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Attention Deficit Hyperactivity Disorder (ADHD)(ADD)

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What is attention deficit hyperactivity disorder (ADHD)?

ADHD refers to a pattern of ongoing, long-standing ("chronic") behavior disorders that have three core symptoms: hyperactivity, impulsivity, and inattention. These

are defined as "disorders" based on the child's stage of development. No one expects much quiet activity, impulse control, or attention span from the average, normal 2-year-old. But by age 5 or 6, it is expected that the child is beginning to regulate his activity level, control his behavior, and attend to tasks. The ADHD child has not achieved these capacities. And the degree to which each of these symptoms show themselves can vary greatly from child to child. The problems that these disorders create show up in all areas of the child's life from home to school to social settings. It is no surprise, then, that ADHD has been shown to have long-term adverse effects on social-emotional development, school performance, and vocational success. Children with ADHD experience an inability to sit still and pay attention in class and the negative consequences of such behavior. They experience peer rejection and engage in a broad array of disruptive behaviors. Their academic and social difficulties have far-reaching and adverse long-term consequences. These children have higher injury rates. As they grow older, children with unrecognized/untreated ADHD are more prone to experience [drug abuse](#), gang activity, other antisocial activities, and other conduct disorders. The symptoms of significant ADHD persist into adolescent years and very often into adulthood.

What are the symptoms of ADHD?

The diagnostic criteria for ADHD are outlined in the *Diagnostic and Statistical Manual of Mental Health*, 4th ed. (DSM-IV), Copyright 1994, American Psychiatric Association. All of the symptoms of inattention, hyperactivity, and impulsivity must have persisted for at least six months to a degree that is maladaptive and inconsistent with the developmental level of the child.

Inattention:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- Often has difficulty sustaining attention in tasks or play activities
- Often does not seem to listen when spoken to directly
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
- Often has difficulty organizing tasks and activities
- Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- Often loses things necessary for tasks or activities (for example, toys, school assignments, pencils, books, or tools)
- Is often easily distracted by extraneous stimuli
- Is often forgetful in daily activities

Hyperactivity:

- Often fidgets with hands or feet or squirms in seat
- Often leaves seat in classroom or in other situations in which remaining seated is expected
- Often runs about or climbs excessively in situations in which it is inappropriate

- Often has difficulty playing or engaging in leisure activities quietly
- Often talks excessively

Impulsivity:

- Often blurts out answers before questions have been completed
- Often has difficulty awaiting turn
- Often interrupts or intrudes on others (for example, butts into conversations or games)

In addition, some hyperactive, impulsive or inattention symptoms that cause present difficulties were present before 7 years of age, and are present in two or more settings (at school [or work] or at home). There must be clear evidence of significant impairment in social, academic, or occupational functioning. And the symptoms are not entirely caused by another severe physical disorder (for example, severe illness associated with [chronic pain](#)) or mental disorder (for example, [schizophrenia](#), other [psychotic disorders](#), severe disabling mood disorders, etc.).

How is ADHD diagnosed?

The diagnosis of ADHD can be made reliably using well-tested diagnostic information-gathering methods. Diagnosis is based on history and observable behaviors in the child's usual settings. The child's doctor should follow a process that takes several steps to gather information from the parents, the child's school, and any other caretakers who spend time with the child. There are behavioral questionnaires for parents/caretakers and for teachers/other school professionals that can be filled out and made available to the doctor. The doctor should also evaluate any reports from any school-based (or work-based) multidisciplinary evaluations, if these exist. It is helpful to determine what precipitated the request for the evaluation and what approaches have been used in the past. And the diagnosis of ADHD should never be made without a complete and comprehensive physical examination, along with a thorough review of the child's medical, developmental, psychosocial, and family history. There are no physical abnormalities that establish the diagnosis, but other physical and/or emotional abnormalities that can mimic ADHD must be ruled out.

How many children are diagnosed with ADHD?

ADHD is the most commonly diagnosed behavior disorder of childhood. Recent evidence suggests that the older rates of ADHD in school-age children often quoted in textbooks (3% to 5%) are inaccurate. More complete studies in community samples indicate actual rates to be 4% to 12%, and occurring three times more often in boys than in girls. On average, about one child in every classroom in the United States needs help for this disorder.

Aren't there various types of ADHD?

According to *DSM-IV*, the fourth and most recent edition of the *DSM*, while most individuals have symptoms of both inattention and hyperactivity-impulsivity, there are some individuals in whom one or another pattern is predominant (for at least

the past six months).

