

# A Guide to the Treatment of Adults With ADHD

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While child and adolescent physicians are familiar with the treatment of attention-deficit/hyperactivity disorder (ADHD), many adult physicians have had little experience with the disorder. It is difficult to develop clinical skills in the management of residual adult manifestations of developmental disorders without clinical experience with their presentation in childhood. Adult patients are increasingly seeking treatment for the symptoms of ADHD, and physicians need practice guidelines. Adult ADHD often presents differently from childhood ADHD. Because adult ADHD can be comorbid with other disorders and has symptoms similar to those of other disorders, it is important to understand differential diagnoses. Physicians should work with patients to provide feedback about their symptoms, to educate them about ADHD, and to set treatment goals. Treatment for ADHD in adults should include a medication trial, restructuring of the patient's environment to make it more compatible with the symptoms of ADHD, and ongoing supportive management to address any residual impairment and to facilitate functional and developmental improvements.

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Attention-deficit/hyperactivity disorder (ADHD) is known to affect approximately 4% to 12% of children<sup>1</sup> and continues into adulthood for approximately 50% of those diagnosed in childhood.<sup>2</sup> Prevalence is estimated at 4.7% of the adult population,<sup>3-10</sup> indicating that this is both a common and impairing condition for which treatment is now available. Research into the neurobiology of ADHD clearly established the validity of the disorder in adults,<sup>11</sup> which in turn opened a new window of opportunity for providing effective treatment.

The past 5 years have seen rapid development of all the tools we need for clinical intervention and research in the area of adult ADHD, including a structured diagnostic interview,<sup>12</sup> rating scales,<sup>3,13-16</sup> practice guidelines,<sup>5</sup> psychological treatments,<sup>17,18</sup> and medication options.<sup>19</sup> Our objective here is to integrate this new research with clinical experience in such a way as to assist clinicians who wish to begin working with these patients. Many adult physicians have not been trained in the use of these treatments and, in fact, have had little experience with the treatment of ADHD. Because of this, they may be hesitant

about diagnosing or treating ADHD in adults. But, as the first generation of children who were diagnosed with attention deficit disorder and attention-deficit/hyperactivity disorder become adults, physicians will be increasingly faced with patients who insist on continuity of the type of care they received through childhood into adulthood.

Because diagnosis of ADHD in adults has been well-covered previously,<sup>20,21</sup> we will concentrate on the treatment of adults who have recently been diagnosed with ADHD. Our purpose in this article is to give physicians clinical suggestions about the treatment of ADHD in adults so they will feel confident in treating such patients. These are the procedures we follow in our own practices when treating adult patients who have ADHD.

## DIFFERENCES IN PRESENTATION OF CHILD AND ADULT ADHD

Child psychiatrists who begin treatment of adults with ADHD may ask if there is anything different about the presentation of the condition in adults. In adults, just as in children, the symptoms of ADHD are described by the deficits associated with the core syndrome. ADHD includes problems with attention such as being forgetful, losing things, and organizational problems. However, as the demands for planning increase with age, these difficulties become increasingly prominent over the life cycle. Some symptoms such as procrastination, overreacting to frustration, poor motivation, insomnia, and difficulty with time management are common complaints but are not included in the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV)<sup>1</sup> diagnostic criteria.

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Adults tend to be less obviously hyperactive than young children, who can be seen jumping, running, and climbing. Adult variants of these symptoms would include difficulties such as being a workaholic, feeling uncomfortable sitting through meetings, being unwilling to wait in line, and speeding while driving. Some of the symptoms of hyperactivity are not based on motor behavior but other aspects of functioning, such as talking. Adults may present to physicians complaining that they talk too much, talk out of turn, blurt out inappropriate comments, or talk on their cell phone in meetings. These behaviors may lead to both social and occupational impairments.

Adults with ADHD may continue to have difficulty seeing which of their actions provoke irritation in others, but age may have also given them the insight to monitor the reactions of others and adjust their behavior accordingly. Wisdom and age also may bring the insight that the impact of ADHD can be minimized by tailoring the environment to be ADHD-friendly and by working to structure coping strategies. For example, a child who felt restless and frustrated sitting in the classroom all day might feel much better as an adult in his job as a real estate agent going from house to house. One adult described how he realized when he was 7 years old that his compulsive need to keep talking would make him a great radio announcer, and he did indeed fulfill that goal. Another child who got into trouble because of his magnetic attraction to high risk activities became a highly paid logger who took on dangerous jobs. In these circumstances, traits that were problematic in the classroom were adaptive on the job. This does not mean that these individuals no longer suffered impairment in quality of life, social relationships, personal planning, and other dimensions of functioning. In summary, adult ADHD is distinct from child ADHD in that the adult can often modify his daily routine to better match his temperament, whereas all children are forced to deal with the ADHD-challenging milieu of school.

An adolescent once wisely said, "You don't grow out of ADHD; you just get better at coping with it." This process is much like the process whereby patients with a learning disability develop the insight and skill to work with their learning strengths and compensate for learning weaknesses. An adult with ADHD who knows that he or she will blurt out inappropriate comments may find it adaptive to avoid cocktail parties with colleagues. Those who know they have problems losing things may come to realize that it is worthwhile to have several sets of keys or to avoid carrying a purse.

However, occasionally, coping strategies that are adaptive reactions to ADHD symptoms can be problematic in their own right. For example, one man had learned that he functioned better if he structured his day, and so he had developed the habit of strictly planning his time. While this was very helpful for him personally, his family complained that he insisted they follow his plan every

weekend. He was unable to be flexible, to tailor the plan to changes in the weather, or to adjust to the priorities of other members of the family. When this was explained to him, he responded, "But if I don't follow the plan, I won't do anything." For him, the choice had always been between no planning or rigid planning; flexible planning was still too challenging to be realistic.

ADHD in adulthood may also differ from ADHD in childhood in that the person who seeks treatment is the person who receives it. Children are brought in by parents, often on the recommendation of teachers. Therefore, children are brought for treatment often without understanding why and without necessarily feeling that they want anything to change. Adults are preselected for treatment because they have come in on their own or agreed to come, although they may not necessarily agree to actually change anything.

This difference between children and adults with ADHD has several important implications. First, it means that children are more likely to be referred for problems that are bothersome or noticeable to others, such as being disruptive or defiant. Adults are more likely to seek treatment for problems that impact their own well being, such as difficulties being productive, frustration over being disorganized and wasting time, or more subtle impairments in their quality of life. Second, with adults, the person who consents to treatment and the person who reports on treatment progress is also the person receiving treatment. With children, we often treat according to the parents' reports or wishes, even if the child is only partially willing. This means that adults are much more likely to refuse treatments that are associated with uncomfortable side effects such as irritability, trouble sleeping, and anxiety. The focus with children is on their behavior. Children may refuse to take medication, but they can have significant difficulty explaining their refusal. Adults are therefore more likely to complain of subjective dysphoria associated with medication treatment.

Adults with ADHD have more difficulty implementing behavioral treatments that use rewards and consequences. One adult related that he had set up a program where he could have a piece of candy every time he paid his bills, but then it seemed much easier just to have the candy even when he did not pay the bills. His wife refused to play the role of "mother" and administer the candies for him. By contrast, it is routine for parents to administer consequences in working with their child's therapist.

Adults with ADHD may have more difficulty than children obtaining objective feedback from their support environment about their response to treatment. Physicians routinely contact teachers to evaluate children's responses to treatment, but obtaining objective reports from employers can be more problematic. Often, adults use their spouses or roommates for this purpose, but these sources provide feedback on evening social behaviors or behaviors at

home rather than on work behaviors, and many adults taking stimulant medication are only medicated while they are working. Adults with ADHD who have serious problems with social skills may live alone, and in that case they often do not have someone who can provide collateral information.

Adults and children sometimes differ in the time of day during which they experience the highest degree of impairment. Children suffer both at home and at school, but at least at home they have more freedom, more supervision, and fewer demands for attentiveness than adults. Adults also suffer at home and at work, but the converse is true. An ADHD-friendly occupation or self-employment allows them more freedom and mobility during the day, while the constraints of parenting, driving, and housework often put more demands on attentiveness during their evening hours. It may be in the evening that they seek out substances to “unwind,” when they need to help children with homework, pay bills, and plan activities for the next day. This means that, for adults, many of their most attention-demanding tasks occur at a time of day when stimulants are not easily or typically prescribed.

The prevalence of adult ADHD is almost equally divided between men and women, whereas ADHD in children is more common in males. Since there is no evidence that men grow out of ADHD faster, this suggests different patterns of referral between the 2 age groups. Although this demographic difference is still not well explained, we know that women are less likely to be disruptive, and so as the ratio of self-referral for attention problems versus referral by others for disruptiveness increases through the life cycle, so does the ratio of women to men in treatment.

Finally, an important difference between ADHD in adults and children is that adults are often caring for others rather than being cared for by others. They may seek treatment not only for their own well-being but because they are aware that their difficulties impact their children and/or their spouses.

### MANAGEMENT OF COMORBID DISORDERS AND DIFFERENTIAL DIAGNOSES

Diagnosis of ADHD in adults presents several challenges that continue to impede the confidence of adult psychiatrists treating these patients. Some of the symptoms commonly associated with ADHD but not listed in the 18 core items of DSM-IV<sup>1</sup> overlap with symptoms of other disorders. In this circumstance, the adult psychiatrist may selectively identify these symptoms while failing to inquire about symptoms of developmental patterns pathognomonic of ADHD. This would lead the psychiatrist to diagnose such an adult as having an atypical presentation of the disorder with which they are familiar, while failing to identify the residual ADHD. This is particularly likely with symptoms such as temper outbursts,

irritability, unpredictable moods, difficulty settling to sleep, pragmatic language problems, and rigid behavior patterns.

Because these patients have lived with ADHD symptoms all their lives, they may not recognize these types of chronic symptoms as problematic or treatable. By contrast, acute mood or anxiety symptoms are new and subjectively disturbing, making them much more salient to the patient and increasing the likelihood that these symptoms will be represented as the chief complaint without the clinician detecting the underlying ADHD. Treating mood and anxiety disorders without addressing the ADHD often leads to a partial response. ADHD patients with sleep, appetite, and impulse control problems do not easily comply with or tolerate medication. Without treating the underlying ADHD the patient may be stabilized to a baseline that continues to be highly impaired.

Adult psychiatrists may also have difficulty recognizing residual symptoms of other neurodevelopmental disorders, including oppositional defiant symptoms, conduct disorder that does not meet criteria for antisocial personality, Asperger’s disorder, and other autism-spectrum conditions. Such symptoms may be misinterpreted and diagnosed as “personality disorder not otherwise specified.” For this reason, experts in the field have developed tools that may assist adult psychiatrists to identify developmental disorders in adult patients that are likely to either be comorbid with ADHD or important in the differential diagnosis. The Adult Self Report Inventory-4 (ASRI-4)<sup>16</sup> provides a screening checklist for DSM-IV symptoms of developmental disorders and personality disorder, as well as the major disorders of adulthood. This inventory can be easily reviewed by the clinician, and even without formal scoring can clue clinicians into groupings of symptoms that signify patterns of comorbidity that might otherwise be missed.

In child psychiatry, it is routine to use multiple informants. We interview the child and his or her family, and we either contact the teacher directly or communicate with the teacher via a rating scale. These procedures provide our “window” for observing symptoms that patients may have difficulty reporting themselves. A good assessment of ADHD in an adult applies the procedures of a child psychiatry assessment to the adult context. In this context, information obtained from collateral informants is helpful. While obtaining collateral reports is not an essential procedure for adult assessment, it can be educational as well as helpful where it is feasible. Part of the reason why adult psychiatrists have not previously identified ADHD in adults may be that, unlike their child counterparts, most adult assessments focus on the patient rather than other informants. This means that the psychiatrist only has access to information about family complaints or employer frustration to the extent that the patient is aware of those perspectives. With ADHD, insight is variable. The Adult

**Table 1. Questions to Establish the Patient's Developmental History<sup>a</sup>**


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Were you a very active child?  
 Did parents and/or teachers complain you were difficult?  
 Are you accident prone?  
 How did you do academically?  
 Did you ever fail a grade?  
 Were you ever labeled as having a learning disability?  
 Did you need special help at school?  
 Were you ever suspended or expelled?  
 Were you an underachiever?  
 Was your performance at school variable or unpredictable?  
 Do you have problems with rage attacks?  
 How many jobs have you had? How many times have you been fired?  
 Why?  
 What kinds of things give you problems at work?  
 Do you have trouble living with others?  
 How much do you smoke? Drink? Use marijuana?  
 How many car accidents have you had? How many traffic tickets or speeding tickets?  
 Have you had problems as a parent?  
 What do you enjoy doing with your spare time?  
 Do you have trouble with money? Housework? Being on time?  
 Do you feel addicted to anything? Gambling? Computers? Games?

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<sup>a</sup>Adapted with permission from Weiss and Murray.<sup>21</sup>

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Inventory-4 (AD-4)<sup>16</sup> was therefore developed to provide collateral information from a second informant in a similar form to the self-report. By comparing the reports from 2 different informants, the clinician has access to multiple informants and a sense of the compatibility of the patient's report with that of others for the full range of comorbid diagnoses. For example, the clinician may observe that the patient does not identify difficulties such as lying, defiance, or poor social skills, but these are major areas of concern for his or her spouse. On the other hand, both patient and informant may show good agreement on report of ADHD symptoms. This feedback is in itself helpful to the patient.

Adult psychiatrists can also avail themselves of a variety of other tools designed to facilitate obtaining a good developmental history appropriate to this condition. Experts have developed several semistructured interviews or patient self-report forms for this purpose.<sup>12,15</sup> Typical questions are listed for easy reference in Table 1. Finally, since part of an assessment of ADHD in adulthood also includes assessment for symptomatology in childhood, use of a rating scale normed to identify a childhood history of ADHD in adults is useful.<sup>22</sup>

Even the best screening checklists and developmental history forms can only be an aid to assessment, and the gold standard of diagnosis remains the clinical interview. Diagnosis of ADHD is particularly challenging in that it is the rule, rather than the exception, for the patient to also have a lifetime or current history of other disorders. Diagnosis of ADHD is relatively simple compared with the clinical acumen that makes it possible to put the diagnosis into the context of wider psychiatric and social circumstances of the patient. Although it is beyond the scope of

this article to review comorbidity and differential diagnosis in depth, excellent resources dedicated to this subject are available.<sup>20,23-25</sup> Some of the most common clinical dilemmas are described below.

ADHD is often comorbid with posttraumatic stress disorder; ADHD predisposes individuals to trauma, and trauma (most especially traumatic brain injury) predisposes individuals to attention problems. It was previously commonly believed that disruptive behavior disorders (also called externalizing disorders) were incompatible with mood and anxiety disorders (also called internalizing disorders). This is not correct. Patients with conditions characterized by disturbing others can also feel considerable subjective distress themselves. Patients with ADHD may be vulnerable to depressed mood, unstable mood, and anxiety. In such circumstances, both disorders will need treatment. In some patients, one has the impression that ADHD symptoms and anxiety are feeding each other in a vicious cycle, in which the patient reacts to the uncertainty of never knowing when they will lose something, get into trouble, or suffer some other type of impairment with anxiety. The anxiety in turn then exacerbates the baseline attention problems. Practice guidelines differ significantly in their recommendation as to whether to treat ADHD or internalizing disorders first when they present together.<sup>5,26</sup>

While there has been considerable research demonstrating ongoing impairment of ADHD into adulthood, less attention has been paid to oppositional defiant disorder (ODD) and conduct disorder. Residual symptoms of ODD in adults may present as externalizing behaviors, e.g., "There is nothing wrong with my kid; the school system just can't handle him." Another typical presentation is the adult who comes in saying he or she does not believe in ADHD and medication, but insists the doctor deal with his or her employer's complaints. Oppositional defiant disorder that manifested as defiance in childhood may also, somewhat ironically, manifest as a tendency to be controlling in adulthood. The child who refused to be told what to do may grow up to become the parent who insists that his or her children follow commands to the letter of the law. In either case, frustration is expressed with temper outbursts. It should be noted that the childhood remedy of time-outs may also be effective self-management in adulthood.

Conduct disorder presents in childhood as getting into trouble, sometimes by intent and sometimes not. In adulthood, individuals may still find themselves doing things they should not—cheating on tax returns, running stop lights when no one is around, or being cruel or inappropriate with employees or service personnel. Unfortunately, none of the type of research that permitted the validation of ADHD in adulthood has been extended to other disruptive behavior disorders, and so these comments remain anecdotal.

We make these observations with the view that clinicians will benefit from considering such possibilities,

**Table 2. Differential Diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD) and Borderline Personality Disorder**

ADHD	Borderline personality disorder
Early onset	Adolescent onset
Charming, naïve	Angry and negative
Stable relationships	Intense, stormy relationships
Adventurous	Fear abandonment
Unpredictable	Manipulative
Insensitive	Oversensitive, distort
Poor judgment	Mini-psychosis
Random impulsivity	Driven intent to harm

since unrecognized comorbid disruptive behavior disorders are a likely impediment to treatment if the clinician dismisses the ADHD patient as having a personality disorder. For example, patients who are defiant often comply quite easily if given choices for treatment options, while they become belligerent if they are told what they “have to” do. Patients with very severe disruptive behavior disorders characterized by serious explosions of anger or violence may be considered as good candidates for treatment with a low dose of an atypical neuroleptic such as risperidone, rather than a stimulant.<sup>27</sup>

Tourette’s disorder is often comorbid with ADHD in childhood, but because it tends to be a self-limited disorder, it may be less common in adulthood.<sup>28,29</sup> Chronic tics can impede attention. Tourette’s disorder occurs in approximately 3% of the population and resolves in adulthood for approximately 50% of patients.<sup>28</sup> In patients with both ADHD and Tourette’s, the onset of ADHD usually precedes that of Tourette’s disorder and continues after the Tourette’s has abated. Physicians should assess adult patients who have ADHD for childhood Tourette’s as well and should explain the differences and similarities between the 2 disorders.<sup>30</sup> Psychoeducation is one of the most gratifying aspects of treating adults with ADHD, and this applies as much to explaining previously undiagnosed Tourette’s disorder as it does for ADHD itself.

Physicians sometimes have difficulty with the differential diagnosis of borderline personality disorder, perhaps because borderline personality is one of the few impulse control disorders with which adult psychiatrists are familiar. However, patients with borderline personality disorder demonstrate a selective distortion in their perceptions during relationships and have a driven intent to harm. By contrast, patients with ADHD often seem ingenuous and naïve and have impulsivity that tends to occur more randomly than with a directed manipulative intent (Table 2). Anti-social personality can be distinguished from ADHD and/or conduct disorder by absence of remorse and consistent delinquent behavior.

Of all the developmental disorders, Asperger’s disorder seems to present the greatest diagnostic difficulty to adult psychiatrists and, like ADHD, may be difficult to recognize in its adult form without the benefit of the clinical ex-

perience that provides a feel for the disorder when it is present in childhood. Asperger’s disorder has been described as a type of social blindness. It may well be comorbid with attention problems, although more research is needed to determine whether the profile of attention problems of individuals with Asperger’s is distinct from that of ADHD. For example, individuals with Asperger’s will hyperfocus on a unique issue or activity (cars, computer games, dinosaurs) to the exclusion of normal daily life. This is not a problem with being distractible, but rather a pathologic inability to be redirected by externally enforced demands. Individuals with ADHD tend to be social and outgoing, while individuals with Asperger’s often have far less interest in people than those who care for them wish they had. Asperger’s has been described as being associated with a technical mastery of language that belies poor pragmatic skills in applying language appropriately to social communication. Individuals with ADHD may talk too much, and they may not listen, but once engaged they can usually “get it.” Individuals with Asperger’s disorder often operate under a logic that defies understanding for others, e.g., “If you don’t build this sink with a garbage disposal, it is inefficient. If it is inefficient, I won’t use it and will simply drop my trash wherever I am,” or “If you are stopping in New York on your way to see your mother, then you are not coming to see me, and I don’t want you to visit.” ADHD is not typically associated with this unique type of thought disorder. As with Tourette’s disorder, there is a developmental progression to diagnosis of ADHD and Asperger’s. These children may be diagnosed as having ADHD and merely seem somewhat odd during latency, but they often flounder in high school when their social deficits and concrete thought patterns prevent them from adequately negotiating the developmental challenges of adolescence.<sup>31</sup>

## PHYSICIAN FEEDBACK

After being diagnosed with ADHD, the patient will probably be curious about the disorder. The physician should tell the patient how the diagnosis is made, i.e., what the DSM-IV criteria are, what rating scales were used, and how the patient’s symptoms are measured by these scales. The physician should also explain to the patient how any comorbid disorders that may be present interact with ADHD to impact functioning. Physician feedback should also include a discussion of the relationship between symptoms and actual impairment. Rating scales that measure the patient’s functioning can be useful additions to the assessment and feedback process.<sup>32-34</sup> The physician should also review associated symptoms of ADHD, which will give the patient an idea of how the problems that he or she originally sought treatment for—lack of motivation, trouble interacting in social situations—led to a diagnosis of ADHD (Table 3). Now that the patient has information

**Table 3. Associated Symptoms of Adult Attention-Deficit/Hyperactivity Disorder**


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Reactivity
Risk taking; inability to tolerate low stimulation
Environmental dependence
Procrastination
Inability to generate forced effort
Mood lability
Lack of motivation
Temper outbursts
Inept social skills or lack of social judgment
Poor frustration tolerance
Dysregulated sleep, nutrition, exercise, health

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about specific symptoms of ADHD, the physician should tie everything together by explaining the relationship between ADHD and the patient's past symptoms and developmental history.

### PSYCHOEDUCATION

Once the patient and physician have reviewed the impact of ADHD on past behavior and events, they should discuss how ADHD is currently affecting the patient's life. The physician should explain the relationship between current symptoms, functional impairment, and the patient's capacity to negotiate new developmental challenges. This may include problems of which the patient is aware, but collateral informants may have made it clear that other problems are just as important. For example, the patient's chief complaint may be procrastinating at work, but his wife's chief complaint is that he is not participating in family life. Bibliotherapy is useful at this stage to answer any questions from patients and their families (Table 4).

### IDENTIFICATION OF TREATMENT TARGETS

Once the patient is aware of the impact that ADHD has on his or her life, it is time for the patient and physician to identify the targets of treatment. Clinicians may be surprised that the patient's chief complaint is not within the core ADHD symptoms per se, but rather one or more of the associated symptoms. If the patient's chief complaint is impulsive eating, difficulty falling asleep, or procrastination, the patient may be frustrated to be told that there is improvement in attention because he or she never saw this as an issue in the first place. Establishing a way of measuring outcome for the patient's chief complaint and using rating scales that measure a broad range of symptoms and functioning are helpful in this regard. Patients who have comorbidities should be monitored with a broad scale (like the ASRI-4 used first at baseline) to ensure that improvement in some areas is not accompanied by deterioration in other areas.

Adults with ADHD often experience the observation of change on a standardized outcome measure as therapeutic

**Table 4. Aids in Bibliotherapy for Patients With Adult Attention-Deficit/Hyperactivity Disorder (ADHD)**


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Books
<i>Driven to Distraction</i> by Hallowell and Ratey <sup>35</sup>
<i>ADHD in Adulthood</i> by Weiss, Trokenberg Hechtman, and Weiss <sup>20</sup>
Video
<i>ADHD in Adults</i> by Barkley <sup>36</sup>
Organizations
Children and Adults With Attention-Deficit-Hyperactivity Disorder (www.chadd.org)
National Alliance for the Advancement of ADHD Care (www.naac.org)

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**Table 5. Sample Indicators of Impairment in Attention-Deficit/Hyperactivity Disorder and Improved Functioning**


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Impairment	Improved Functioning
Occupational difficulties	Working and studying are more efficient
Low self-esteem	
Trouble with relationships	Workspace is better organized at work and at home
Poor parenting	Able to enjoy social activities
Legal problems	Able to contain aggressive impulses such as social wisecracks,
Health concerns	faults in sports, abuse in parenting
Injuries	Marriage more stable, spouse is happier
Motor vehicle accidents, speeding, and tickets	Improved parenting
Smoking	Financial responsibility
Substance abuse	No longer speeding or getting traffic tickets
	Decrease in marijuana dependence

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and reassuring in its own right. They will work toward a desired endpoint once they understand how the outcome measure fits with their own perceptions of their symptoms and treatment objectives. Treatment objectives should be decided by the physician and patient working together to determine what symptoms of ADHD impair the patient the most and what would be the best way to achieve symptom remission. The physician should review with the patient common areas of impairment in patients with ADHD such as academic limitations,<sup>37</sup> occupational problems,<sup>11</sup> relationship difficulties,<sup>37</sup> motor vehicle accidents,<sup>38</sup> and substance abuse<sup>39</sup> (Table 5). The physician should also review the indicators of improved functioning with the patient. These may include more efficient working or studying, a more organized workspace, a more stable marriage, fewer traffic tickets, more consistent parenting, or better self-care.

Before prescribing medication, the physician should explore the patient's preferred method of treatment, as well as any expectations and reservations he or she has about treatment. These should be taken into consideration when deciding how the treatment should progress. Also at this time, the physician should set the time frame for therapy. Adult patients with ADHD can be dependent, in the sense that both they and their loved ones have often learned early on that it is much easier to rely on someone else to get a task accomplished than to reach a point where

**Table 6. Steps in Introducing Medication to the Patient With ADHD**


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Provide the patient with written and oral information on medication
Review with the patient current empirical research from clinical trials with ADHD adults
Explore patient's apprehensions: "This is a crutch," "It won't be my personality any more, it will be the pill," "Once my chemical imbalance is fixed, I'll start to clean up"
Choose medication based on duration of action, comorbidity, symptom targets, patient preference, family history, patient medication history, and risk of abuse
Dose: start low, go slow, and keep going until you can determine optimal risk/benefit ratio
Measure outcome: continue to use ADHD rating scales with the patient as a psychoeducational tool
Teach patients to find observational anchors they can use to self-monitor progress

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Abbreviation: ADHD = Attention-Deficit/Hyperactivity Disorder.

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they can do it themselves. It is therefore helpful to ensure that the patient understands both the nature and the duration of the clinician's involvement from the start.

Both patients and clinicians need to be aware of the time course for improvement in each area of impairment. This is particularly true for those adults with ADHD who seem to only understand 2 units of time: right away or never. Some symptoms may improve within days or even hours of starting medication if the adult can tolerate a sufficient initial dose. However, it is important to wait to judge what the full effect of medication will be. It can take some time for circumstances to play out so that the patient can see the differences in how he responds to challenging situations. It can also take time for the patient to observe differences in how people are reacting to him or her or to evaluate changes in productivity or efficiency. Symptoms tend to get better within weeks, functioning gets better within months, and perhaps most importantly, careful observation may identify changes in development taking place over years. For example, an individual who never had a friend now makes and keeps them. Another individual who could not hold down a job has now worked in one position for a year and been promoted.

### MEDICATION TRIAL

After discussing ADHD, its symptoms, and the treatment goals with the patient, the physician should begin a medication trial. Many myths surround medication treatment for ADHD, such as that medication is a 'crutch' or that stimulants are addictive. The availability of many new treatment options with differing durations of action has meant that a critical part of the assessment must be to determine the patient's impairment at various times throughout the day to ensure that medication coverage overlaps with the time when the patient is most likely to benefit. For example, there would be little point in a college student taking a stimulant in the morning when he or she tends to have sports practice and then to be in rebound in the late

evening when he or she is studying. A short-term medication trial carries little risk for patients but can help them to observe the impact of their symptoms on everyday life. This gives patients an idea of what life can be like once symptoms have diminished and they are operating on a level playing field with others.

It is important to keep in mind the principle of informed consent when prescribing medication for a patient (Table 6). The physician should provide written and oral information to the patient about medications and review with the patient current empirical research from clinical trials in adults with ADHD. The physician should also explore the patient's concerns about medication. Fear of "chemicals" and unrealistic expectations need to be addressed before writing a prescription. The physician should ultimately choose a medication based on its duration of action, the patient's comorbidity, the symptom targets, the patient's preference, family history, past medication history, and risk of abuse.

As with all medication trials, it is important to start with a low dose of the medication and keep increasing it slowly until the optimal risk-to-benefit ratio has been determined. Many patients with ADHD, particularly those who are anxious, are sensitive to side effects, so slow and careful titration is warranted. Overcompliance, undercompliance, and random patterns of pill taking may all be issues for adults with ADHD who are trying to take medication. ADHD is a chronic developmental disorder best treated slowly and systematically. From the patient's point of view, however, once he or she discovers what is wrong there is a sense of urgency for an immediate cure, but quick titration of medication may backfire and lead to a longer course of ineffective treatment or multiple medication trials in the long run. Many physicians are reluctant to give patients adequate doses of medication, which may result in failure to identify optimal response. A sample titration schedule for several popular medications for ADHD is provided (Table 7). During this time, the physician should continue to use the rating scales used at baseline as psychoeducational tools to measure the patient's progress in symptom remission while taking the medication. The physician should also teach patients to find observational anchors so they can self-monitor their own progress.

At titration visits, the physician should monitor compliance, side effects, vital signs, dosage, symptoms of ADHD, and any change in comorbid conditions. With patients who can reliably self-monitor, collateral reports are not absolutely necessary, but they should be obtained if the clinician feels the patient cannot be relied on to report his or her own symptoms accurately. One of the useful things about obtaining both a self report and collateral information at baseline is that, when combined, they provide information on the patient's level of insight. The physician should observe the patient's response to the medication at different times of the day and in different environments, as

Table 7. Sample Titration Schedules for Attention-Deficit/Hyperactivity Disorder Medications<sup>a</sup>

Medication	Starting daily dosage (mg)	Dosing Frequency	Increase by <sup>b</sup>	Maximum daily dosage (mg)
Ritalin (methylphenidate immediate release)	10	3 times a day	10 mg/wk	80
Concerta (methylphenidate extended release)	36	Every morning	18 mg/wk	80
Ritalin LA (methylphenidate extended release)	20	Every morning	20 mg/wk	80
Adderall (mixed amphetamine salts compound)	5	3 times a day	5 mg/wk	40
Adderall XR (mixed amphetamine salts compound extended release)	10	Every morning	10 mg/wk	40
Strattera (atomoxetine)	40	Every morning	40 mg every 2 wk	120 <sup>c</sup>

<sup>a</sup>As tolerated until optimal risk/benefit ratio is achieved.  
<sup>b</sup>Increase a.m. doses before p.m. doses.  
<sup>c</sup>100 mg/day is the maximum label dosage approved by the U.S. Food and Drug Administration.

well as in accomplishing various tasks. If compliance is a problem, it can be improved with long-acting medication, a dosette box, blister packs, or assistance from others. Patients with ADHD can often improve in their compliance if they piggyback taking the pill onto another task they do routinely; one patient taped the pill to the toilet seat with masking tape, a strategy that proved 100% successful. Patients who are very anxious about taking medication will often respond well to first taking a homeopathic dose or a placebo for a while, with the explanation that this will allow them to sort out whether their side effects are from the medication or their anxiety about taking medication.

The stimulant medications used to treat adults with ADHD are safe and effective, and have been well studied. Double-blind, placebo-controlled trials have shown that a majority of adults will show a robust response to medications such as methylphenidate and mixed amphetamine salts.<sup>40-44</sup> The last few years have seen the launch in the United States of several new long-duration formulations of stimulant medications lasting 6 hours (Focalin), 8 to 10 hours (Ritalin LA, Metadate CD), or 12 hours (Concerta or Adderall XR). These drugs facilitate compliance by eliminating the need for frequent dosing. The development of these products has often included testing in adults with ADHD with the intent to have an indication for treatment of ADHD in adulthood, and has therefore contributed to research in this area, although the results of these large scale adult trials have not yet been published. Because the dose formulations that have been marketed to date are often targeted to the pediatric population, the number of pills—and thus the cost of treatment—is increased for adults.

Not only are titration guidelines for the use of stimulants similar between adults and children,<sup>45</sup> but also side effects of stimulant treatment are similar between the 2 patient age groups.<sup>42</sup> Potential side effects associated with stimulant medications in adults with ADHD include appetite loss, insomnia, nervousness, a mild increase in pulse and blood pressure, and unwanted psychiatric effects such as irritability, dysphoria, and rebound. An exception is that adults may be more vulnerable to mild elevations in blood pressure or heart rate if they have occult or borderline hypertension or other cardiovascular pathology.

