

Adult ADHD: Issues and Answers

CME Newsletter of the Adult ADHD Program,
Department of Psychiatry, NYU School of Medicine

Survey shows highest risk for adult ADHD among those once married, unemployed, white, and male

The results of the National Comorbidity Survey Replication (NCSR), which included a subset of 3,199 18- to 44-year-old respondents, revealed that the estimated prevalence of current adult attention-deficit/hyperactivity disorder (ADHD) is 4.4%, with male gender, previously married, unemployed, and non-Hispanic white being the highest risk groups.¹ In addition, adult ADHD was found to be highly comorbid with many other *DSM-IV* disorders, such as mood, anxiety, substance use, and impulse control disorders. The majority of cases were not treated for ADHD, although many individuals had received treatment for other comorbid mental and substance abuse-related disorders. The NCSR is a nationally representative survey of 9,282 English-speaking residents—aged 18 years and older—that was carried out by the Institute of Social Research at the University of Michigan.

As expected, and shown in [Table 1](#), the vast majority of

respondents in the entire sample reported no clinically significant attention problems. The estimated prevalence of clinician-assessed adult ADHD in the total sample (4.4%; SE = 0.6) was based on multiple imputation, including a combination of directly interviewed respondents from the clinician reappraisal sample and multiple imputed cases in the remainder of the sample. [Table 2](#) shows that the estimates of clinician-assessed adult ADHD were significantly higher among men, non-Hispanic whites, the previously married and unemployed/disabled. Adult ADHD appeared to transcend education levels, income strata, age groups, and urban versus non-urban residence. Adult ADHD was significantly comorbid with a wide range of other *DSM-IV* disorders, including mood disorders, anxiety, phobias, and substance use disorders (SUDs). For example, more than twice of those with ADHD had major depressive disorder (18.6% vs 7.7%) or anxiety disorder (47.1% vs 19.5%) than those who were non-ADHD; more than 3 times as many had intermittent explosive disorder (19.6% vs 6.1%), and

Table 1. Risk for Adult ADHD in the National Comorbid Survey Replication*

ADHD Risk	Definition	Imputed Prevalence [†] (n = 3,199)	
		%	SE
None	No clinically significant problems with inattention, hyperactivity, or impulsivity during childhood	85.8	0.8
Low	Subthreshold childhood symptoms	7.5	0.5
Medium	Full childhood criteria without current symptoms	4.0	0.4
High	Full childhood criteria with current symptoms	2.6	0.4

*Among respondents aged 18 to 44 years who met the criteria for at least one disorder assessed in part 1 of the survey (diagnostic assessment) or included in part 2 as part of a probability sub-sample of other respondents.

[†]Multiple imputation was used to assign predicted diagnoses of clinician-assessed adult ADHD to respondents who did not participate in the reappraisal interviews.

Abstracted from Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163:716-723.

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Statement of Need

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood; incidence ranges from 5% to 10% among school-age children. Up to 50% of children with ADHD continue to have ADHD-related problems during their adult years. In addition, many ADHD cases are first diagnosed only after patients have reached adulthood. Adults with ADHD may experience significant functional problems, such as job difficulties, academic underachievement, troublesome relationships with family and peers, and low self-esteem. Diagnosing ADHD in adults can be difficult, and—when the diagnosis is made—available medications are often not used to treat the disorder, or medication management varies widely across communities and among physicians. Recent findings continue to expand the understanding of ADHD in these patients and the associated comorbidities. Brain research into binding sites and transporters also is enhancing the clinicians' understanding of how medications work to effect change in patients with ADHD.

As subjects with ADHD age and more adults are newly diagnosed, there is a concern over the possible abuse and misuse of ADHD medications, particularly stimulants. It is known that untreated ADHD patients are more likely to smoke and abuse alcohol and cocaine. In addition, a recent study suggests that some college students use their medications to get high or sell them to others for similar purposes. Research has hypothesized that an increased risk of misuse is noted in subjects taking immediate-release stimulant preparations and in those with conduct disorder and previous substance use disorder. Never beaded and osmotic-controlled delivery systems may offer potential advantages in subjects at risk for abuse of misuse.

1. Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163:716-723.
2. Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62:629-640.
3. Faraone SV, Biederman J, Wozniak J, Mundy E, Merrin D, O'Donnell D. Is comorbidity with ADHD a marker for juvenile-onset mania? *J Am Acad Child Adolesc Psychiatry*. 1997;36:1046-1055.
4. Nierenberg AA, Miyahara S, Spencer T, et al. STEP-BD Investigators. Clinical and diagnostic implications of lifetime attention-deficit/hyperactivity disorder comorbidity in adults with bipolar disorder: data from the first 1000 STEP-BD participants. *Biol Psychiatry*. 2005;57:1467-1473.
5. Drexel S, Krause J, Krause KH, et al. Attention-deficit/hyperactivity disorder: binding of [99mTc]TRODAT-1 to the dopamine transporter before and after methylphenidate treatment. *Eur J Nucl Med*. 2000;27:1518-1524.
6. Krause J, Krause KH, Drexel SH, la Fougere C, Achenthal M. ADHD in adolescence and adulthood, with a special focus on the dopamine transporter and nicotine. *Dialogues Clin Neurosci*. 2006;8:29-36.
7. Krause KH, Drexel SH, Krause J, Kung HF, Tattich K, Achenthal M. Stimulant-like action of nicotine on striatal dopamine transporter in the brain of adults with attention-deficit/hyperactivity disorder. *Int J Neuropsychopharmacol*. 2002;11:111-113.
8. Keel PK, Mayer SA, Harnden-Fischer JH. Importance of size in defining binge eating episodes in bulimia nervosa. *Int J Eat Disord*. 2001;29:294-301.
9. Surman CB, Biederman J, Faraone SV, et al. Association between attention-deficit/hyperactivity disorder and bulimia nervosa: analysis of 8 case-control studies. *J Clin Psychiatry*. 2006;67:355-354.
10. Santford MS, Haffner LE, Conklin SH, et al. A comparison of anticonvulsants in the treatment of impulsive aggression. *Eur Clin Psychopharmacol*. 2005;13:72-77.
11. Dawkins E, B. Spedica M, Gaspar M. A pilot clinical trial of oxcarbazepine in adults with attention-deficit/hyperactivity disorder. *Prog Neuropsychopharmacol Biol Psychiatry*. 2006;30(10):1033-1038.
12. Robinson TE, Berridge KD. Addiction. *Annu Rev Psychol*. 2003;54:25-53.
13. Lambert NM, McLeod M, Shenk S. Subjective responses to initial experience with cocaine: an exploration of the incentive-activation theory of drug abuse. *Addiction*. 2006;101:713-725.
14. Biederman J. Pharmacotherapy for attention-deficit/hyperactivity disorder (ADHD) decreases the risk for substance abuse: findings from a longitudinal follow-up of youth with and without ADHD. *J Clin Psychiatry*. 2003;64(suppl 1):3-8.

Learning Objectives

After completing this activity, you should be better able to:

1. Identify the characteristic findings of a recent survey on the incidence of adult ADHD.
2. Summarize the associated comorbidities found in adults with ADHD.
3. Explain the importance of comorbid bipolar disorder in the diagnosis of childhood ADHD.
4. Discuss the DAT receptor findings and the impact of treatment with ADHD medication.
5. Distinguish between the sexes when associating ADHD with comorbid bulimia.

Method of Participation

Read this newsletter, complete the CME Posttest Answer Form and Activity Evaluation Form, and fax or mail the forms to Medical Education Resources, Inc. at the address listed. You will receive a certificate by fax or mail. There is no certificate processing fee.

Intended Audience

This activity was developed for psychiatrists, primary care physicians/internists, neurologists, and psychologists.

Effective Dates

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almost 4 times as many were socially phobic (29.3% vs 7.8%) than those who were non-ADHD. Of note, many people are in treatment for other mental disorders or SUDs but not for ADHD. The 10% of respondents diagnosed with ADHD in this study who had received treatment for ADHD is much lower than the rates for anxiety, mood, or substance abuse, which Wang and colleagues recently suggested were treated suboptimally (<50%) as well.² Thus, direct-to-consumer outreach and physician education are needed to address this imbalance. Currently approved medications for the treatment of adult ADHD include Adderall XR® (mixed amphetamine salts), Focalin XR® (dexamethylphenidate), and Strattera® (atomoxetine).