How are schools involved in diagnosing, assessing, and treating ADHD?

Physicians and parents should be aware that schools are federally mandated to perform an appropriate evaluation if a child is suspected of having a disability that impairs academic functioning. This policy was recently strengthened by regulations implementing the 1997 reauthorization of the Individuals with Disabilities Act (IDEA), which guarantees appropriate services and a public education to children with disabilities from ages 3 to 21. For the first time, IDEA specifically lists ADHD as a qualifying condition for special-education services. If the assessment performed by the school is inadequate or inappropriate, parents may request that an independent evaluation be conducted at the school's expense. Furthermore, some children with ADHD qualify for special-education services within the public schools, under the category of "Other Health Impaired." In these cases, the special-education teacher, school psychologist, school administrators, classroom teachers, along with parents, must assess the child's strengths and weaknesses and design an Individualized Education Program. These special education services for children with ADHD are available though IDEA.

But be aware that despite this "federal mandate," the reality is that many school districts, because of underfunding or understaffing, are unable to perform "an appropriate evaluation" for all children suspected of having ADHD. The districts have the latitude to define the degree of "impairment of academic functioning" necessary to approve "appropriate evaluation." This usually means the children who are failing or near-failing in their academic performance. A very large segment of the ADHD-affected children will be "getting by" (not failing) academically (at least for their early years of school), but they are usually achieving well below their potential and getting more and more behind each year on the academic prerequisite skills necessary for later school success. They are also suffering the peer rejection and lowered self-esteem so often felt by the ADHD child. So, for any child in whom ADHD is suspected, his doctor should be consulted first, appropriate diagnostic criteria should be investigated, and thereafter, further school testing requested, if needed. Since as noted above, the diagnosis of ADHD is based primarily on diagnostic interview methods, testing performed by educational psychologists through the schools generally are helpful to rule out other disorders that can mimic ADHD, such as specific [learning disorders](#), [dyslexias](#), language disorders, and so on.

Is ADHD inherited?

Research shows that ADHD tends to run in families, so there are likely to be genetic influences. Children who have ADHD usually have at least one close relative who also has ADHD. And at least one-third of all fathers who had ADHD in their youth have one or more children with ADHD. It is often seen that parents are diagnosed as having ADHD at the same time their child is diagnosed. And an even more convincing indication of a genetic role in ADHD is the fact that non-twin siblings of an ADHD patient have a 30% chance of having ADHD, and identical twins are at even higher risk!

Is ADHD on the increase? If so, why?

No one knows for sure whether the prevalence of ADHD per se has risen, but it is very clear that the number of children identified with the disorder and who obtain treatment has risen over the past decade. Some of this increased identification and increased treatment seeking is due in part to greater media interest, heightened consumer awareness, and the availability of effective treatments. Teachers are better trained to recognize the condition and suggest that the family seek help, especially in the more mild to moderate cases. The condition itself is so much more clearly defined and more concisely diagnosed now. And families are more willing to accept the condition as a treatable physical disorder. ADHD is a biological disorder, not just "bad behavior." There is much less of a social stigma attached to the ADHD diagnosis now, as compared to 15-20 years ago. A similar pattern of increased recognition of ADHD is now being observed in other countries. Whether the frequency of the disorder itself has risen remains unknown and needs to be studied.

Can ADHD be seen in brain scans of children with the disorder?

Neuroimaging research has shown that the brains of children with ADHD differ fairly consistently from those of children without the disorder in that several brain regions and structures (prefrontal cortex, striatum, basal ganglia, and cerebellum) tend to be smaller. Overall brain size is generally 5% smaller in affected children than children without ADHD. While this average difference is observed consistently, it is too small to be useful in making the diagnosis of ADHD in a particular individual. In addition, there appears to be a link between a person's ability to pay continued attention and measures that reflect brain activity. In people with ADHD, the brain areas that control attention appear to be less active, suggesting that a lower level of activity in some parts of the brain may be related to difficulties sustaining attention. But it's important to reiterate that these laboratory observations are not yet sufficiently sensitive or specific enough to use to make the diagnosis of ADHD or to monitor the effectiveness of treatment.

Can a preschool-aged child be diagnosed with ADHD?

