

Attention Deficit Hyperactivity Disorder

People with Attention Deficit Hyperactivity Disorder (ADHD) have difficulties in sustaining attention to tasks, particularly if they demand more effort than usual. They have significant problems with resisting distractions, which contributes further to their problems paying attention. Just as problematic are difficulties in controlling their impulses to act or to inhibit behavioral responses to situations. Many, though by no means all, may also have problems with controlling their activity level, being perceived as more active, restless, fidgeting, and otherwise engaged in behavior that is not relevant or is frankly inappropriate for the task or situation. The disorder has had various labels over the past century, including hyperkinetic reaction of childhood, hyperactivity or hyperactive child syndrome, minimal brain dysfunction, and Attention Deficit Disorder (with or without Hyperactivity). It is now known to occur in children, adolescents, and adults.

Major Characteristics

Although normal individuals, particularly young children, may show some of these behavioral characteristics, what distinguishes the individual with ADHD from others individual is the considerably greater degree or frequency with which they display such characteristics that rises to a level of being developmentally inappropriate for their age group. ADHD is often recognized by the following signs or symptoms:

1. Poorly sustained attention or persistence of effort to tasks, particularly those that are relatively tedious, boring, and go on for a long time. The individual becomes bored rapidly during repetitive tasks, shifts from one uncompleted activity to another, frequently loses concentration during lengthy tasks, and fails to complete routine assignments without supervision. Combined with these problems of persistence are striking difficulties with distractibility such that the person's concentration is often interrupted by irrelevant thoughts or external events.
2. Impaired impulse control or delay of gratification. This is often noted in the individual's not being able to stop and think before acting; not being able to wait his or her turn while playing or talking with others; not being able to work for larger, longer-term rewards rather than smaller, immediate ones; and not being able to inhibit behavior as a situation demands.
3. Excessive task-irrelevant activity or poorly regulated activity to situational demands. Individuals with ADHD are often excessively fidgety, restless, and "on the go." They display movement that is not needed to complete a task, such as wriggling feet and legs, squirming in their seats when required to remain seated, tapping things, rocking, or shifting position while performing relatively boring tasks. Trouble sitting still or inhibiting movement as a situation demands is often seen in younger children with ADHD. The hyperactivity may decline with age and, by adulthood, is often reported to be a more subjective feeling of the need to be busy or always doing things.

ADHD is currently subtyped into three types. The Combined Type is the most common (approximately 60% or more of clinical cases) and involves all of the characteristics noted above. It is also the most extensively studied of the types of ADHD, with there being thousands of scientific studies published over the past 100 years on this group. The Predominantly Hyperactive Type was recognized in 1994 and does not have sufficient problems with inattentiveness to be diagnosed with the Combined Type. It principally manifests the difficulties with impulsive and hyperactive behavior noted in #2 and #3 above. Research suggests that this may not be a true subtype of ADHD but more an early developmental stage to the Combined

Type given that as many as 90% of these cases will eventually be diagnosed as having the Combined Type within 3-5 years of initial diagnosis. The remainder appears to be milder variants of the Combined Type.

Individuals who exhibit mainly the attention problems but do not display excessive activity levels or poor impulse control are presently considered to have the Predominantly Inattentive Type of ADHD. First recognized around 1980, they comprise 30% or more of clinically referred cases. While some of these cases are just milder forms of the Combined Type noted above, up to half of the cases placed in this type appear to have a qualitatively different form of attention problem from that seen in other cases of ADHD, such as the Combined Type. Researchers now refer to this subset of cases as having a “sluggish cognitive tempo” (SCT) and view them as differing in many respects from the Combined Type of ADHD, enough so that some researchers have argued that this may represent a separate disorder from ADHD. These differences are relatively numerous and include:

- Different presenting symptoms, including excessive:
 - Daydreaming, spacey appearance, staring
 - Hypoactive, slow moving, lethargic, sluggish
 - Easily confused, mentally “foggy”
- Slow, error prone information processing
- Poor focused or selective attention (identifying what is important from what is not in the information one must process).
- Possibly more erratic retrieval from long-term memory
- Being socially reticent, shy, or withdrawn
- Not impulsive
- Comorbidity:
 - Rarely show aggression or oppositional defiant disorder or conduct disorder
 - Greater risk of anxiety and possibly depression
- Equally impaired in educational performance
- Just as likely to have learning disabilities (20-50%) and possibly a greater frequency of math disorders
- Possibly less likely to have a clinically impressive response to stimulants (only a few studies exist however)
- Possibly a better response to social skills training than ADHD cases are likely to show.