Citations:

1. Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163:716-723.
2. Wang PS, Lane M, Olfson M, Pincus HA, Wells KB, Kessler RC. Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62:629-640.

Data from the first 1,000 STEP-BD participants show that ADHD is a frequent comorbidity with bipolar disorder

Previous research has shown that adolescents with childhood-onset mania have the same rates of comorbid ADHD as manic children (90%), and that both these groups had higher rates of ADHD than adolescents with adolescent-onset mania (60%).¹ ADHD is more common in childhood-onset cases of bipolar disorder compared with adolescent-onset cases, suggesting that, in some cases, ADHD may signal a very early onset of bipolar disorder. The high proportion of ADHD in juvenile bipolar patients raises the possibility that many adults with bipolar disorder might have residual comorbid ADHD. Nierenberg and colleagues assessed the prevalence and clinical implications of lifetime comorbid ADHD in a very large cohort of systematically evaluated patients with bipolar disorder in a multicenter study, The Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD).² In this study funded by the National Institute of Mental Health, the first consecutive 1000 adults with bipolar disorder were assessed for lifetime ADHD. The retrospective course of bipolar disorder, current mood state, and prevalence of other comorbid psychiatric diagnoses were compared in the groups with and without lifetime comorbid ADHD.

The results revealed that the overall lifetime prevalence of comorbid ADHD in this large cohort of bipolar patients was 9.5%: 14.7% for male patients and 5.8% for female patients. Patients with bipolar disorder and ADHD had the onset of their mood disorder approximately 5 years earlier. After adjusting for age of onset, those with ADHD comorbidity had shorter periods of wellness and were more frequently depressed. In addition, the investigators found that patients with bipolar disorder comorbid with ADHD had a greater number of

Table 2. Sociodemographic Correlates of Adult ADHD in the National Comorbidity Survey Replication (n = 3,199)*

Characteristic	Respondents With Adult ADHD Who Had Characteristic		Respondents With Characteristic Who Had Adult ADHD		Analysis [†]	
	%	SE	%	SE	Odds Ratio	95% CI
Gender						
• Female	38.4	4.7	3.2	0.6	1.0	
• Male	61.6	4.7	5.4	9.9	1.6 [‡]	1.0-2.5
Ethnicity						
• Non-Hispanic white	81.8	3.8	5.4	0.8	1.0	
• Non-Hispanic black	6.2	1.9	1.9	0.6	0.3 [‡]	0.2-0.6
• Hispanic	7.5	2.3	2.1	0.8	0.3 [‡]	0.2-0.6
• Other	4.5	2.1	3.6	1.8	0.6	0.2-1.8
Marital status						
• Married or cohabitating	45.0	4.3	3.9	0.7	1.0	
• Previously married	17.7	4.0	6.9	1.9	1.9 [‡]	1.1-1.3
• Never married	37.3	4.7	4.1	0.8	1.0	0.7-1.5
Employment						
• Working	72.0	4.3	3.9	0.7	1.0	
• Student	5.6	2.5	4.4	1.8	1.1	0.4-2.6
• Homemaker	4.9	1.9	3.7	1.6	1.2	0.5-2.8
• Other [§]	16.8	4.0	7.1	1.9	2.0 [‡]	1.0-4.0

*Among respondents aged 18 to 44 years who met the criteria for at least one disorder assessed in part 1 of the survey (diagnostic assessment) or included in part 2 as part of a probability subsample of other respondents.

[†]Based on multivariate logistic regression analysis using 2-sided design-based multiple-imputation tests.

[‡] $P < .05$

[§]Disabled or unemployed

Abstracted from Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163:716-723.

other comorbid psychiatric diagnoses compared with those without comorbid ADHD, with substantially higher rates of posttraumatic stress disorder (29% vs 15%; $P = .0002$), drug abuse and dependence (48% vs 25%; $P < .003$), alcohol use and dependence (61% vs 39%; $P = .011$), and social phobia (36% vs 20%; $P = .006$). Thus, in this study, lifetime ADHD is a frequent comorbid condition in adults with bipolar disorder, associated with a worse course of bipolar disorder and greater burden of other psychiatric comorbid conditions. Studies are needed that will focus on the efficacy and safety of treating ADHD comorbid with bipolar disorder.

