychosis.^{38,40,41} The nonstimulant, atomoxetine, carries a black box warning for suicidal ideation in children, adolescents, and young adults, as well as a bolded warning about the potential for severe liver injury. Atomoxetine has also been associated with hypersensitivity and narrow angle glaucoma.³⁹

In addition to the warnings, all of the pharmacotherapies are associated with some adverse events. Some of the more common adverse events for both the stimulant and nonstimulant treatments include dry mouth, nausea, decreased appetite, dizziness, and insomnia. Atomoxetine has also been associated with constipation,

erectile dysfunction, urinary problems, and dysmenorrhea.³⁹ Within the stimulant class of treatments, adverse events include headache, anxiety, agitation or irritability, feeling jittery, and diarrhea. In addition, amphetamine salts-XR has been associated with weight loss and tachycardia;³⁸ dexamethylphenidate has been associated with dyspepsia and pharyngolaryngeal pain;⁴⁰ and lisdexamfetamine has been associated with upper abdominal pain and fatigue.⁴¹

Behavioral Therapies

Some patients report a reduction of ADHD symptoms during behaviorally oriented therapies.

Cognitive-Behavioral Therapy

In the only controlled trial of psychotherapy for ADHD conducted to date, cognitive-behavioral therapy (CBT) was associated with a reduction of residual ADHD symptoms in patients managed with medication.⁴³ The trial demonstrated a lower rate of investigator-reported depression ($P < 0.01$) in patients receiving CBT, as well as a trend to a lower rate of self-reported depression ($P = 0.06$). CBT continued to show superiority over continued psychopharmacology alone when levels of depression were statistically controlled for in analyses of core ADHD symptoms. Significantly more treatment responders were counted among patients who received CBT (56%) than among those who did not (13%; $P < 0.02$). These data support the hypothesis that CBT for adults with ADHD who have residual symptoms is a feasible, acceptable, and potentially efficacious next-step approach to treatment and worthy of further testing.

Neurofeedback

Neurofeedback (NFB; also known as neurobiofeedback or electroencephalographic biofeedback) attempts to train brainwave activity, as measured by electrodes on the scalp. Electrode data are presented to the patient as feedback in the form of a video display, sound, or vibration. If brain activity changes in the direction desired by the therapist, a positive "reward" feedback is given. If brain activity regresses, either a negative feedback or no feedback is given, depending on the protocol. Although a review of a number of ADHD studies indicated that NFB has some merit in controlling ADHD symptoms,⁴⁴ there were no findings that could be generalized once the course of NFB had been completed.

NFB also has a few constraints. A sustained, long-term improvement may require as many as 60 sessions, or 6 months of treatment. However, when potential improvement in quality of life is factored in, a 6-month time frame may be a reasonable investment if the outcome appears to be good. Compared with a program of medication, the cost is higher for NFB in the short term; successful long-term change has been found in as few as 20 sessions in 30% of ADHD cases treated with NFB.⁴⁴

Psychotherapy

In a pilot study that evaluated group therapy in 72 adult patients with ADHD, a structured group program in skills training resulted in significant symptomatic improvements.⁴⁵ The patients were assigned to 13 weekly sessions, each lasting 2 hours, at 4 different sites. The therapy was well tolerated and led to significant reductions in ADHD and depressive symptoms, and significant improvements in personal health status ($P < 0.001$). The investigators observed that treatment site and medication were not factors related to overall improvement. From a patient standpoint, the program topics "behavioral analyses," "mindfulness," and "emotion regulation" were regarded as the most useful. The therapy program demonstrated therapist-independent effects that appeared to be disorder-specific. More controlled studies are warranted to further assess this therapeutic option for adults with ADHD.

Conclusion

Adult ADHD is a complex disorder that is often masked by comorbid psychiatric conditions and plagued by an uncertain identity that has only recently begun to shift diagnostic and therapeutic paradigms. Clinicians are wise to systematically screen for all conditions in the belief that full results are obtained when comprehensive assessment and intervention plans are applied.

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CME Post-test

Select the single-letter response that best answers the question or completes the sentence and record your answers in the Post-test Answer Section on the following page. Physicians must score at least a 70% in order to receive credit.

