

Recognizing ADHD in Adults with Comorbid Mood Disorders: Implications for Identification and Management

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Abstract: The objective of this study was to assist those in psychiatric clinical practice in the identification and management of attention-deficit/hyperactivity disorder (ADHD) in adults, with an emphasis on ADHD in the presence of comorbid mood disorders in adults. PubMed was searched to identify relevant studies and critical reviews published in English between 1988 and 2008 on the prevalence, persistence, and consequences of ADHD in adults. Additionally, relevant studies and critical reviews pertaining to the treatment of adults with ADHD and the relationships between ADHD and mood disorders with regard to overlapping symptom profiles, comorbidity, and treatment options were identified. The symptoms of ADHD persist into adulthood for a high proportion of children with this disorder. Among adults, the estimated prevalence of clinician-assessed ADHD in the general population is 4% to 5%. Untreated ADHD can adversely affect school and work achievements, diminish self-esteem, damage interpersonal relationships, and significantly reduce quality of life for adults. A significant proportion of adults with mood disorders have comorbid ADHD, and a significant proportion of adults with ADHD have comorbid mood disorders. Few reports have described the outcome of treatment of individuals with ADHD and concurrent mood disorders and no controlled trials were identified. Attention-deficit/hyperactivity disorder in adults can be identified despite resembling, or coexisting with, other psychiatric disorders. The complexities of comorbid psychiatric conditions require careful diagnostic prioritization when developing a comprehensive sequential treatment plan. The current research literature offers little clinical guidance for constructing treatment algorithms.

Keywords: ADHD; mood disorders; comorbidity; adults

Introduction

Attention-deficit/hyperactivity disorder (ADHD) in children was first described more than 100 years ago,¹ although its persistence into adulthood was not recognized until the 1970s.² The persistence of ADHD symptoms into adulthood was not formally included in the nomenclature until the publication of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) in 1994.³

The prevalence of ADHD among children in the United States is estimated at 7.4% (10.7% of boys and 4% of girls) according to the National Health Interview Survey⁴ and 7.8% (11% of boys and 4.4% of girls) according to the National Survey of Children's Health.⁵ Attention-deficit/hyperactivity disorder is not "just" an American disorder: cross-national surveys indicate that the prevalence of ADHD among children in other countries is generally comparable, ranging from 5.8% in Canada to 11.2% in India.⁶ It was once widely believed that childhood ADHD symptoms would remit by the end of adolescence. A growing literature now demonstrates, however, that ADHD symptoms (particularly inattention) and their many associated impairments persist

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into adulthood in a high proportion of subjects.⁷⁻⁹ Dulcan,¹⁰ for example, has estimated that up to 65% of children with ADHD will exhibit ADHD symptoms into adulthood, and other studies have reported higher estimates.

Estimating the prevalence of ADHD in adults can depend on how persistence is defined. In a meta-analysis of 22 follow-up studies of children with ADHD,¹¹ outcomes were divided into 2 groups: those who met full DSM-IV diagnostic criteria for ADHD at follow-up assessment and those who showed only impairment signs of the disorder (the residual group was defined as “in partial remission” according to DSM-IV). The rate was ~15% at age 25 years when persistence was defined by full ADHD diagnostic criteria and up to 60% when the residual group was included. If one assumes that the prevalence of ADHD is 8% in childhood, the expected prevalence of adult ADHD at 25 years would range from 1.2% for those meeting the full ADHD criteria to 3.2% when those in partial remission are included.

Evidence from studies of clinical correlates, family history, treatment response, and laboratory measures supports the validity of ADHD as a disorder in adults.¹² Attention-deficit/hyperactivity disorder is a highly heritable disorder; 76% of ADHD cases have a genetic component.¹³ Delayed maturation in the prefrontal cortex, known to be involved with executive function and working memory, has been

observed in neuroanatomic studies of children with ADHD.¹⁴ Smaller volumes in the frontal cortex, cerebellum, and subcortical structures have also been identified in structural imaging studies of children and adults with ADHD.¹⁵ Such neuroanatomical differences reflect morphological differences in the ADHD brain and do not yet convey a causal explanation.

Because of its relatively recent recognition as a psychiatric disorder in adults, there is good reason to believe that ADHD is often under-recognized and undertreated.^{8,16} Because adults with ADHD often present for treatment for other problems, clinicians who treat the prevalent mental disorders of adult life must be able to recognize the presenting signs of ADHD and, if appropriate, be able to treat it. The acceptance of adult ADHD as a valid diagnosis suggests that the number of adults seeking professional attention for the disorder will continue to increase. Clinicians need to recognize that ADHD symptom presentation differs in children and adults.^{17,18} The evolution of ADHD symptoms from childhood to adulthood is shown in Table 1.¹⁷

The objective of this article is to assist those in psychiatric clinical practice in the identification and management of ADHD in adults, with an emphasis on ADHD in the presence of comorbid mood disorders. We review data on the prevalence of ADHD in adults, the possible consequences of