1. Faraone SV, Biederman J, Wozniak J, Mundy E, Mennin D, O'Donnell D. Is comorbidity with ADHD a marker for juvenile-onset mania? *J Am Acad Child Adolesc Psychiatry*. 1997;36:1046-1055.

2. Nierenberg AA, Miyahara S, Spencer T, et al; STEP-BD Investigators. Clinical and diagnostic implications of lifetime attention-deficit/hyperactivity disorder comorbidity in adults with bipolar disorder: data from the first 1000 STEP-BD participants. *Biol Psychiatry*. 2005;57:1467-1473.

Case report

Carol, a 45-year-old attorney, presented for evaluation of a lifelong history of inattention and distraction after recently being let go from her position at a law firm. She thought she might have ADHD based on her reading of material found on the Internet and a referral for evaluation from a local support group she attended. The patient has a history of losing jobs for similar reasons: both employers and clients complained of her disorganization, easy distraction, procrastination, trouble planning for large projects, taking longer than needed to complete tasks, drifting off in conversations during meetings, and making careless mistakes when preparing documents. She reported that her employers always saw her as trying hard and working very long hours, but being puzzled as to why the quality of work was not consistently present and the work took so long to complete.

The impairment from these attentional symptoms was present in not only the work setting, but also at home (eg, disorganization, paying bills late) and social settings (eg, not making plans to see friends and colleagues, which contributed to social isolation). Carol has never married, and has had several failed relationships, which has heightened her isolation. Her underperformance goes back to early elementary school, where she was seen as a hard worker who always aimed to please, but did not consistently deliver the quality of work her teachers thought she was capable of producing. She also describes a lifelong history of reticence in general when having to talk in public settings and avoids public speaking whenever possible. Carol did feel that this social avoidance has held her back occupationally as she does not perform as well in groups because of concerns about public speaking.

Family psychiatric history is negative. Review of symptoms did not reveal any active medical problems. Mental status exam was notable for a full affect, with a preponderance of an anxious mood. Eye contact was fair, with Carol frequently looking at the floor when answering questions. Neither thought disorder nor suicidal/homicidal ideation was observed, and no psychotic symptoms were present.

Based on her current symptoms, the initial assessment was that Carol had ADHD—inattentive subtype. Additionally, a diagnosis of comorbid social anxiety disorder was made. The initial treatment plan included a trial of sustained-release OROS methylphenidate (MPH) (Concerta[®]), starting at a dose of 18 mg/day and concomitant coaching. The patient was initially hesitant to treat the social anxiety disorder, but agreed to do so if the symptoms persisted after the initiation of pharmacologic treatment for the ADHD and coaching.

On OROS MPH, the patient described substantial improvement in her inattentive symptoms and also in her work performance in that she was better able to plan and execute projects. Doses of OROS MPH above 18 mg/day led to a substantial exacerbation of her anxiety, so the dose was maintained at this level with supplementation of 5-mg immediate-release MPH in the afternoon to extend the duration of effect. As symptoms of social anxiety persisted, Carol agreed to a treatment course with the SSRI citalopram, which—at a dose of 10 mg/day—successfully ameliorated these symptoms.

The patient consistently worked on issues of planning, distractibility, and task execution, and made significant progress. However, it became evident that her current position in a large law firm was not a good match in terms of her getting feedback from superiors on a regular basis. Carol subsequently obtained alternative employment in a midsize firm, whose institutional structure and support were more conducive to her needs, and she has remained highly productive in this position. Additionally, the successful treatment of her social anxiety disorder led her to be more proactive in group settings at work.

Key points:

- Symptoms of inattention alone can impair significantly
- Multiple job losses denote a pattern of adult ADHD
- Beneficial effects of coaching in establishing appropriate needs at work and the right job fit, which led to eventual success
- Comorbid social anxiety disorder, which can appear in about 3 out of 10 people with adult ADHD,¹ was treated and helped lead to success at work

1. Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163:716-723.

