

include epilepsy and constipation.

Attention-Deficit/Hyperactivity Disorder

Attention-Deficit/Hyperactivity Disorder

Diagnostic Criteria

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

1. **Inattention:** Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

- a. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
- b. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
- c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).
- d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- e. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- f. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
- g. Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile

telephones).

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- h. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).
- i. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

2. **Hyperactivity and impulsivity:** Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or a failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

- a. Often fidgets with or taps hands or feet or squirms in seat.
 - b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
 - c. Often runs about or climbs in situations where it is inappropriate. (**Note:** In adolescents or adults, may be limited to feeling restless.)
 - d. Often unable to play or engage in leisure activities quietly.
 - e. Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
 - f. Often talks excessively.
 - g. Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).
 - h. Often has difficulty waiting his or her turn (e.g., while waiting in line).
 - i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).
- B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.
- C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).
- D. There is clear evidence that the symptoms interfere with, or reduce the quality of,

social, academic, or occupational functioning.

- E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

Specify whether:

F90.2 Combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

F90.0 Predominantly inattentive presentation: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

F90.1 Predominantly hyperactive/impulsive presentation: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met for the past 6 months.

Specify if:

In partial remission: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

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Specify current severity:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.

Moderate: Symptoms or functional impairment between “mild” and “severe” are present.

Severe: Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.

Diagnostic Features

The essential feature of attention-deficit/hyperactivity disorder (ADHD) is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development. *Inattention* manifests behaviorally in ADHD as wandering off task, failing to follow through on instructions or finishing work or chores, having difficulty sustaining focus, and being disorganized and is not attributable to defiance or lack of comprehension. *Hyperactivity* refers to excessive motor activity (such as a child running about) when it is not appropriate, or excessive fidgeting, tapping, or talkativeness. In adults, hyperactivity may manifest as extreme restlessness or wearing others out with their activity. *Impulsivity* refers to hasty actions that occur in the moment without forethought, which may have potential for harm to the individual (e.g., darting into the street without looking). Impulsivity may reflect a desire for immediate rewards or an inability to delay gratification. Impulsive behaviors may manifest as social intrusiveness (e.g.,

interrupting others excessively) and/or as making important decisions without consideration of long-term consequences (e.g., taking a job without adequate information).

ADHD begins in childhood. The requirement that several symptoms be present before age 12 years conveys the importance of a substantial clinical presentation during childhood. At the same time, an earlier age at onset is not specified because of difficulties in establishing precise childhood onset retrospectively. Adult recall of childhood symptoms tends to be unreliable, and it is beneficial to obtain ancillary information. ADHD cannot be diagnosed in the absence of any symptoms prior to age 12. When symptoms of what appears to be ADHD first occur after age 13, they are more likely to be explained by another mental disorder or to represent the cognitive effects of substance use.

Manifestations of the disorder must be present in more than one setting (e.g., home and school, or home and work). Confirmation of substantial symptoms across settings typically cannot be done accurately without consulting informants who have seen the individual in those settings. Typically, symptoms vary depending on context within a given setting. Signs of the disorder may be minimal or absent when the individual is receiving frequent rewards for appropriate behavior, is under close supervision, is in a novel setting, is engaged in especially interesting activities, has consistent external stimulation (e.g., via electronic screens), or is interacting in one-on-one situations (e.g., the clinician's office).

Associated Features

Delays in language, motor, or social development are not specific to ADHD but often co-occur. Emotional dysregulation or emotional impulsivity commonly occurs in children and adults with ADHD. Individuals with ADHD self-report and are described by others as being quick to anger, easily frustrated, and overreactive emotionally.

Even in the absence of a specific learning disorder, academic or work performance is often impaired. Individuals with ADHD may exhibit neurocognitive deficits in a variety of areas, including working memory, set shifting, reaction time variability, response inhibition, vigilance, and planning/organization, although these tests are not sufficiently sensitive or specific to serve as diagnostic indices.

