

## Attention Deficit Hyperactivity Disorder (ADHD)

According to epidemiological data, approximately 4% to 6% of the U.S. population has ADHD. ADHD usually persists throughout a person's lifetime. It is NOT limited to children. Approximately one-half to two-thirds of children with ADHD will continue to have significant problems with ADHD symptoms and behaviors as adults. ADHD will impact their lives on the job, within the family, and in social relationships.

Attention deficit hyperactivity disorder (ADHD) is the most commonly diagnosed behavioral disorder of childhood. Its core symptoms include developmentally inappropriate levels of attention, concentration, activity, distractibility, and impulsivity. Children with ADHD usually have functional impairment across multiple settings including home, school, and peer relationships. ADHD has also been shown to have long-term adverse effects on academic performance, vocational success, and social-emotional development.

Despite the progress in the assessment, diagnosis, and treatment of children and adults with ADHD, the disorder has remained controversial. The diverse and conflicting opinions about ADHD have resulted in confusion for families, care providers, educators, and policymakers.

### What is Attention Deficit Hyperactivity Disorder?

ADHD is a syndrome generally characterized by inattention, distractibility, impulsivity, and hyperactivity. It is further categorized into three subtypes: behavior marked by hyperactivity and impulsivity but not inattentiveness; behavior that is marked by the reverse characteristics; and a mixed type. A diagnosis of ADHD can be applied to children and adults who consistently display certain characteristic behaviors over a period of time. The most common core features include:

- Distractibility (poor sustained attention to tasks)
- Impulsivity (impaired impulse control and delay of gratification)
- Hyperactivity (excessive activity and physical restlessness)

Attention Deficit Disorder (ADD) is similar to ADHD except that the victims do not have the excessive activity. ADD can be just as detrimental to a person's social and educational development as ADHD.

Under rare circumstances a CASA may be subpoenaed to testify in a court case related to the child for whom you are advocating. Here are some guidelines to use if a CASA receives a subpoena.

### What Causes ADHD?

ADHD is NOT caused by poor parenting, family problems, poor teachers or schools, too much TV, food allergies, or excess sugar. One early theory was that attention disorders were caused by minor head injuries or damage to the brain, thus for many years ADHD was called "minimal brain damage" or "minimal brain dysfunction." The vast majority of people with ADHD have no history of head injury or evidence of brain damage. There is a great deal of evidence that ADHD runs in families, which is suggestive of genetic factors. If one person in a family is diagnosed with ADHD there is a 25% to 35% probability that any other family member also has ADHD, compared to a 4% to 6% probability for someone in the general population.

## **Physical Factors**

Advanced imaging techniques have detected differences in the brains of ADHD children compared to those of non-ADHD children. In some studies, brain scans reveal that the right side of the brain is smaller in ADHD children than in non-ADHD children (ordinarily the right and left sides of the brain are the same size). The right side contains three important areas: the prefrontal cortex; the caudate nucleus; and globus pallidus. The prefrontal cortex, which is located in the front of the brain, is thought to be the brain's command center and regulates the ability to inhibit responses. The caudate nucleus and globus pallidus, located near the center of the brain, speed up or stop orders coming from the prefrontal cortex. Abnormalities in these areas may impair a person's ability to brake actions, resulting in the impulsivity typical of ADHD people. Also located here are important neurotransmitters -- chemical messages in the brain -- including norepinephrine, dopamine, and serotonin, which affect mental and emotional functioning. Dopamine is under particular scrutiny. One recent study reported that adults with ADHD had abnormally low levels of DOPA decarboxylase, the enzyme that produces dopamine.

## **Problems Surrounding Pregnancy**

ADHD is often associated with problem pregnancies and with difficult deliveries. Maternal smoking during pregnancy is also associated with a higher risk for ADHD. One study indicated that an increased risk also existed in children of women who were exposed to environmental toxins, including dioxins and polychlorinated biphenyls (PCBs), during pregnancy.

