



CIGNA HEALTHCARE COVERAGE POSITION

Subject Attention-Deficit/Hyperactivity Disorder (ADHD): Assessment and Treatment

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Coverage Position

Services provided by a psychiatrist, psychologist or other behavioral health professionals are subject to the provisions of the applicable behavioral health benefit.

Services for the assessment or treatment of attention-deficit/hyperactivity disorder (ADHD) that are primarily educational or training in nature or related to improving academic or work performance are not covered under most CIGNA HealthCare benefit plans.

When not otherwise excluded, CIGNA HealthCare covers medically necessary services for the treatment of ADHD when the criteria of the Diagnostic and Statistical Manual of Mental Health Disorders, Fourth Edition, Text Revision (DSM-IV-TR) are met.

CIGNA HealthCare does not cover the following services, because they are considered educational in nature and not medically necessary for the assessment and/or treatment of ADHD (this list may not be all-inclusive):

- Intelligence Quotient (IQ) testing
- education and achievement testing
- educational intervention (e.g., classroom environmental manipulation, academic skills training, and parental training)
- neuropsychological testing

CIGNA HealthCare does not cover the following procedures/services, because they are considered experimental, investigational or unproven for the assessment and/or treatment of ADHD (these lists may not be all-inclusive):

Assessment:

- actometer
- computerized electroencephalogram (EEG) (e.g., brain mapping, neurometrics, or quantitative electroencephalography [QEEG])
- computerized tests of attention and vigilance
- event-related potentials (i.e., evoked potential studies)
- hair analysis
- neuroimaging (e.g., computerized tomography [CT], magnetic resonance imaging [MRI], positron emission tomography [PET] and single-photon emission computerized tomography [SPECT])

Treatment:

- anti-candida albicans and antifungal medications
- anti-motion sickness medication
- auditory integration therapy
- chiropractic manipulation
- cognitive rehabilitation
- dietary treatments
- Dore program/Dyslexia Dyspraxia Attention Treatment (DDAT)
- EEG biofeedback
- herbal remedies
- megavitamin therapy
- metronome training
- movement therapy
- sensory integration therapy
- transcranial magnetic stimulation/cranial electrical stimulation
- vision therapy

Note: Coverage of medications related to the treatment of ADHD is subject to the pharmacy benefit of the applicable CIGNA HealthCare benefit plan.

General Background

Attention-deficit/hyperactivity disorder (ADHD) is a common disorder of childhood and adolescence that is characterized by symptoms of inattention and/or hyperactivity/impulsivity. In this disorder, the symptoms have persisted for at least six months, to a degree that is maladaptive and inconsistent with developmental level. The hyperactive-impulsive or inattention symptoms that cause impairment are present before age seven, although many individuals are diagnosed after the symptoms have been present for a number of years. Some impairment from the symptoms is present in two or more settings (e.g., at home and at school).

Children with ADHD may experience significant functional problems, such as school difficulties, academic underachievement, troublesome interpersonal relationships with family members and peers, and low self-esteem. Individuals with a history of untreated childhood ADHD are more likely to experience conduct

disorder, substance abuse, antisocial behavior and injuries later in life (National Institute of Health [NIH], 1998). Early recognition, assessment and management of this condition can redirect the educational and psychosocial development of most children with ADHD.

In 2005, the Centers for Disease Control and Prevention (CDC) published data regarding prevalence of diagnosis and medication treatment for ADHD (CDC, 2005). The CDC noted that prevalence estimates of ADHD in school-aged children have ranged from 2% to 18% in community sample. The CDC analyzed data from the 2003 National Survey of Children's Health (NSCH). The CDC report described the results of that analysis, which indicates that in 2003, approximately 4.4 million children aged 4–17 years were reported to have a history of ADHD diagnosis and of these, 2.5 million (56%) were reported to be taking medication for the disorder. It was reported that approximately 7.8% had ever had ADHD diagnosed. It was reported to occur approximately 2.5 times more frequently among males than females.