Other Characteristics (Combined Type)

Several other features are associated with the Combined Type of ADHD, including:

1. *Early onset of the symptoms.* Many ADHD individuals begin to show problems in early childhood, often at 3 or 4 years of age, and half or more have had their difficulties since the age of seven. Nearly all cases have developed their symptoms by 14-16 years.
2. *Executive function or self-regulation deficits.* ADHD is frequently associated with problems with holding information in mind that is directing one’s behavior toward tasks or goals (working memory), self-motivation, and problem-solving during goal-directed behavior. These cognitive abilities are part of a larger complex of mental faculties known as the executive function because they contribute to self-control and future-directed actions.
3. *Highly variable or inconsistent performance of tasks over time.* ADHD individuals show wide swings in the amount of work they produce across time. To a lesser extent, there is also greater variability in the quality, correctness, and speed with which they perform assigned work. This may be seen in highly variable school or work performance. This variability is seen less in

situations involving one-to-one activities with others, particularly if they are with their fathers or other authority figures. They also do better when the activities are new, highly interesting, or involve an immediate consequence for completing them. Group situations or relatively repetitive, familiar, and uninteresting activities are likely to cause the most problems for them.

4. *Trouble following directions, instructions, or rules.* ADHD individuals often have difficulty following through on instructions or assignments, particularly without supervision. This is not due to poor language comprehension, defiance, or memory impairment. It seems as if instructions do not guide behavior as well in ADHD individuals.

5. *Relatively chronic course.* Over 70% of children with ADHD continue to have their symptoms throughout childhood and in to adolescence. Although the major features improve with age, most ADHD individuals remain behind others their age in their ability to sustain attention, inhibit behavior, and control their activity level. Recent studies suggest that as many as 66% or more continue to have significantly elevated symptoms in adulthood and are impaired by their symptoms.

Frequently Associated Conditions

Persons with ADHD are more likely than others to have the following conditions

1. *Academic under-productivity, underachievement, and learning disabilities.* The vast majority of individuals with ADHD produce far less work in school than do others of their age. They also often perform below their expected levels of achievement in school when tested relative to their intellectual abilities. As many as 30% of individuals with ADHD have reading disorders. An additional 10% to 25% may have other academic disabilities, such as difficulties in spelling, math or writing. Language problems may occur in 10-25% of cases while difficulties with verbal interactions with others, known as pragmatics, are far more common.

2. *Aggression or conduct problems.* Studies suggest that 45-84% of individuals with ADHD have a co-existing condition known as Oppositional Defiant Disorder or aggression. This is shown by arguing, defiance toward adults or other authorities, stubbornness, disobedience, temper outbursts, destructiveness, and verbal or physical aggression toward others.

3. *Excessive emotional displays or immaturity.* A pattern of exaggerated emotional expressions may be observed, particularly in children with ADHD, in which the individual tends to overreact emotionally to frustrating, provocative, or stressful situations. These individuals may be described as having a lower frustration tolerance and as being more moody or emotionally sensitive than others. A quickness to display anger, sadness, elation, or other normal emotions occurs frequently in ADHD children. It is not that these reactions are abnormal or grossly inappropriate for the place or setting but that they are more easily brought out than is normal for their age. Low self-esteem is common by late childhood or early adolescence.

4. *Social relationship problems.* At least 50% of ADHD individuals have problems beginning or maintaining social relationships, or resolving conflicts with others. They may be described as self-centered, demanding intrusive, insensitive to the feelings of others, and unappreciative of assistance from others. These problems are especially common in that subset of cases that also have oppositional defiant disorder or conduct disorder (anti-social and aggressive behavior).

Prevalence

ADHD occurs in approximately 3% to 7.7% of the childhood population and 4-5% of adults. It is three times more common in boys than girls. It is found in all countries and ethnic groups studied to date. ADHD is more commonly seen in individuals with a history of oppositional defiant disorder, conduct disorder (aggression, delinquency, substance abuse, truancy, etc.), learning disabilities (delays in reading, spelling, math, writing, etc.), childhood bipolar disorder, or Tourette's Syndrome (multiple motor and vocal tics).

Causes

ADHD appears to arise from multiple causes. Yet nearly all of those recognized to have a sound scientific basis fall in the realm of neurology and genetics. The evidence for the hereditary or genetic basis of ADHD is now overwhelming and irrefutable. It is now believed that genetics probably accounts for 65-75% of all clinical cases. The disorder occurs far more often among biological family members of diagnosed cases, shows an increasing concordance (co-occurrence) as genetic similarity increases (from unrelated people to siblings to identical twins), and is believed to be associated with variations in certain genes that regulate dopamine activity in the brain (e.g., DRD4, DAT1, DRD5, DBH, etc.). Other genes related to the development of the disorder are likely to be identified indicating that ADHD arises from a combination of risk genes, that genetic subtypes of the disorder are likely to be identified in the near future, that different medications will prove useful for these different subtypes, and that genetic testing may eventually facilitate more accurate diagnosis and subtyping. In a smaller percentage of cases (35%), ADHD may arise from early brain injuries or other disruptions to normal brain development, such as maternal alcohol consumption or smoking during pregnancy, pregnancy or birth complications, early and serious lead poisoning, atypical autoimmune reactions to bacterial infections, head trauma, brain tumors, stroke, etc.