Study shows that adult ADHD responds better to MPH if dopamine transporter is elevated Nicotine use also affects response

The availability of striatal dopamine transporter (DAT), which is elevated in patients with ADHD, can effectively be lowered with methylphenidate (MPH), a mainstay in ADHD treatment.¹ A recent study has shown that patients with low DAT availability do not respond well to MPH therapy.² In 18 nonsmoking and nonmedicated adult patients with ADHD, DAT availability was measured with [^{99m}Tc] TRODAT-1 SPECT. The patients received MPH, individually titrated to 60 mg/day. Clinical improvement was rated by the Clinical Global Impressions scale at Week 10. In all, 6 (33%) patients were classified as nonresponders, and 12 (67%) responded to MPH. From the nonresponders, 5 presented with a DAT availability below that of normal controls of the same age, whereas in the group of responders, all patients had elevated DAT availability. A significant negative correlation was noted between values for global clinical improvement and striatal DAT availability ($r = -0.7$; $P < .001$). Only nonsmoking patients were enrolled in this study because earlier research has shown that nicotine, which is frequently abused by patients with ADHD, may have an influence on DAT similar to that of stimulants.³ The investigators in this study suggested that, in studies with DAT measurement in ADHD adults, smokers and nonsmokers should be assessed separately.

Citations:

1. Dresel S, Krause J, Krause KH, et al. Attention-deficit/hyperactivity disorder: binding of [^{99m}Tc]TRODAT-1 to the dopamine transporter before and after methylphenidate treatment. *Eur J Nucl Med*. 2000;27:1518-1524.
2. Krause J, Krause KH, Dresel SH, la Fougere C, Ackenheil M. ADHD in adolescence and adulthood, with a special focus on the dopamine transporter and nicotine. *Dialogues Clin Neurosci*. 2006;8:29-36.
3. Krause KH, Dresel SH, Krause J, Kung HF, Tatsch K, Ackenheil M. Stimulant-like action of nicotine on striatal dopamine transporter in the brain of adults with attention-deficit/hyperactivity disorder. *Int J Neuropsychopharmacol*. 2002;5:111-113.

Bulimia may be linked to ADHD in some women

Impulsivity is a common feature of ADHD, and this trait may be an indicator of poor prognosis for individuals with bulimia nervosa.¹ Impulsivity is one of the key features of ADHD; thus, an analysis of 4 case-control studies—the first such

evaluation—was performed by Surman and colleagues to assess whether ADHD was comorbid in patients who had bulimia.² In the 2 samples of adults with and without ADHD, the results showed that significantly greater rates of bulimia nervosa were identified in women with ADHD versus without ADHD (12% vs 3%, $P < .05$ for the first sample and 11% vs 1%, $P < .05$ for the other sample). However, no significant differences in rates of bulimia nervosa were identified in men. Thus, although the results are preliminary and warrant further confirmation, these findings suggest that adult ADHD may be associated with bulimia in some women; specifically, women with ADHD may be at a higher risk for the eating disorder than non-ADHD women. If confirmed, this association between bulimia and adult ADHD could have significant clinical and therapeutic implications.

Citations

1. Keel PK, Mayer SA, Harnden-Fischer JH. Importance of size in defining binge eating episodes in bulimia nervosa. *Int J Eat Disord*. 2001;29:294-301.
2. Surman CB, Randall ET, Biederman J. Association between attention-deficit/hyperactivity disorder and bulimia nervosa: analysis of 4 case-control studies. *J Clin Psychiatry*. 2006;67:351-354.

Oxcarbazepine evaluated in adult ADHD pilot study

A randomized controlled trial of the mood stabilizer and antiepileptic carbamazepine has shown a significant symptom reduction compared with placebo in the treatment of impulsive aggression.¹

Following the results of this study, oxcarbazepine—a structural variant of carbamazepine with a better safety profile—was assessed in an open pilot study for the treatment of adults with ADHD.² Of the 9 adults who met *DSM-IV* criteria for ADHD for the study, 8 (4 hyperactive-impulsive and 4 combined hyperactive/impulsive/inattentive ADHD clinical subtypes) were given oxcarbazepine 300 mg to 1500 mg per day for 8 weeks. At the end point of the active treatment, a significantly high proportion of subjects were considered improved while receiving oxcarbazepine. Scores from the ADHD symptom checklist showed significant reduction during the treatment period: ADHD-IV rating scale ($P = .018$), the observer version of the Conners ADHD adult rating scale ($P = .012$), and ADHD self-rating scale ($P = .018$). Treatment with oxcarbazepine was relatively well tolerated; dizziness, sedation, and nausea were the most frequently reported adverse effects. These preliminary results indicate that oxcarbazepine might be a potentially useful agent for the treatment of ADHD in adults. However, placebo-controlled randomized trials and further study are warranted to examine whether the effect is specific to ADHD or on impulsivity in general.