## **Genetic Factors**

Evidence that genetic factors increase susceptibility is mounting. In a study of twins, 90% of children with a full diagnosis of ADHD shared it with their twin. Most likely, more than one gene is responsible for inherited cases; this is not surprising, since there is no consensus that ADHD is even a single disorder. Researchers are reporting underlying genetic mechanisms that regulate hyperactivity, particularly those that affect the neurotransmitter dopamine. Studies are finding that a variation of a dopamine D4 receptor gene is common in a high proportion of people with addictions and ADHD, and appears to be associated with novelty-seeking and extroversion. About 50% of adults and 70% of children with a genetic resistance to thyroid hormone have ADHD. The thyroid hormone is essential for normal brain development. People who have this condition appear to have a more severe form of ADHD. The thyroid disorder is not a common cause of ADHD, however, and only those with a family history of thyroid disease are at risk.

## **Diet**

A number of studies have suggested that sugar plays no role in hyperactivity. In fact, one study reported that ADHD children had fewer problems after a high-carbohydrate breakfast than after a high-protein one. Another reported that children actually moved more slowly after a high-sugar meal, suggesting that the carbohydrates may have a sedative effect. Studies on the effect of food and food-additive allergies are controversial. For example, one reported that 62% of ADHD children had symptoms provoked by various foods and additives. Another study indicated, however, that less than 5% of children with attention-deficit hyperactivity disorder are affected by food additives and even then, the effect is very slight. Among the additives and foods that parents report as culprits in inciting behavioral changes are any artificial flavors or coloring (particularly red), milk, chocolate, eggs, and wheat. Allergies themselves have recently been associated with a higher risk for behavioral problems; children who respond to allergen-restrictive diets may not have had true ADHD in the first place.

## **The signs and symptoms of ADHD**

Some common symptoms of ADHD include: often fails to give close attention to details or makes careless mistakes; often has difficulty sustaining attention to tasks; often does not seem to listen when spoken to directly; often fails to follow instructions carefully and completely; loses or forgets important things; feels restless, often fidgeting with hands or feet, or squirming; runs or climbs excessively; often talks excessively; often blurts out answers before hearing the whole question; often has difficulty waiting for his or her turn.

In a busy environment, such as a classroom or a crowded store, ADHD children often become distracted and react by pulling items off the shelves, hitting people, or spinning out of control into erratic, silly, or strange behavior. ADHD children are often hypersensitive to sights, sounds, and touch and complain excessively about stimuli that seem low key or bland to others. Sleeping problems usually continue well after the point at which most small children sleep through the night.

Many experts now believe that an essential feature in ADHD is impaired working, or short-term, memory. But it should be kept in mind that the exact nature and severity of ADHD symptoms varies from person to person. For example, approximately one-third of people with ADHD do not have the hyperactive or overactive behavior component.

### **DSM-IV (1994) Criteria: Either 1 (Inattention) or 2 (Hyperactivity-Impulsivity)**

Behavior has persisted for at least six months and to such a degree that it is maladaptive and inconsistent with developmental level. Must present with six or more of the following:

#### **1. 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 (toys, school assignments, pencils, books, or tools)
- Is often easily distracted by extraneous stimuli
- Is often forgetful in daily activities

#### **2. Hyperactivity-Impulsivity**

##### **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 ( in adolescents or adults, may be limited to subjective feelings of restlessness)
- Often has difficulty playing or engaging in leisure activities quietly
- Is often "on the go" or often acts as if "driven by a motor"
- Often talks excessively

##### **Impulsivity**

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

**Note:** These criteria have been provided to help inform you of some of the symptoms of ADHD. This is not intended to be a diagnostic tool. If you believe you know someone who has an Attention Deficit Disorder, take them to a professional for a thorough diagnosis and treatment plan.

#### **Disorders Similar to ADHD**

There are several disorders that may mimic or accompany attention-deficit hyperactivity disorder. ADHD exists alone in only about one-third of children. Many of these other disorders require different methods of treatment and should be diagnosed separately, even if they accompany ADHD.

### **Attention Deficit Disorder Without Hyperactivity**

Attention deficit disorder can appear without hyperactivity, in which case the child's primary symptoms are distractibility and an inability to persist in tasks.