The diagnosis of ADHD in the preschool-aged (under 5 years old) child is possible, but it can be difficult and should be made cautiously by experts well trained in childhood neurobehavioral disorders. A variety of physical problems, emotional problems, developmental problems (especially language delays), and adjustment problems can sometimes imitate ADHD in this age group. It is certainly not mandatory that the preschool-aged child showing ADHD-suggestive symptoms be placed in a preschool. The first line of therapy for children of this age showing ADHD-like symptoms is not stimulant medication therapy, but environmental or behavioral therapy. This type of therapy can certainly be carried out in the home, with appropriate training supplied to the parents. If the child is to be placed in a preschool, the caretakers must be equally trained in the techniques of behavioral therapy. Stimulant therapy can reduce oppositional behavior and improve mother-child interaction, but is usually reserved for severe cases or when a child does not respond to environmental or behavioral interventions.

What is the impact of ADHD on children and their families?

Life can be hard for children with ADHD. They're the ones who are so often in trouble at school, can't finish a game, and have trouble making friends. They may spend agonizing hours each night struggling to keep their mind on their homework, then forget to bring it to school. It is not easy coping with these frustrations day after day for children or their families. Family conflict can increase. In addition, problems with peers and friendships are often present in children with ADHD. In adolescence, these children are at increased risk for poor self-esteem, motor-vehicle accidents, [tobacco](#) and other drug use, early [pregnancy](#), and lower educational attainment. School programs to help children with problems often connected to ADHD (social skills and behavior training) are not available in many schools. In addition, not all children with ADHD qualify for special-education services. To overcome these barriers, parents may want to look for school-based programs that have a team approach involving parents, teachers, school psychologists, other mental-health specialists, and physicians.

Fortunately, most insurance companies and health-maintenance organizations are now recognizing ADHD as a biological disorder and the importance of covering the costs of medication and more frequent doctor visits to monitor the safety and effectiveness of the medication.

Aren't there nutritional treatments for ADHD?

Many parents have exhausted nutritional approaches, such as eliminating sugar from the diet, before they seek medical attention. However, there are no well-established nutritional interventions that have been consistently demonstrated to be efficacious for assisting the great majority of children with ADHD. A small body of research has suggested that some children may benefit from these interventions, but delaying the implementation of well-established, effective interventions while engaged in the search for unknown, generally unproven [allergens](#), is likely to be harmful for many children. However, once effective intervention is established, the stressing of good [nutrition](#), the avoidance of excess natural sugars, and perhaps avoiding foods high in preservatives and artificial coloring and sweeteners certainly cannot hurt. Future studies may determine a contributory effect from some or all of these factors.

What are behavioral treatments?

In 2001, the American Academy of Pediatrics (AAP), in their Clinical Practice Guideline, suggested that when treating target ADHD symptoms, "clinicians should recommend stimulant medication and/or behavior therapy, as appropriate." Several forms of behavioral intervention have been found to show little or no effectiveness in treating ADHD patients. These included individual or play therapy, long-term [psychotherapy](#), psychoanalysis, sensory-integration training, and cognitive behavioral therapy. But one form of a non-medication approach, behavioral therapy, has been demonstrated to be effective with ADHD children. The therapy sessions are conducted by a mental-health professional (for example, a psychologist or social worker) and consist of parent and teacher training in child behavior management. The parents and teachers are taught to consider their child's behavior as a function of the disorder, rather than "bad behavior" or the result of failed parenting/teaching skills. The sessions then go on

to teach the adults to pay attention to appropriate behavior, ignore minor inappropriate behavior, to give clear and concise directions, and to establish effective incentive programs, such as token or point reward systems. The adults manage misbehavior by applying immediate, specific, and consistent consequences (removal of privileges). Basically, the three principles of behavior therapy are:

1. Set specific goals
2. Provide rewards and consequences
3. Keep using the rewards and consequences for a long time

Many feel that behavior therapy can be an appropriate first-level treatment in several scenarios:

1. The milder ADHD patient
2. For the preschool-aged child with ADHD-suspicious symptoms
3. When the family prefers this approach vs. medication

What medications are currently being used to treat ADHD?