There are double-blind, placebo-controlled trials of bupropion<sup>46</sup> and desipramine<sup>47</sup> in the management of ADHD in adults. Response to the older antidepressants is quite similar to that in children, with between half and two-thirds of adult patients showing a clinically significant response. Antidepressants are therefore second-line drugs for ADHD.

In 2002, the U.S. Food and Drug Administration announced approval for the first medication to receive a specific indication for the treatment of ADHD in adults. This medication, atomoxetine, is a nonstimulant that is a highly specific norepinephrine reuptake inhibitor. The development of this medication treatment for management of ADHD in both adults and children was the result of a large research program of clinical trials that helped to develop a methodology for conducting clinical trials with adults and the feasibility of providing these patients with safe and efficacious treatment.<sup>48,49</sup> It is of some interest that the development of this medication was initially piloted in adults rather than children, although later confirmation of benefit in children followed.<sup>50</sup>

Atomoxetine has some unique benefits of interest for treatment of adults: there is less rebound, once-a-day dosing provides full coverage even into the evening, mild antidepressant effects may be helpful for management of comorbidity, and it is not a scheduled substance. Atomoxetine may also be a useful treatment for patients who are apprehensive about stimulants or for whom they may not be appropriate because of concerns about past substance use. In particular, patients who become dysphoric, anxious, “zombied,” or experience severe rebound on stimulants may react better to atomoxetine, which was initially developed as an antidepressant. Potential side effects associated with atomoxetine in adults with ADHD are dry mouth, insomnia, nausea, decreased appetite, constipation, decreased libido, dizziness, erectile dysfunction, sweating, and dysuria.

## ENVIRONMENTAL RESTRUCTURING

The impact of neurobiological symptoms is context-dependent, so once patients begin to show signs of im-

provement, environmental restructuring can improve their environment and thereby reinforce gains. Individualized instruction may compensate for executive dysfunction in learning, and computerized aids such as personal digital assistants and cell phones may assist with dysgraphia and problems with organization, attention, planning, and time management. Rescheduling attention-demanding tasks to periods of the day in which attention is optimal or when assistance is available can lessen the impact of ADHD symptoms on performance, as can assigning organizational tasks to a spouse or assistant. Just as one helps a patient with a learning disability to discover how he or she can best manage each new learning challenge, so one can help a patient with ADHD discover how to self-monitor and experiment to create better coping strategies. For example, the therapist may suggest experimenting with the amount of background noise. Some patients identify techniques they use to help them concentrate such as “picking” at their skin, holding something in their hands, jiggling their knees, and rocking on a chair. The patient should be encouraged to explore ADHD-friendly occupations and hobbies. For example, a patient who tries baseball as a hobby but does not have the patience to wait to get up to bat or the attention to keep his or her eyes on the ball in the outfield may find that he or she is a great snowboarder and mountain biker. The problem is not sports in general; it is the attention-demanding aspects of baseball.

It is also helpful for patients and therapists to reframe for family members behaviors that may be misinterpreted as intentional callousness but instead reflect an attention deficit. For example, it may help to say, “It’s not that he forgets your birthday because he doesn’t care. He just forgets. How about planning a dinner together and then you drive by the office to pick him up?” Instrumental tasks of parenting, such as cooking, cleaning, supervision, or picking children up from school on time, may be impaired, which may in turn create a functional dependency on the spouse to take on these tasks. Environmental restructuring in this circumstance would mean reallocating tasks such that the patient takes on the types of responsibilities that he or she can complete successfully.

ADHD has a familial nature<sup>51</sup> and can exist in different forms in various multiple family members. A study<sup>51</sup> found that 48 (57%) of 84 children studied who had a parent with ADHD met the criteria for ADHD themselves. Physicians may be tempted to blame family issues on a systems problem when family members are just trying to live and cope with a neuropsychiatric condition. These difficulties in families with more than one member with ADHD often lead to social isolation for the entire family.

Children and partners of adults with ADHD may feel burdened by increased demands because of their family member’s ADHD, and they can feel trapped by living with the consequences of impulsive decisions they cannot

control. Families who have more than one member with ADHD may function differently from other families; for example, routines such as an established dinner hour may not work. Television, which is commonly regarded as a waste of time, may make it possible to have one-to-one time with one child while occupying the other child. Quality family time may be dedicated to rollerblading rather than attempting to sit still together in church. These are all compromises, and families come to realize that a compromise does not mean failure. Modified expectations can salvage a sense of continued well-being.

## PSYCHOLOGICAL TREATMENT OF RESIDUAL IMPAIRMENT

After medication therapy has begun, the patient’s environment has been modified, and the patient’s symptoms are going into remission, psychological treatment is helpful to reduce any residual impairment. The physician should know, though, that there can be limitations to the use of some psychotherapies with ADHD patients. If a psychoanalytically oriented therapist unfamiliar with ADHD misinterprets neuropsychiatric symptoms as dynamically motivated, this will increase and compound self-blame.<sup>52</sup>

Behavior therapy that requires self-monitoring and self-control in order to be effective is unlikely to succeed with impulsive individuals who cannot self-monitor, delay gratification, or stick to a plan. Cognitive therapy strategies, which require application of higher level thinking, may have limitations in modulating behaviors that are impulse-driven and never cognitively processed until after the fact.

During psychological therapy, physicians need to keep in mind certain behavioral characteristics of adults with ADHD. Patients can misinterpret the neurobiological basis of ADHD to justify a type of psychological impotence: “It’s not me; it’s my ADHD, so it’s not my fault and there is nothing I can do about it.” This can be reframed by teaching the patient that ADHD is like any disability—it will require effort to overcome impairment. Diagnosis is not a reason to give up. Adults with ADHD often have crises during therapy, which may actually be a form of stimulus-seeking behavior. Patients may even project this anxiety onto the therapist, with off-the-cuff comments like, “Well, at least you don’t have to worry that I’ll bore you,” not recognizing that the issue with boredom was theirs, not the therapist’s. ADHD patients may be late for appointments, miss appointments, come without an appointment, and break into a rage if kept waiting. They may fail to return forms and then express frustration with this as yet another example of their incompetence. Physicians should identify these behaviors as part of the disorder, helping the patient to set up the structures that will assist in modifying their behavior, and physicians should exemplify in the

therapeutic context that having insight into the symptom base of the deficit does not remove the expectation that the patient function appropriately. Also, the rhythm of the patient's change may be erratic; dramatic improvements may be followed by periods of little change. Structured, action-based, problem-solving, and focused therapies work well for patients with ADHD. Physicians should keep psychotherapy strategies simple, avoid nagging, and redirect dependency.

### LONG-TERM SUPPORT

As is the case in working with any chronic developmental disorders, gains made by patients in short-term treatment should be reinforced by booster sessions or some type of long-term support. Long-term psychoeducation to reframe issues of self-worth and supportive psychotherapy to deal with issues of self-esteem and other psychological issues may be necessary to treat the impact of earlier symptoms of ADHD on the patient's sense of self. The physician should experiment with teaching the patient new coping skills in areas such as finances, self-care, drug use, driving, study and work habits, and time management. Family intervention can also be useful to assist children or partners in compensating for and understanding impairment. Group therapy can provide ongoing support and social contacts to isolated individuals, and self-help groups offer long-term support through developmental transitions.

Symptom improvement with medication may be quite dramatic. Functional improvement follows quickly and meets the patient's expectations for change. However, the most gratifying outcome of effective treatment of ADHD is when the patient and clinician observe attainment of developmental milestones that would never have been previously possible. It is a gratifying experience to see a patient who failed throughout school now graduate professional school, or a child who was teased and rejected now raising his or her own children in a strong marital relationship.

### CONCLUSION

Research has established ADHD as a valid disorder in adults and in children. Adult physicians will be more frequently faced with this disorder as children who were treated for ADHD in childhood become adults and seek treatment for their symptoms. The symptoms of ADHD may look somewhat different in adults than in children, and adult-specific diagnostic and treatment guidelines are needed. ADHD is often comorbid with other disorders, which the clinician needs to screen for, diagnose, and treat. Adult physicians should be especially aware of comorbidity and differential diagnoses with other developmental disorders and mood and anxiety disorders, as well as personality disorders.

The first step in treating adults with ADHD is to give the patient feedback on his or her symptoms of ADHD and screen for comorbid disorders. Then, begin psychoeducation by explaining ADHD to the patient, along with the relationship between symptoms, developmental history, and future gains. Next, identify treatment targets with the patient, going over rating scales, deciding what objectives for improvement the patient feels are the most important, and setting a time frame for treatment. The next step is to start medication trials to determine which medication is most effective in treating the patient's ADHD. After the patient begins showing improvement, it is helpful to restructure the patient's environment to make it more accommodating. Psychological treatment is useful for any residual impairment. The physician should also anticipate and plan for the patient's needs for long-term support of functional and developmental growth. With these guidelines, the adult physician will be better prepared to treat patients with ADHD.

*Drug names:* atomoxetine (Strattera), bupropion (Wellbutrin), desipramine (Norpramin and others), methylphenidate (Ritalin, Concerta, and others), mixed dextroamphetamine and amphetamine (Adderall and others), risperidone (Risperdal).

*Disclosure of off-label usage:* The authors of this article have determined that, to the best of their knowledge, bupropion, desipramine, and risperidone are not approved by the U.S. Food and Drug Administration for the treatment of attention-deficit/hyperactivity disorder (ADHD); and methylphenidate and mixed dextroamphetamine and amphetamine are not approved for the treatment of ADHD in adults.

### REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
2. Barkley RA, Fischer M, Fletcher K, et al. Persistence of attention deficit hyperactivity disorder into adulthood as a function of reporting source and definition of disorder. *J Abnorm Psychol* 2002;111:279-289
3. Adler LA, Spencer T, Faraone SV, et al. Validity of patient administered ADHD RS to rate adult ADHD symptoms. Presented at the 43rd annual meeting of the New Clinical Drug Evaluation Unit, May 27-30, 2003; Boca Raton, Fla
4. U.S. Census Bureau. Census 2000 data. Available at: <http://factfinder.census.gov>. Accessed Sept 23, 2003
5. Dulcan M. Practice parameters for the assessment and treatment of children, adolescents, and adults with attention-deficit/hyperactivity disorder. American Academy of Child and Adolescent Psychiatry. *J Am Acad Child Adolesc Psychiatry* 1997;40(suppl 10):85S-121S
6. Murphy K, Barkley RA. Prevalence of DSM-IV symptoms of ADHD in adult licensed drivers: implications for clinical diagnosis. *J Atten Disord* 1996;1:147-161
7. Wender PH, Wolf LE, Wasserstein J. Adults with ADHD: an overview. *Ann N Y Acad Sci* 2001;931:1-16
8. Heiligenstein E, Keeling RP. Presentation of unrecognized attention deficit hyperactivity disorder in college students. *J Am Coll Health* 1995;43:226-228
9. Heiligenstein E, Conyers LM, Berns AR, et al. Preliminary normative data on DSM-IV attention deficit hyperactivity disorder in college students. *J Am Coll Health* 1998;46:185-188
10. Heiligenstein E, Conyers LM, Berns AR, et al. Psychological and academic functioning in college students with attention deficit hyperactivity disorder. *J Am Coll Health* 1999;47:181-185
11. Faraone SV, Biederman J, Spencer T, et al. Attention-deficit/hyperactivity disorder in adults: an overview. *Biol Psychiatry* 2000;48:9-20

