

A Guide to the Treatment of Adults With Attention-Deficit/Hyperactivity Disorder

Traditionally, attention-deficit/hyperactivity disorder (ADHD) has been thought of as a disorder that affects only children. However, ADHD is present in about 4.5% of adults, i.e., about two thirds of the estimated 6.5% of children who have the disorder.¹

As outlined in the *Diagnostic and Statistical Manual for Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR),² the core symptoms of ADHD—inattention, hyperactivity, and impulsivity—are associated with continual impairment in patients' social, academic, and occupational functioning.

As individuals with ADHD become adults, the responsibility for their treatment should be transferred from child psychiatrists to psychiatrists who treat adults. Unfortunately, many adult and general psychiatrists are unfamiliar with diagnosing and treating the disorder.

There is a need for physicians who are comfortable treating adults with ADHD. As patients age, they continue to have symptoms for which they demand treatment.

Research has established the validity of ADHD in adults. Diagnostic protocols for ADHD have been developed, and the U.S. Food and Drug Administration (FDA) has recently approved atomoxetine specifically for the indication of adult ADHD.

Rating scales are being developed specifically for adults, and more medication trials are being conducted in this population. Researchers are also in the process of developing and publishing guidelines for psychological treatments designed for adults with ADHD.

With the help of the growing body of literature and clinical experience, psychiatrists and other physicians can learn to identify patients with ADHD, design a targeted medi-

cation plan, implement psychosocial therapy, and help patients build a support network for their functional and developmental growth.

References

1. Wender PH, Wolf LE, Wasserstein J. Adults with ADHD: an overview. *Ann NY Acad Sci* 2001;931:1–16
2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, DC: American Psychiatric Association; 2000

To obtain credit, read the material and complete the CME/CE Posttest and Registration Form.

CME/CE Objectives

After completing this educational activity, participants should be able to:

- ✓ List common characteristics of adults with attention-deficit/hyperactivity disorder (ADHD)
- ✓ Take the history of an adult with ADHD
- ✓ Identify therapeutic targets for an adult with ADHD
- ✓ Choose a medication strategy for an adult with ADHD
- ✓ Discuss the role of psychosocial treatment in adults with ADHD

Faculty

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Differences Between Child and Adult Populations With ADHD

Although the core symptoms remain the same between childhood and adulthood ADHD, some differences emerge as patients age (Table 1).

The adult population with ADHD includes more women than does the childhood population.^{1–3} This difference might result from girls often being less disruptive than boys

Table 1. Differences Between Child and Adult Populations With ADHD

Characteristic	Child	Adult
Ratio of male to female patients	3:1 to 10:1 ^a	3:2 ^b
Frequent source of referral	Parent or teacher	Self
Motivation for treatment	Often stems from caregiver	Generally comes from self
Individuals affected by outcome	Caregivers, teachers, and peers	Dependent family members, coworkers, and peers
Awareness of connections among illness, treatment, and behavior	Less aware	More aware

^aData from Arnold¹ and Gaub and Carlson.²

^bData from Biederman et al.³

and, therefore, having their ADHD go unnoticed until adulthood. Adults with ADHD often refer themselves for treatment and are self-motivated to get better.

As children with ADHD become adults, their symptoms and the resulting effects evolve. Impulsive behavior might change from blurting out answers in class to answering a cellular phone at inappropriate times.

Unlike children, adults can often choose to spend their days in environments that are well suited for the

restlessness and need for stimulation associated with ADHD. Therefore, adults often suffer greater impairment in the evenings at home than they do during the day. For example, a supervisor at a factory might be able to perform well at work where he is constantly engaged but might be impatient and unable to relax with his family in the more quiet setting of home.

Unlike child ADHD, adult ADHD often affects individuals who are dependent on the patient. For example, difficulty managing money might

cause problems for a patient's spouse, and difficulty keeping appointments might cause a patient's children to miss sports practice or doctor's visits.

Compared with children, adults with ADHD are more likely to have the experience and intelligence to realize which behaviors are related to their illness and how their treatment improves symptoms. Also, the future course of adult ADHD is often more predictable because patients' developmental history over many years is known.

