

## **Attention-Deficit/Hyperactivity Disorder**

### **What is attention-deficit/hyperactivity disorder?**

Attention-deficit/hyperactivity disorder (ADHD) is an illness characterized by inattention, hyperactivity, and impulsivity. The most commonly diagnosed behavior disorder in young persons, ADHD affects an estimated three percent to five percent of school-age children.

Although ADHD is usually diagnosed in childhood, it is not a disorder limited to children -- ADHD often persists into adolescence and adulthood and is frequently not diagnosed until later years.

### **What are the symptoms of ADHD?**

There are actually three different types of ADHD, each with different symptoms: predominantly inattentive, predominantly hyperactive/impulsive, and combined.

#### **Those with the predominantly inattentive type often:**

- fail to pay close attention to details or make careless mistakes in schoolwork, work, or other activities
- have difficulty sustaining attention to tasks or leisure activities
- do not seem to listen when spoken to directly
- do not follow through on instructions and fail to finish schoolwork, chores, or duties in the workplace
- have difficulty organizing tasks and activities
- avoid, dislike, or are reluctant to engage in tasks that require sustained mental effort
- lose things necessary for tasks or activities
- are easily distracted by extraneous stimuli
- are forgetful in daily activities

#### **Those with the predominantly hyperactive/impulsive type often:**

- fidget with their hands or feet or squirm in their seat
- leave their seat in situations in which remaining seated is expected

- move excessively or feel restless during situations in which such behavior is inappropriate
- have difficulty engaging in leisure activities quietly
- are "on the go" or act as if "driven by a motor"
- talk excessively
- blurt out answers before questions have been completed
- have difficulty awaiting their turn
- interrupt or intrude on others

**Those with the combined type**, the most common type of ADHD, have a combination of the inattentive and hyperactive/impulsive symptoms.

### **What is needed to make a diagnosis of ADHD?**

A diagnosis of ADHD is made when an individual displays at least six symptoms from either of the above lists, with some symptoms having started before age seven. Clear impairment in at least two settings, such as home and school or work, must also exist. Additionally, there must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

### **How common is ADHD?**

ADHD affects an estimated two million American children, an average of at least one child in every U.S. classroom. In general, boys with ADHD have been shown to outnumber girls with the disorder by a rate of about three to one. The combined type of ADHD is the most common in elementary school-aged boys; the predominantly inattentive type is found more often in adolescent girls.

While there is no specific data on the rates of ADHD in adults, the disorder is sometimes not diagnosed until adolescence or adulthood, and half of the children with ADHD retain symptoms of the disorder throughout their adult lives. (It is generally believed that older individuals diagnosed with ADHD have had elements of the disorder since childhood.)

### **What is ADD? Is it different than ADHD?**

This is a question that has become increasingly difficult to answer simply. *ADHD*, or *attention-deficit/hyperactivity disorder*, is the only clinically diagnosed term for disorders characterized by inattention, hyperactivity, and impulsivity used in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition*, the diagnostic "bible" of psychiatry. However (and this is where things get tricky), *ADD*, or *attention-deficit disorder*, is a term that has become increasingly popular among laypersons, the media, and even some professionals. Some use the term *ADD* as an umbrella term -- after all, ADHD is an attention-deficit disorder. Others use the term *ADD* to refer to the predominantly inattentive type of ADHD, since that type does not feature hyperactive symptoms. Lastly, some simply use the terms *ADD* and *ADHD*

interchangeably. The bottom line is that when people speak of ADD or ADHD, they generally mean the same thing. However, only *ADHD* is the "official" term.

