



## WHAT WE KNOW

# The Disorder Named ADHD

Occasionally, we may all have difficulty sitting still, paying attention or controlling impulsive behavior. For some people, the problems are so pervasive and persistent that they interfere with their lives, including home, academic, social and work settings.

Attention-deficit/hyperactivity disorder (ADHD) is a common neurobiological condition affecting 5-8 percent of school age children<sup>1,2,3,4,5,6,7</sup> with symptoms persisting into adulthood in as many as 60 percent of cases (i.e. approximately 4% of adults).<sup>8,9</sup> It is characterized by developmentally inappropriate levels of inattention, impulsivity, and hyperactivity.

Although individuals with this disorder can be very successful in life, without identification and proper treatment, ADHD may have serious consequences, including school failure, family stress and disruption, depression, problems with relationships, substance abuse, delinquency, risk for accidental injuries and job failure. Early identification and treatment are extremely important.

Medical science first documented children exhibiting inattentiveness, impulsivity and hyperactivity in 1902. Since that time, the disorder has been given numerous names, including minimal brain dysfunction, hyperkinetic reaction of childhood and attention-deficit disorder with or without hyperactivity. With the *Diagnostic and Statistical Manual, fourth edition (DSM-IV)* classification system, the disorder has been renamed attention-deficit/hyperactivity disorder, or ADHD. The current name reflects the importance of the inattention characteristics of the disorder as well as the other characteristics of the disorder, such as hyperactivity and impulsivity.

## THE SYMPTOMS

Typically, ADHD symptoms arise in early childhood, unless associated with some type of brain injury later in life. Some symptoms persist into adulthood and may pose life-long challenges. Although the official diagnostic criteria state that the onset of symptoms must occur before age seven, leading researchers in the field of ADHD argue that criterion should be broadened to include onset anytime during childhood.<sup>10</sup> The symptom-related criteria for the three primary subtypes are adapted from *DSM-IV* and summarized as follows:

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### ADHD predominantly inattentive type: (ADHD-I)

- Fails to give close attention to details or makes careless mistakes.
- Has difficulty sustaining attention.
- Does not appear to listen.
- Struggles to follow through on instructions.
- Has difficulty with organization.
- Avoids or dislikes tasks requiring sustained mental effort.
- Loses things.
- Is easily distracted.
- Is forgetful in daily activities.

### ADHD predominantly hyperactive-impulsive type: (ADHD-HI)

- Fidgets with hands or feet or squirms in chair.
- Has difficulty remaining seated.
- Runs about or climbs excessively.
- Difficulty engaging in activities quietly.
- Acts as if driven by a motor.
- Talks excessively.
- Blurs out answers before questions have been completed.
- Difficulty waiting or taking turns.
- Interrupts or intrudes upon others.

### ADHD combined type: (ADHD-C)

- Individual meets both sets of inattention and hyperactive/impulsive criteria.

Youngsters with ADHD often experience delays in independent functioning and may therefore behave in ways more like younger children.<sup>11</sup> In addition, ADHD frequently co-occurs with other conditions, such as depression, anxiety or learning disabilities. For example, in 1999, NIMH research indicated that two-thirds of children with ADHD have at least one other co-existing condition.<sup>12</sup> When co-existing conditions are present, academic and behavioral problems, as well as emotional issues, may be more complex.

Teens with ADHD present a special challenge. During these years, academic and organizational demands increase. In addition, these impulsive youngsters are facing typical adolescent issues: discovering their identity, establishing independence, dealing with peer pressure, exposure to illegal drugs, emerging sexuality, and the challenges of teen driving.

Recently, deficits in executive function have emerged as key factors impacting academic and career success.<sup>13</sup> Simply stated, executive function refers to the "variety of functions within the brain that activate, organize, integrate and manage other functions."<sup>14</sup> This permits individuals to appreciate the longer-term consequences of their actions and guide their behavior across time more effectively.<sup>15</sup> Critical concerns include deficits in working memory and the ability to plan for the future, as well as maintaining and shifting strategies in the service of long-term goals.

## THE DIAGNOSIS

Determining if a child has ADHD is a multifaceted process. Many biological and psychological problems can contribute to symptoms similar to those exhibited by children with ADHD. For example, anxiety, depression and certain types of learning disabilities may cause similar symptoms. In some cases, these other conditions may actually be the primary diagnosis; in others, these conditions may co-exist with ADHD.

There is no single test to diagnose ADHD. Therefore, a comprehensive evaluation is necessary to establish a diagnosis, rule out other causes and determine the presence or absence of co-existing conditions. Such an evaluation requires time and effort and should include a careful history and a clinical assessment of the

individual's academic, social, and emotional functioning and developmental level. A careful history should be taken from the parents and teachers, as well as the child, when appropriate. Checklists for rating ADHD symptoms and ruling out other disabilities are often used by clinicians; these age-normed instruments help to ensure that the symptoms are extreme for the child's developmental level.