References

1. Arnold LE. Sex differences in ADHD: conference summary. *J Abnorm Child Psychol* 1996;24:555–569
2. Gaub M, Carlson CL. Gender differences in ADHD: a meta-analysis and critical review. *J Am Acad Child Adolesc Psychiatry* 1997;36:1036–1045
3. Biederman J, Faraone SV, Spencer T, et al. Gender differences in a sample of adults with attention deficit hyperactivity disorder. *Psychiatry Res* 1994;53:13–29



Patient History

The first step in identifying and managing ADHD in adults is to take a history of the patient's symptoms, comorbid disorders, functioning, and developmental transitions.

The basic symptoms of ADHD can be identified by asking patients if they have experienced any of the symptoms of the disorder listed in the DSM-IV-TR. Rating scales (Table 2) may be used to measure the frequency and severity of associated symptoms (Table 3), which are often patients' chief complaints, and to eliminate the presence of other disorders. Physicians may discover more detailed information

from patients' responses to open-ended questions (Table 4).

If possible, information about patients' past and current behavior

should be obtained from informants because some patients might have underestimated or overestimated their symptoms. Ideally, both

Table 2. Rating Scales Used in the Diagnosis of ADHD in Adults

<p>Adult Inventories Gadow KD, Sprafkin J, Weiss M, et al. Adult Inventories. Checkmate Plus. Available at: http://www.checkmateplus.com/product/ai-4.htm. Accessed Aug 26, 2003</p> <p>Barkley and Murphy's ADHD Symptom Scales Barkley RA, Murphy KR. Attention-Deficit/Hyperactivity Disorder: A Clinical Workbook, Second Edition. New York, NY: Guilford Press; 1998</p> <p>Brown Attention-Deficit Disorder Scales Brown TE. Brown Attention-Deficit Disorder Scales for Adolescents and Adults. San Antonio, Tex: Psychological Corporation; 1996. Available at: http://marketplace.psychcorp.com/PsychCorp.com/Cultures/en-US/Products/Product+Detail.htm?CS_ProductID=015-8029-240&CS_Category=ADD&CS_Catalog=TPC-USCatalog</p>	<p>Conners' Adult ADHD Rating Scales Conners CK, Erhart D, Sparrow E. Conners' Adult ADHD Rating Scales, Technical Manual. New York, NY: Multi-Health Systems; 1999. Available at: http://www.mhs.com. Accessed Aug 26, 2003</p> <p>Adult ADHD Self-Report Scale Adler LA, Kessler RC, Spencer T. Adult ADHD Self-Report Scale. New York, NY: World Health Organization; 2003. Available at: http://www.med.nyu.edu/Psych/training/adhdscreen18.pdf. Accessed Aug 26, 2003</p> <p>Wender Utah Rating Scale Ward MF, Wender PH, Reimherr FW. The Wender Utah Rating Scale: an aid in the retrospective diagnosis of childhood attention deficit hyperactivity disorder. <i>Am J Psychiatry</i> 1993;150:885–890</p>
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Table 3. Symptoms Associated With ADHD

- Mood lability
- Poor tolerance for frustration
- Reactivity
- Temper outbursts
- Lack of social judgment
- Risk taking
- Poor tolerance for low stimulation
- Environmental dependence
- Lack of motivation and/or forced effort
- Procrastination
- Dysregulated sleep, nutrition, exercise, and health

someone who knew them well in childhood, e.g., a parent or grandparent, and someone who knows them well now, e.g., a spouse, friend, parent, or sibling, would report on patients' behavior.

ADHD is believed to be highly heritable.² To better assess patients'

Table 4. Questions to Help Determine the Presence of ADHD in Adults^a

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|---|---|
| <p>Childhood</p> <ul style="list-style-type: none"> • Were you active or impulsive? • Did your parents or teachers complain that you were difficult? • Did you have any medical or psychiatric illnesses or serious accidents? <p>School</p> <ul style="list-style-type: none"> • How did you perform academically, eg, was your performance variable? • Were you told that you had a learning disability? • Did you receive special tutoring? • Did you fail a grade? • Were you ever suspended or expelled? <p>Current</p> <ul style="list-style-type: none"> • How many jobs have you had? • Have you been fired, and if so, why? | <ul style="list-style-type: none"> • What kinds of problems do you have at work? • Do you dislike participating in quiet activities during your spare time? • Do you feel addicted to any pastimes such as gambling, playing games, and using a computer? • How often do you use substances such as tobacco, alcohol, and marijuana? • How many automobile accidents and traffic tickets have you had? • Do you have difficulty managing money, completing housework, or being on time? • Do you have trouble living with others? • Have you had problems as a parent or spouse? • Do you have rage attacks? |
|---|---|

^aAdapted with permission from Weiss and Murray.¹

risk for ADHD and comorbid conditions, clinicians should obtain psychiatric and medical histories, especially related to ADHD symptoms, for patients' first-degree relatives, i.e., parents, siblings, and children.