Although ADHD is not associated with specific physical features, rates of minor physical anomalies (e.g., hypertelorism, highly arched palate, low-set ears) may be elevated. Subtle motor delays and other neurological soft signs may occur. (Note that marked co-occurring clumsiness and motor delays should be coded separately [e.g., developmental coordination disorder].)

Children with neurodevelopmental disorders with a known cause (e.g., fragile X syndrome, 22q11 deletion syndrome) may often also have symptoms of inattention and impulsivity/hyperactivity; they should receive an ADHD diagnosis if their symptoms meet the full criteria for the disorder.

Prevalence

Population surveys suggest that ADHD occurs worldwide in about 7.2% of children; however, cross-national prevalence ranges widely, from 0.1% to 10.2% of children and adolescents. Prevalence is higher in special populations such as foster children or correctional settings. In a

cross-national meta-analysis, ADHD occurred in 2.5% of adults.

Development and Course

Many parents first observe excessive motor activity when the child is a toddler, but symptoms are difficult to distinguish from highly variable normative behaviors before age 4 years. ADHD is most often identified during elementary school years when inattention becomes more prominent and impairing. The disorder is relatively stable through early adolescence, but some individuals have a worsened course with development of antisocial behaviors. In most individuals with ADHD, symptoms of motoric hyperactivity become less obvious in adolescence and adulthood, but difficulties with restlessness, inattention, poor planning, and impulsivity persist. A substantial proportion of children with ADHD remain relatively impaired into adulthood.

In preschool, the main manifestation is hyperactivity. Inattention becomes more prominent during elementary school. During adolescence, signs of hyperactivity (e.g., running and climbing) are less common and may be confined to fidgetiness or an inner feeling of jitteriness, restlessness, or impatience. In adulthood, along with inattention and restlessness, impulsivity may remain problematic even when hyperactivity has diminished.

Risk and Prognostic Factors

Temperamental. ADHD is associated with reduced behavioral inhibition, effortful control, or constraint; negative emotionality; and/or elevated novelty seeking. These traits may predispose some children to ADHD but are not specific to the disorder.

Environmental. Very low birth weight and degree of prematurity convey a greater risk for ADHD; the more extreme the low weight, the greater the risk. Prenatal exposure to smoking is associated with ADHD even after controlling for parental psychiatric history and socioeconomic status. A minority of cases may be related to reactions to aspects of diet. Neurotoxin exposure (e.g., lead), infections (e.g., encephalitis), and alcohol exposure in utero have been correlated with subsequent ADHD, but it is not known whether these associations are causal.

Genetic and physiological. The heritability of ADHD is approximately 74%. Large-scale genome-wide association studies (GWAS) have identified a number of loci enriched in evolutionarily constrained genomic regions and loss-of-function genes as well as around brain-expressed regulatory regions. There is no single gene for ADHD.

Visual and hearing impairments, metabolic abnormalities, and nutritional deficiencies should be considered as possible influences on ADHD symptoms. ADHD is elevated in individuals with idiopathic epilepsy.

Course modifiers. Family interaction patterns in early childhood are unlikely to cause ADHD but may influence its course or contribute to secondary development of conduct problems.

Culture-Related Diagnostic Issues

Differences in ADHD prevalence across regions appear attributable mainly to different diagnostic procedures and methodological practices, including using different diagnostic

interviews and differences in whether functional impairment was required and, if so, how it was defined. Prevalence is also affected by cultural variation in attitudes toward behavioral norms and expectations of children and youth in different social contexts, as well as cultural differences in interpretations of children's behaviors by parents and teachers, including differences by gender. Clinical identification rates in the United States for African American and Latinx populations tend to be lower than for non-Latinx White populations. Underdetection may result from mislabeling of ADHD symptoms as oppositional or disruptive in socially oppressed ethnic or racialized groups because of explicit or implicit clinician bias, leading to overdiagnosis of disruptive disorders. Higher prevalence in non-Latinx White youth may also be influenced by greater parental demand for diagnosis of behaviors seen as ADHD-related. Informant symptom ratings may be influenced by the cultural background of the child and the informant, suggesting that culturally competent diagnostic practices are relevant in assessing ADHD.