### **Oppositional Defiant Disorder**

About half the children diagnosed with ADHD also have oppositional defiant disorder (ODD). The most common symptom for this disorder is a pattern of negative, defiant, and hostile behavior toward authority figures that lasts more than six months. In addition to displaying inattentive and impulsive behavior, these children demonstrate aggression, have frequent temper tantrums, and display antisocial behavior. Up to 25% of children with ODD have phobias and other anxiety disorders, which should be treated separately.

### **Pervasive Developmental Disorder**

Pervasive developmental disorder (PDD) is rare and usually marked by autistic-type behavior, hand-flapping, repetitive statements, slow social development, and speech and motor problems. If a child who has been diagnosed with ADHD does not respond to treatment, the parents might inquire about PDD, which often responds to antidepressants.

### **Primary Disorder of Vigilance**

Primary disorder of vigilance is a term for a syndrome that includes poor attention and concentration as well as difficulties staying awake. People with vigilance disorder tend to fidget, yawn and stretch, and appear to be hyperactive in order to remain alert; they typically have kind and affectionate temperaments. The condition is inherited and gets worse with age, but is treatable with stimulants.

### **Central Auditory Processing Disorder and Hearing Problems**

Children with ADHD often have difficulties with tasks that involve listening or hearing. Research is indicating that symptoms of the two disorders often overlap but may actually be two distinct disorders. Hearing problems themselves may cause ADHD symptoms.

### **Bipolar Disorder (Manic Depression)**

One study found that as many as 25% of children diagnosed with attention deficit disorder may also have bipolar disorder, commonly called manic depression. Indications of this problem include episodes of depression and mania (with symptoms of irritability, rapid speech, and disconnected thoughts), sometimes occurring at the same time. Children with mania and ADHD may have more aggression, behavioral problems, and emotional disorders than those with ADHD alone.

### **Anxiety Disorders**

Anxiety disorders commonly accompany attention deficit hyperactivity disorder. Obsessive compulsive disorder is a specific anxiety disorder that shares many characteristics with ADHD and may share a genetic component. Young children who have experienced traumatic events, including sexual or physical abuse or neglect, exhibit characteristics of ADHD, including impulsivity, emotional outbursts, and oppositional behavior.

### **Other Diagnoses**

**Lead** - Children who ingest even low amounts of lead exhibit many symptoms similar to ADHD; they are easily distractible, disorganized, and have trouble thinking logically. The major cause of lead toxicity is exposure to leaded paint, particularly in homes that are old and in poor repair.

**Genetic Abnormalities** - A number of genetic disorders cause symptoms resembling ADHD, including fragile X and Tourette's syndrome. About 50% of those with Tourette's syndrome also have ADHD and some of the treatments are similar.

**Medical Conditions** - A number of medical problems can produce ADHD-like symptoms, including hyperthyroidism and hearing or vision problems.

**Post-traumatic Stress Disorder** - Young children who have experienced traumatic events, including sexual or physical abuse or neglect, exhibit characteristics of ADHD, including impulsivity, emotional outbursts, and oppositional behavior.

**Restless Legs Syndrome (RLS)** - RLS and periodic limb movement disorder are thought by some experts to be strongly associated with attention-deficit hyperactivity disorder in some children. The disorders have much in common, including poor sleep habits, twitching, and the need to get up suddenly and walk about frequently.

### **What Is the Impact of ADHD on Individuals, Families, and Society?**

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 long-term consequences. These children have higher injury rates. As they grow older, children with untreated ADHD in combination with conduct disorders experience drug abuse, antisocial behavior, and injuries of all sorts. For many individuals, the impact of ADHD continues into adulthood. Families who have children with ADHD, as with other behavioral disorders and chronic diseases, experience increased levels of parental frustration, marital discord, and divorce. In addition, the direct costs of medical care for children and youth with ADHD are substantial. These costs represent a serious burden for many families because they frequently are not covered by health insurance.