Patients should be examined for other psychiatric conditions that share symptoms with ADHD. Biederman et al.³ found that many adults with ADHD have also been diagnosed with another psychiatric



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Statement of Need and Purpose

A substantial number of children who have attention-deficit/hyperactivity disorder (ADHD) continue to have symptoms well into adulthood. In adults, ADHD is most often associated with substance abuse as well as co-occurring anxiety, mood, and disruptive disorders. Physicians sometimes fail to consider, detect, or treat adults for ADHD, due to a lack of information on the diagnosis and treatment of ADHD. This educational activity was designed to meet the needs of participants in the CME activities of Physicians Postgraduate Press, Inc. who have requested information on the diagnosis and management of ADHD in adults. There are no prerequisites for participating in this activity.

Accreditation Statement

Physicians Postgraduate Press, Inc. is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

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Physicians Postgraduate Press, Inc. designates this educational activity for up to 1 Category 1 credit toward the AMA Physician's Recognition Award. Each participant should claim only those credits that he/she actually spent in the educational activity.

Date of Original Release/Review

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Faculty Disclosure

In the spirit of full disclosure and in compliance with all ACCME Essential

Areas and Policies, the faculty for this CME activity was asked to complete a full disclosure statement. The information received is as follows: **Dr. Weiss** is a consultant for and is a member of the speakers/advisory boards for Novartis, Shire Richwood, Janssen, and Eli Lilly; has received grant/research support from Eli Lilly and Janssen; and has received honoraria from Novartis, Janssen, and Eli Lilly.

Disclosure of Off-Label Usage

The editor has determined that, to the best of her knowledge, methylphenidate and the combination of amphetamine and dextroamphetamine are not approved by the U.S. Food and Drug Administration for the treatment of adult ADHD. If you have questions, contact the medical affairs department of the manufacturer for the most recent prescribing information.

Acknowledgment

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strength from knowing that other adults understand their feelings should be referred to an ADHD support group, and those who have difficulty in relationships might benefit from counseling that helps them understand others' needs.

Patients with comorbid psychiatric conditions might need to receive separate treatment for another condition before beginning ADHD treatment. Generally, substance use disorders should

be treated first because they might impede treatment for other conditions. Then the next most impairing psychiatric condition should be treated, whether ADHD or another illness such as depression. This strategy should continue until all disorders are being managed.

The last step in establishing a treatment plan is setting a time frame for therapy and the frequency of clinician-patient contact. Patients with ADHD often depend on others

to function, so they would benefit from knowing how long treatment will last. For many patients, treatment might continue the rest of their lives. However, contact with the clinician generally becomes less frequent when ADHD is being successfully managed. Clinicians should make the transition easier for the patient by establishing a preliminary schedule for appointments when treatment begins and gradually reducing the frequency of visits.

Principles of Medication Treatment

Understanding and following general principles of medication treatment for ADHD will help clinicians and patients have confidence in and realistic expectations of the management strategy (Table 7).

Educate Patients

Patients should receive written and oral information on both the benefits and side effects of medication. Adults might appreciate hearing how others with ADHD have progressed with treatment. Physicians should dispel any misconceptions patients have about medication. Despite reports to the contrary, medication can be a first-line treatment for adults with ADHD and has little abuse liability when used appropriately.

Table 7. General Principles of Medication Treatment

- Explain the benefits and drawbacks of medications
- Choose the best medication for the patient
- Obtain the patient's informed consent
- Begin a medication trial
- Measure outcomes with rating scales and/or similar questions
- Teach the patient to identify observational anchors for self-monitoring progress

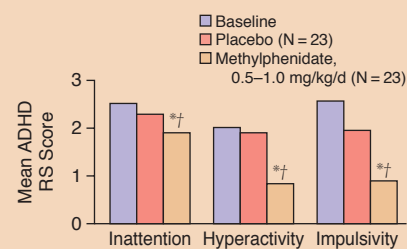
Medication will not cure ADHD, but symptom improvement will increase patients' awareness of their particular symptoms and the resulting impact on functioning. Medication is unlikely to be a crutch for patients, and their mood and personality will not be drastically altered by one of these drugs.