Psychostimulant medications, including [methylphenidate](#) (Ritalin®, Metadate, and Concerta), amphetamine ([Dexedrine®](#), [Dextrostat®](#), and [Adderall®](#)), and a newer drug, [atomoxetine](#) (Strattera, marketed as a "non-stimulant," although its mechanism of action and potential side effects are essentially equivalent to the "psychostimulant" medications), are by far the most widely researched and commonly prescribed treatments for ADHD. Numerous short-term studies have established the safety and effectiveness of stimulants and psychosocial (behavioral therapy) treatments for not only alleviating the symptoms of ADHD, but also improving the child's ability to follow rules and improve relationships with peers and parents. National Institute of Mental Health (NIMH) research has indicated that the two most effective treatment modalities for elementary-school children with ADHD are a closely monitored medication treatment or a program that combines medication with intensive behavioral interventions (behavior therapy). In the NIMH Multimodal Treatment Study for Children with ADHD (MTA), which included nearly 600 elementary-school children across multiple sites, nine out of 10 children improved substantially on one of these treatment programs.

Two types of antidepressant medications, the "tricyclic antidepressants" (TCA) ([imipramine](#), [desipramine](#), nortriptyline) and [bupropion](#) (Wellbutrin) have also been shown to have a positive effect on all three of the major components of ADHD: inattention, impulsivity, and hyperactivity. They tend, though, to be considered as second options for the children who have shown inadequate response to stimulant medication or who experience unacceptable side effects from stimulant medication such as tics (uncontrolled movement disorders) or [insomnia](#). The antidepressants, however, have a greater potential for side effects of their own, such as heart rate and rhythm changes, [dry mouth](#), [headaches](#), and drowsiness, to name a few. And if higher doses are required, bupropion may bring on [seizures](#). The antidepressants, therefore, require more careful monitoring.

For the child who has a combination of ADHD and comorbid conditions such as

[depression](#), [anxiety](#) disorders, or mood disorders, stimulant medications can be combined with an antidepressant medication very successfully.

Are there standard doses for these medications?

For most children, stimulant medications are very safe and extremely effective. Research has shown that up to 80% of ADHD children show very good to excellent response to these medications. And there have been dramatic improvements in the delivery systems for these medications in the last few years that have allowed the child to frequently only require one dose per day, alleviating the embarrassing "trip to the nurses office" for a midday dose at school. And there is now a skin patch (Daytrana, a methylphenidate transdermal system) that, when applied daily, delivers the medication at a carefully controlled rate. The doctor will work with the child and his family to find the best medication, dosage, schedule, and delivery system. This requires careful individualization, since some children respond to one type of stimulant much better than another and each child's daily needs and schedules are so variable.

How long are children on these medications?

The expected duration of treatment has lengthened during this past decade as evidence has accumulated that benefits extend into adolescence and adulthood. But as the child enters [teen](#) years, there can frequently arise problems such as the teen's resistance to "taking medicine," the feelings of the need to be independent, disliking the feeling of being on medication, and so on. The teenager must become a much more active participant in his ADHD program. He must feel empowered in the decisions regarding his schedules, his life, and his medication, as much as possible. It may even be necessary to experience a time without the medication to demonstrate to the teen the major differences in his life that the medication is still making. It is frequently the case that medication will be required into adulthood, and these years are critically important ones for the adolescent to begin to learn self-management of medication and other issues related to ADHD.

Hasn't the use of stimulant medication become excessive?

Absolutely not true. While it is certainly true that the prescribing of stimulant medication has increased sharply in the last 15 years, the statistics indicate that this increase coincides with the number of legitimately diagnosed cases of ADHD worldwide. Physicians, and the population in general, have achieved a much greater degree of awareness of, and acceptance of the biological nature of ADHD, as well as the dramatic effectiveness of treatment protocols. But these are powerful medications, and though doctors are more comfortable with their use, they must continue to make accurate diagnoses prior to their use and monitor their effectiveness and safety continuously.

Are there differences in stimulant use across racial and ethnic groups?

There are significant differences in access to mental-health services between children of different racial groups; and, consequently, there are differences in medication use. In particular, African-American children are much less likely than Caucasian children to receive psychotropic medications, including stimulants, for

treatment of mental disorders.

Why are stimulants used when the problem is overactivity?

Recall that the three key components in ADHD are inattention, impulsiveness, and hyperactivity. While the exact nature of the disorder at the brain cell level is not understood for sure, it is the feeling that the medications work by stimulating the brain cells to make more of the chemicals (neurotransmitters) available that send messages from one brain cell to another. This improved message-sending system enhances the brain's ability to pay attention, control our behavior and our impulses, plan our actions, and follow through on schedules.

What are the risks of the use of stimulant medication and other treatments?