There are several types of professionals who can diagnose ADHD, including school psychologists, clinical psychologists, clinical social workers, nurse practitioners, neurologists, psychiatrists and pediatricians. Regardless of who does the evaluation, the use of the *Diagnostic and Statistical Manual IV* diagnostic criteria for ADHD is necessary. A medical exam by a physician is important and should include a thorough physical examination, including assessment of hearing and vision, to rule out other medical problems that may be causing symptoms similar to ADHD. In rare cases, persons with ADHD

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also may have a thyroid dysfunction. Only medical doctors can prescribe medication if it is needed. Diagnosing ADHD in an adult requires an evaluation of the history of childhood problems in behavior and academic domains, as well as examination of current symptoms and coping strategies. For more information, read *What We Know #9, "Diagnosis of ADHD in Adults."*

## THE CAUSES

Multiple studies have been conducted to discover the cause of the disorder. Research clearly indicates that ADHD tends to run in families and that the patterns of transmission are to a large extent genetic.<sup>16,17</sup> More than 20 genetic studies, in fact, have shown evidence that ADHD is strongly inherited. Yet ADHD is a complex disorder, which is undoubtedly the result of multiple interacting genes. Other causal factors (such as low birth weight, prenatal maternal smoking, and additional prenatal problems) may contribute to other cases of

ADHD.<sup>18,19,20,21</sup> Problems in parenting or parenting styles may make ADHD better or worse, but these do not cause the disorder. ADHD is clearly a brain-based disorder. Currently research is underway to better define the areas and pathways that are involved.

## PROGNOSIS AND LONG-TERM OUTCOMES

Children with ADHD are at risk for potentially serious problems in adolescence: academic underachievement and school failure, problems in social relations, risk for antisocial behavior patterns, teen pregnancy, and adverse driving consequences.<sup>22</sup> As noted above, ADHD persists from childhood to adolescence in the vast majority of cases, although the symptom area of motor activity tends to diminish with time. Furthermore, up to two-thirds of children with ADHD continue to experience significant symptoms in adulthood. Yet many adults with ADHD learn coping strategies and compensate quite well.<sup>23,24</sup> A key to good outcome is early identification and treatment.

## MULTIMODAL TREATMENT

ADHD in children often requires a comprehensive approach to treatment called "*multimodal*" and includes:

- Parent and child education about diagnosis and treatment
- Behavior management techniques
- Medication
- School programming and supports

Treatment should be tailored to the unique needs of each child and family. Research from the landmark NIMH Multimodal Treatment Study of ADHD is very encouraging.<sup>25</sup> Children who received carefully monitored medication, alone or in combination with behavioral treatment, showed significant improvement in their behavior at home and school plus better relationships with their classmates and family than did children receiving lower quality care.

Psychostimulants are the most widely used class of medication for the management of ADHD related symptoms. Approximately 70 to 80 percent of children with ADHD respond positively to psychostimulant medications.<sup>26</sup> Significant academic improvement is shown by students who take these medications: *increases in attention and concentration, compliance and effort on tasks, as well as amount and accuracy of schoolwork, plus decreased activity levels, impulsivity, negative behaviors in social interactions and physical and*

verbal hostility.<sup>27,28</sup> A new, nonstimulant medication—atomoxetine—appears to have similar effects as the stimulants.

Other medications that may decrease impulsivity, hyperactivity and aggression include some antidepressants and antihypertensives. However, each family must weigh the pros and cons of taking medication (see *What We Know #3, “Managing Medication for Children and Adolescents with ADHD”*).

Behavioral interventions are also a major component of treatment for children who have ADHD. Important strategies include being consistent and using positive reinforcement, and teaching problem-solving, communication, and self-advocacy skills. Children, especially teenagers, should be actively involved as respected members of the school planning and treatment teams (see *What We Know #7, “Psychosocial Treatment for Children and Adolescents with ADHD”*).

School success may require a variety of classroom accommodations and behavioral interventions. Most children with ADHD can be taught in the regular classroom with minor adjustments to the environment. Some children may require special education services if an educational need is indicated. These services may be provided within the regular education classroom or may require a special placement outside of the regular classroom that meets the child's unique learning needs (see *What We Know #4 “Educational Rights for Children with ADHD”*).

Adults with ADHD may benefit from learning to structure their environment. In addition, medications effective for childhood ADHD are also helpful for adults who have ADHD. While little research has been done on interventions for adults, diagnosis and treatment are still important.

## SUMMARY

Although the symptoms of ADHD—inattention, impulsivity and hyperactivity—are present to some extent in most children, when these symptoms are developmentally extreme, pervasive and persistent a diagnosis of ADHD is warranted. This diagnostic category is associated with significant impairment in family relations, peer interactions, school achievement, and risk for accidental injury, which are domains of crucial importance for healthy and successful development. Because ADHD can become a lifelong

disorder, careful diagnosis and treatment are essential. CHADD is seeking out solutions that will lead to improved quality of life for children, adolescents and adults.

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