Table 1. ADHD Symptom Evolution From Childhood to Adulthood^{3,18}

	Childhood	Adulthood
Inattention	<ul style="list-style-type: none"> • Difficulty sustaining attention • Failure to pay attention to details • Appears not to listen • Lacks follow-through • Cannot organize • Loses important items 	<ul style="list-style-type: none"> • Difficulty sustaining attention (meetings, reading, paperwork) • Makes careless errors • Easily distracted/forgetful • Poor concentration • Difficulty finishing tasks • Disorganized/misplaces items
Hyperactivity	<ul style="list-style-type: none"> • Squirming/fidgeting • Cannot stay seated • Cannot wait his or her turn • Runs/climbs excessively • Cannot play/work quietly • “On the go”/driven by motor • Talks excessively 	<ul style="list-style-type: none"> • Inefficiencies at work • Internal restlessness • Difficulty sitting through meetings • Works more than 1 job • Works long hours • Self-selects very active job • Overwhelmed • Talks excessively
Impulsivity	<ul style="list-style-type: none"> • Blurts out answers • Cannot wait in line • Intrudes/interrupts others 	<ul style="list-style-type: none"> • Impulsive job changes • Drives too fast • Interrupts others • Easily frustrated

Abbreviation: ADHD, attention-deficit/hyperactivity disorder.

undiagnosed or untreated ADHD in adults, the association of ADHD with mood disorders (and vice versa), and the identification and treatment of ADHD, particularly when comorbid with a mood disorder.

Methods

PubMed was searched to identify relevant studies and critical reviews published in English between 1988 and 2008 on the prevalence, persistence, and consequences of ADHD in adults. Additionally, relevant studies and critical reviews pertaining to the treatment of adults with ADHD and the relationships between ADHD and mood disorders with regard to overlapping symptom profiles with comorbidity were identified. Keywords for this search were “ADHD” and “adults” and “mood disorder,” and the limits were set to include only clinical trials, meta-analyses, randomized controlled trials, and reviews published in English including adults (≥ 19 years). These search criteria returned 92 publications. Studies that were primarily focused on children were excluded, as were studies of genetics and studies that involved either ADHD or mood disorders, but without emphasis on their relationship. The remaining studies and references cited in those studies relevant to the focus of this review are described. Like any literature search, ours is limited by the selected keywords and search parameters and may therefore result in relevant articles not being recovered during the search.

Results

Prevalence of ADHD in Adults

According to an analysis of data from the United States National Comorbidity Survey Replication ($N = 3199$; respondents aged 18–44 years), the estimated prevalence of ADHD in the general adult population of the United States is 4.4% (5.4% of men and 3.2% of women).¹⁹ The World Health Organization (WHO) World Mental Health Survey Initiative ($N = 11\,422$; respondents aged 18–44 years) similarly estimated that the prevalence of clinician-assessed adult ADHD in the United States was 5.2%.²⁰ In the 10 countries included in the WHO surveys, the estimated prevalence of ADHD ranged from 1.2% in Spain to 7.3% in France, and in 4.1% of men and 2.7% of women. Both of these surveys assessed current adult ADHD with the Adult ADHD Clinical Diagnostic Scale, version 1.2.^{19,20}

The prevalence of ADHD in adults seeking treatment in psychiatric clinics has been reported to be substantially higher. For example, ADHD was diagnosed in 15% of 381 men and 6% of 536 women with bipolar disorder;²¹ in

16% of 116 adults with a current episode of major depressive disorder (MDD);²² in 28% of 106 men and 19% of 95 women with substance use disorders;²³ and in 33% of 97 adults with anxiety disorders.²⁴

Despite its high prevalence, only 25.2% of adults with ADHD in the United States National Comorbidity Survey had ever received treatment.¹⁹ Moreover, only 10.9% of adults with ADHD (10.1% of men and 12.1% of women) had received specific treatment for ADHD during the year prior to assessment. The WHO surveys likewise found that treatment for ADHD during the previous 12 months had been received by only 12.6% of adults with ADHD in the United States.²⁵ The growing recognition of the persistence of ADHD in adulthood might suggest that the number of adults seeking professional attention for the disorder will increase in the years to come.¹⁷ These findings are supported by an analysis of pharmacy claims data for > 2.5 million participants that found the proportion of adults (aged ≥ 20 years) receiving ADHD medications increased from 0.4% in 2000 to 0.8% in 2005, a 15.3% annual growth rate.²⁶ During the same period, the growth rate among youth aged ≤ 19 years was 9.5% (from 2.8% to 4.4%).²⁶

Adults with Undiagnosed/Untreated ADHD

Many adults with ADHD have never sought or received the diagnosis, and their symptoms are often attributed to motivational, characterological, or intellectual deficits.¹⁷ Untreated ADHD can adversely affect school and work achievements, diminish self-esteem, damage interpersonal relationships, and significantly reduce quality of life for adults, especially if the disorder is unrecognized.^{9,17,25,27} Some of the negative effects and potential functional impairments associated with adult ADHD are illustrated by the 2 studies reviewed below.^{28,29} Awareness of the educational, social, and occupational problems experienced by many adults with ADHD may assist clinicians in identifying adults with ADHD and planning their treatment.