In the larger world, these individuals consume a disproportionate share of resources and attention from the health care system, criminal justice system, schools, and other social service agencies. Methodological problems preclude precise estimates of the cost of ADHD to society. However, these costs are large. For example, additional national public school expenditures on behalf of students with ADHD may have exceeded \$3 billion in 1995. Moreover, ADHD, often in conjunction with coexisting conduct disorders, contributes to societal problems such as violent crime and teenage pregnancy.

Families of children impaired by the symptoms of ADHD are in a very difficult position. The painful decision-making process to determine appropriate treatment for these children is often made substantially worse by the media war between those who overstate the benefits of treatment and those who overstate the dangers of treatment.

### **The barriers to treating ADHD**

Studies identify a number of barriers to appropriate identification, evaluation, and treatment of ADHD. Barriers to identification and evaluation arise when central screening programs limit access to mental health services. The lack of insurance coverage for psychiatric or psychological evaluations, behavior modification programs, school consultation, parent management training, and other specialized programs, presents a major barrier to accurate classification, diagnosis, and management of ADHD. Substantial cost barriers exist in that diagnosis results in out-of-pocket costs to families for services not covered by managed care or other health insurance. Mental health benefits are carved out of many policies offered to families, thus access to treatment other than medication might be severely limited. Parity for mental health conditions in insurance plans is essential. Another cost implication lies in the fact that there is no funded special education category specifically for ADHD, which leaves these students underserved, and there is currently no tracking or monitoring of children with ADHD who are served outside of special

education. This results in educational and mental health service sources disputing responsibility for coverage of special educational services.

Barriers exist in relationship to gender, race, socioeconomic factors, and geographical distribution of physicians who identify and evaluate patients with ADHD.

Other important barriers include those perceived by patients, families, and clinicians. These include lack of information, concerns about risks of medications, loss of parental rights, fear of professionals, social stigma, negative pressures from families and friends against seeking treatment, and jeopardizing jobs and military service. For health care providers, the lack of specialists and difficulties obtaining insurance coverage as outlined above present significant obstacles to care.

### **Treatment of Attention-Deficit Hyperactivity Disorder**

A wide variety of treatments have been used for ADHD including, but not limited to, various psychotropic medications, psychosocial treatment, dietary management, herbal and homeopathic treatments, biofeedback, meditation, and perceptual stimulation/training.

Clinical experience has shown that the most effective treatment for ADHD is a combination of medication (when necessary), counseling to learn coping skills and adaptive behaviors. Medication is often used to help normalize brain activity. The stimulant medications (Ritalin, Dexedrine, Adderall) are commonly used because they have been shown to be most effective for most people with ADHD, however, many other medications may also be used at the discretion of the physician. Behavior therapy and cognitive therapy is often helpful to modify certain behaviors and to deal with the emotional effects of ADHD. This type of therapy has been shown to help adults with ADHD manage problem behaviors and develop coping skills, such as improving organizational skills and improving productivity.

### **Pharmacological Treatments**

Pharmacological treatment with psychostimulants is the most widely studied treatment for ADHD. Psychostimulants are highly effective for 75 to 90 percent of children with ADHD. At least four separate psychostimulant medications consistently reduce the core features of ADHD in literally hundreds of randomized controlled trials: methylphenidate, dextroamphetamine, pemoline, and a mixture of amphetamine salts.

These medications are metabolized, leave the body fairly quickly, and work for 1 to 4 hours. Administration is timed to meet the child's school schedule, to help the child pay attention and meet his or her academic demands, and to mitigate side effects. These medications have their greatest effects on symptoms of hyperactivity, impulsivity, and inattention and the associated features of defiance, aggression, and oppositionality. They also improve classroom performance and behavior and promote increased interaction with teachers, parents, and peers. Small effects were found on learning and school achievement. However, psychostimulants do not appear to achieve long-term changes in outcomes such as peer relationships, social or academic skills, or school achievement.

Children who do not respond to one stimulant may respond to another. Children should be reevaluated without the medication to see if stimulant treatment is still indicated. Many families choose to have their child take a "drug holiday" on weekends and vacations to reduce overall exposure, but the utility of this strategy has not been demonstrated.

