

## Attention-Deficit / Hyperactivity Disorder (ADHD) in Children

### What is ADHD?

ADHD, also called attention-deficit disorder, is a behavior disorder, usually first diagnosed in childhood, that is characterized by inattention, impulsivity, and, in some cases, hyperactivity. These symptoms usually occur together; however, one may occur without the other(s).

The symptoms of hyperactivity, when present, are almost always apparent by the age of 7 and may be present in very young preschoolers. Inattention or attention-deficit may not be evident until a child faces the expectations of elementary school.

### What are the different types of ADHD?

Three major types of ADHD include the following:

- **ADHD, combined type.** This, the most common type of ADHD, is characterized by impulsive and hyperactive behaviors as well as inattention and distractibility.
- **ADHD, impulsive/hyperactive type.** This, the least common type of ADHD, is characterized by impulsive and hyperactive behaviors without inattention and distractibility.
- **ADHD, inattentive and distractible type.** This type of ADHD is characterized predominately by inattention and distractibility without hyperactivity.

### What causes attention-deficit/hyperactivity disorder?

ADHD is one of the most researched areas in child and adolescent mental health. However, the precise cause of the disorder is still unknown. Available evidence suggests that ADHD is genetic. It is a brain-based biological disorder. Low levels of dopamine (a brain chemical), which is a neurotransmitter (a type of brain chemical), are found in children with ADHD. Brain imaging studies using PET scanners (positron emission tomography; a form of brain imaging that makes it possible to observe the human brain at work) show that brain metabolism in children with ADHD is lower in the areas of the brain that control attention, social judgment, and movement.

### Who is affected by attention-deficit/hyperactivity disorder?

Estimates suggest that about 4% to 12% of children have ADHD. Boys are 2 to 3 times more likely to have ADHD of the hyperactive or combined type than girls.

Many parents of children with ADHD experienced symptoms of ADHD when they were younger. ADHD is commonly found in brothers and sisters within the same family. Most families seek help when their child's symptoms begin to interfere with learning and adjustment to the expectations of school and age-appropriate activities.

### What are the symptoms of attention-deficit/hyperactivity disorder?

The following are the most common symptoms of ADHD. However, each child may experience symptoms differently. The 3 categories of symptoms of ADHD include the following:

- Inattention:
  - Short attention span for age (difficulty sustaining attention)
  - Difficulty listening to others
  - Difficulty attending to details
  - Easily distracted
  - Forgetfulness
  - Poor organizational skills for age

- Poor study skills for age
- Impulsivity:
  - Often interrupts others
  - Has difficulty waiting for his or her turn in school and/or social games
  - Tends to blurt out answers instead of waiting to be called upon
  - Takes frequent risks, and often without thinking before acting
- Hyperactivity:
  - Seems to be in constant motion; runs or climbs, at times with no apparent goal except motion
  - Has difficulty remaining in his/her seat even when it is expected
  - Fidgets with hands or squirms when in his or her seat; fidgeting excessively
  - Talks excessively
  - Has difficulty engaging in quiet activities
  - Loses or forgets things repeatedly and often
  - Inability to stay on task; shifts from one task to another without bringing any to completion

The symptoms of ADHD may resemble other medical conditions or behavior problems. Keep in mind that many of these symptoms may occur in children and teens who do not have ADHD. A key element in diagnosis is that the symptoms must significantly impair adaptive functioning in both home and school environments. Always consult your child's doctor for a diagnosis.

## How is attention-deficit/hyperactivity disorder diagnosed?

ADHD is the most commonly diagnosed behavior disorder of childhood. A pediatrician, child psychiatrist, or a qualified mental health professional usually identifies ADHD in children. A detailed history of the child's behavior from parents and teachers, observations of the child's behavior, and psychoeducational testing contribute to making the diagnosis of ADHD. Because ADHD is a group of symptoms, diagnosis depends on evaluating results from several different sources, including physical, neurological, and psychological testing. Certain tests may be used to rule out other conditions, and some may be used to test intelligence and certain skill sets. Consult your child's doctor for more information.

## Treatment for attention-deficit/hyperactivity disorder

Specific treatment for attention-deficit/hyperactivity disorder will be determined by your child's doctor based on:

- Your child's age, overall health, and medical history
- Extent of your child's symptoms
- Your child's tolerance for specific medications or therapies
- Expectations for the course of the condition
- Your opinion or preference

Major components of treatment for children with ADHD include parental support and education in behavioral training, appropriate school placement, and medication. Treatment with a psychostimulant is highly effective in most children with ADHD.

Treatment may include:

- **Psychostimulant medications.** These medications are used for their ability to balance chemicals in the brain that prohibit the child from maintaining attention and controlling impulses. They help "stimulate" or help the brain to focus and may be used to reduce the major characteristics of ADHD.

Medications that are commonly used to treat ADHD include the following:

- Methylphenidate (Ritalin, Metadate, Concerta, Methylin)
- Dextroamphetamine (Dexedrine, Dextrostat)
- A mixture of amphetamine salts (Adderall)
- Atomoxetine (Strattera). A nonstimulant SNRI (selective serotonin norepinephrine reuptake inhibitor) medication with benefits for related mood symptoms.
- Lisdexamfetamine (Vyvanse)

Psychostimulants have been used to treat childhood behavior disorders since the 1930s and have been widely studied. Traditional immediate release stimulants take effect in the body quickly, work for 1 to 4 hours, and then are eliminated from the body. Many long-acting stimulant medications are also available, lasting 8 to 9 hours, and requiring 1 daily dosing. Doses of stimulant medications need to be timed to match the child's school schedule to help the child pay attention for a longer period of time and improve classroom performance. The common side effects of stimulants may include, but are not limited to, the following:

- Insomnia
- Decreased appetite
- Stomach aches
- Headaches
- Jitteriness
- Rebound activation (when the effect of the stimulant wears off, hyperactive and impulsive behaviors may increase for a short period of time)

Most side effects of stimulant use are mild, decrease with regular use, and respond to dose changes. Always discuss potential side effects with your child's doctor.

Antidepressant medications may also be administered for children and adolescents with ADHD to help improve attention while decreasing aggression, anxiety, and/or depression.

- **Psychosocial treatments.** Parenting children with ADHD may be difficult and can present challenges that create stress within the family. Classes in behavior management skills for parents can help reduce stress for all family members. Training in behavior management skills for parents usually occurs in a group setting which encourages parent-to-parent support. Behavior management skills may include the following:

- Point systems
- Contingent attention (responding to the child with positive attention when desired behaviors occur; withholding attention when undesired behaviors occur)

Teachers may also be taught behavior management skills to use in the classroom setting. Training for teachers usually includes use of daily behavior reports that communicate in-school behaviors to parents.

Behavior management techniques tend to improve targeted behaviors (such as completing school work or keeping the child's hands to himself or herself), but are not usually helpful in reducing overall inattention, hyperactivity, or impulsivity.

## Prevention of attention-deficit/hyperactivity disorder

Preventive measures to reduce the incidence of ADHD in children are not known at this time. However, early

detection and intervention can reduce the severity of symptoms, decrease the interference of behavioral symptoms on school functioning, enhance the child's normal growth and development, and improve the quality of life experienced by children or adolescents with ADHD.