To evaluate functional impairments associated with ADHD, Biederman et al²⁸ conducted a telephone-interview survey of a community sample of 500 adults (mean age, 32 years) who reported being diagnosed with ADHD by a clinician, and 501 sex- and age-matched adults without ADHD. The adults with ADHD were significantly more likely to not have graduated from high school than those without ADHD (17% vs 7%, respectively; $P \leq 0.001$) and were less likely to have attained a college degree (19% vs 26%; $P < 0.01$). Fewer adults with ADHD were currently

employed (52% vs 72%; $P \leq 0.001$) or had full-time jobs (34% vs 57%; $P \leq 0.001$) and were significantly more likely to be looking for work (14% vs 5%; $P \leq 0.001$). They were also more likely to have been arrested (37% vs 18%; $P \leq 0.001$), to have received more than 1 speeding ticket in a 12-month period (25% vs 17%; $P \leq 0.01$), to report an addiction to tobacco (64% vs 36%; $P \leq 0.001$) and recreational drug use (52% vs 33%; $P \leq 0.001$), and to have been divorced (28% vs 15%; $P \leq 0.001$).²⁸

Adults with undiagnosed ADHD were the focus of a recent study by Able et al²⁹ conducted among members of 2 large managed health care plans. During telephone interviews, the Adult ADHD Self-Report Scale (ASRS) was completed by 20011 plan members who had no medical claims, but who had a coded ADHD diagnosis within the study period. According to their responses on the ASRS, 1236 (6.2%) plan members were classified as having undiagnosed ADHD; 752 of these members (referred to as the undiagnosed ADHD group) agreed to participate in a more detailed study. The other 2 study groups were 199 members who did not screen positive for ADHD (the non-ADHD group) and 198 members who had a medical claim with a coded ADHD diagnosis or a pharmacy claim for ADHD medication (the diagnosed ADHD group).²⁹

In the Able et al study, significantly more of the undiagnosed group than the non-ADHD group were women (57% vs 42%, respectively), and more had a history of depression (31% vs 13%), anxiety (20% vs 7%), or bipolar disorder (6% vs 1%; each comparison, $P < 0.001$).²⁹ Current treatment for a mental health disorder was being received by 18% of the undiagnosed group and 8% of the non-ADHD group ($P < 0.01$). Fewer members of the undiagnosed group had an annual personal income of $> \$50,000$ (29% vs 42%; $P < 0.01$) and fewer reported that their current health was “very good” or “excellent” (44% vs 67%; $P < 0.001$). On 4 scales of functional impairment and quality of life (the Sheehan Disability Scale, Moos Dyadic Assessment, Finch Criticality Scale, and Adult ADHD Quality of Life Scale), the undiagnosed group showed significantly more severe impairments and poorer quality of life compared with the non-ADHD group ($P < 0.01$).²⁹

The undiagnosed and the diagnosed ADHD groups differed in various ways.²⁹ For example, those in the undiagnosed group were less well educated (a high school diploma or less by 28% vs 9%, respectively; $P < 0.001$); significantly more were African American (12% vs 1%; $P < 0.01$); fewer reported having a family member with ADHD (19% vs 50%; $P < 0.001$); fewer reported a history of depression (31% vs

55%; $P < 0.001$), anxiety disorder (20% vs 30%; $P < 0.001$), or bipolar disorder (6% vs 10%; $P < 0.05$); and more reported use of tobacco (22% vs 12%; $P < 0.001$) and problem drinking (29% vs 19%; $P < 0.05$).

The authors noted that the results of the study²⁹ confirmed their hypothesis that a substantial number of persons receiving their health care within a managed care environment have ADHD (6.2% of adults without an ADHD diagnosis in this study). Moreover, compared with the respondents without ADHD, those with undiagnosed ADHD were found to have higher rates of past and present comorbid mental illness, lower socioeconomic status, more severe functional impairments, and poorer quality of life.²⁹

ADHD and Mood Disorders

A significant overlap between ADHD and mood disorders has been found by many researchers, as noted below. Because opportunities for misdiagnosis abound, relying solely on presenting symptoms to draw diagnostic conclusions is not advisable. Attention-deficit/hyperactivity disorder may be misidentified as a mood disorder, a mood disorder and ADHD may both be present though only 1 is identified, or—although probably rare in adults—a mood disorder may be misidentified as ADHD. Diagnostic accuracy can be improved by including longitudinal course and family psychiatric history in the clinical assessment. Using specific ADHD screening and diagnostic rating scales may also improve the chances of making a proper diagnosis. In the clinical trials on MDD and bipolar disorder in adults, exclusion criteria generally do not specifically rule out individuals with ADHD, and conventional standardized diagnostic assessments (ie, the Structured Affective Disorders Schedule or Structured Clinical Interview for DSM Disorders) used in research studies do not assess for ADHD. Given the high comorbidity rate, it is virtually certain that some adults with ADHD have been included in these treatment trials. Unfortunately, because these individuals cannot be identified post hoc, there is no way of knowing if their outcomes were similar to or different from the other trial participants.