### **Stimulants**

**Methylphenidate (Ritalin, Metadate)** is the most commonly used drug for ADHD. Ritalin needs to be administered several times a day, making compliance difficult. Metadate, an extended release form, may help. Medication regimens are generally recommended for hours spent at school, with drug holidays during the evenings, weekends, and vacations. Some physicians argue, however, that too much emphasis is placed on improvement only during school hours. When taken in the morning, the medication usually wears off in the late afternoon; at this point, a rebound effect can occur and ADHD symptoms intensify. The family members, whose affection and on-going support is so important, become victims of

the disruptions generated by rebound, and the quality of life can worsen for everyone. Some physicians recommend a "homework" dose given after school to prevent rebound. Under investigation is a purer form of methylphenidate, which may prove to be more effective in treating symptoms in children and have fewer side effects.

Some people have become concerned about Ritalin abuse and the risk of addiction. Although Ritalin is a stimulant with properties similar to amphetamines, at the oral doses given for ADHD, levels of Ritalin rise very slowly in the brain, preventing a so-called "high" and subsequent addiction to the drug. Dependence has not been reported in children who have taken this drug for long periods in appropriate dosages. Crushing the pills and inhaling them nasally, however, can provide a euphoric state. The primary danger for drug abuse appears to come from peers; in one study, 16% of ADHD children reported pressure from their fellow students to sell or give them their medication.

**Adderall** combines four kinds of amphetamine salts. It is inexpensive and only needs to be taken once a day. In two studies comparing Adderall given once daily with two daily doses of Ritalin, both drugs were beneficial and the effect on behavior was similar. In one of these studies, Adderall was superior to low-dose Ritalin in preventing evening wearing-off effects and the staff involved in monitoring the children recommended Adderall over Ritalin by three to one. Eventually, this drug may prove to be a good alternative to Ritalin, since dosing at school is not necessary. Studies are needed to determine long-term risks.

**Pemoline (Cylert)** is an effective stimulant in children and may also prove to be beneficial for adults with ADHD. It takes longer (sometimes weeks) to produce improvement than the other drugs; its advantage, however, is that it allows once-daily administration. Cylert increases the risk of liver damage, particularly when taken in combination with other medications or alcohol. Although the risk is small, physicians should test children if they exhibit any symptoms of liver toxicity, including tenderness of the abdomen, yellow skin or eyes, vomiting, weight loss, or malaise.

**Dextroamphetamine (Dexedrine)** is similar to Ritalin. Although it is commonly believed that it is both less effective and less safe than Ritalin, there is no evidence of this, and one study reported a slightly better response with dextroamphetamine. Side effects are similar. The arguments against dextroamphetamine mainly rest on widespread abuse of this drug in earlier decades. Some experts believe it may be a useful alternative for people who do not respond to Ritalin.

## Side Effects

The most common side effects of any stimulant are nervousness and sleeplessness, although some parents have reported improved sleep patterns in their children after taking stimulants. Other side effects include irritability, withdrawal, depression, hallucinations, and lack of spontaneity. (Children with developmental disabilities may be more susceptible to these side effects.) Tics or jerky, disordered movements occur in about 9% of children, although some studies indicate they are not caused by standard doses of Ritalin. In any case, low doses are often effective in controlling impulsivity without causing tics, even in many (but not all) children who also have mild to moderate Tourette's syndrome. Lower doses (defined in one study as 0.28mg per kg of body weight) may not be as effective, however, at improving attention as higher doses (0.56mg/kg). Symptoms of overdose include confusion, breathing difficulties, sweating, vomiting, and muscle twitches; if they occur, parents should call the doctor immediately. Children may also lose weight and growth may be retarded during long-term treatment, although not permanently. Rebound activation (i.e., a sudden increase in attention deficit and hyperactivity) has been noted anecdotally after the child's last dose of medication wears off. Most of the side effects are mild, recede over time, and respond to dose changes. Children rarely experience cognitive impairment, which, if it does occur, can be resolved with reduction or cessation of the drug. A few cases of psychosis have been reported. Many people have taken Ritalin for years without experiencing adverse effects or loss of effectiveness. Of some concern were studies reporting liver cancers in mice given very high doses of Ritalin. There have been no reports of an increased risk in people.