Citations

1. Stanford MS, Helfritz LE, Conklin SM, et al. A comparison of anticonvulsants in the treatment of impulsive aggression. *Exp Clin Psychopharmacol*. 2005;13:72-77.
2. Davids E, Kis B, Specka M, Gastpar M. A pilot clinical trial of oxcarbazepine in adults with attention-deficit/hyperactivity disorder. *Prog Neuropsychopharmacol Biol Psychiatry*. 2006;30(6):1033-1038.

Adult ADHD patients may be at higher risk for cocaine dependence, says study

Drugs with high abuse liability, such as cocaine, produce both positive (euphoria or “liking”) and negative (craving or “wanting more”) effects. The incentive-sensitization theory accounts for the psychological and neurobiological basis of drug craving, which can lead to dependence. According to this theory, pleasure is the first stage of incentive motivation and serves to activate mechanisms of associative learning and incentive salience.¹ Incentive salience of a drug results, in part, from pleasurable experience with the drug and the environmental contexts in which the drug is used. When the pleasurable effects of drugs become reduced with repeated exposure, compulsive drugseeking ensues, thereby increasing the risk for subsequent abuse. In a new study, 202 adult participants who had tried cocaine on at least one occasion (89 of whom had ADHD) were studied prospectively from childhood into adulthood.² Some participants were treated with psychostimulants and/or were regular smokers prior to cocaine initiation, and there were some who were not regular smokers nor treated with stimulants. Rates of dependence and lifetime use of these groups were developed to evaluate the association between psychostimulant pre-exposure to cocaine dependence and lifetime use.

When cocaine was first tried, “liking” and “wanting more” were significant predictors of cocaine dependence and lifetime use, and did not differ by participant characteristics. The models predicting *DSM-III-R* cocaine dependence and lifetime use at aged 26 to 30 years and 36 to 40 years showed that ADHD increased the likelihood of cocaine dependence, but not lifetime use. The criteria for *DSM-III-R* diagnosis of psychoactive substance dependence require evidence that the individual continues to use the substance despite the presence of psychological, social, occupational, or health problems, and the person is aware that these problems may be exacerbated by the use of the substance. The authors hypothesize that those with ADHD may be considered to be compromised in the ability to control or self-regulate the impulse to use substances and to become dependent on them. However, keep in mind that prior longitudinal studies have found that stimulant therapy significantly reduces the risk of subsequent substance abuse.³

Citations

1. Robinson TE, Berridge KD. Addiction. *Annu Rev Psychol*. 2003;54:25-53.
2. Lambert NM, McLeod M, Schenk S. Subjective responses to initial experience with cocaine: an exploration of the incentive-sensitization theory of drug abuse. *Addiction*. 2006;101:713-725.
3. Biederman J. Pharmacotherapy for attention-deficit/hyperactivity disorder (ADHD) decreases the risk for substance abuse: findings from a longitudinal follow-up of youths with and without ADHD. *J Clin Psychiatry*. 2003;64(suppl 11):3-8.

Posttest

Please select only one answer for each question. Circle the letter corresponding to the correct answer on the answer form on the next page.