Depression

In a 1993 study of 84 adults with childhood-onset ADHD, Biederman et al³⁰ reported that full DSM-III-R diagnostic criteria for MDD were met by 31% of adults with ADHD. It has been noted that of the 9 DSM-IV criteria for MDD episode, 7 are associated to some degree with ADHD: 1) diminished interest; 2) decreased appetite; 3) insomnia;

4) psychomotor agitation or retardation; 5) fatigue; 6) feelings of worthlessness; and 7) poor concentration.⁴ Conversely, several symptoms of ADHD may also be associated with symptom criteria for MDD. Specifically, the inattentive symptoms of ADHD such as distractibility and difficulty concentrating, as well as the impulsive symptom of difficulty sitting still, are also symptom criteria for MDD.³¹ Diagnostically, it is important to make the distinction between demoralization, an outgrowth of the negative consequences of ADHD, and a clinical diagnosis of major depression, a specific constellation of symptoms lasting for at least 2 weeks. Many adults with ADHD are demoralized by their disappointing performance,³¹ while only approximately 1 in 5 adults with ADHD fulfill criteria for major depression.¹⁹

Strong associations between ADHD and depression and other mood disorders have been found in a national US survey and in a WHO study conducted in 10 countries in the Americas, Europe, and the Middle East.^{19,20} The United States National Comorbidity Survey Replication¹⁹ identified ADHD in 9.4% of adults with MDD, 22.6% of adults with dysthymia, and 21.2% of adults with bipolar disorder (Table 2). In the WHO Mental Health Surveys,²⁰ ADHD was identified in 11.1% of adults with mood disorders (Table 3). Among the adults with ADHD in the US survey, MDD was identified in 18.6% and dysthymia in 12.8%, while among the adults with ADHD in the WHO survey, a mood disorder was identi-

fied in 24.8% of the respondents with ADHD (Tables 2, 3). In both surveys, ADHD was assessed according to DSM-IV criteria, and other DSM-IV disorders were assessed using the WHO Diagnostic Interview.

Among 116 adults with a current episode of MDD who were consecutively enrolled in a treatment program,²² childhood-onset ADHD was diagnosed in 16% (9 met full DSM-III-R ADHD criteria and 10 were rated as subthreshold). Comorbid conditions among 56 adults who were referred for treatment of “hyperactivity” included dysthymia in 25%, cyclothymic disorder in 25%, and MDD in 10%; all met DSM-III-R criteria for diagnosis of ADHD. The second most common condition was generalized anxiety disorder (53%).³²

In a study conducted in Mannheim, Germany,³³ 70 adults (mean age, 37 years) referred to an ADHD outpatient clinic and 70 age- and sex-matched controls were compared. A significantly higher prevalence of these lifetime comorbid psychiatric disorders was reported in the ADHD group than in the controls (all at $P < 0.001$): total affective disorders (61% vs 26%); MDD episodes (55% vs 24%); and total substance-related disorders (30% vs 7%). Depressive episodes were reported in 78% of the 32 women and 39% of the 38 men with ADHD ($P < 0.05$).³³

An analysis of data from a large claims database of inpatient, outpatient, and prescription drug services included 2252 adults with ADHD and an age- and sex-matched group

Table 2. Comorbidity and Adult ADHD in the US National Comorbidity Survey Replication¹⁹

ADHD in Respondents with Other Disorders	%	Other Disorders in Respondents with ADHD	%
Mood disorders		Mood disorders	
Major depressive disorder	9.4	Major depressive disorder	18.6
Dysthymia	22.6	Dysthymia	12.8
Bipolar disorder	21.2	Bipolar disorder	19.4
Any mood disorder	13.1	Any mood disorder	38.3
Anxiety disorders		Anxiety disorders	
Generalized anxiety disorder	11.9	Generalized anxiety disorder	8
PTSD	13.4	PTSD	11.9
Panic disorder	11.1	Panic disorder	8.9
Agoraphobia	19.1	Agoraphobia	4
Specific phobia	9.4	Specific phobia	22.7
Social phobia	14	Social phobia	29.3
Obsessive-compulsive disorder	6.5	Obsessive-compulsive disorder	2.7
Any anxiety disorder	9.5	Any anxiety disorder	47.1
Any substance use disorder	10.8	Any substance use disorder	15.2
Impulse control disorder	12.3	Impulse control disorder	19.6

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; PTSD, post-traumatic stress disorder.

Table 3. Comorbidity and Adult ADHD in the WHO World Mental Health Surveys²⁰

Disorder	ADHD in Respondents with Other Disorders (%)	Other Disorders in Respondents with ADHD (%)
Mood	11.1	24.8
Anxiety	9.9	38.1
Substance use	12.5	11.1
Concurrent disorders		
1	5.4	20.4
2	10.3	12.9
≥ 3	20.3	16.2
Any	8.5	49.5

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; WHO, World Health Organization.

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of 2252 adults without ADHD.³⁴ Significantly more adults with ADHD than those without had a comorbid diagnosis of depression (17.1% vs 2.9%, respectively; $P < 0.01$); anxiety (13.8% vs 3.5%; $P < 0.01$); bipolar disorder (4.5% vs 0.6%; $P < 0.01$); and drug or alcohol abuse (5.1% vs 1.9%; $P < 0.01$).