## Anti-depressants

Antidepressants may be helpful in certain people with ADHD. In fact, some experts recommend them as first line treatments for adults with the disorder.

### **Designer Antidepressants**

Bupropion (Wellbutrin) and venlafaxine (Efexor) are unique antidepressants, sometimes referred to as designer antidepressants, which affect one or more neurotransmitters that are not targeted by other, earlier antidepressants. They may actually be helpful for treating ADHD itself as well as for accompanying depression. One study suggested that bupropion may be helpful for ADHD adolescents with conduct disorder problems.

### **SSRIs**

The antidepressant drugs known as selective serotonin reuptake inhibitors (SSRIs), which include fluoxetine (Prozac), sertraline (Zoloft), and paroxetine (Paxil), are effective and safe and often recommended for treating depression with ADHD. It should be noted, however, that some SSRIs may increase the risk for impulsive behavior. Sertraline has also helped adults with pervasive development disorder, but its effect on children is unknown; other SSRIs have not been very helpful for childhood ADD.

### **Tricyclics**

Antidepressants known as tricyclics, which include desipramine (Norpramin, Pertofrane), desipramine (Norpramin), or imipramine (Janimine, Tofranil), have also been prescribed for children who do not respond to stimulants or who have accompanying anxiety or depression. In a study of adults with ADHD, desipramine was as effective as Ritalin. Such drugs appear to have a mild effect on blood pressure and heart rate that does not appear to be harmful. Reports of sudden death of a few children taking tricyclics, however, have caused alarm, although these occurrences are extremely rare and the role tricyclics may have played is not clear. Reports of delirium and increased heart rate have occurred in adolescents who take tricyclics and smoke marijuana. Careful monitoring is important.

### **MAOIs**

Tranylcypromine (Parnate) is an antidepressant known as a monoamine oxidase inhibitor (MAOI) that has helped some children. Patients who are prescribed MAOIs, however, have a restricted diet and cannot eat certain foods including cheese, dried meats and fish, canned figs, fava beans, and concentrated yeast products. They must also avoid certain drugs, including some common over-the-counter cough medications. It is important to note that fatal reactions have occurred when SSRIs and MAOIs were taken at the same time. There should be a two to five-week break, depending on the specific medication, when a patient is changing from one type of antidepressant to the other.

### **Other drug treatments**

#### **Alpha-2 Agonists**

Clonidine (Catapres), a drug known as an alpha-2 agonist, is used for Tourette's syndrome and for ADHD children with tics and whose problems tend more toward impulsivity and aggression than inattentiveness. The drug stimulates the neurotransmitter norepinephrine, which appears to be important for concentration. Sedation is the most common side effect. A clonidine skin patch, which gradually releases the medication, helps reduce the sedative effect. Few major studies have been conducted on its efficacy in ADHD children, however. Because the drug slows the heart down, it can have very adverse effects in some children. Going off too quickly or missing doses can cause rapid heartbeats and other symptoms that may lead to severe problems. Of great concern are reports of severe adverse effects, including four deaths from heart problems, in children taking the drug in combination with Ritalin for improving sleep. Experts strongly recommend that no child be given this medication without a preliminary examination of any heart problems, and no child with existing heart, kidney, or circulatory problems should take it. A similar drug, guanfacine (Tenex), also improves symptoms in ADHD children and may cause less drowsiness than clonidine.