1. According to the National Comorbidity Survey Replication (NCSR), all but which of the following is a high risk factor for adult ADHD:
 - A. Male gender
 - B. Married
 - C. Unemployed
 - D. Non-Hispanic white
2. The NCSR also concluded that adult ADHD appeared to transcend all but which of the following:
 - A. IQ
 - B. Urban versus non-urban residence
 - C. Income strata
 - D. Age
3. According to the same study, adult ADHD was significantly comorbid with a wide range of all but which of the following disorders:
 - A. Mood disorders
 - B. Anxiety
 - C. Schizophrenia
 - D. Phobias
4. ADHD is _____ common in childhood-onset compared with adolescent-onset cases of bipolar disorder.
 - A. More
 - B. Less
 - C. As
 - D. Not at all
5. The STEP-BD found that patients with bipolar disorder comorbid with ADHD had a greater number of other comorbid psychiatric diagnoses compared with those without comorbid ADHD. Which of the following comorbidities was most prevalent?
 - A. Post-traumatic stress disorder
 - B. Drug abuse and dependence
 - C. Alcohol use and dependence
 - D. Social phobia
6. In the case presented in this issue, the patient was diagnosed with ADHD-inattentive subtype along with which comorbidity?
 - A. Alcohol abuse
 - B. Social anxiety disorder
 - C. Kleptomania
 - D. Bipolar disorder
7. The availability of striatal dopamine transporter (DAT), which is elevated in patients with ADHD, can effectively be lowered with which drug?
 - A. Mixed amphetamine salts
 - B. SSRIs
 - C. Pemoline
 - D. Methylphenidate
8. According to the analysis by Surman, which statement is true?
 - A. Greater rates of bulimia nervosa were identified in men with versus without ADHD.
 - B. Greater rates of anorexia nervosa were identified in women with versus without ADHD.
 - C. Greater rates of bulimia nervosa were identified in women with versus without ADHD.
 - D. ADHD and bulimia have no correlation in women.
9. Which antiepileptic agents reviewed in this issue may be useful in treating adult ADHD based on the results of a pilot study?
 - A. Valproic acid
 - B. Oxcarbazepine
 - C. Phenytoin
 - D. Levetiracetam
10. Which theory accounts for the psychological and neurobiological basis of drug craving that leads to dependence?
 - A. The incentive-sensitization theory
 - B. The relational frame theory
 - C. Hedgehog's dilemma
 - D. The Atkinson-Shiffrin theory

Adult ADHD: Issues and Answers

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 Medical Education Resources, Inc.
 Attention: Certificate Processing
 1500 West Canal Court
 Littleton, CO 80120
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There is no fee for certificate processing.

Posttest Answer Form (Circle the correct answer to each question)	
1. A B C D	6. A B C D
2. A B C D	7. A B C D
3. A B C D	8. A B C D
4. A B C D	9. A B C D
5. A B C D	10. A B C D

To receive credit, you must answer 7 of the 10 posttest questions correctly, complete all forms, and submit them by July 31, 2007.

Registration for Credit (please print)

First Name: _____

Last Name: _____

Degree: _____

Specialty: _____

Street Address (your certificate will be sent here):

City: _____

State: _____

ZIP: _____

Phone: _____ Fax: _____

E-mail: _____

I certify that I have completed this CME activity. The actual amount of time I spent on this activity was _____ minutes.

Signature _____ Date _____

Activity Evaluation Form

Please circle the appropriate rating in answer to the questions that follow:

- How would you rate the content of this CME activity?
 Poor 1 2 3 4 5 Outstanding
- How relevant was the content of this activity to your practice?
 Not relevant at all 1 2 3 4 5 Very relevant
- To what degree were you able to meet each of the learning objectives of the activity? Please respond to each learning objective listed below:
 - Identify the characteristic findings of a recent survey on the incidence of adult ADHD
 Poor 1 2 3 4 5 Outstanding
 - Summarize the associated comorbidities found in adults with ADHD
 Poor 1 2 3 4 5 Outstanding
 - Explain the importance of comorbid bipolar disorder in the diagnosis of childhood ADHD
 Poor 1 2 3 4 5 Outstanding
 - Discuss the DAT receptor findings and the impact of treatment with ADHD medication
 Poor 1 2 3 4 5 Outstanding
 - Distinguish between the sexes when associating ADHD with comorbid bulimia
 Poor 1 2 3 4 5 Outstanding
- Based on your knowledge and experiences, the level of the activity was:
 Basic Appropriate Complex
- How would you rate the activity overall?
 Poor 1 2 3 4 5 Outstanding
- Do you believe this activity was fair, balanced, and free of commercial bias?
 - Yes No
 - If No, please state the reason:

 - How much did this activity enforce your current clinical opinions?
 Not at all 1 2 3 4 5 A lot
 - How much new information did you find in this activity?
 None 1 2 3 4 5 A lot
 - As a result of this activity, will you alter your practice?
 Yes No
 - If Yes, please describe any change(s) you plan to make:

 - How committed are you to making these changes?
 Not at all committed 1 2 3 4 5 Very committed
 - If No, why not? _____
- Additional comments about this activity?

- Do you feel future activities on this subject matter are necessary and/or important to your practice?
 Yes No
- Please list any other topics that would be of interest to you for future educational activities.




Adult ADHD: Issues and Answers

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