Research on the association between ADHD and depression has also been conducted in a state prison. In a study of 102 male offenders in the Utah State Prison,³⁵ of the 26 men with high levels of depressive symptoms, 13 (50%) were reported to have had significant symptoms of ADHD in childhood, and 15 (58%) had significant symptoms of ADHD as adults (depressive symptoms were assessed using the Beck Depression Inventory and DSM-III-R and Utah criteria for ADHD). Depression was diagnosed in 22 (85%) of the 26 subjects with significant child and adult symptoms of ADHD. Both significant child and adult symptoms of ADHD and depression were diagnosed in 11 (10.8%) of the prisoners.

A comparison of health service costs for patients with ADHD and depression was reported by Hinnenthal et al³⁶ in their analysis of pharmacy and medical claims data from a US managed care plan: 12-month mean per-patient costs were \$3020 for 6793 patients with ADHD and \$4216 for 58017 patients with depression. Of 249874 adults enrolled at the Group Health Cooperative in 2001,³⁷ 17792 were diagnosed with depression, 1023 with ADHD, and 454 with both depression and ADHD. The mean total health care costs per patient per year were \$2880 for all adults, \$6029 for adults with depression, \$3928 for adults with ADHD, and \$4979 for adults with both depression and ADHD.

Bipolar Disorder

Because those with ADHD and bipolar disorder have similar symptoms (eg, hyperactivity), relying only on presenting symptoms for a diagnosis of either is not advisable, as previously noted.

A recent study sponsored by the National Institute of Mental Health,²¹ designed to evaluate long-term treatment outcomes in adults with bipolar disorder, showed that criteria for a lifetime diagnosis of ADHD were met by 87 (9.5%) of 919 patients. Attention-deficit/hyperactivity disorder in this study was diagnosed by means of the Mini-International Neuropsychiatric Interview.³⁸ Criteria for full, current ADHD were met by 62% of the 87 patients (the criteria were that symptoms must have caused significant problems in at least 2 of these situations: school, work, home, or with family or friends). Sex differences were noted: 64% of the bipolar patients with ADHD were men compared with 39% of those without ADHD ($P < 0.001$). Patients with lifetime ADHD were more likely to have been diagnosed as bipolar I (83% vs 68% of non-ADHD patients) than bipolar II (14% vs 27%; $P < 0.05$) and to have had an earlier onset of mood disorder (13.9 years vs 18 years; $P < 0.05$). Some comorbid disorders were more common in bipolar patients with ADHD than in those without, including social phobia (36% vs 20%; $P < 0.01$); post-traumatic stress disorder (29% vs 15%; $P < 0.001$); alcohol abuse/dependence (61% vs 39%; $P < 0.05$); and drug abuse/dependence (48% vs 25%; $P < 0.01$).

Winokur et al³⁹ compared characteristics of patients with bipolar I disorder ($n = 189$) and primary unipolar depression ($n = 218$). The patients' mean ages at onset were 24.7 years (bipolar patients) and 32.1 years (unipolar patients); 52% and 64%, respectively, were women. Among the clinical characteristics examined was a history of "hyperactive syndrome" in childhood as defined by self-report of at least 2 of these 5 symptoms: restlessness, hyperactivity, impulsiveness, short attention span, and "short fuse" for anger. Hyperactive syndrome was identified in 21% of the bipolar patients compared with only 9% of the unipolar patients ($P < 0.001$). Likewise, hyperactive syndrome was reported by 19% of the relatives of the bipolar patients and 7% of the relatives of the unipolar patients ($P < 0.01$).³⁹

Identification and Treatment of Adults with ADHD

Correctly diagnosing and developing a comprehensive treatment plan for adults with ADHD and comorbid conditions can be challenging. Careful attention to patients' clinical features will help physicians distinguish between ADHD

and other psychiatric disorders. Because of the widespread under-recognition of ADHD, many adults with ADHD are not treated for the disorder. Many primary care physicians consulted by patients for their primary health care needs do not feel confident about diagnosing adults with ADHD. In a survey of 400 primary care physicians who regularly treat mental health disorders,⁴⁰ approximately half of the respondents reported that they were not confident about diagnosing ADHD in adults and considered the diagnostic criteria for ADHD in adults to be unclear. Approximately three-fourths believed it was more difficult to diagnose adults than children with ADHD. Two-thirds deferred to a specialist when diagnosing adult ADHD compared with 2% for depression and 3% for generalized anxiety disorder.⁴⁰