Research has not supported the popular view that ADHD is frequently due to the consumption of food additives, preservatives, or sugar. While in a few individuals, allergies can contribute to a worsening of ADHD; these allergies are not viewed as the cause of ADHD. Individuals with seizures or epilepsy have a 2-3 times greater likelihood of having ADHD as well. Those cases who must take sedatives or anticonvulsant drugs may develop ADHD as a side effect of their medication or may find their pre-existing ADHD features made worse by some of these older medications, such as Phenobarbital or Dilantin.

Adult Outcome

It has been estimated that between 15% and 30% of children with ADHD ultimately outgrow their problems. However, most ADHD individuals will continue to display significantly elevated levels of their symptoms into adulthood. Children with ADHD who begin to exhibit serious aggressiveness, defiance, and lying or stealing during elementary school years are most likely to be at serious risk for later antisocial behavior problems. Yet some well-behaved ADHD children may also be at risk.

The most common area of maladjustment is in educational performance and eventual attainment; ADHD individuals are more likely to be held back in grade (25-50%), to need special education (50-80%), to be suspended for inappropriate conduct (10-20%), to be expelled (10-15%), or to quit (30-40%) before completing high school. ADHD individuals therefore often have less education than do others their age. Approximately 35-50% or more of ADHD cases will display a learning disability besides their ADHD features.

Treatment

No treatments have been found to cure this disability, but many exist that have shown effectiveness in reducing either the level of symptoms or the degree to which they impair

adjustment. The most substantiated treatments are medication management (stimulants, such as methylphenidate and amphetamines, and the non-stimulant, atomoxetine), behavioral parent training, behavioral interventions in educational settings, special educational placements, and information-based counseling of clients and their family members. Social skills training has shown less promise and rather contradictory findings in the current literature.

For adults with ADHD, educating them in practical methods of coping with their disability and enlisting the assistance of others in helping to better organize and structure ADHD individuals' work-related activities may prove helpful. Medications noted above are also effective in adults.

Treatments with little or no evidence for their effectiveness, even though they are widely popular, include dietary management (elimination of sugar or food additives), long-term psychotherapy, EEG biofeedback or neurotherapy, high doses of vitamins, chiropractic treatment, sensory integration therapy and cognitive therapy or self-instruction training.

The treatment of ADHD requires a comprehensive behavioral, psychological, educational, and medical/psychiatric evaluation, followed by the education of the individuals or their caregivers as to the nature of the disorder and the methods proven to assist with its management. Treatment is likely to be multi-disciplinary, requiring the assistance of the mental health, educational, and medical professions at various points in its course. Treatment must be provided periodically over long intervals to assist ADHD individuals in coping with their behavioral disability.

What Is Cognitive Behavior Therapy?

Behavior Therapy and Cognitive Behavior Therapy are types of treatment that are based firmly on research findings. These approaches aid people in achieving specific changes or goals.

Changes or Goals might involve:

- a way of acting - like smoking less or being more outgoing;
- a way of feeling - like helping a person be less scared, less depressed, or less anxious;
- a way of thinking - like learning to problem-solve or get rid of self-defeating thoughts;
- a way of dealing with physical or medical problems - like lessening back pain or helping a person stick to a doctor's suggestions; or
- a way of adjusting - like training developmentally disabled people to care for themselves or hold a job.

Behavior Therapists and Cognitive Behavior Therapists usually focus more on the current situation and its solution, rather than the past. They concentrate on a person's views and beliefs about their life, not on personality traits. Behavior Therapists and Cognitive Behavior Therapists treat individuals, parents, children, couples, and families. Replacing ways of living that do not work well, with ways of living that work, and giving people more control over their lives are common goals of behavior therapy.

The Association for Behavioral and Cognitive Therapies (ABCT) is an interdisciplinary organization committed to the advancement of a scientific approach to the understanding and amelioration of problems of the human condition. These aims are achieved through the

investigation and application of behavioral, cognitive, and other evidence-based principles to assessment, prevention, and treatment.

For more information, please contact ABCT at
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Further Reading

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Useful Websites

Children and Adults with ADD (CHADD) Organization: chadd.org

National Attention Deficit Disorders Association (ADDA) Organization: adda.org

National Institute of Mental Health: help4adhd.org

Charles Schwab Foundation (for Learning Disorders): SchwabLearning.org

Council for Exceptional Education (CEC): cec.sped.org

American Academy of Child & Adolescent Psychiatry: aacap.org

American Academy of Pediatrics: aap.org

Learning Disabilities Association of America (LDA): ldanatl.org

National Information Center for Children and Youth with Disabilities: nichcy.org