Clinicians should review current empirical research on medication treatments. Stimulants, such as methylphenidate and the combination of amphetamine and dextroamphetamine, as well as the nonstimulant atomoxetine have the best evidence for efficacy in adults with ADHD. Although the methodology for each trial has been different, improvement in rating scale scores has been significantly greater with both stimulants and atomoxetine than with placebo.

Stimulants

A benefit of stimulants is that they have a robust and quick onset of effect on attention and disinhibition. In 7-week, double-blind, crossover studies,^{1,2} patients experienced

Figure 1. Mean ADHD Rating Scale (RS) Scores for All Patients at Baseline and for the Placebo and Methylphenidate Groups at Endpoint^a



^aData from Spencer et al.¹ Symptoms were rated as follows: 0 = none, 1 = mild, 2 = moderate, 3 = severe.

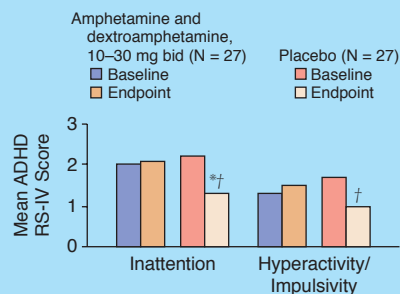
*p < .001 vs. baseline.

[†]p < .001 vs. placebo at endpoint.

significantly greater improvements in scores on rating scales while taking methylphenidate (ADHD Rating Scale [RS]³) or the combination of amphetamine and dextroamphetamine (ADHD RS-IV⁴) than while taking placebo (Figures 1 and 2).

In both studies, response was defined as a 30% or greater reduction in ADHD Rating Scale scores. In the methylphenidate study,¹ 18 (78%) of the 23 patients achieved response during active treatment, compared

Figure 2. Mean ADHD Rating Scale (RS)-IV Scores at Baseline and Endpoint for the Placebo and Amphetamine and Dextroamphetamine Groups^a



^aData from Spencer et al.² Symptoms were rated as follows: 0 = none, 1 = mild, 2 = moderate, 3 = severe. *p = .001 vs. baseline. †p < .01 vs. placebo at endpoint.

with only 4% during placebo treatment. In the study of amphetamine and dextroamphetamine,² 19 (70%) of the 27 adults met response criteria while taking active medication versus 7% while taking placebo.

Potential side effects include appetite loss, insomnia, nervousness, mild increases in pulse and blood pressure, irritability, dysphoria, and rebound symptoms.

Another drawback of stimulants is that they lack 24-hour symptom control. However, some longer-acting formulations of stimulants have been approved by the FDA for use in children and are currently being studied in adults.

Atomoxetine

Atomoxetine is a norepinephrine reuptake inhibitor that was recently approved for use in adult ADHD. A benefit of atomoxetine is that it is not a controlled substance. Also, a single morning dose of atomoxetine might relieve symptoms into the night. Further, this drug has not been found to exacerbate comorbid mood disorders or tics.

In 2 randomized, double-blind studies,⁵ atomoxetine was associated with significantly greater improvement in scores on the Conners' Adult Attention Rating Scale than was placebo during the 10-week treatment period (Figure 3). Improvement in work, home, and social life, as measured by the Sheehan Disability Scale,⁶ was also greater with atomoxetine than placebo.

Potential side effects of atomoxetine include dry mouth, insomnia, nausea, decreased appetite, and constipation.

Choose a Medication

After discussing available options, physicians and patients should choose the best medication for patients' preference, treatment targets, comorbid conditions, family history, risk for abuse, and desired duration of action. No single medication is the best option for all patients.

Obtain Informed Consent

After the medication is chosen, patients should provide their informed consent for treatment. Adults should tell their physicians that they understand the possible benefits and side effects of treatment and would like to begin a trial with the agreed-upon medication.

Begin a Medication Trial

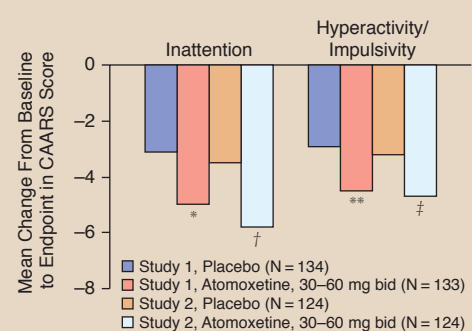
Begin medication at a low dose, and slowly increase the dose until the patient obtains optimal improvement in symptoms and functioning with minimal side effects. Titration schedules will vary according to the drug and the patient. Table 8 includes some sample titration schedules for commonly prescribed medications. A key to establishing the optimal dose is to closely monitor symptom improvement and medication tolerability at each dosage. If intolerable side effects arise, the dose can be lowered.