A comprehensive clinical interview and evaluation are essential to the diagnosis of ADHD and its differentiation from other psychiatric disorders in adults.^{16,41} The evaluation includes discussion on patient recall of any childhood symptoms of ADHD, an investigation of current symptoms and impairment at work, home, and social functioning, and an assessment of the patient's family history and observable impairments of family members, including disorganization, job/financial instability, and alcohol/substance use disorders.⁴¹ Information obtained through the use of rating scales can be helpful in assessing childhood and current symptoms.⁴² During the assessment, a collateral interview with a family member, if possible, can provide valuable information that the patient may not self-report. Alternatively, a family member serving as an observer may complete an ADHD rating scale to complement and confirm the patient's symptoms and impairment report. Formal records such as report cards and conduct reports are also useful for historical documentation.¹⁶ In addition, the clinician needs to extrapolate symptoms and other information to adult domains of functioning because the DSM-IV-TR diagnostic criteria use child-specific language. Another important consideration during the clinical assessment is an investigation into patient coping strategies. As a result of dealing with ADHD symptoms for years, adults with ADHD frequently develop compensatory strategies that help minimize the observable symptom impact.¹⁶ While these strategies may help adults with ADHD to function, they can also complicate the diagnosis of ADHD. Because elaborate coping strategies can make impairments less evident to others, clinicians need to account for the degree of compensation when assessing symptom severity. Coping strategies for an adult with ADHD may include choosing a very active job or a spouse/assistant who helps with organization to compensate for the patient's difficulties.

In many instances, a presenting problem such as MDD or bipolar disorder may be the first opportunity to recognize comorbid ADHD.^{41,43} Current comorbid psychiatric conditions in the presence of ADHD, however, can complicate the options for treatment. Generally, if ADHD is recognized, clinicians opt to stabilize the mood disorder first before turning their attention to ADHD, but complexities abound. For example, how should one sequence treatments for a patient with cocaine abuse, bipolar disorder, panic disorder, and ADHD?⁴¹ To construct an effective pharmacologic algorithm, the active concurrent conditions must be prioritized in the diagnosis. The objective is to improve one condition without making the others worse. Considering the preliminary research at this time, the recommended diagnostic prioritization calls for the treatment of active alcohol and substance abuse first, then severe mood disorders, followed by severe anxiety disorders, and finally ADHD.⁴¹ The prioritization also takes into account the severity of each concurrent disorder. For example, if a patient presents with a severe episode of MDD and has ADHD, we recommend that the severe depression takes priority over the ADHD. However, if a patient presents with chronic dysthymia and ADHD, the ADHD should be the priority, since its treatment may lead to an amelioration of the dysthymia.

Five pharmacologic treatment options have been approved by the US Food and Drug Administration for use in adults with ADHD; 4 psychostimulants and 1 nonstimulant.⁴⁴⁻⁴⁸ In clinical trials, these medications have demonstrated efficacy and similar tolerability profiles in adults with ADHD.⁴⁹⁻⁵⁹ The labels of medications approved for the treatment of ADHD in adults carry a warning about psychiatric adverse events including treatment-emergent psychotic or manic symptoms in patients with no history, or exacerbation of symptoms in patients with pre-existing psychosis.⁴⁴⁻⁴⁸ Because of the potential risk for effects of ADHD medications on mood, carefully distinguishing a severe depression such as MDD or a depressive phase of bipolar disorder is important. Conversely, psychotropic medications used to treat mood disorders (antidepressants, mood stabilizers, and/or anticonvulsants) may result in isolated cognitive deficits temporally related to the medication, but these will not cause or induce ADHD.

Although medication is a cornerstone in the treatment of adult ADHD, individualized psychotherapy provides complementary benefits for patients and their families. Several therapeutic approaches can be considered, although to be most effective, the key target symptoms and impairments need to be identified. Figure 1 provides an outline of specific target symptoms and the appropriate therapeutic approach.⁴¹