The Diagnostic and Statistical Manual of Mental disorders, Fourth edition, Text Revision (DSM-IV-TR) notes that there are three subtypes of ADHD (American Psychiatric Association [APA], 2000):

- ADHD, combined type: This subtype is used when six or more symptoms of inattention and six or more symptoms of hyperactivity/impulsivity have persisted for at least six months. Most children and adolescents with the disorder have the combined type.
- ADHD, predominantly inattentive: This subtype is used when six or more symptoms of inattention (but fewer than six symptoms of hyperactivity/impulsivity) have persisted for at least six months.
- ADHD, predominantly hyperactive/impulsive: This subtype is used when six or more symptoms of hyperactivity/impulsivity (but fewer than six symptoms of inattention) have persisted for at least six months.

<p>Diagnostic Criteria from Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) for:</p> <p>314.00 Attention-Deficit/Hyperactivity Disorder, predominantly inattentive type</p> <p>314.01 Attention-Deficit/Hyperactivity Disorder, predominantly hyperactive-impulsive type</p> <p>314.01 Attention-Deficit/Hyperactivity Disorder, combined type</p>	
<p>A. Either 1 or 2:</p>	
<p>1) Inattention: six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:</p> <p>a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities</p> <p>b) often has difficulty sustaining attention in tasks or play activities</p> <p>c) often does not seem to listen when spoken to directly</p> <p>d) often does not follow through on instructions and fails to finish school work, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)</p> <p>e) often has difficulty organizing tasks and activities</p> <p>f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)</p> <p>g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils,</p>	<p>2) Hyperactivity-impulsivity: six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:</p> <p>Hyperactivity:</p> <p>a) often fidgets with hands or feet or squirms in seat</p> <p>b) often leaves seat in classroom or in other situations in which remaining seated is expected</p> <p>c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)</p> <p>d) often has difficulty playing or engaging in leisure activities quietly</p> <p>e) is often "on the go" or often acts as if "driven by a motor"</p> <p>f) often talks excessively</p> <p>Impulsivity:</p> <p>g) often blurts out answers before questions have been completed</p> <p>h) often has difficulty awaiting turn</p> <p>i) often interrupts or intrudes on others (e.g., butts into</p>

books, or tools) h) is often easily distracted by extraneous stimuli i) is often forgetful in daily activities	conversations or games)
<p>B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.</p> <p>C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).</p> <p>D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.</p> <p>E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorders, or a Personality Disorder).</p>	

In addition, the DSM-IV-TR notes that the designation of “not otherwise specified” (NOS) (DSM-IV-TR code 314.9) may be used for disorders with prominent symptoms of inattention or hyperactivity-impulsivity that do not meet the above criteria for ADHD. Examples of this may include (APA, 2000):

- individuals whose symptoms and impairment meet the criteria for attention-deficit disorder, predominantly inattentive type but the age of onset is seven years or after
- individuals with clinically significant impairment who present with inattention and whose symptom pattern does not meet the full criteria for the disorder but have a behavioral pattern marked by sluggishness, daydreaming, and hypoactivity

Assessment

The diagnosis is clinical, based on findings that are derived from the history, physical and patient/family interviews. There are no specific diagnostic tests for ADHD. The established diagnostic tools used in the assessment of ADHD include:

- parent/child interview (to rule out other psychiatric or environmental causes of symptoms)
- medical evaluation with a complete medical history and physical examination (to assess for co-existing conditions)
- electroencephalogram (EEG) or neurological consult when the presence of focal signs or clinical findings is suggestive of a seizure disorder or a degenerative neurological condition

In general, no other form of testing has been established to be of benefit in assessing ADHD. The DSM-IV-TR, notes that, “There are no laboratory tests, neurological assessments, or attentional assessments that have been established as diagnostic in the clinical assessment of Attention-Deficit/Hyperactivity Disorder” (APA, 2000).

The American Academy of Pediatrics (AAP) developed a clinical practice guideline for the assessment and diagnosis of ADHD among school-age children who are evaluated by primary care clinicians. The significant components of the diagnostic guideline include (AAP, 2000):

- use of the DSM-IV-TR criteria for the diagnosis
- the importance of obtaining information about the child's symptoms in more than one setting (especially from schools)
- the search for coexisting conditions that may make the diagnosis more difficult or complicate treatment planning

The use of the DSM-IV-TR criteria is a standard of care for practitioners of all types (e.g., primary care, subspecialty, psychiatry and non-physician mental health providers) to use in the assessment and

diagnosis of ADHD. Diagnosis usually requires several steps, and clinicians will generally need to carry out the evaluation in more than one visit, often two to three visits.

Children who meet diagnostic criteria for the behavioral symptoms of ADHD but who do not demonstrate functional impairment do not meet the diagnostic criteria for ADHD (AAP, 2000). The behaviors must adversely affect functioning in school or in a social setting. Information obtained from the parent and school can assist the physician in assessing the effects that the symptoms are having on classroom performance, self-esteem, and family and social relationships.

Other psychological and developmental disorders, including oppositional defiant disorder, conduct disorder, depression, anxiety disorder, and learning disabilities, frequently coexist in children who are evaluated for ADHD. Assessment and examination for such coexisting disorders are an integral part of the evaluation process for ADHD patients. Evidence for most of these coexisting disorders may be readily detected by the primary care clinician. For example, a family history of anxiety disorders, coupled with a patient's history of frequent fears and difficulties with separation from caregivers, may suggest the presence of anxiety disorder either as the primary diagnosis or as a comorbid diagnosis to ADHD. Several screening tests are available that can detect areas of concern for many of the mental health disorders that coexist with ADHD. Although these scales have not been tested for use in primary care settings and are not diagnostic tests for either ADHD or associated mental health conditions, some clinicians may use them to establish high risk for coexisting psychological conditions.

According to the literature, several medical screening tests and laboratory measures have been used to evaluate children with suspected ADHD. These include blood lead levels, neuroimaging (e.g., computerized tomography [CT], magnetic resonance imaging [MRI]), EEG, and neurological screening exams, as well as other miscellaneous laboratory assessments (Brown, et al., 2001). The association between elevated lead levels and impairments in cognitive functioning, including attention problems, has been consistently reported in the literature. Brown et al. (2001) reviewed six studies and found no statistically significant associations in three of them. One study reported a positive association between lead level and behavioral problems. Two studies examined children screened for disruptive behavioral problems and found associations between elevated lead levels and behavioral problems. Since these studies did not assess ADHD, however, the extent to which their findings may apply to children with this disorder is unknown (Brown, et al., 2001). The studies' findings suggest an association between elevated lead levels and a range of behavioral problems, including inattention, but do not support the routine use of lead screening as a diagnostic indicator for ADHD. Only when clinical or environmental factors are present is the measurement of blood lead levels appropriate. There is insufficient evidence in the medical literature to support the use of computerized methods of EEG (e.g., quantitative electroencephalography [QEEG]) brain mapping, neurometrics) to be used in the assessment of ADHD.

Neuropsychological testing for educational reasons is generally considered not medically necessary for the assessment of ADHD. Educational testing is usually provided by school systems under applicable state and federal rules. Neuropsychological testing may be medically necessary in neurologically complicated cases of ADHD (e.g., post-head trauma, seizures). Children with uncomplicated ADHD do not require neuropsychological testing.

The AAP clinical practice guidelines (2000) made the following statements regarding the diagnosis and evaluation of patients with ADHD:

- Regular screening of children for high lead levels does not aid in the diagnosis of ADHD.
- Current literature does not support the routine use of EEG in the diagnosis of ADHD.
- Available evidence does not support routine screening of thyroid function as part of the effort to diagnose ADHD.
- Neuroimaging studies should not be used as a screening or diagnostic tool for children with ADHD because they are associated with high rates of false-positives and false-negatives.
- Current data do not support the use of any available continuous performance tests in the diagnosis of ADHD.

The Agency for Healthcare Research and Quality (AHRQ) sponsored the development of a systematic technical review to summarize current scientific evidence from the literature on the prevalence of ADHD and on the value of various evaluation methods. Data from 97 accepted articles and manuals were abstracted, tabulated systematically, and subjected to statistical analysis. The AHRQ (1999) made the following statements, based on the findings, regarding medical screening tests:

- Analysis of six studies on the relation between elevated lead levels and ADHD showed that lead levels are not useful as a general diagnostic tool for ADHD. This is strengthened by the fact that ADHD prevalence appears to be increasing even as lead levels in the population appear to be decreasing.
- Analysis of four studies showed no relation between abnormal thyroid function and ADHD. Thus, the evidence does not support the use of tests of thyroid function to screen for ADHD.
- Analysis of seven imaging studies of the brain (e.g., computerized axial tomography [CAT] and magnetic resonance imaging [MRI]) that were performed to detect morphologic differences in brain structures of children with ADHD yielded sparse and diverse evidence. Thus, none of the imaging procedures analyzed are considered useful as a screening or diagnostic tool for ADHD.
- Eight studies of electroencephalogram (EEG) patterns and ADHD found no serious EEG abnormalities in ADHD children, although many studies found significant differences in brain wave activity between ADHD children and normal controls. The heterogeneity of results across studies indicates that the EEG should not be routinely used as a screening tool for ADHD.
- Evidence from studies of neurological screening tests did not yield any clues to the etiology of ADHD. Thus, these tests are not deemed effective for screening ADHD.
- Continuous performance tests (CPT) measure impulsivity, inattention, and vigilance. Statistical analysis of studies using these tests indicated that CPTs would not serve as useful screening tools for ADHD.

The American Academy of Child and Adolescent Psychiatry (AACAP) published updated evidenced-based practice parameters for the assessment and treatment of children and adolescents with ADHD (Pliszka, et al., 2007). The guidelines include the following recommendations regarding evaluation of ADHD:

- Screening for ADHD should be part of every patients' mental health assessment: if a patient or the parent reports that the patient suffers from any symptom of ADHD that induce impairment of if the patient scores in the clinical range for ADHD symptoms on a rating scale, then a full evaluation is indicated
- Evaluation of preschooler, child or adolescent for ADHD should consist of clinical interviews with the parent and patient, obtaining information about the patient's school or day care functioning, evaluation for comorbid psychiatric disorders and review of patient's medical, social and family histories.
- If the patient's medical history is unremarkable, laboratory or neurological testing is not indicated. The guidelines note that there are few medical conditions that pose as ADHD, and the vast majority of patients with ADHD will have an unremarkable medical history. The parameters note that, "Unless there is strong evidence of such factors in the medical history, neurological studies (electroencephalography [EEG], magnetic resonance imaging, single-photon emission computed tomography [SPECT], or positron emission tomography [PET]) are not indicated for the evaluation of ADHD." They note that the American Psychiatric Association Council on Children, Adolescents and Their Families in their report of brain imaging and child and adolescent psychiatry have warned against the exposure of children to intravenous radioactive nucleotides as part of the diagnosis or treatment of childhood psychiatric disorders, citing both a lack of evidence of validity and safety issues.
- Psychological and neuropsychological tests are not mandatory for the diagnosis for ADHD, but should be performed if the patient's history suggests low general cognitive ability or low achievement in language or mathematics relative to the patient's intellectual ability. The guidelines note that, "Psychological testing of the ADHD patient usually consists of a standardized assessment of intellectual ability (IQ) to determine any contribution of low general cognitive ability to the academic impairment, and academic achievement. Neuropsychological testing, speech-language assessments, and computerized testing of attention or inhibitory

control are not required as part of a routine assessment for ADHD, but may be indicated by the findings of the standard psychological assessment.”

- The clinician must evaluate the patient with ADHD for the presence of comorbid psychiatric disorders. The guidelines note that it should be determined if the patient meets criteria for separate comorbid disorder in addition to ADHD, the comorbid disorder is the primary disorder and ADHD is caused by it, or the comorbid symptoms do not meet criteria for separate disorder but rather represent secondary symptoms that are caused by the ADHD.

Treatment

The most widely researched and commonly prescribed treatments for ADHD are psychostimulant medications, including methylphenidate and other amphetamines (NIH, 1998). The U.S. Food and Drug Administration (FDA) approved Stattera® (atomoxetine) (Eli Lilly and Co., Indianapolis, IN) in November 2002 as a new non-stimulant treatment for ADHD. Studies with atomoxetine have thus far compared it only to a placebo. Until head-to-head studies are available comparing the efficacy and safety of atomoxetine with those of stimulants, its role in the treatment of ADHD remains limited. It can be recommended for those patients who are unable to tolerate stimulants or cannot take stimulants because of a clinical reason (Corman, et al., 2004).

Many studies have documented the efficacy of stimulants in reducing the core symptoms of ADHD. Numerous short-term studies have established the safety and efficacy of stimulants and psychosocial treatments for alleviating the symptoms of ADHD, as well as for improving function in a number of domains. Most studies of stimulants have been short-term, demonstrating efficacy over several days or weeks. The National Institute of Mental Health (NIMH) Multimodal Treatment Study (MTA) of ADHD extended the demonstrated efficacy to 14 months (MTA, 2004). The NIMH research indicates that the two most effective treatment modalities for elementary school children with ADHD are a closely monitored medication treatment and a treatment that combines medication with intensive behavioral interventions. The MTA study for children with ADHD involved 579 elementary school children with ADHD (ages 7.0–9.9 years) across multiple sites. The participants were randomized to four treatment groups:

- medication management alone
- medication management and behavior treatment
- behavior treatment alone
- standard community care

The medication management groups followed specific protocols and algorithms in relation to routine community practice, based on clinicians' best judgments. The results showed that nine out of ten children with ADHD showed marked reduction in core ADHD symptoms over a 14-month period when treated with medication management alone or a combination of medication and behavior treatment. Eighty-five percent of the children treated with medication received a stimulant medication. While the medications were extremely beneficial to most children, MTA findings indicated that medications alone may not necessarily be the best strategy for many children. For example, children who had accompanying problems (e.g., anxiety, stressful home circumstances, social skills deficits) over and above the ADHD symptoms appeared to obtain maximal benefit from the combined treatment. Although the MTA study demonstrated that efficacy of stimulants lasts at least 14 months, the longer term effects of stimulants remain unclear. According to the NIH Consensus Statement, because of the lack of consistent improvement beyond the core symptoms and the paucity of long-term studies, longer term studies of drugs and behavioral modalities and their combination are needed (NIH, 1998).

In April 2004, the MTA group published an evaluation of the persistence of the beneficial effects of medication management and the combination of medication and behavior treatment for 10 months beyond the 14 months previously reported. Five hundred and forty children, or 93%, of the original group participated in the follow-up. It was noted that the medication management strategy showed persisting significant superiority over the behavior treatment and community comparison, although not as great as at 14 months. Significant additional benefits of combination therapy were not found. The authors concluded that the benefits of intensive medical management for ADHD extend 10 months beyond the intensive treatment phase only in symptom domains and diminish over time. The NIMH researchers will continue to

track the children in the MTA study into adolescence to evaluate the long-term outcomes of these treatments and ongoing reports will be published (MTA, 2004).

In August 2007, a three-year follow-up of the MTA study was published (Jensen, et al., 2007). This report examined 36-month outcomes, two years after treatment by the time the study ended. At three years, 485 of the original 579 subjects (83.8%) participated in the follow-up. The children were now at ages 10 to 13 years, (mean 11.9 years). Once the delivery of randomly assigned treatments by MTA staff ended at 14 months, the MTA became an observational study in which the subjects and their parents were able to choose their own treatment in the context of availability and barriers to care existing in their communities. It was noted that in contrast to the significant advantage of medication management and combination treatment over behavior treatment and community comparison for ADHD symptoms at 14 and 24 months, treatment groups did not differ significantly on any measure at 36 months. The percentage of children taking medication > 50% of the time changed between 14 and 36 months across the initial treatment groups: Behavior therapy significantly increased (14% to 45%), combination of medication and behavior treatment significantly decreased (91% to 71%), and community care remained relatively constant (60%–62%). The report indicated that regardless of their treatment use changes, all of the groups showed symptom improvement over baseline. In particular, initial symptom severity, sex (male), comorbidity, public assistance, and parental psychopathology (ADHD) did not moderate children's 36-month treatment responses, but these factors predicted worse outcomes over 36 months, regardless of original treatment assignment. The authors concluded that by 36 months, the earlier advantage of having had 14 months of the medication algorithm was no longer apparent. The authors theorized that the results may be due to age-related decline in ADHD symptoms, changes in the medication management intensity, starting or stopping medications altogether, or other factors that have not been evaluated.

The AACAP guidelines (Pliszka, et al., 2007) contain the following recommendations regarding treatment of ADHD:

- A well-thought-out and comprehensive treatment plan should be developed for the patient with ADHD. The treatment plan may consist of pharmacological and/or behavior therapy. The plan should consider the most recent evidence concerning effective therapies as well as family preferences and concerns. The treatment plan should be reviewed on a regular basis and modified if the patient is not responding.
- The initial psychopharmacological treatment of ADHD should be a trial with an agent approved by the FDA for treatment of ADHD. These medications include dextroamphetamine (DEX), D, L-methylphenidate (MPH), mixed salts amphetamine and atomoxetine. The guidelines also include typical dosing of medications. Regarding selection of which agent, the guidelines note that it is the sole choice of the family and the clinician as to which agent should be used, and each patient's treatment must be individualized.
- If none of the FDA approved agents results in satisfactory treatment of the patient with ADHD, the clinician should undertake a careful review of the diagnosis and then consider behavior therapy and/or use of medications not approved by the FDA for treatment of ADHD. As part of the review of diagnosis, it should be examined whether any undetected comorbid conditions are present, such as affective disorders, anxiety disorders, or subtle developmental disorders. Among the medications that may be used at this time are bupropion, tricyclic antidepressants (TCAs), and alpha-antagonists. The guidelines note that the evidence base for these medications is far weaker than for the FDA-approved agents.
- While receiving psychopharmacological interventions, the patient should be monitored for treatment-emergent side effects. This assessment may necessitate the use of a different stimulant or a nonstimulant medication.
- If there is a robust response to psychopharmacological treatment and subsequently normative functioning in academic, family and social functioning, the psychopharmacological treatment of the ADHD alone is satisfactory. The guidelines note that it is not mandatory that behavior therapy be added to the regimen, although parental preferences should be taken into account.
- When there is a less than optimal response to medication, the patient has a comorbid disorder, or experiences stressors in their family life, then psychosocial treatment in conjunction with medication is often beneficial.

- The patient should be assessed at regular intervals to determine whether there is continued need for treatment or if symptoms have been decreased. The treatment should continue as long as symptoms remain present and cause impairment. The guidelines note that signs that ADHD has diminished include: lack of any need to adjust despite robust growth, lack of deterioration when a dose of stimulant medication is missed, or newfound abilities to concentrate during drug holidays.
- While treated with medication, height and weight should be monitored.

A Cochrane review was performed (Bjornstad and Montgomery, 2005) to address the question of whether family therapy without medication can reduce the core symptoms of ADHD as compared to no treatment or standard treatment. The review involved two studies that met the criteria for quality of research method. It was noted that one found no difference in children's symptoms of ADHD after either family therapy or normal treatment in the community. The second study found that family therapy was more effective than a medication placebo. The reviewers concluded that further research examining the effectiveness of family therapy versus a non-treatment control condition is needed to determine whether family therapy is an effective intervention for children with ADHD.

In an effort to support and empower parents of children age 12 and under who are diagnosed with ADHD, CIGNA Behavioral Health has implemented a preventive health program for improving the management of ADHD (www.cignabehavioral.com). The program went into effect on October 1, 2003. Automated algorithms within the Care Advocacy Program of CIGNA Behavioral Health identify the first claim for a service to a child age 12 or under who carries the diagnosis of ADHD. An information packet is then mailed to the child's parents, and resources are made available to treating practitioners. The ability of parents to effectively understand and report information to those involved with their child is critical to care planning and to evaluating treatment response for ADHD. Early recognition, assessment, and management of this condition can redirect the educational and psychosocial development of most children with ADHD.

A variety of nonpharmacological treatments for ADHD other than behavior therapy were reviewed by the AACAP in developing their practice parameters (Pliszka, et al., 2007). These include cognitive-behavioral therapy and dietary modifications. It was found that there was no evidence to support these interventions. It was also noted that the efficacy of EEG feedback, either as primary treatment or an adjunct to medications, has not been established.

Other alternative interventions have been proposed for treatment of ADHD. These include the use of anti-candida albicans, antifungal medications and anti-motion sickness medication, chiropractic manipulation, dietary interventions, EEG biofeedback, herbal remedies, megavitamin therapy, vision therapy, sensory (auditory) integration therapy, transcranial magnetic stimulation/cranial electrical stimulation, metronome training or movement therapy. Review of the medical literature indicates that there is a lack of scientific evidence to support the use of these interventions. According to the NIH, empirical evidence regarding these treatment interventions is uneven, ranging from no data to well-controlled trials, suggesting the need for further research (NIH, 1998). There is also insufficient evidence in the published, peer-reviewed medical literature to support the use of cognitive rehabilitation for attention deficit disorders (NIH, 1998).

Dore program/Dore program for Attention Deficit Disorder: The Dore program, also known as Dore Program for Attention Deficit Disorder, or Dyslexia Dyspraxia Attention Treatment (DDAT), is an exercise-based program that was originally developed to treat dyslexia. The program is aimed at treating dyslexia, ADHD, dyspraxia and Asperger's Syndrome. The program consists of a specialized neurological evaluation and series of patient-specific exercises designed to simulate the cerebellum or "hind brain." The proponents of this program theorize that cerebellar size and function are related to a constellation of learning disorders that are referred to as cerebellar developmental delay (CDD). At the Dore USA website, it notes that the exercises incorporated in the program "stimulate the cerebellum to function more rapidly and to enable the development of previously poor motor and cognitive skills. The exercise program directly impacts motor skills while cognitive skills slowly improve through the exercises' stimulatory effects." A review of this treatment (Bishop, 2007) notes that published studies regarding this program "are seriously flawed." The review notes that two studies were published regarding this treatment for children with dyslexia. Regarding the use of the Dore program for ADHD, the review notes that, "There is nothing here to justify the claims made that the Dore Programme is more effective than state-of-the-art medication for ADHD, especially in view of the fact that only one child in the study had an ADHD

diagnosis.” Review of the literature does not support the efficacy of the Dore program for treatment of ADHD.

Adult ADHD

It was previously thought that ADHD did not continue beyond adolescence, but long-term, controlled, follow-up studies have shown that the disorder persists in a sizable number of adults who were diagnosed with ADHD in childhood. ADHD occurs in approximately 4% of adults, and the condition can impair work and social functioning (Goroll, 2000). The clinical features are highly reminiscent of the pediatric form of the disorder. The condition frequently coexists with anxiety, depression and substance abuse. ADHD can be diagnosed reliably in adults who currently have symptoms of ADHD as defined in the DSM-IV-TR and who, on careful questioning, give a history of such symptoms since childhood.

Unlike treatment for childhood ADHD, treatment for adult ADHD has not been well-established by randomized, controlled trials, nor are there any published treatment guidelines (Goroll, 2000). Modalities include cognitive-behavioral therapy and pharmacotherapy. Support groups, such as Children and Adults with Attention-Deficit/ Hyperactivity Disorder (CHADD) assist newly diagnosed adults by providing information about ADHD and available resources, including peer support groups. Coaching and training in organizational skills appear useful but remain unstudied.

The benefit of pharmacotherapy for the treatment of ADHD in children has been established, but the usefulness of medication as a treatment for adults with ADHD has not been well-established. To date, the FDA has approved the following agents for adult use: mixed amphetamine compounds, the noradrenergic-specific reuptake inhibitor, Strattera. In May 2005, the FDA approved Focalin XR[®] (dexamethylphenidate HCl) (Novartis, East Hanover, NJ) for treatment of ADHD in adults, adolescents and children. One review article notes that the stimulants, methylphenidate and amphetamine, are the most commonly used and are highly effective in a dose-dependent manner for adults with ADHD (Wilens, 2004). Other available medication shown to be effective for adults with ADHD includes bupropion, desipramine and pemoline (Wilens, 2004).

Summary

Attention-deficit/hyperactivity disorder (ADHD) is a common neurobehavioral disorder of childhood and adolescents. It is characterized by symptoms of inattention and/or hyperactivity/impulsivity that have persisted for at least six months. It is diagnosed by parent/child interview, medical evaluation with complete medical history and physical examination; other testing or consultation may be warranted when the presence of focal signs or clinical findings is suggestive of neurological condition. Treatment generally includes medication management, in particular, the use of stimulants. There is evidence to support that a combination of medical management and behavior management is effective for treatment of ADHD in children. The effectiveness and functional outcomes of treatment in adults is less apparent in the medical literature.

Coding/Billing Information

Note: This list of codes may not be all-inclusive.

Covered when medically necessary:

CPT ^{®*} Codes	Description
	No specific codes

HCPCS Codes	Description
	No specific codes

ICD-9-CM Diagnosis	Description
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Codes	
314.00	Attention deficit disorder without mention of hyperactivity
314.01	Attention deficit disorder with hyperactivity

Experimental/Investigational/Unproven/Not Covered:

CPT* Codes	Description
90901	Biofeedback training by any modality
92065	Orthoptic and/or pleoptic training with continuing medical direction and Evaluation
95930	Visual evoked potential (VEP) testing central nervous system, checkerboard or flash
95957	Digital analysis of electroencephalogram (EEG) (eg, for epileptic spike analysis) (QEEG)
95961	Functional cortical and subcortical mapping by stimulation and/or recording of electrodes on brain surface, or of depth electrodes, to provoke seizures or identify vital brain structures; initial hour of physician attendance
96020	Neurofunctional testing selection and administration during noninvasive imaging functional brain mapping, with test administered entirely by a physician or psychologist, with review of test results and report
96111	Developmental testing; extended (includes assessment of motor, language, social, adaptive and/or cognitive functioning by standardized developmental instruments) with interpretation and report
96116	Neurobehavioral status exam (clinical assessment of thinking, reasoning and judgment, eg, acquired knowledge, attention, language, memory, planning and problem solving, and visual spatial abilities), per hour of the psychologist's or physician's time, both face-to-face time with the patient and time interpreting test results and preparing the report
96118	Neuropsychological testing (eg, Halstead-Reitan Neuropsychological Battery, Wechsler Memory Scales and Wisconsin Card Sorting Test), per hour of the psychologist's or physician's time, both face-to-face time with the patient and time interpreting test results and preparing the report
96119	Neuropsychological testing (eg, Halstead-Reitan Neuropsychological Battery, Wechsler Memory Scales and Wisconsin Card Sorting Test), with qualified health care professional interpretation and report, administered by technician, per hour of technician time, face-to-face
96120	Neuropsychological testing (eg, Wisconsin Card Sorting Test), administered by a computer, with qualified health care professional interpretation and report
97112	Therapeutic procedure, one or more areas, each 15 minutes; neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities
97532	Development of cognitive skills to improve attention, memory, problem solving (includes compensatory training), direct (one-on-one) patient contact by the provider, each 15 minutes
97533	Sensory integrative techniques to enhance sensory processing and promote adaptive responses to environmental demands, direct (one-on-one) patient contact by the provider, each 15 minutes
0160T	Therapeutic repetitive transcranial magnetic stimulation treatment planning
0161T	Therapeutic repetitive transcranial magnetic stimulation treatment delivery and management, per session

HCPCS Codes	Description
P2031	Hair analysis (excluding arsenic)
S8035	Magnetic source imaging
S8040	Topographic brain mapping

ICD-9-CM Diagnosis Codes	Description
314.00	Attention deficit disorder without mention of hyperactivity
314.01	Attention deficit disorder with hyperactivity

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