## **Other Medications**

Neuroleptics have been found to be occasionally effective, yet the risk of movement disorders, such as tardive dyskinesia, make their use problematic. Lithium, fenfluramine, or benzodiazapines have not been found to be effective treatments for ADHD. Furthermore, more than 20 studies have shown that dietary manipulation is not effective, and controlled studies failed to demonstrate that sugar exacerbates the symptoms of children with ADHD

## **Psychosocial treatments of ADHD**

Important options for the management of ADHD are psychosocial treatments, particularly in the form of training in behavioral techniques for parents and teachers. Behavioral techniques typically employ time-outs, point systems and contingent attention (adults reinforcing appropriate behavior by paying attention to it). Psychosocial treatments are useful for the child who does not respond to medication at all or for whom the therapeutic benefits of the medication have worn off, and for the child who responds only partially to medication or cannot tolerate medication. In addition, some families express a strong preference not to use medication. Even children who are receiving medication may continue to have residual ADHD symptoms or symptoms from other disorders which make specialized child management skills necessary and helpful. Furthermore, children with ADHD can present a challenge that puts significant stress on the family. Skills training for parents can help reduce this stress on parents and siblings.

## **Behavioral Approaches**

The main psychosocial treatments for ADHD are behavioral training for parent and teacher, as well as systematic programs of contingency management. Of these options, systematic programs of intensive contingency management, conducted in specialized classrooms or summer camps with the setting controlled by highly trained individuals, are the most effective. A number of studies have compared parent training or school-based behavioral modification with the use of stimulants. Most of the studies are of outpatient behavioral therapy programs in which parents meet in groups and are taught behavioral techniques such as time out, point systems, and contingent attention. Teachers are taught similar classroom strategies, as well as the use of a daily report card for parents that evaluates the child's in-school behavior. The improvements in the symptoms of ADHD achieved with psychosocial treatments are not as large as those found with psychostimulants. Behavioral interventions tend to improve targeted behaviors or skills but are not as helpful in reducing the core symptoms of inattention, hyperactivity, or impulsivity. Questions remain about the effectiveness of these treatments in other settings. To be fully effective, treatments for ADHD need to be conducted at school, at home and within the community. This involves different people in the separate environments and consistency and comprehensiveness can be hard to achieve.

## **Cognitive-Behavioral Therapy**

Cognitive-behavioral therapy (CBT), primarily training in problem solving and social skills, has not been shown to provide clinically important changes in behavior and academic performance of children with ADHD. However, CBT might be helpful in treating symptoms of accompanying disorders such as oppositional defiant disorder, depression, or anxiety disorders.

## **Psychoeducation**

Although there are no studies evaluating the efficacy of psychoeducation as a treatment modality for ADHD, providing information to parents, children, and teachers about ADHD and treatment options is considered critical in the development of a comprehensive treatment plan. Educational accommodations for children with ADHD are federally mandated, and mental health providers are required to ensure that patients and families have access to adequate and appropriate educational resources.

## **Psychosocial Strategies**

**For parents:**

An ADHD child is different from other children in very specific ways. The ADHD toddler is physically aggressive and the parent must teach the child to channel this into verbal expression. The young ADHD child then often becomes verbally abusive, and the parent must encourage the child to redirect this form of aggression into more acceptable physical or intellectual activities, such as sports, music or art. It is futile to try to force an ADHD child to be just like most children. But it is possible to limit destructive behavior and to instill a sense of self-worth that will help the child overcome negativity.

Parents should prepare a list giving priority to those behaviors they think are most negative, such as fighting with other children or refusing to get up in the morning. The least negative behaviors on the bottom of the list should be ignored temporarily or even permanently. Certain odd behaviors that are not hurtful to the child or to others may be an indication of creative or humorous attempts to adapt. These should be accepted as part of the child's unique and positive development, even if they seem peculiar to the parent. It is very important to understand that ADHD children have much more difficulty adapting to change than do children without the condition.

Parents must be as consistent as possible in their discipline, which should reward good behavior and discourage destructive behavior. Rules should be well-defined but flexible enough to incorporate harmless idiosyncrasies. It is valuable to reward even simple positive behaviors that are taken for granted in most people. Rewards of food or gifts should be used infrequently, if at all. Rewards that don't cost money can include playing a favorite game with the child, extending bedtime by an hour, or allowing an extra half-hour of TV. These children respond better with small rewards promised in the short term than large rewards offered in the future.