Measure Outcomes

When patients come for office visits, clinicians should assess improvement in ADHD symptoms and functioning. Medication response should be evaluated at different times of the day and in different settings. Scores on one of the rating scales in Table 2 and the frequency of current symptoms listed in Table 4 can be used to determine the effectiveness of treatment. Changes in patients' specific treatment targets, such as those listed in Table 6, should also be evaluated.

Adverse effects might be detected by checking patients'

Figure 3. Mean Change From Baseline to Endpoint in Scores on the Investigator-Rated Version of the Conners' Adult ADHD Rating Scale (CAARS) for Placebo and Atomoxetine^a



^aData from Michelson et al.⁵

^bMean baseline scores for inattention ranged were between 18 and 20 of a possible 27 in both studies.

^cMean baseline scores for hyperactivity/impulsivity were between 14 and 16 of a possible 27 in both studies.

*p = .010, †p = .001, **p = .017, ‡p = .013 for the difference between atomoxetine and placebo in the individual study.

Table 8. Sample Titration Schedules for Commonly Prescribed ADHD Medications

Drug	Starting Dose	Increment for Change	Usual Maximum Dose
Methylphenidate			
Immediate release	10 mg tid	10 mg/wk	90 mg/d or 1 mg/kg/d
Delayed release			
Concerta	36 mg q am	18 mg/wk	100 mg/d
Ritalin LA	20 mg q am ^a	20 mg/wk	100 mg/d
Amphetamine and dextroamphetamine			
Immediate release	5 mg bid	5 mg/wk	50 mg/d
Delayed release			
Adderall XR	10 mg q am	10 mg/wk	50 mg/d
Atomoxetine	40 mg/d	30 mg/2 wk	120 mg/d

^aMay need to be dosed bid to achieve a full 18 hours of coverage.
Abbreviation: LA = long acting, XR = extended release.

vital signs and asking patients if they have experienced any discomfort while taking their medication.

Patients' compliance with their medication regimen should also be evaluated. Compliance might be improved with a long-acting medication, a visual aid such as a dosette or blister pack, or reminders from an alarm, family member, or roommate.

Physicians should try to get a collateral report from a close family member or friend about patients' symptoms, side effects, and compliance if possible, especially if patients are unable to accurately report their condition. The collateral informant might discuss the patient's progress with the physician or complete an observer version of one of the scales listed in Table 2.

If patients do not respond well or experience intolerable side effects, their dosage and possibly medication should be adjusted.

Teach Patients to Self-Monitor

Patients should learn to look for changes in their symptoms and functioning. They can self monitor by identifying and observing a few targeted behaviors. For example, patients could record how many

times and how many minutes they are late for meetings. At home, they might monitor how often they are able to sit quietly through dinner. When out with friends, patients could keep track of how often their attention drifts and they have to ask other people to repeat themselves.

Only patients are in the position to observe their symptoms and functioning all day every day in a variety of settings. Measuring improvement in their condition might make patients feel like they are taking an active part in their treatment.



Psychosocial Treatment

Psychosocial treatment in ADHD serves 2 basic purposes: to help patients understand the relationship between their symptoms and functioning and to aid them in altering their problem behavior.

As soon as the diagnosis of ADHD is made, clinicians should provide patients with psychoeducation about the disorder and its effects in their life. Patients should understand how their past symptoms influenced their development.

Being able to see improvement for themselves might motivate patients to comply with their treatment regimen. Knowing the severity of their symptoms will help patients give accurate feedback to their physicians and provide them insight into which behaviors they need to change.

References

1. 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
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3. DuPaul GJ. Parent and teacher ratings of ADHD symptoms: psychometric properties in a community-based sample. *J Clin Child Psychol* 1991;20:245–253
4. DuPaul G, Power T, Anastopoulos A, et al. *ADHD Rating Scale, IV: Checklists, Norms, and Clinical Interpretation*. New York, NY: Guilford Press; 1990
5. Michelson D, Adler L, Spencer T, et al. Atomoxetine in adults with ADHD: two randomized, placebo-controlled studies. *Biol Psychiatry* 2003;53:112–120
6. Sheehan DV. *The Anxiety Disease*. New York, NY: Scribner; 1983

Questions about problems identified during the patient's interview should help the patient draw connections. An example is "Do you think the reason you performed better in a private school than public school is that the more structured environment helped you compensate for your difficulties concentrating and meeting deadlines?"