Sex- and Gender-Related Diagnostic Issues

ADHD is more frequent in males than in females in the general population, with a ratio of approximately 2:1 in children and 1.6:1 in adults. Females are more likely than males to present primarily with inattentive features. Sex differences in ADHD symptom severity may be due to differing genetic and cognitive liabilities between sexes.

Diagnostic Markers

No biological marker is diagnostic for ADHD. Although ADHD has been associated with elevated power of slow waves (4–7 Hz “theta”) as well as decreased power of fast waves (14–30 Hz “beta”), a later review found no differences in theta or beta power in either children or adults with ADHD relative to control subjects.

Although some neuroimaging studies have shown differences in children with ADHD compared with control subjects, meta-analysis of *all* neuroimaging studies do not show differences between individuals with ADHD and control subjects. This likely is due to differences in diagnostic criteria, sample size, task used, and technical aspects of the neuroimaging technique. Until these issues are resolved, no form of neuroimaging can be used for diagnosis of ADHD.

Association With Suicidal Thoughts or Behavior

ADHD is a risk factor for suicidal ideation and behavior in children. Similarly, in adulthood, ADHD is associated with an increased risk of suicide attempt, when comorbid with mood, conduct, or substance use disorders, even after controlling for comorbidity. Suicidal thoughts are also more common in ADHD populations than in non-ADHD control subjects. ADHD predicted persistence of suicidal thoughts in U.S. Army soldiers.

Functional Consequences of Attention-Deficit/Hyperactivity Disorder

ADHD is associated with reduced school performance and academic attainment. Academic deficits, school-related problems, and peer neglect tend to be most associated with elevated

symptoms of inattention, whereas peer rejection and, to a lesser extent, accidental injury are most

salient with marked symptoms of hyperactivity or impulsivity. Inadequate or variable self-application to tasks that require sustained effort is often interpreted by others as laziness, irresponsibility, or failure to cooperate.

Young adults with ADHD have poor job stability. Adults with ADHD show poorer occupational performance, attainment, attendance, and higher probability of unemployment, as well as elevated interpersonal conflict. On average, individuals with ADHD obtain less schooling, have poorer vocational achievement, and have reduced intellectual scores than their peers, although there is great variability. In its severe form, the disorder is markedly impairing, affecting social, familial, and scholastic/occupational adjustment.

Family relationships may be characterized by discord and negative interactions. Individuals with ADHD have lower self-esteem relative to peers without ADHD. Peer relationships are often disrupted by peer rejection, neglect, or teasing of the individual with ADHD.

Children with ADHD are significantly more likely than their peers without ADHD to develop conduct disorder in adolescence and antisocial personality disorder in adulthood, consequently increasing the likelihood for substance use disorders and incarceration. The risk of subsequent substance use disorders is elevated, especially when conduct disorder or antisocial personality disorder develops.

Individuals with ADHD are more likely than peers to be injured. Children and adults with ADHD are at higher risk for suffering trauma and developing subsequent posttraumatic stress syndrome. Traffic accidents and violations are more frequent in drivers with ADHD. Individuals with ADHD have a higher overall mortality rate, largely because of accidents and injuries. There may also be an elevated likelihood of obesity and hypertension among individuals with ADHD.

Differential Diagnosis

Oppositional defiant disorder. Individuals with oppositional defiant disorder may resist work or school tasks that require self-application because they resist conforming to others' demands. Their behavior is characterized by negativity, hostility, and defiance. These symptoms must be differentiated from aversion to school or mentally demanding tasks because of difficulty in sustaining mental effort, forgetting instructions, and impulsivity in individuals with ADHD. Complicating the differential diagnosis is the fact that some individuals with ADHD may develop secondary oppositional attitudes toward such tasks and devalue their importance.

Intermittent explosive disorder. ADHD and intermittent explosive disorder share high levels of impulsive behavior. However, individuals with intermittent explosive disorder show serious aggression toward others, which is not characteristic of ADHD, and they do not experience problems with sustaining attention as seen in ADHD. In addition, intermittent explosive disorder is rare in childhood. Intermittent explosive disorder may be diagnosed in the presence of ADHD.

Other neurodevelopmental disorders. The increased motoric activity that may occur in ADHD must be distinguished from the repetitive motor behavior that characterizes stereotypic movement disorder and some cases of autism spectrum disorder. In stereotypic movement disorder, the motoric behavior is generally fixed and repetitive (e.g., body rocking, self-biting), whereas the fidgetiness and restlessness in ADHD are typically generalized and not characterized by repetitive stereotypic movements. In Tourette's disorder, frequent multiple tics can be mistaken for the generalized fidgetiness of ADHD. Prolonged observation may be needed to differentiate fidgetiness from bouts of multiple tics.

Specific learning disorder. Children with specific learning disorder alone may appear inattentive because of frustration, lack of interest, or limited ability in neurocognitive

processes, including working memory and processing speed, whereas their inattention is much reduced when performing a skill that does not require the impaired cognitive process.

Intellectual developmental disorder (intellectual disability). Symptoms of ADHD are common in children with intellectual developmental disorder placed in academic settings that are inappropriate to their intellectual ability. In such cases, the symptoms are not evident during nonacademic tasks. A diagnosis of ADHD in intellectual developmental disorder requires that inattention or hyperactivity be excessive for mental age.

Autism spectrum disorder. Individuals with ADHD and those with autism spectrum disorder exhibit inattention, social dysfunction, and difficult-to-manage behavior. The social dysfunction and peer rejection seen in individuals with ADHD must be distinguished from the social disengagement, isolation, and indifference to facial and tonal communication cues seen in individuals with autism spectrum disorder. Children with autism spectrum disorder may display tantrums because of an inability to tolerate a change from their expected course of events. In contrast, children with ADHD may misbehave or have a tantrum during a major transition because of impulsivity or poor self-control.

Reactive attachment disorder. Children with reactive attachment disorder may show social disinhibition, but not the full ADHD symptom cluster, and display other features such as a lack of enduring relationships that are not characteristic of ADHD.

Anxiety disorders. ADHD shares symptoms of inattention with anxiety disorders. Individuals with ADHD are inattentive because of their preferential engagement with novel and stimulating activities or preoccupation with enjoyable activities. This is distinguished from the inattention attributable to worry and rumination seen in anxiety disorders. Restlessness might be seen in anxiety disorders. However, in ADHD, the symptom is not associated with worry and rumination.

Posttraumatic stress disorder. Concentration difficulties associated with posttraumatic stress disorder (PTSD) may be misdiagnosed in children as ADHD. Children younger than 6 years often manifest PTSD in nonspecific symptoms such as restlessness, irritability, inattention, and poor concentration, which can mimic ADHD. Parents may also minimize their children's trauma-related symptoms, and teachers and other caregivers are often unaware of the child's exposure to traumatic events. A comprehensive assessment of past exposure to traumatic events can rule out PTSD.

Depressive disorders. Individuals with depressive disorders may present with inability to concentrate. However, poor concentration in mood disorders becomes prominent only during a depressive episode.

Bipolar disorder. Individuals with bipolar disorder may have increased activity, poor concentration, and increased impulsivity, but these features are episodic, unlike ADHD, in which the symptoms are persistent. Moreover, in bipolar disorder, increased impulsivity or inattention is accompanied by elevated mood, grandiosity, and other specific bipolar features. Children with

ADHD may show significant changes in mood within the same day; such lability is distinct from a manic or hypomanic episode, which must last 4 or more days to be a clinical indicator of bipolar disorder, even in children. Bipolar disorder is rare in preadolescents, even when severe irritability and anger are prominent, whereas ADHD is common among children and adolescents who display excessive anger and irritability.

Disruptive mood dysregulation disorder. Disruptive mood dysregulation disorder is characterized by pervasive irritability, and intolerance of frustration, but impulsiveness and disorganized attention are not essential features. However, most children and adolescents with the disorder also have symptoms that meet criteria for ADHD, which is diagnosed separately.