1. **Of the 13 million American adults who have attention-deficit/hyperactivity disorder (ADHD), in what percentage has the disease never been diagnosed?**
 - a. 25%
 - b. 50%
 - c. 75%
 - d. 90%
2. **In a study by Biederman and colleagues, adults with diagnosed ADHD were _____ than their non-ADHD peers.**
 - a. more likely to have graduated from high school
 - b. more likely to have graduated from college
 - c. more likely to be unemployed
 - d. less likely to have changed jobs over a 10-year period
3. **Research shows that in comparison to symptoms of hyperactivity and impulsivity in ADHD, the symptom of inattention in ADHD declines at _____ over time.**
 - a. a faster rate
 - b. a slower rate
 - c. the same rate
 - d. a perpendicular rate
4. **The National Comorbidity Survey Replication demonstrated that almost 1 in 6 adults with ADHD also have _____.**
 - a. a mood disorder
 - b. an anxiety disorder
 - c. an impulse control disorder
 - d. a substance abuse disorder
5. **Which psychiatric disorder shares symptoms of impulsivity and affective instability with ADHD?**
 - a. Borderline and antisocial personality disorder
 - b. Generalized anxiety disorder
 - c. Bipolar disorder
 - d. Major depression
6. **Which of the following is a self-report symptom scale for adult ADHD?**
 - a. Adult ADHD Clinical Diagnostic Scale
 - b. Conners' Adult ADHD Rating Scale
 - c. Conners' Adult ADHD Diagnostic Interview for the *DSM-IV*
 - d. Attention-Deficit Hyperactivity Disorder Rating Scale
7. **Which of the following products is not a psychostimulant?**
 - a. OROS (osmotic-release oral system) methylphenidate
 - b. Dexmethylphenidate XR
 - c. Atomoxetine
 - d. Lisdexamfetamine
8. **What assessment did the American Heart Association recently strongly suggest that children undergo before being prescribed a psychostimulant agent for ADHD?**
 - a. Alanine transaminase (ALT) measurement
 - b. Electrocardiography
 - c. Electroencephalography
 - d. Thyroid-stimulating hormone (TSH) measurement
9. **Which of the following is a therapeutically inactive prodrug that is converted to pharmacologically active *D*-amphetamine?**
 - a. Atomoxetine
 - b. Benzedrine
 - c. Lisdexamfetamine
 - d. Methamphetamine
10. **Which nonpharmacologic approach attempts to train brain wave activity?**
 - a. Acupuncture
 - b. Biofeedback
 - c. Hypnotherapy
 - d. Psychotherapy

Application for Credit/Evaluation Form

Diagnosis and Treatment Issues in Adult ADHD

Release Date: August 2008 Expiration Date: August 2009

If you wish to receive acknowledgment for completing this activity, please fill in your contact information and return this form to Kecia Johnson, Physicians Academy - ADHD, 60 East 42nd Street, Suite 1022, New York, NY 10165 or by fax at 646-214-0948 or via email at keciaj@physacad.com.

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If you wish to receive your certificate via email, please type or print legibly in CAPITAL LETTERS:

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Or participate online at: CMEZone.com Enter "SR08024" in the keyword field.

Record your answers to the post-test here by circling the appropriate letter:

- | | | | | |
|------------|------------|------------|------------|-------------|
| 1) a b c d | 2) a b c d | 3) a b c d | 4) a b c d | 5) a b c d |
| 6) a b c d | 7) a b c d | 8) a b c d | 9) a b c d | 10) a b c d |

Did the activity meet the learning objectives?	Please check one:	Yes	No	Partially
At the conclusion of this activity, physicians should be better able to:				
1. Evaluate diagnostic approaches for adult ADHD.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Recognize and manage impairments associated with ADHD over the lifespan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Incorporate existing knowledge into decision-making when planning treatment strategies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Develop treatment strategies for complicated adult patients with ADHD.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The content presented:	Please circle one:	Strongly Disagree			Strongly Agree	
Was timely and will influence how I practice.	1	2	3	4	5	
Enhanced my current knowledge base.	1	2	3	4	5	
Addressed my most pressing questions.	1	2	3	4	5	
Provided new ideas or information I expect to use.	1	2	3	4	5	
Addressed competencies identified by my specialty.	1	2	3	4	5	

	Please check one:	Yes	No
Do you feel the information presented was based on the best evidence available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In your opinion did you perceive any commercial bias in the presentation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you plan on making any changes in your practice as a result of this activity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If yes, please specify:

Please list topics you would like addressed in future activities:

Please provide any additional comments about this activity:
