Attention-Deficit/Hyperactivity Disorder in Adults

Case Study and Commentary, Paulette Marie Gillig, MD, PhD, Julie P. Gentile, MD, and Rafay Atiq, MBBS

Abstract

• **Objective:** To review the diagnosis and treatment of attention-deficit/hyperactivity disorder (ADHD) in adults.
• **Methods:** Qualitative assessment of the literature.
• **Results:** ADHD in adults is characterized by symptoms such as difficulty getting started on tasks, variable attention to details, difficulties with self-organization and prioritization, and poor persistence in tasks that require sustained mental effort. These symptoms result in impaired performance in academic, occupational, and social spheres. To meet diagnostic criteria for ADHD as an adult, the disorder must have been present in childhood (possibly undiagnosed). Adult ADHD can co-occur with other psychiatric disorders, making the differential diagnosis challenging at times. Treatment modalities include patient education, pharmacologic therapy, and psychosocial interventions.
• **Conclusion:** It is important for primary care physicians to identify patients with adult ADHD and ensure that they receive effective treatment.

Attention-deficit/hyperactivity disorder (ADHD) is a heterogeneous disorder of unknown etiology. Although historically considered by clinicians to be limited to childhood, affecting 3% to 7% of school-age children [1,2], follow-up studies suggest it persists into adulthood in 10% to 60% of childhood-onset cases and is present in approximately 4.5% of adults [3,4].

Cardinal signs and symptoms of ADHD in adulthood include difficulty getting started on tasks, variable attention to details, difficulties with self-organization and prioritization, and poor persistence in tasks that require sustained mental effort [5-8]. Impulsivity and low frustration tolerance may be present to varying degrees, while hyperactivity tends to be a less salient symptom in adults as compared with childhood presentations of ADHD [3]. Patients who present in primary care settings often have chaotic lifestyles and associated psychiatric comorbidities. They appear to be disorganized and may rely on substances such as drugs and alcohol to “get by.” Often they have a family member with ADHD.

Higher separation and divorce rates and more frequent job changes are associated with ADHD [3,8].

ADHD is thought to be caused by a complex combination of environmental, genetic, and biologic factors, and the precise etiology in a given patient may be unknown and may differ among individuals. There are well-defined prenatal and perinatal risk factors for ADHD, which include exposure to cigarettes and alcohol in utero, low birth weight, and brain injuries occurring in utero [9]. Family, twin, adoption, and gene segregation analysis studies suggest that genetics plays a major role in ADHD. The influence of genetics in the development of ADHD varies from 0.6 to 0.8, where “1” equals...
“totally genetic” [10–14]. Approximately half of parents who have been diagnosed with ADHD will have a child with the disorder.

A possible association between ADHD and several genes, including those regulating dopamine, norepinephrine, serotonin, gamma-aminobutyric acid, and androgens, has been investigated [15]. The most widely accepted gene association is with the D4 dopamine receptor gene [16]. Norepinephrine and epinephrine also influence the amount of available dopamine at this receptor site, and this is purportedly why medications affecting norepinephrine or epinephrine also can influence the dopamine system and thereby improve ADHD symptoms.

**CASE STUDY**

**Initial Presentation**

A 26-year-old male school teacher was referred to his family doctor by a school administrator. The teacher admits that he has a “temper problem,” impatience with others, and distractibility at work. He states, “I think I have ADHD.”

**History**

The patient was “hyperactive” as a child and often caused disruption both in school and home settings. His father told teachers that his son’s behavior was because “boys will be boys,” but his mother noticed several differences between him and his brothers. She told teachers that he was more impulsive and that he was constantly “running and climbing.” She described him as being impatient with other family members and said that he had trouble adjusting to new situations. His first-grade teacher criticized him for “blurting out answers” and complained that he had difficulty focusing and often interrupted others. He had 1 or 2 friends but was not popular. He required redirection many times throughout the school day and was at times argumentative and resistant. Although he also was described as “very bright and imaginative,” he often failed to complete assignments, especially in mathematics, and had difficulty learning conversational Spanish in the language lab. He was diagnosed by a family physician as having ADHD and given a trial of methylphenidate (Ritalin), which produced improvement from both a social and academic perspective. He continued in school with a solid academic record but had ongoing difficulties in social situations. He continued to take the methylphenidate for several years despite decreased appetite and weight loss, but discontinued it around the time he graduated from college, thinking he likely had “outgrown” his ADHD.

However, since finishing college and starting his first teaching job, he describes feeling socially awkward and states, “I don’t have any friends.” He has chronically low self-esteem and trouble adjusting to new situations. He misses appointments because he “forgets.” He describes conversations with others as “a chore.” He also is an impatient driver and often spends money impulsively. He often interrupts others and is impulsive in his responses, at times losing his temper. He reports multiple verbal outbursts but no physical violence. Finally, the school principal advised him to seek help or risk losing his job.

The patient reports a positive family history of ADHD in his mother and a paternal uncle. In addition, he reports that his mother has a history of alcohol dependence. The patient takes no medications at this time. He reports a recent increase in his alcohol consumption, especially after a “bad day at work.”

**Physical Examination**

The patient is 5’10” and weighs 165 lb. His respirations are 18 breaths/min, and his pulse is regular at 92 bpm. He appears to be nervous and fidgets during the interview. He taps his foot and occasionally wrings his hands. His speech is somewhat rapid, and he frequently interrupts the interviewer. His eye contact is brief initially but improves by the end of the interview. His affect appears depressed. The patient has difficulty performing serial 7s. Neurologic examination and physical examination are otherwise unremarkable.

- **What are diagnostic criteria for ADHD?**

DSM-IV-TR criteria for ADHD are presented in Table 1 [1]. Although not specific to adults, it remains the accepted diagnostic criteria for adults with ADHD. The following points are important to keep in mind when considering making the diagnosis of ADHD in an adult.

**Childhood Onset**

ADHD is not an acquired disorder of adult life. To qualify for ADHD as an adult one must have had it as a child, although some of the *symptoms* of ADHD can occur in adults due to brain injuries or other organic causes.

**Persistence of Symptoms into Adulthood**

Symptoms should have been present consistently since childhood and not occur episodically. ADHD is a persistent and chronic disorder. Symptoms do not wax and wane over time, although they may worsen under certain circumstances. Patients who report extensive periods of their lives free of ADHD symptoms are unlikely to have ADHD.

**Academic, Occupational, and Social Impairments**

Impairments in function must be global, not selective. The impact of ADHD is generally noticeable in all spheres of life to a greater or lesser degree. Although adult ADHD is a
relatively common disorder, only one third to one half of adults who believe they have ADHD actually meet formal DSM-IV-TR criteria [17]. The “Utah Criteria” [18] reflect some of the distinct features of ADHD in adults (Table 2). The limitations of using Utah criteria is its overreliance on hyperactive/impulsive symptoms and comorbid symptoms (affective lability, hot temper, impulsivity), and it gives little importance to difficulty in attention span and concentration, thus ignoring the primarily inattentive subtype which is potentially more common in community and primary care settings.

Rule Out Psychiatric Disorders

The diagnosis of ADHD is only justifiable when other psychiatric diagnoses or circumstances that may be better explanations for the symptoms are ruled out.

• What is the differential diagnosis for an adult with poor work performance, social difficulties, decreased concentration, impulsivity, and trouble completing tasks?

Patients with a range of psychiatric conditions may emphasize difficulty with concentration, attention, or short-term memory when they describe their problems to physicians [19]. The most common psychiatric conditions that may have overlapping symptoms with adult ADHD include mood disorders, anxiety disorders, substance use disorders, antisocial personality disorder, borderline personality disorder, developmental disabilities or mental retardation, and certain medical conditions.

Individuals with major depressive disorder and dysthymic disorder may show signs of inattention. However, they also experience at least 2 weeks of depressed mood (in the case of major depressive disorder) and persistent low and depressed mood for at least 2 years (in dysthymic disorder). Along with low mood they also experience loss of interest or pleasure in most activities, fatigue, and loss of energy rather than hyperactivity, as well as an appetite disturbance. In addition to the above symptoms, insomnia, especially terminal insomnia, feelings of worthlessness, indecisiveness, excessive guilt, and decline in concentration from previous level also are frequently reported by patients suffering from major depressive disorder and dysthymic disorder.

Adults with bipolar disorder and patients with ADHD share the common symptoms of hyperactivity/impulsivity and distractibility, although patients suffering from bipolar affective disorder have clear episodic mood impairments including periods of elation, severe anger and irritability, grandiosity, decreased need for sleep (and not feeling tired), hypersexuality, and racing thoughts [20]. They may have psychotic symptoms such as delusions and hallucinations.

### Table 1. DSM-IV-TR Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder

<table>
<thead>
<tr>
<th>A. Either (1) or (2):</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 6 (or more) of the following symptoms of <strong>inattention</strong> have persisted for at least 6 months to a degree that it is maladaptive and inconsistent with developmental level:</td>
</tr>
<tr>
<td>(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities</td>
</tr>
<tr>
<td>(b) often has difficulty sustaining attention in tasks or play activities</td>
</tr>
<tr>
<td>(c) often does not seem to listen when spoken to directly</td>
</tr>
<tr>
<td>(d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace</td>
</tr>
<tr>
<td>(e) often has difficulty organizing tasks and activities</td>
</tr>
<tr>
<td>(f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)</td>
</tr>
<tr>
<td>(g) often loses things necessary for tasks or activities</td>
</tr>
<tr>
<td>(h) is often easily distracted by extraneous stimuli</td>
</tr>
<tr>
<td>(i) is often forgetful in daily activities</td>
</tr>
<tr>
<td>(2) 6 (or more) of the following symptoms of <strong>hyperactivity-impulsivity</strong> have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:</td>
</tr>
<tr>
<td>Hyperactivity</td>
</tr>
<tr>
<td>(a) often fidgets with hands or feet or squirms in seat</td>
</tr>
<tr>
<td>(b) often leaves seat in classroom or in other situations in which remaining seated is expected</td>
</tr>
<tr>
<td>(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be linked to subjective feelings of restlessness)</td>
</tr>
<tr>
<td>(d) often has difficulty playing or engaging in leisure activities quietly</td>
</tr>
<tr>
<td>(e) is often “on the go” or often acts as if “driven by a motor”</td>
</tr>
<tr>
<td>Impulsivity</td>
</tr>
<tr>
<td>(g) often blurts out answers before questions have been completed</td>
</tr>
<tr>
<td>(h) often has difficulty awaiting turn</td>
</tr>
<tr>
<td>(i) often interrupts or intrudes on others</td>
</tr>
</tbody>
</table>

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years

C. Some impairment from the symptoms is present in 2 or more settings (eg, at school [or work] and at home)

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning

E. The symptoms do not occur exclusively during a course of a pervasive developmental disorder, schizophrenia, or other psychotic disorder and are not better accounted for by another mental disorder (eg, mood disorder, anxiety disorder, dissociative disorder, or a personality disorder)

Adapted with permission from the Diagnostic and statistical manual of mental disorders. 4th ed., text revision. Washington (DC): Amer-
Patients with anxiety disorders may show hyperactive behavior such as fidgeting and inattentive behaviors, but these behaviors are accompanied by persistent fear, worries, and somatic symptoms of anxiety.

In substance abuse disorders, symptoms are directly related to intoxication with substances and associated withdrawal if physiologic dependence is present.

Patients with antisocial personality disorder differ from patients with ADHD by exhibiting persistent antisocial behavior such as lying, cheating, and stealing and also a pervasive pattern of disregard for and violation of the rights of others. They also have frequent arrests and more serious legal issues.

Although there also are similarities in the symptoms of borderline personality disorder and ADHD (eg, impulsivity, affective lability, angry outbursts), the impulsivity and anger in ADHD is usually thoughtless and brief, while symptoms in the borderline patient are more goal-directed and ongoing. Unlike patients with borderline personality disorder, patients with ADHD do not have intensely conflicted relationships, suicidal preoccupation, self-mutilation, identity disturbances, or feelings of abandonment.

An adult with developmental disabilities or mental retardation may present with some of the symptoms seen in ADHD patients but rarely will have presented for initial consultation during adulthood, and psychologic testing will reveal significant neurocognitive deficits [21].

Finally, medical conditions that may at first appear to be adult ADHD include hyperthyroidism, seizure disorder, lead toxicity, hearing deficits, hepatic disease [22], sleep apnea, drug interactions, and head injury [22–24].

### Further Questioning of Patient

**Clinician:** You stopped your medication about 2 years ago?

**Patient:** I thought the ADHD was gone. It was something I had as a kid. I’m embarrassed to be here now, but I can’t lose my job. The principal at the school where I teach is worried about me.

**Clinician:** It was a good decision to have come in today. Tell me more about your work situation . . .

**Patient:** (Interrupts and speaks rapidly) It’s not just the work. I haven’t made any friends since I left college. I seem to either avoid people altogether, or I annoy them. I struggle to make conversation, you know, small talk. I’m frustrated, and you’ve got to help me.

**Clinician:** Tell me what happens when you get frustrated.

**Patient:** I lose it, I mean, I have no patience for people including the children in my classroom. I find myself saying things without thinking and then regretting it. Sometimes things just seem to fly out of my mouth. There is nothing wrong with my hearing, but I just don’t seem to hear what other people tell me.

**Clinician:** When things escalate, have you ever become violent?

**Patient:** No, I’ve never become violent, doctor, and never really destroyed anything, but just tend to embarrass myself on a regular basis. I guess you could say my mouth gets me into trouble.

- **Why should the diagnosis of ADHD be strongly considered in this patient?**

The description of this patient’s symptoms during his childhood is typical for childhood ADHD. He described difficulties in academic performance, social interaction, and interpersonal relationships both at home and in school when he was a child, along with evidence of hyperactivity and impulsivity. He also had documented improvement with the use of psychostimulants, and his symptoms worsened after college when he discontinued his medication. Currently, the patient demonstrates multiple symptoms in both the inattentive and hyperactive/impulsive categories of ADHD, and there is clear evidence of impairment in both social and occupational functioning.

- **Is there a co-occurring psychiatric disorder in this patient?**

Adult ADHD often does not present as an isolated disorder, and comorbidities may complicate the total picture. Common comorbid conditions include affective disorders, anxiety disorders, substance abuse disorders, learning disabilities, and borderline and antisocial personality disorders [25–28]. However, this patient does not appear to have a coexisting psychiatric condition at this time. It is notable, however, that his alcohol intake is increasing.
Further Assessment

The chronicity and degree of symptomatology of ADHD symptoms in adults can be difficult to establish. Information from third parties, such as family members, significant others, and even employers can be helpful. In addition, a number of rating scales are available that may help the clinician clarify symptoms and to establish a baseline before treatment:

- Connors’ Adult ADHD Rating Scale
- The Copeland Symptom Checklist for Adult ADHD, a 3-point severity rating scale for a broad range of cognitive, emotional, and social symptoms [29]
- The Wender Utah Rating Scale, a retrospective 5-point severity rating scale of childhood ADHD symptoms [30]
- The Brown Adult ADHD Scale, a 4-point frequency rating scale for cognitive symptoms associated with difficulty initiating and maintaining optimal arousal level [31]

It may at times be difficult to determine whether or not ADHD is the solitary or primary disorder. Patients may describe symptoms of depression, anxiety, substance use, or conflicts at school, work, or home. If after taking a detailed history the clinician cannot make a definitive diagnosis, the patient may need to have additional evaluations.

Laboratory Evaluation

No specific laboratory tests are indicated in ADHD. However, in this patient, liver function studies are recommended because of the patient’s history of alcohol use and because the medications that might be selected for treating adult ADHD are metabolized in the liver. A complete blood count should be obtained because of the possibility of anemia secondary to complications from alcohol use, and because erythrocyte, leukocyte, and platelet counts are monitored during treatment with stimulants. Because of clinical symptoms that might reflect anxiety, a thyroid function test should be considered.

Referral for Psychologic Testing

The primary care physician refers the patient to a psychologist for further testing. The clinical diagnosis of ADHD is supported by tests of intelligence and attention. A performance deficit is observed across certain modalities in the presence of very superior verbal comprehension and a very superior full-scale IQ. Additional neuropsychologic testing is recommended by the psychologist to rule out a learning disability and/or neurobiologic abnormalities.

When should more detailed neuropsychologic testing be done?

The patient had originally presented with some symptoms that were atypical for adult ADHD alone. He had more difficulty with mathematical tasks than verbal tasks, yet had severe problems learning conversational Spanish in the language laboratory despite very superior verbal ability. ADHD would be expected to influence all learning approximately equally.

In general, a referral should be made to a neuropsychologist (a subspecialty of clinical or educational psychology) if the diagnosis is not clear from the initial assessment, there is substantial comorbidity, there are concerns over learning disabilities, or it is difficult to determine if the disorder had a childhood onset [32,33].

In a neuropsychologist’s report, various test results will be described. For example, tests of vigilance by continuous performance testing (CPT) have been found to be abnormal in adults with ADHD [32,33]. Commonly used CPTs include the TOVA and Connor’s CPT. Persons with adult ADHD have abnormalities in perceptual-motor speed, working memory, verbal learning, semantic clustering, and response inhibition. Other commonly used tests used by neuropsychologists include IQ tests, trails A and B, go/no-go protocols, California Verbal Learning Test, and measures of time estimation. Tests of academic standing such as Woodcock-Johnson often are used when adults are in school situations. A neuropsychologist also may test the patient’s performance in several sensory modalities (e.g., visual versus auditory presentation of stimuli) to determine if the person has a deficit in one modality but not the other, as would be true in a learning disability.

Results of Neuropsychologic Testing

The patient’s verbal comprehension (verbal reasoning with acquired knowledge) was found to be “very superior,” as was his working memory. However, a test of automatic processing of information (“processing speed index”) fell in the low-average range. (Processing speed index is a test of time and learning strategies used to associate new information with previously learned constructs and processes.) Responses to visual stimuli were more accurate than were responses to auditory stimuli.

Measures of attention with and without medication revealed that with medication the patient’s processing speed was faster, and he was less impulsive and inaccurate. However, he continued to have a performance discrepancy between visual
and auditory stimulus presentations. This supports the diagnosis of a learning disability or other neurocognitive problem in addition to adult ADHD.

- How should this patient be managed?

Since this patient is experiencing significant functional problems from adult ADHD, treatment is indicated. Modalities that can be used include patient education, pharmacotherapy, and psychosocial interventions. The patient’s coexisting learning disability can be helped by a consulting educational specialist, who can assist the patient in finding ways to maximize learning opportunities by using multimedia presentations of materials, summarizing texts for review, and other educational techniques.

Patient Education

Education of the patient is important in the treatment of ADHD in adults. Self-esteem usually improves when patients realize that many of the problems they have experienced stem from a medical disorder rather than “laziness” or character defects. The physician can suggest coping strategies, such as making lists of things to do everyday, breaking up large assignments into small tasks, using a calendar or computerized schedule to help plan and organize, working in a quiet area without windows, and arriving at work before coworkers. The patient should be advised to create a routine, exercise regularly, and get sufficient sleep.

Adult patients with ADHD can make notes to summarize reading material to decrease the span of attention needed to review a text. They can be advised to take short but frequent breaks after about 20 minutes of reading in order to process what has been read, especially when the material is detailed or novel. The patient can write questions regarding the material to assist attention, and thereby understanding and comprehension. Patients can be referred to self-help books, such as Kate Kelly and Peggy Ramundo’s *You Mean I’m Not Lazy, Stupid, or Crazy?: A Self-help Book for Adults with ADHD* [34]. A number of Web sites are available that offer information for adults with ADHD (Table 3).

Medical Management/Pharmacotherapy

Medications used in the treatment of adult ADHD may result in enhanced attention, better academic performance, and facilitated working memory [32]. They also can reduce psychomotor activity, decrease aggression, and decrease disruptive behavior. Residual symptoms may persist at a lower level, however. Stimulants, norepinephrine reuptake inhibitors, norepinephrine-serotonin reuptake inhibitors, and norepinephrine-dopamine reuptake inhibitors are the most widely used treatments for adult ADHD [25–28,35,36].

Psychostimulants (schedule II drugs) remain the commonly recommended treatment for adult ADHD, and they improve both behavioral and cognitive aspects of the disorder in the majority of patients [32,37]. Recently, alternative agents have been substituted due to less need for laboratory retesting and little addiction potential, particularly since a number of adult ADHD patients have a co-occurring substance use disorder [37]. Agents other than psychostimulants also should be considered when there is inadequate response to psychostimulants or when they are not tolerated because of side effects. Alternative agents also may be considered if there is a coexisting psychiatric disorder and both disorders can be treated simultaneously with a second-line ADHD medication (eg, an antidepressant). Second-line agents may offer the advantages of once daily dosing or may allow less frequent office visits because refills can be written on the prescription.

The pathophysiologic basis of ADHD likely centers on an imbalance in catecholamine metabolism (adrenergic and dopaminergic systems) in the cerebral cortex [38]. Nonstimulant medications used for the treatment of adult ADHD all have a catecholaminergic effect, either influencing epinephrine or norepinephrine. These medications are less well-studied to date, and issues such as relative magnitude of symptom reduction, long-term effectiveness, and tolerability are not as well-characterized. However, 3 types of nonstimulant drugs have demonstrated some efficacy in the treatment of adult ADHD.

The first type of drug, atomoxetine, has an effect on norepinephrine systems alone [39,40]. Atomoxetine is the first nonstimulant drug approved by the U.S. Food and Drug Administration (FDA) for the treatment of ADHD in children and adolescents. The efficacy, safety, and tolerability have been well-established [41,42]. Atomoxetine has a low potential for abuse and recently has been used with good results in adults [43].

The second type includes drugs that are known to have an effect on norepinephrine and serotonin systems, such as the
A drawback to the use of tricyclics is their potential for cardiovascular toxicity. Blood levels must be monitored regularly, as well as blood pressure and pulse. Periodic electrocardiograms are required.

The third type includes drugs that have an effect on noradrenaline and dopamine systems, such as bupropion. These drugs, although sometimes used in the management of adult ADHD symptoms, are not yet approved by the FDA for this purpose. Patients with ADHD have difficulties in interpersonal relationships at home and at work, commonly resulting in criticism and rejection. A skilled therapist can assist the patient to understand and work through past experiences and improve functioning in these areas. To address this problem, psychoeducation and family and couples therapy may be helpful. Working with the couple to enhance communications skills, problem solving, and conflict resolution can dramatically improve the relationship. Educational literature about ADHD should be handed out to partners and family members and arrangements should be made to meet with partners or families separately to address their specific problems and issues. Because other psychiatric disorders are significantly more common in adults with ADHD than in other populations, these comorbidities may need to be addressed in therapy as well.

**Psychosocial Interventions**

Appropriate management of adult ADHD may require psychosocial interventions as well. Supportive psychotherapy (which enhances the patient’s pre-existing coping skills) and interpersonal psychotherapy (which addresses issues that may have developed between the patient and others due to misunderstandings about adult ADHD symptoms) may be useful in adults with ADHD if there are concomitant personal issues such as a sense of failure, low self-esteem, frequent job changes, or other disturbances in sense of identity or relationships with others. Patients with ADHD have difficulties in interpersonal relationships at home and at work, commonly resulting in criticism and rejection. A skilled therapist can assist the patient to understand and work through past experiences and improve functioning in these areas. To address this problem, psychoeducation and family and couples therapy may be helpful. Working with the couple to enhance communications skills, problem solving, and conflict resolution can dramatically improve the relationship. Educational literature about ADHD should be handed out to partners and family members and arrangements should be made to meet with partners or families separately to address their specific problems and issues. Because other psychiatric disorders are significantly more common in adults with ADHD than in other populations, these comorbidities may need to be addressed in therapy as well.

**Treatment in This Patient**

The patient was treated with a standard recommended dose of a nonstimulant medication prescribed once per day. He had expressed a preference to avoid

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**Table 4. Pharmacologic Treatment of Adult Attention-Deficit/Hyperactivity Disorder**

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Trade Name</th>
<th>Manufacturer’s Recommended Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First-line treatment agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphetamine/dextroamphetamine</td>
<td>Adderall</td>
<td>5–40 mg once or twice daily</td>
</tr>
<tr>
<td>Dextroamphetamine SR</td>
<td>Dexedrine</td>
<td>5 mg once or twice daily; max dose 40 mg/day</td>
</tr>
<tr>
<td>Methylphenidate</td>
<td>Ritalin</td>
<td>5–15 mg twice or 3 times daily</td>
</tr>
<tr>
<td></td>
<td>Ritalin SR (sustained release)</td>
<td>20 mg once or twice daily</td>
</tr>
<tr>
<td></td>
<td>Ritalin LA (extended release)</td>
<td>20–40 mg once daily</td>
</tr>
<tr>
<td></td>
<td>Methylphenidate</td>
<td>5–15 mg twice or 3 times daily</td>
</tr>
<tr>
<td></td>
<td>Methylin</td>
<td>10–20 mg once or twice daily</td>
</tr>
<tr>
<td></td>
<td>Metadate CR</td>
<td>10–20 mg once or twice daily</td>
</tr>
<tr>
<td></td>
<td>Metadate CD</td>
<td>20–60 mg once daily</td>
</tr>
<tr>
<td></td>
<td>Concerta</td>
<td>18–54 mg divided doses</td>
</tr>
<tr>
<td>Amoxetine</td>
<td>Strattera</td>
<td>80–100 mg divided doses</td>
</tr>
<tr>
<td><strong>Second-line treatment agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bupropion</td>
<td>Wellbutrin</td>
<td>100–150 mg once to 3 times daily</td>
</tr>
<tr>
<td></td>
<td>Wellbutrin SR</td>
<td>100–200 mg once or twice daily</td>
</tr>
<tr>
<td></td>
<td>Wellbutrin XL</td>
<td>150–450 mg once daily</td>
</tr>
<tr>
<td>Venlafaxine</td>
<td>Effexor</td>
<td>37.5–75 mg once to 3 times daily</td>
</tr>
<tr>
<td></td>
<td>Effexor XR</td>
<td>37.5–225 mg once daily</td>
</tr>
<tr>
<td>Desipramine*</td>
<td>Generic</td>
<td>25–75 mg once to 3 times daily</td>
</tr>
<tr>
<td>Imipramine*</td>
<td>Generic</td>
<td>25–300 mg every night</td>
</tr>
<tr>
<td>Nortriptyline*</td>
<td>Generic</td>
<td>25–150 mg once daily</td>
</tr>
</tbody>
</table>

*Monitor for cardiovascular toxicity: plasma levels, serial blood pressure, pulse, and periodic electrocardiograms.
psychostimulants if possible, and preferred once daily dosing for convenience. He subjectively reported the same decrease in impulsivity and increase in concentration and attention as he had previously experienced with stimulants, but noted the lack of peak and trough effects. He noted results within 1 week of initiation and reported no side effects. He was maintained on a middle-range dose of the medication and was seen every 3 months for follow-up. He reported visiting several of the Web sites listed on the office handout and attended supportive psychotherapy for 8 sessions to discuss his relationship difficulties. After 12 months of treatment, which included the pharmacologic and psychotherapeutic interventions available, he endorsed continued remission of symptoms and improvement in social and occupational functioning.

• When should an adult ADHD patient be referred to a psychiatrist or mental health treatment team?

Indications for Referral
Sometimes adults with ADHD have personality development issues (borderline, antisocial, others) that require psychiatric assessment and a complex mental health treatment plan. These persons should be evaluated by a psychiatrist. Such patients can present challenges for ongoing management in the ordinary primary care outpatient setting, including the time required to manage the case without an available treatment team. Persons with coexisting Axis I diagnoses such as bipolar affective disorder, schizophrenia, or generalized anxiety disorder would probably benefit from referral to a psychiatrist and/or a mental health treatment team if the patient needs ongoing psychotropic medication, is relatively low functioning, needs mental health community support (case management), vocational assessment, or access to a substance abuse outpatient program.

A patient who has periods of suicidal (or homicidal) thoughts needs psychiatric assessment. Of course, any primary care patient can be evaluated by the community mental health crisis system on an urgent basis should the need arise (eg, if the patient is imminently suicidal).

Once stabilized, adult ADHD patients should be re-evaluated periodically for weight loss if they are being prescribed stimulants.

SUMMARY
Although ADHD was previously thought to be a disorder of childhood, it is now believed to be a psychiatric condition that persists into adulthood in some persons and affects many aspects of their daily lives. Adults who present to clinicians with ADHD often report problematic social, occupational, and relational functioning. There are no current DSM-IV criteria that are specific to adults, but the treatment modalities are similar across the lifespan. Comorbid learning difficulties, substance use, and relationship difficulties are common, and the clinician must be cognizant of these complicating conditions. Screening for adult ADHD may be done in the primary care physician’s office, with additional consultation or neuropsychologic testing arranged if necessary. Every adult patient with ADHD deserves the benefit of the multiple evidence-based pharmacologic, psychosocial, and psychotherapeutic interventions available for complete treatment.

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References
EVALUATION FORM: Attention-Deficit/Hyperactivity Disorder in Adults

To receive 1 hour of AMA PRA Category 1 CME credit, read the article named above and mark your responses on this form. You must complete all parts to receive credit. Then return this form using the fax number or address appearing at the bottom of this page. A certificate awarding 1 hour of category 1 CME credit will be sent to you by fax or mail. This CME Evaluation Form must be fax marked or postmarked within 1 year of this JCOM issue date. Please allow up to 4 weeks for your certificate to arrive.

Part 1. Please respond to each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was provided with new information pertinent to my practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I reaffirmed a specific skill or knowledge.</td>
<td></td>
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<tr>
<td>This article will help with clinical decision making.</td>
<td></td>
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<tr>
<td>Relevant clinical outcomes are addressed.</td>
<td></td>
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<tr>
<td>The case is communicated in a manner that kept my interest.</td>
<td></td>
<td></td>
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<tr>
<td>The case presentation is realistic and effective.</td>
<td></td>
<td></td>
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<tr>
<td>I could easily interpret the tables and figures.</td>
<td></td>
<td></td>
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<tr>
<td>My attitude about this topic changed in some way.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional comments: ______________________________________________________________________________________
________________________________________________________________________________________________________

Part 2. Please complete the following sentence.

As a result of reading this case study, I . . .

☐ see no need to change my practice.
☐ will seek more information before modifying my practice.
☐ intend to change the following aspect(s) of my practice: (Briefly describe)
________________________________________________________________________________________________________
________________________________________________________________________________________________________


Signature: __________________________ Date: __________________________

Part 4. Identifying information: Please PRINT legibly or type the following:

Name: __________________________________ Fax number __________________________________
Address: __________________________________ Telephone number __________________________________
Social Security number: __________________________________
(Required and confidential)

Medical specialty: __________________________________

SEND THE COMPLETED
cme evaluation form to:
BY FAX: 313-577-7554
BY MAIL: Wayne State University
Division of CME
101 Alexandrine, Lower Level
Detroit, MI 48201

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