12. Conners D, Epstein J, Johnson D. Conners Adult ADHD Diagnostic Interview for DSM-IV. North Tonawanda, NY: Multi-Health Systems; 2001
13. Brown TE. Brown Attention-Deficit Disorder Scales. San Antonio, Tex: The Psychological Corporation; 1996
14. Conners CK, Erhart D, Sparrow E. Conners' Adult ADHD Rating Scales, Technical Manual. New York, NY: Multi-Health Systems; 1999
15. Barkley RA, Murphy KR. Attention-Deficit Hyperactivity Disorder: A Clinical Workbook, Second Edition. New York, NY: Guilford Press; 1998
16. Gadow K, Sprafkin J, Weiss MD. Adult Inventories. New York, NY: Checkmate Plus; 1999
17. McDermott SP. Cognitive therapy for adults with attention-deficit/hyperactivity disorder. In: Brown TE, ed. Attention-Deficit Disorders and Comorbidities in Children, Adolescents, and Adults. 1st ed. Washington, DC: American Psychiatric Press; 2000:569–606
18. Wilens T, Biederman J, Spencer TJ. Cognitive therapy in the treatment of adults with ADHD: a systematic chart review of 26 cases. *J Cognit Psychother* 1999;13:215–226
19. Wilens TE, Spencer TJ, Biederman J. A review of the pharmacotherapy of adults with Attention-Deficit/Hyperactivity Disorder. *J Atten Disord* 2002; 5:189–202
20. Weiss M, Trokenberg Hechtman L, Weiss G. ADHD in Adulthood. Baltimore, Md: Johns Hopkins University Press; 1999
21. Weiss M, Murray C. Assessment and management of attention-deficit hyperactivity disorder in adults. *CMAJ* 2003;168:715–722. Available at: <http://www.cmaj.ca/cgi/reprint/168/6/715>. Accessed Oct 16, 2003
22. Ward MF, Wender PH, Reimherr FW. The Wender Utah Rating Scale: an aid in the retrospective diagnosis of childhood attention deficit hyperactivity disorder. *Am J Psychiatry* 1993;150:885–890
23. Brown T. Attention-Deficit Disorders and Comorbidities in Children, Adolescents, and Adults. Washington, DC: American Psychiatric Press; 2000
24. Pliszka SR, Carlson CL, Swanson JM. ADHD with Comorbid Disorders: Clinical Assessment and Management. New York, NY: Guilford Press; 1999
25. Pliszka SR. Patterns of psychiatric comorbidity with attention-deficit/hyperactivity disorder. *Child Adolesc Psychiatr Clin N Am* 2000;9: 525–540
26. Pliszka SR, Greenhill LL, Crismon ML, et al. The Texas Children's Medication Algorithm Project: report of the Texas Consensus Conference Panel on medication treatment of childhood attention-deficit/hyperactivity disorder, pt 2: tactics. *J Am Acad Child Adolesc Psychiatry* 2000;39:920–927
27. Medsafe. New Zealand Information for Health Professionals Data Sheet: Risperdal. April 2002. Available at: <http://www.medsafe.govt.nz/Profes/Datasheet/r/risperdalabsol.htm>. Accessed July 10, 2003
28. Leckman JF, Zhang H, Vitale A, et al. Course of tic severity in Tourette syndrome: the first two decades. *Pediatrics* 1998;102:14–19
29. Spencer T, Coffey B, and Biederman J. Chronic tics in adults with ADHD. In: Scientific Proceedings of the Annual Meeting XVIII American Academy of Child and Adolescent Psychiatry; Oct 22–27, 2002; San Francisco, Calif. Pages 76–77
30. Castellanos FX, Giedd JN, Elia J, et al. Controlled stimulant treatment of ADHD and comorbid Tourette's syndrome: effects of stimulant and dose. *J Am Acad Child Adolesc Psychiatry* 1997;36:589–596
31. Attwood T. Asperger's Syndrome: A Guide for Parents and Professionals. London, England: Jessica Kingsley; 1998
32. Weissman MM. Social Adjustment Scale–Self-Report. New York, NY: Multi-Health Systems; 1999
33. Keller MB, Lavori PW, Friedman B, et al. The Longitudinal Interval Follow-Up Evaluation: a comprehensive method for assessing outcome in prospective longitudinal studies. *Arch Gen Psychiatry* 1987;44:540–548
34. Endicott J, Nee J, Harrison W, et al. Quality of Life Enjoyment and Satisfaction Questionnaire: a new measure. *Psychopharmacol Bull* 1993;29:321–326
35. Hallowell EM, Roney J. Driven to Distraction: Recognizing and Coping with Attention-Deficit Disorder from Childhood through Adulthood. New York, NY: Pantheon Books; 1994
36. Barkley RA. ADHD in Adults [video]. New York, NY: Guilford Press; 1994
37. McCann BS, Roy-Byrne P. Attention-deficit/hyperactivity disorder and learning disabilities in adults. *Semin Clin Neuropsychiatry* 2000;5: 191–197
38. Barkley RA, Murphy KR, Kwasnik D. Motor vehicle driving competencies and risks in teens and young adults with attention deficit hyperactivity disorder. *Pediatrics* 1996;98(6 pt1):1089–1095
39. Biederman J, Wilens TE, Mick E, et al. Does attention-deficit hyperactivity disorder impact the developmental course of drug and alcohol abuse and dependence? *Biol Psychiatry* 1998;44:269–273
40. Spencer T, Biederman J, Wilens T, et al. Pharmacotherapy of attention-deficit hyperactivity disorder across the life cycle. *J Am Acad Child Adolesc Psychiatry* 1996;35:409–432
41. Wilens TE, Biederman J, Spencer TJ, et al. Pharmacotherapy of adult attention deficit/hyperactivity disorder: a review. *J Clin Psychopharmacol* 1995;15:270–278
42. Wilens TE, Spencer TJ, Biederman J. Pharmacotherapy of adult ADHD. In: Barkley RA, ed. Attention Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment. New York, NY: Guilford Press; 2001:596–606
43. Spencer T, Wilens T, Biederman J, et al. A double-blind, crossover comparison of methylphenidate and placebo in adults with childhood-onset attention-deficit hyperactivity disorder. *Arch Gen Psychiatry* 1995;52:434–443
44. Spencer T, Biederman J, Wilens T, et al. Efficacy of a mixed amphetamine salts compound in adults with attention-deficit/hyperactivity disorder. *Arch Gen Psychiatry* 2001;58:775–782
45. Greenhill LL, Pliszka S, Dulcan MK, et al. Summary of the practice parameter for the use of stimulant medications in the treatment of children, adolescents, and adults. *J Am Acad Child Adolesc Psychiatry* 2001;40:1352–1355
46. Wilens TE, Spencer TJ, Biederman J, et al. A controlled clinical trial of bupropion for attention deficit hyperactivity disorder in adults. *Am J Psychiatry* 2001;158:282–288
47. Wilens TE, Biederman J, Prince J, et al. Six-week, double-blind, placebo-controlled study of desipramine for adult attention deficit hyperactivity disorder. *Am J Psychiatry* 1996;153:1147–1153
48. Spencer T, Biederman J, Wilens T, et al. Effectiveness and tolerability of tomoxetine in adults with attention deficit hyperactivity disorder. *Am J Psychiatry* 1998;155:693–695
49. Michelson D, Adler L, Spencer T, et al. Atomoxetine in adults with ADHD: two randomized, placebo-controlled studies. *Biol Psychiatry* 2003;53:112–120
50. Michelson D, Faries D, Wernecke J, et al, the Atomoxetine ADHD Study Group. Atomoxetine in the treatment of children and adolescents with attention-deficit hyperactivity disorder: a randomized, placebo-controlled, dose response study. *Pediatrics* 2001;108:E83
51. Biederman J, Faraone SV, Mick E, et al. High risk for attention deficit hyperactivity disorder among children of parents with childhood onset of the disorder: a pilot study. *Am J Psychiatry* 1995;152:431–435
52. Roney J, Greenberg MS, Bemporad JR, et al. Unrecognized attention-deficit hyperactivity disorder in adults presenting for outpatient psychotherapy. *J Child Adolesc Psychopharmacol* 1992;2:267–275