Parents should try to give little attention to mildly disruptive behaviors that allow this energetic child to let off some harmless steam. The parent will also be wasting energy that will be needed when the negative behavior becomes destructive, abusive, or intentional. The use of "time-out," isolating the child immediately for a short period of time, is the most effective measure for allowing both the caregiver and the child to cool down. In these cases, the child should be disciplined immediately, or he or she will quickly learn to manipulate the caregiver.

Parents should be on the lookout for activities that hold the child's concentration.

- Word puzzles
- Computer games (which offer and require problem-solving techniques)
- Sports that focus attention and limit peripheral stimuli (tennis, golf, swimming)
- Some forms of martial arts (they can teach self-discipline, self-restraint, and offer controlled emotional outlets)

#### **For teachers:**

The ADHD child is often demanding, highly visible, and often forgets homework or misses assignments. Lack of fine motor control makes taking notes very difficult. Repetitive memorization and math computation, which require following a set of ordered steps, are often difficult. (ADHD children may do better with math concepts.) Many ADHD children respond well to school tasks that are rapid, intense, novel, or of short duration (such as spelling bees or competitive educational games), but they almost always have problems with long-term projects where there is no direct supervision.

One useful skill that has helped some ADHD children is learning to type at around the third or fourth grade. Many times, lack of small motor coordination can be a stumbling block in the writing and educational process; using a typewriter or computer can compensate for this. Having the child sit in the front of the classroom and finding a tutor to help after school may be helpful.

#### **Other Methods of Treating ADHD**

##### **Multimodal Treatments**

Many researchers and families have long suspected that multimodal treatment (medication used together with multiple psychosocial interventions in multiple settings) should be more effective than medication alone. To determine whether multimodal treatment is indeed effective, the recent NIMH Multimodal Treatment Study of ADHD (called the MTA Study) examined three experimental conditions: medication management alone, behavioral treatment alone, and a combination of both types of treatment. The study compared the effectiveness of these three treatment modes with each other and with standard care provided in the community (the control group). The MTA Study was also designed to determine the relative benefits of these treatments over time. All 579 subjects were treated for 14 months and then followed for an additional 22 months.

The results show that at 14 months, medication and the combination treatment were generally more effective than the behavioral treatment alone or the control treatment (medication management alone). Notably, the combined treatment resulted in significant improvement over the control condition in six outcome areas - social skills, parent-child relations, internalizing (e.g., anxiety) symptoms, reading achievement, oppositional and/or aggressive symptoms, and parent and/or consumer satisfaction - whereas the single forms of treatment (medication or behavior therapy) were each superior to the control condition in only one to two of these domains. The conclusions from this major study are that carefully managed and monitored stimulant medication, alone or combined with behavioral treatment, is effective for ADHD over a period of 14 months. Incorporating behavioral treatment yields no additional benefits for core ADHD symptoms but appears to provide some additional benefits for non-ADHD-symptom outcomes.

### **Dietary Changes**

A number of diets have been suggested for people with ADHD. The most popular is the Feingold diet, a salicylate- and additive-free diet, which requires rigorous vigilance over a child's eating habits. Although some parents report great success with this diet, it is very difficult to impose it on any child, particularly one with ADHD. Any minor deviation in the diet presumably throws the child immediately into hyperactive mode. One study that reported its efficacy suggested, however, that it might not provide enough nutritive value. It is certainly wise to avoid food with high sugar content and artificial colors and flavors, but the imposition of too rigorous a diet can easily reinforce the ADHD child's sense of alienation from his or her peers. Parents would do better to provide a healthy balance of fresh, natural foods and to try other treatment methods before forcing the Feingold diet on their children.

### **Neurofeedback**

Neurofeedback is an experimental approach that uses electronic devices to speed up or slow down brain wave activity. In one study, children given this treatment were taught certain high-level mental activities when feedback information indicated that they were fully concentrating. They attended four 50-minute sessions, usually twice a week. At the end of the study, Ritalin use had dropped from 30% to 6%. Significant improvement was reported in inattention, impulsivity, and response time, and IQs increased by an average of 12 points. It should be noted that this was not a controlled study and other factors, such as attention given the children, may have contributed to their improvement. Nevertheless, the positive results from this and other studies warrant research.