Stimulant drugs, when used with medical supervision, are usually considered quite safe. These medications, when abused by adolescents and adults, are certainly known to be addictive. But when prescribed for ADHD, and with careful monitoring by the prescribing doctor, they have not been shown to be addictive or to lead to substance abuse problems. They should make children neither "high"/jittery, nor dull/listless. If these symptoms occur, a change in dosage or type of medication is usually indicated. Although little information exists concerning the long-term effects of psychostimulants, there is no evidence that careful therapeutic use is harmful. When adverse drug reactions do occur, they are usually related to dosage and are reversible. About 15-30% of children may experience minor motor tics (involuntary rapid twitching of facial and/or neck and shoulder muscles) while on stimulant medication. These are almost always short-lived and go away without stopping the medication. Other effects associated with moderate doses are decreased appetite and insomnia. These effects usually occur early in treatment and decrease within a short time. There is current investigation regarding any increased risk of [heart attack](#), heart rate abnormalities, and [strokes](#) caused by stimulant medication. All patients for whom these medications are prescribed should have complete physical exams and any appropriate tests performed to rule out pre-existing heart abnormalities. Some children may experience irritability as the medication is leaving their systems. This is also usually short-lived and is frequently helped by a nutritious snack and encouragement to participate in a fun, physical activity at this time. The earlier concerns about the medication's possible slowing of the child's growth rate have not been shown to be true, especially when the lowest effective dosages are used, and careful attention is paid to nutrition and timing of quality meals.

Will children taking these medications for ADHD become drug addicts?

Actually, it appears to be just the opposite. Although an increased risk of drug abuse and cigarette smoking is associated with childhood ADHD, this risk appears mostly due to the ADHD condition itself, rather than its treatment. In a study jointly funded by the NIMH and the National Institute on Drug Abuse, boys with ADHD who were treated with stimulants were significantly less likely to abuse drugs and [alcohol](#) when they got older. Caution is warranted, nonetheless, as the overall evidence suggests that persons with ADHD (particularly untreated ADHD) are indeed at greater risk for later alcohol or substance abuse. Because some studies have come to conflicting conclusions, more research is needed to understand these phenomena. Regardless, in view of the substantial, well-

established findings of the harmful effects of inadequate or no treatment for a child with ADHD, parents should not be dissuaded from seeking effective treatments because of misconstrued or exaggerated claims about substance abuse risks.

What is the relationship between ADHD and other disorders, such as learning disabilities, anxiety disorders, bipolar disorder, or depression?

While the recognition and understanding of ADHD has advanced greatly, it is still frequently under-recognized by most laypeople and many physicians that other coexisting conditions exist in as many as 50-60% of all children with ADHD. Many of these coexisting conditions have many of the same symptoms of ADHD, and these symptoms are often the first signs of problems in youngsters under 5 years of age. At the time of the initial evaluation and diagnosis of ADHD, as well as throughout the lifetime of the ADHD patient, these other conditions must be looked for. They include:

Disruptive behavior disorders (in up to 35% of children with ADHD), include oppositional defiant disorder (ODD) and conduct disorder (CD). The behaviors in these areas go well beyond the usual "limit testing" of childhood and adolescence. They include, in the ODD definition, major defiance and hostility toward authority figures, refusal to follow rules, frequent loss of temper, deliberate annoyance of others, and generally angry, vindictive, and resentful behavior. Conduct disorder is more extreme and is defined as "a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate social rules are violated." CD extends into serious acts of violence against people and/or animals, school truancy, running away, vandalism, stealing, and so on. The person with CD is often labeled as "a delinquent" and has the potential for serious legal problems. It has been shown that early introduction of stimulant medication improves not only the basic ADHD symptoms but also the ODD or CD symptoms as well. But frequently, additional measures are also needed, especially in the CD category, from professional behavior therapist intervention to special classrooms set up for more intensive behavior management to residential school placement with psychiatric involvement.

Mood disorders (in up to 15-20% of children with ADHD), such as depression and [bipolar disorder](#), are often more difficult to recognize than the disruptive behavior disorders. Many children with ADHD alone are noted to be irritable, moody, easily frustrated, or immature emotionally. When these symptoms become severe enough to dominate the child's life, mood disorders must be considered. Children with combined ADHD/mood disorders (especially the more severe bipolar disorder) are at greater risk for drug abuse and [suicide](#). Children in this category often require referral to a developmental/behavioral specialist or a psychiatrist, as there are a variety of behavioral/psychotherapeutic methods along with additional medications that can be very helpful.