Substance use disorders. Differentiating ADHD from substance use disorders may be problematic if the first presentation of ADHD symptoms follows the onset of abuse or

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frequent use. Clear evidence of ADHD before substance misuse from informants or previous records may be essential for differential diagnosis.

Personality disorders. In adolescents and adults, it may be difficult to distinguish ADHD from borderline, narcissistic, and other personality disorders. Some personality disorders tend to share the features of disorganization, social intrusiveness, emotional dysregulation, and cognitive dysregulation. However, ADHD is not characterized by fear of abandonment, self-injury, extreme ambivalence, or other features of personality disorder. It may take extended clinical observation, informant interview, or detailed history to distinguish impulsive, socially intrusive, or inappropriate behavior from narcissistic, aggressive, or domineering behavior to make this differential diagnosis.

Psychotic disorders. ADHD is not diagnosed if the symptoms of inattention and hyperactivity occur exclusively during the course of a psychotic disorder.

Medication-induced symptoms of ADHD. Symptoms of inattention, hyperactivity, or impulsivity attributable to the use of medication (e.g., bronchodilators, isoniazid, neuroleptics [resulting in akathisia], thyroid replacement medication) are diagnosed as other specified or unspecified other (or unknown) substance-related disorders.

Neurocognitive disorders. While impairment in complex attention may be one of the affected cognitive domains in a neurocognitive disorder, it must represent a decline from a previous level of performance in order to justify a diagnosis of major or mild neurocognitive disorder. Moreover, major or mild neurocognitive disorder typically has its onset in adulthood. In contrast, the inattention in ADHD must have been present prior to age 12 and does not represent a decline from previous functioning.

Comorbidity

Although ADHD is more common in males, females with ADHD have higher rates of a number of comorbid disorders, particularly oppositional defiant disorder, autism spectrum disorder, and personality and substance use disorders. Oppositional defiant disorder co-occurs with ADHD in approximately half of children with the combined presentation and about a quarter with the predominantly inattentive presentation. Conduct disorder co-occurs in about a quarter of children

or adolescents with the combined presentation, depending on age and setting. Most children and adolescents with disruptive mood dysregulation disorder have symptoms that also meet criteria for ADHD; a lesser percentage of children with ADHD have symptoms that meet criteria for disruptive mood dysregulation disorder. Anxiety disorders, major depressive disorder, obsessive-compulsive disorder, and intermittent explosive disorder occur in a minority of individuals with ADHD but more often than in the general population. Although substance use disorders are relatively more frequent among adults with ADHD in the general population, the disorders are present in only a minority of adults with ADHD. In adults, antisocial and other personality disorders may co-occur with ADHD.

ADHD may co-occur in variable symptom profiles with other neurodevelopmental disorders, including specific learning disorder, autism spectrum disorder, intellectual developmental disorder, language disorders, developmental coordination disorder, and tic disorders.

Comorbid sleep disorders in ADHD are associated with daytime impairments in cognition (e.g., inattention). Many individuals with ADHD report daytime sleepiness that may meet criteria for hypersomnolence disorder. One quarter to one-half of individuals with ADHD report sleep difficulties; studies have shown an association of ADHD with insomnia, circadian rhythm sleep-wake disorder, sleep-disordered breathing, and restless legs syndrome.

Individuals with ADHD have been found to have elevated rates of a number of medical conditions, particularly allergy and autoimmune disorders, as well as epilepsy.

Other Specified Attention-Deficit/Hyperactivity Disorder

F90.8

This category applies to presentations in which symptoms characteristic of attention-deficit/hyperactivity disorder that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for attention-deficit/hyperactivity disorder or any of the disorders in the neurodevelopmental disorders diagnostic class. The other specified attention-deficit/hyperactivity disorder category is used in situations in which the clinician chooses to communicate the specific reason that the presentation does not meet the criteria for attention-deficit/hyperactivity disorder or any specific neurodevelopmental disorder. This is done by recording “other specified attention-deficit/hyperactivity disorder” followed by the specific reason (e.g., “with insufficient inattention symptoms”).

Unspecified Attention-Deficit/Hyperactivity Disorder

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