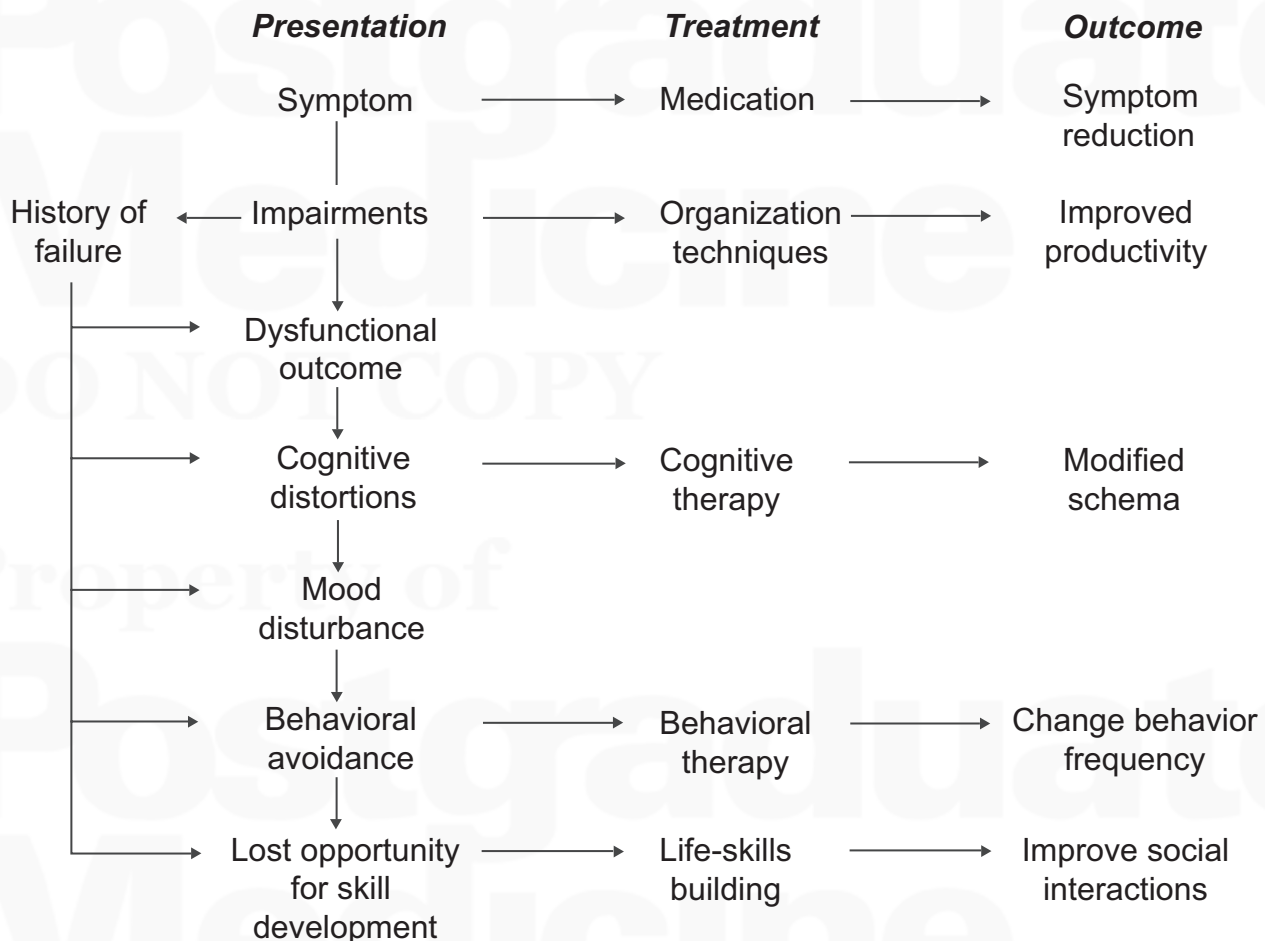
Of the approaches to therapy, cognitive behavioral therapy (CBT) seems to be best able to introduce new cognitive skills to the patient. Preliminary evidence for CBT in adult ADHD is noted in several studies, both open-label⁶⁰ and controlled.⁶¹ Safren et al⁶¹ investigated CBT for adults with ADHD in a randomized controlled trial. Thirty-one patients who were stable on medication (had received medications prescribed for ADHD for 2 months with no more than a 10% change in dose for 1 month) were randomized to receive medication plus CBT or medication only. The CBT used in the study was conceptualized in 3 modules: organizational and planning skills, reducing distractibility, and cognitive restructuring. Several investigator-rated and self-rated assessment scales were used to evaluate outcomes. Mean ADHD Current Symptoms Scale scores declined 14.2 points in patients receiving CBT plus medication ($P < 0.01$) versus 5.2 points in the medication-only group. Improvements in the CBT plus medication group were noted on all assess-

ment scales, and this group had more treatment responders compared with medication alone (56% vs 13%).⁶¹

Solanto et al⁶² recently completed a study of a program called meta-cognitive therapy (MCT) in the treatment of 38 adults (aged 23–65 years) with ADHD. The MCT groups met weekly for about 2 hours, and duration of treatment was 8 or 12 weeks. Concomitant psychotropic ADHD medications were being received by 21 of the 38 patients. Treatment outcomes included significant improvements ($P < 0.001$) in inattentive symptoms (but not hyperactive-impulsive symptoms [Conners' Adult Rating Scale–Self-Report]), in scores on the Brown ADD scales of executive functioning, and on a self-report scale measuring competence in time management, organizational skills, and planning.

A thoughtful conceptualization and application of psychotherapy will prevent the therapist from being distracted. Since it is the very nature of the patient to be disorganized and distracted, organization and focus on

Figure 1. Comprehensive Role of the Therapist



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the part of the therapist is critical to ensure adherence to the therapeutic pursuit. Although the empirically tested research on psychotherapies in adult ADHD is very limited, the few studies do suggest that a specific mode of therapy will be helpful to complement the benefits of medication.