Similar questions about present circumstances at home and work and during social activities can be

used to help patients see how their current symptoms impair their functioning and capacity to negotiate new developmental challenges. An example is “Do you think the reason your wife no longer wants to talk about her day when she comes home is that you often interrupt while she is talking?”

Bibliotherapy and support organizations are valuable resources for patients who want to learn more about ADHD and its treatment (Table 9).

Although few controlled trials have been conducted on psychosocial treatment in ADHD, such therapy might help patients cope with residual impairments such as disorganization, forgetfulness, time mismanagement, and low self-esteem.

Certain accommodations made by the therapist may increase the effectiveness of psychosocial treatment for adults with ADHD (Table 10). Patients should learn to actively change their behavior. Therapists should suggest a few simple, structured steps for altering certain behaviors. Then patients can choose

Table 9. Psychoeducation Resources

- Books and videos
- Barkley RA. ADHD in Adults [videotape]. New York, NY: Guilford Publications; 1994
 - Hallowell EM, Roney JJ. Driven to Distraction: Recognizing and Coping With Attention Deficit Disorder From Childhood Through Adulthood. New York, NY: Simon & Schuster; 1995
 - Weiss M, Hechtman L, Weiss G. ADHD in Adulthood. Baltimore, Md: Johns Hopkins University Press; 1999
- Organizations
- Children and Adults With Attention-Deficit/Hyperactivity Disorder (CHADD): <http://www.chadd.org>
 - National Resource Center on AD/HD: <http://www.help4adhd.org> or 800-233-4050
 - Attention Deficit Disorder Association: <http://www.add.org> or 847-432-ADDA

Table 10. Proposed Therapeutic Accommodations

- Use simple, structured, action-based, problem-solving therapies (such as cognitive-behavioral therapy)
- Allow defiant patients control and choice
- Avoid nagging
- Redirect dependency
- Follow short-term interventions with arrangements for follow-up in the community and booster sessions, if needed

a behavior to work on and what steps to take. Having control in therapy might increase the compliance of patients who are oppositional or have difficulty recognizing their problem behavior.

Currently, cognitive-behavioral therapy is the only empirically supported psychosocial therapy for adults with ADHD.¹ However, other psychosocial treatments appropriate for adults with ADHD may need to be developed because these patients

have unique attributes that might limit the effectiveness of current therapies. Behavior therapy that relies on the patient for self-monitoring might not work for impulsive patients. Cognitive strategies that require cortical function might not be effective for inattentive, impulsive, and disinhibited behaviors, which are linked to dysfunctions in the frontal areas of the cerebral cortex.

Regardless of the psychotherapy implemented, many adults with ADHD will benefit from long-term care such as booster sessions and/or support groups.

Reference

1. Wilens TE, McDermott SP, Biederman J, et al. Cognitive therapy in the treatment of adults with ADHD: a systematic chart review of 26 cases. *J Cognitive Psychotherapy* 1999;13(3):215–226



Long-Term Support of Functional and Developmental Growth

Because ADHD is generally a life-long disorder, physicians should provide adult patients the means for long-term support (Table 11). Modifying their environments can help patients cope even when supportive family members or friends are not around.

Family members should understand that they are not the cause of their parent or spouse’s problems. They need to develop the skill of seeing ADHD behaviors as symptoms rather than taking the behaviors “personally.” They should also learn ways to cope with patients’ not fulfilling certain tasks well such as cooking, cleaning, supervising, and driving.

Table 11. Methods of Long-Term Support

- Environmental restructuring
 - Examine the benefits of electronic devices and other people for organization and time management
 - Identify the best time and environment for performing tasks
 - Eliminate coping strategies that do not work
- Family intervention
 - Help family members understand ADHD
 - Show family how to compensate for the patient’s impairment
- Group therapy and self-help groups
 - Provide social contacts and ongoing support through developmental transitions

If physicians are unaware of any local support groups for adults with ADHD and their families, they should instruct patients to contact one of the organizations in Table 9.