

## **An Overview of Attention Deficit/ Hyperactivity Disorder (ADHD)**

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Given all the media attention regarding ADHD, one might think it is a new disorder. That's not the case. ADHD was first described about 100 years ago as a childhood disorder found mainly in boys, initially called "hyperactivity," or "hyperkinesis disorder of childhood," ironically by George Still. In the 1960s the (now outmoded) terms "minimal brain damage" or "minimal brain dysfunction" (MBD) were used to suggest this could be a brain disorder. Revisions in the diagnosis have been made a number of times over the past century. The most significant shift occurred in the 1970s, when the concept of attention dysfunction was introduced as the central defining feature. However, the key symptoms needed for the diagnosis were behavioral descriptions of motor and attentional problems rather than direct cognitive measures of inattention. Nevertheless, the re-naming of the disorder and the subsequent focus on "attention" led to a substantial focus on research, which has substantially reshaped our knowledge over the past two decades.

The diagnosis of ADHD is currently made on the basis of developmentally inappropriate symptoms of inattention, impulsivity, and motor restlessness and 3 subtypes are recognized: "inattentive", "hyperactive-impulsive", and "combined" (reflecting a combination of the other two types). Symptoms must be: (1) observed early in life (before age 7); (2) observed across at least 2 life situations (e.g., work or school and home); and (3) persistent. Current theories emphasize the central role of attentional and executive (self-regulatory) dysfunctions in children. The recent focus on "attention" (as compared to a focus on "hyperactivity") has led to an increase in the number of girls receiving an ADHD diagnosis, although the frequency is probably at least 3:1 (with more boys than girls). ADHD symptoms of boys and girls are largely the same except that boys tend to "externalize" (act out) more than girls and thus boys are more commonly referred for socially disruptive behavior.

ADHD tends to begin early in life, often as early as preschool years, however, establishing a "true" ADHD diagnosis in preschoolers is difficult, in part, because the typical behavior of children this age is much more variable than that of older children and the behaviors of typical preschool aged children include the core features of ADHD, namely, inattention, hyperactivity, and impulsivity. The diagnosis is most commonly made during the elementary school years. Nevertheless it is possible to diagnose the disorder at any point during life, as long as the symptoms began in childhood. It is estimated that ADHD affects approximately 6-8% of elementary school aged children and about four percent of adults. As teenage years progress, studies have shown that the hyperactive and impulsivity symptoms show a greater decline in frequency than the inattentive symptoms. Even though many children with ADHD show fewer ADHD symptoms over time, they may continue to have problems in attention and concentration, lowered self-esteem from the school-age difficulties, and persistent learning disorders (in approximately 20-30% of cases). Neuropsychological testing is often helpful in identifying learning disabilities in persons with ADHD and distinguishing them from the attentional problems.

The similarities between ADHD and those of some neurological patients suggested to researchers that ADHD is a brain disorder affecting the prefrontal cortex. While reviews by this author and others provide some support for this idea, a growing literature demonstrates subtle, but widespread brain changes affecting other cortical regions and the cerebellum in children with ADHD. The most replicated alterations in ADHD in childhood include significantly smaller brain volumes in the prefrontal cortex, basal ganglia, corpus callosum and cerebellum. While research showing these differences supports the idea that ADHD is caused by a disorder of the brain, the disorder is not “progressive” and is frequently well treated with medications, family interventions, tutoring, and environmental manipulation. ADHD is known to run in families and some of the genes predisposing to ADHD are beginning to be identified. However, there are no known biological tests yet for ADHD. Doctors cannot use genetic testing or MRIs to diagnose ADHD. At this point, diagnosis is made pretty much the way it has been over the past 50-100 years: careful observation, interviews, assessment for school and/or work performance and sometimes neuropsychological testing is used.

Although ADHD can be a significantly disabling disorder, research is moving very rapidly to understand the nature of it. Moreover, the currently available treatments are effective in a majority of cases. Thus, the future will undoubtedly be brighter for children with ADHD, who are likely to be better understood and more effectively treated.

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