Treatment of ADHD in the Presence of Mood Disorder

In general, we found a paucity of studies to guide clinical treatment in these cases. No randomized controlled clinical trials have examined the effects of selective serotonin reuptake inhibitors on ADHD symptoms in adults without comorbid depression, and only 1 randomized controlled clinical trial has examined the effects of a tricyclic antidepressant (desipramine) on ADHD symptoms in adults without comorbid depression. In a randomized, 6-week, placebo-controlled, parallel-design study of desipramine in 41 adult patients diagnosed with ADHD, adults treated with desipramine showed clinically significant improvement in ADHD symptoms compared with placebo.⁶³ Only 2 small open-label studies have been published on the treatment of concurrent MDD and ADHD in adults.^{64,65} Seventeen adults with comorbid MDD and ADHD received venlafaxine with or without a concurrent psychostimulant for 8 to 12 weeks.⁶⁴ In a retrospective analysis of data, the authors reported that monotherapy with venlafaxine appeared to be as efficacious in reducing symptoms of depression and ADHD as a combination of a stimulant plus an antidepressant (outcome was rated with the Hamilton Depression Rating Scale and the Clinical Global Impressions scale). In the open-label study by Findling,⁶⁵ 4 adults were first treated with fluoxetine or sertraline for MDD followed by a stimulant for ADHD. This combination therapy was well tolerated and appeared to be effective in ameliorating both ADHD and depressive symptoms. A third study, by Weiss et al,⁶⁶ was a randomized controlled trial of adults with ADHD and mild mood/anxiety symptoms who received psychotherapy plus paroxetine, dextroamphetamine, or placebo. The authors concluded that paroxetine was helpful for the mood/anxiety symptoms but not for the ADHD, whereas dextroamphetamine significantly reduced ADHD symptoms but did nothing for the mood/anxiety symptoms.

A search for publications on treating bipolar disorder and ADHD in adults produced 1 study.⁶⁷ In an open-label trial, 30 adults with ADHD and past or current bipolar disorder received bupropion for 6 weeks. Adults treated with mood stabilizers and antipsychotics for bipolar disorder were admitted to the study, provided that they had been stable on

their regimen for at least 4 weeks before entering the study and that the regimen remained stable throughout the study. Attention-deficit/hyperactivity disorder symptoms were significantly improved at treatment endpoint, as measured by the ADHD Symptom Checklist for DSM-IV and the Clinical Global Impressions scale, with significant reductions in both manic and depressive symptoms.⁶⁷ To date, there are no controlled trials on the treatment of adult ADHD in the presence of treated or untreated bipolar disorder.

Conclusion

The estimated prevalence of ADHD in children in the United States is approximately 7% to 8%, and a high proportion of these children will have persistent symptoms of ADHD into adulthood.^{4,5,7-10} The estimated prevalence of clinician-assessed ADHD in the general adult population ranges from 4% to 5%, and as many as 75% of adults with ADHD have never been diagnosed.^{19,20} Untreated ADHD can adversely affect school and work achievements, diminish self-esteem, damage interpersonal relationships, and significantly reduce quality of life for the adult. Furthermore, comorbid ADHD has been identified in 13% of adults with mood disorders, and 38% of adults with ADHD have been found to have comorbid mood disorders.¹⁹ Attention-deficit/hyperactivity disorder in adults can be identified despite resembling or coexisting with other psychiatric disorders.

Diagnostic prioritization is critical in order to formulate a pharmacologic and therapeutic algorithm that treats each disorder sequentially without jeopardizing the stability of the other conditions. Although research provides effective treatment options for adults with ADHD, there is little research to assist clinicians in developing an evidence-based treatment approach for ADHD and concurrent psychiatric disorders.

Given the high prevalence rate of ADHD in adults relative to other major psychiatric disorders, screening should be part of every initial psychiatric evaluation, as its untreated presence may diminish the treatment outcomes of comorbid psychiatric disorders. This is not common practice because most physicians and mental health professionals have not received training on adult ADHD and are unfamiliar with the assessment process. Screening will help to avoid missing this disorder when patients present with complaints of depression and anxiety, and treatment of all present psychiatric disorders will lead to the most optimal outcome.

An important topic for future research will be to determine whether persistent untreated ADHD adversely affects the outcome of antidepressant or mood stabilizer treatments, and if specific treatments for ADHD can improve

symptomatic and psychosocial outcomes of people receiving treatment for depression or bipolar disorder. Clinicians should consider screening for ADHD in adults diagnosed with primary mood disorders when cognitive and behavioral impairments persist after improvement of the acute mood episode with antidepressant or mood stabilizing therapies.

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Conflict of Interest Statement

David W. Goodman, MD discloses conflicts of interest with Cephalon, Forest Labs, GlaxoSmithKline, McNeil, MLB Communications, Novartis, Schering-Plough, Shire US, Inc., and Wyeth. Michael E. Thase, MD discloses conflicts of interest with AstraZeneca, Bristol-Myers Squibb, Eli Lilly & Company, Forest Pharmaceuticals, Inc., GlaxoSmithKline, Janssen Pharmaceutica, MedAvante, Inc., Neuronetics, Inc., Novartis, Organon International, Pfizer, Schering-Plough, Sepracor, Inc., Shire US, Inc., Supernus Pharmaceuticals, Inc., Transcept Pharmaceuticals, Inc., and Wyeth-Ayerst Laboratories. Dr Thase receives royalty income from American Psychiatric Publishing, Inc., Guilford Publications, Herald House, and W.W. Norton & Company. Dr Thase has provided expert testimony for Phillips Lytle, LLP, and Pepper Hamilton LLP. He has received research grants from Eli Lilly & Company, GlaxoSmithKline, the National Institute of Mental Health, and Sepracor, Inc.

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