Anxiety disorders (in up to 25% of children with ADHD) often involve symptoms that are largely internal and again, more difficult to immediately recognize. These symptoms may be extreme fear, worry, and feelings of panic associated with physical findings like racing heart rates, muscle tension, nausea, vomiting, or

extreme sweating. These bouts of anxiety are severe, ongoing, and frequent, (at least three to five times per week and lasting for more than one hour). The use of stimulant medication alone may help both the ADHD symptoms and anxiety symptoms as well. If not, behavioral therapy and/or additional medication in the tricyclic antidepressant family or the selective serotonin reuptake inhibitor (SSRI) family ([Celexa](#), [Zoloft](#), [Lexapro](#), [Prozac](#), etc.) can be very helpful.

Learning disorders are conditions that can interfere with the child's mastery of specific skills like mathematics or reading. They can include auditory perceptual problems, visual perceptual problems, and so on. The school should be approached to carry out testing for these specific learning disorders. Depending on the type of learning disorder detected, altering teaching techniques can help the student bypass areas of weakness and utilize other pathways of learning that may actually be quite strong.

What is the history of ADHD? How is it related to ADD?

ADHD has assumed many aliases over time from hyperkinesis (the Latin derivative for "superactive") to hyperactivity in the early 1970s. In the 1980s, *DSM-III* dubbed the syndrome Attention Deficit Disorder, or ADD, which could be diagnosed with or without hyperactivity. This definition was created to underline the importance of the inattentiveness or attention deficit that is often but not always accompanied by hyperactivity. The revised edition of *DSM-III*, the *DSM-III-R*, published in 1987, returned the emphasis back to the inclusion of hyperactivity within the diagnosis, with the official name of ADHD. With the publication of *DSM-IV*, the name ADHD still stands, but there are varying types within this classification, to include symptoms of both inattention and hyperactivity-impulsivity, signifying that there are some individuals in whom one or another pattern is predominant (for at least the past six months). In the International Classification of Diseases (used predominantly in other Western countries), the term "Hyperkinetic Disorder" is used, but the criteria are the same as for ADHD/combined type.

What are the future research directions for ADHD?

1. The current criteria for the diagnosis of ADHD are taken from the *Diagnostic and Statistical Manual of Mental Health Disorders*, 4th ed. (*DSM-IV*) published in 1994. Much has been revealed about ADHD since then. The next edition will need to reflect our broader understanding of ADHD. In addition, there is currently just one set of diagnostic criteria used for the diagnosis of ADHD for all age groups. Clearly we must establish different diagnostic criteria for childhood, adolescent, and [adult ADHD](#).
2. We need more data regarding the long-term effects of the methods of treatment (medication, behavioral therapy, etc.) that have now been used for several decades, as well as the long-term outcome of children with ADHD that have not been treated.
3. The development of psychotropic medications in non-ADHD areas has expanded dramatically in the past few years. We must continue to look for even safer and more effective medications for ADHD alone, and (perhaps

even more importantly) for the patients with combined ADHD/comorbid conditions.

4. The societal impact of ADHD needs to be investigated. Studies in this regard include: strategies for implementing effective medication management or combination therapies in different schools and pediatric healthcare systems; the nature and severity of the impact on adults with ADHD beyond the age of 20, as well as their families; and determination of the use of mental-health services related to diagnosis and care of persons with ADHD.

5. Additional studies are needed to improve communication across educational and health care settings to ensure more systematized treatment strategies.

6. Studies should be done in the areas of prevention/early intervention strategies that target known risk factors that may lead to later ADHD.

7. Further evaluation of the rapidly evolving technology of brain imaging techniques as a possible tool in the diagnosis and subsequent management of ADHD.

For more information regarding attention deficit disorder, contact the local school district office or one of the following:

Bureau of Education for the Handicapped
U.S. Office of Education
Washington, DC 20202

The Association for Children with Learning Disabilities, Inc.
3739 S. Delaware Place
Tulsa, OK 74105

Council for Exceptional Children
P. O. Box 9382 Mid-City Station
Washington, DC 20005

U.S. Office of Civil Rights, Washington, DC 20402

For more information about ADHD, please visit [C.H.A.D.D. \(Children and Adults with Attention-Deficit/Hyperactivity Disorder\)](#).

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