### **Is ADHD associated with other disorders?**

Yes. In fact, symptoms like those of ADHD are often mistaken for or found occurring with other neurological, biological, and behavioral disorders. Nearly half of all children with ADHD (especially boys) tend to also have *oppositional defiant disorder*, characterized by negative, hostile, and defiant behavior. *Conduct disorder* (marked by aggression towards people and animals, destruction of property, deceitfulness or theft, and serious rule-breaking) is found to co-occur in an estimated 40 percent of children with ADHD. Approximately one-fourth of children with ADHD (mostly younger children and boys) also experience *anxiety* and *depression*. And, at least 25 percent of children with ADHD suffer from some type of *communication/learning disability*. There is additionally a correlation between *Tourette's syndrome*, a neurobiological disorder characterized by motor and vocal tics, and ADHD--only a small percentage of those with ADHD also have Tourette's, but at least half of those with Tourette's also have ADHD. Research is also beginning to show that ADHD-like symptoms are sometimes actually manifestations of childhood-onset bipolar disorder.

### **What causes ADHD?**

First of all, it is important to realize that ADHD is **not** caused by dysfunctional parenting, nor is it due to a lack intelligence or discipline.

Strong scientific evidence supports the conclusion that ADHD is a biologically based disorder. Recently, National Institute of Mental Health researchers using PET scans have observed significantly lower metabolic activity in regions of the brain controlling attention, social judgment, and movement in those with ADHD than in those without the disorder. Biological studies also suggest that children with ADHD may have lower levels of the neurotransmitter dopamine in critical regions of the brain.

Other theories suggest that cigarette, alcohol, and drug use during pregnancy or exposure to environmental toxins such as lead may be linked to the development of ADHD. Research also suggests a strong genetic basis to ADHD -- the disorder tends to run in families. In addition, research has shown that certain forms of genes related to the dopamine neurotransmitter system are linked to increased likelihood of the disorder.

While early theories suggested that ADHD may be caused by minor head injuries or brain damage resulting from infections or complications at birth, research found this hypothesis to lack substantial supportive evidence. Furthermore, scientific studies have not verified dietary factors, another widely discussed possible influence for the development of ADHD, as a main cause of the disorder.

### **How can ADHD be treated?**

Many treatments -- some with good scientific basis, some without -- have been recommended for individuals with ADHD. The most proven treatments are medication and behavioral therapy.

### ***Medication***

Stimulants are the most widely used drugs for treating attention-deficit/hyperactivity disorder. The four most commonly used stimulants are methylphenidate (Ritalin), dextroamphetamine (Dexedrine, Desoxyn), amphetamine and dextroamphetamine (Adderall). These drugs increase activity in parts of the brain that are underactive in those with ADHD, improving attention and reducing impulsiveness, hyperactivity, and/or aggressive behavior. Antidepressants, major tranquilizers, and the antihypertensive clonidine (Catapres) have also proven helpful in some cases. Most recently, the FDA has approved a non-stimulant medication, Atomoxetine (Strattera), a selective norepinephrine reuptake inhibitor for the treatment of ADHD.

Every person reacts to treatment differently, so it is important to work closely and communicate openly with your physician. Some common side effects of stimulant medications include weight loss, decreased appetite, trouble sleeping, and, in children, a temporary slowness in growth; however, these reactions can often be controlled by dosage adjustments. Medication has proven effective in the short-term treatment of more than 76 percent of individuals with ADHD.

### ***Behavioral Therapy***

Treatment strategies such as rewarding positive behavior changes and communicating clear expectations of those with ADHD have also proven effective. Additionally, it is extremely important for family members and teachers or employers to remain patient and understanding.

*Children* with ADHD can additionally benefit from caregivers paying close attention to their progress, adapting classroom environments to accommodate their needs, and using positive reinforcers. Where appropriate, parents should work with the school district to plan an individualized education program (IEP).

### ***Other Treatments***

There are a variety of other treatment options offered (some rather dubious) for those with ADHD. Those treatments **not** scientifically proven to work include biofeedback, special diets, allergy treatment, megavitamins, chiropractic adjustment, and special-colored glasses.

*Reviewed by Peter Jensen, MD May 2003*