

Attention Deficit Hyperactivity Disorder

A Pamphlet For Parents

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The following TABLE OF CONTENTS is provided for ADD people who do not want to read the whole *boring* article:

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INTRODUCTION

This pamphlet is written for parents of children with learning or behavioral problems, and contains information on the condition known as Attention Deficit Disorder (ADD). It is an attempt to gather together and to present in simple terms current thought about a very complex subject. Most parents who have children with ADD have read or will read a lot of material on the subject and will find contradictions or inconsistencies in the material they read. Hopefully some of these confusing areas will be clarified by what follows.



History of ADD

ADD is only one of many labels which have been used to describe children who are hyperactive or who have attention problems. Other common labels include hyperactivity or hyperactivity syndrome, ADD with and without hyperactivity, or Attention Deficit Hyperactivity Disorder (ADHD) which is the current official term for this disorder. Over the years there have been many attempts to explain hyperactivity and attention problems, and as a result there have been many labels and suggested treatments for this condition.

In the 1930's and 1940's it was realized that some children were dysfunctional because of inability to control impulses and activity. Initially this group of children was called "hyperactive". In the late 1940's and 50's these children were thought to have had birth injury or other brain damage, and the popular term then was "minimal brain damage". Neurological theories at that time were based on experience with children who had suffered brain injury from infections or trauma. Many of these children were hyperkinetic and otherwise similar to "normal" hyperactive children. In the 1960's, when it was realized that there was no evidence of brain injury in most hyperactive children, the name was changed to "minimal brain dysfunction" or MBD.



In the 1970's and 80's there was a shift in emphasis from activity to attention, and the term attention deficit disorder came into use. To make matters more confusing, there was added a stipulation that children could have ADD with or without hyperactivity. The latest terminology again changed the name to attention deficit hyperactivity disorder, or ADHD.

For purposes of simplicity only, this article will use the acronym ADD to refer to children who have significant problems with attention, impulsivity and/or hyperactivity. It is likely that in the near future the names will again be readjusted, and new classification will be necessary.

Current Diagnostic Criteria for ADD

Children who have problems because of poor attention typically have three areas of difficulty:

- Distractibility or trouble focusing attention.
- Hyperactivity or excessive motor activity, often in the fidgety or restless sense (brain hyperactivity).
- Impulsivity (acting without thinking).



The American Psychiatric Association periodically publishes definitions for psychological and behavior disorders. Their most recent publication is called the DSM-IV and is widely used by professionals as the reference manual for diagnostic criteria. These criteria are presented to help understand how the three areas of difficulty mentioned above cause problems.

The newest classification (1994) is presented below. In this classification the symptoms of hyperactivity and impulsivity are combined, and are given equal weight with inattention. The new classification uses the old term, attention deficit hyperactivity disorder (or ADHD), but now breaks the disorder down into three sub-categories:

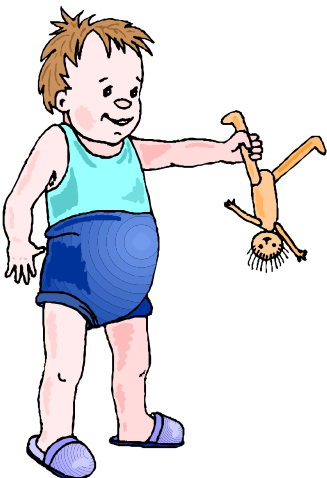
- **ADHD Combined Type**: Inattention and hyperactivity/impulsivity are both problematic.
- **ADHD Predominantly Inattentive Type**: Inattention is of significant degree, but hyperactivity/impulsivity are not particularly a problem.
- **ADHD Predominantly Hyperactive/Impulsive Type**: Inattention is not playing a significant role in the disorder. These children's activity and impulsivity is what is problematic.

DSM-IV DIAGNOSTIC CRITERIA

A. Six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

INATTENTION:

- (1) Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities.
- (2) Often has difficulty sustaining attention in tasks or play activities.



- (3) Often does not seem to listen when spoken to directly.
- (4) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace.
- (5) Often has difficulty organizing tasks and activities.
- (6) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework).
- (7) Often loses things necessary for tasks or activities.
- (8) Is often easily distracted by extraneous stimuli.
- (8) Is often forgetful in daily activities.



HYPERACTIVITY

- (1) Often fidgets with hands or feet or squirms in seat.
- (2) Often leaves seat in classroom or in other situations in which remaining seated is expected.
- (3) Often runs about or climbs excessively in situations in which it is inappropriate (in older children or adults may be feelings of restlessness).
- (4) Often has difficulty playing or engaging in leisure activities quietly.
- (5) Is often “on the go” or acts as if “driven by a motor”.
- (6) Often talks excessively.

IMPULSIVITY

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

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age seven years.

C. Some impairment from the symptoms is present in two or more settings (such as school and home)

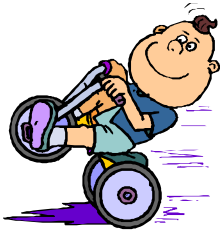
D. Clear evidence of significant impairment in social, academic, or occupational functioning.

Description of ADD Children:

Combined type

The most typical group of ADD children is characterized by hyperactive children (usually boys) who are in preschool or early elementary school grades. This is the category of children which best fits the A.P.A. criteria





listed above of the “combined” or “hyperactive/impulsive” type. The main problem with these children is a lack of control of impulse and activity appropriate for their age. They act much as we expect two or three year olds to act. They seem to be at the mercy of whatever internal whim or external force hits them. They are unable to put off gratification. They may, for instance, annoy their teachers by repeatedly asking when recess is due, and as soon as it comes, start asking when lunchtime or the final bell is coming. They make annoying traveling companions because they constantly ask when the trip will be over. They may be unable to keep friends because of their need to have things their way. They may get into trouble by physically accosting other children. They never walk when they can run.

They seem unable to control their attention. Their attention focus is like a “police scanner”, a radio receiver that constantly monitors all frequencies and jumps from one signal to another as soon as a new signal appears. These children are not, however, unobservant. They are very inquisitive and can acquire large amounts of trivial knowledge. They notice things no one else does. They go off on tangents which seem to have no relevance. They cannot differentiate between what is important and what is unimportant, and may have trouble with the attention required in every day tasks at home as well as at school.

Children with this type of ADD are able to attend to exciting things to a far greater degree than to boring things. All children like exciting things, but ADD children require that something be of high interest in order for them to pay attention. They love exciting video games. They may like TV but only if it is fast and noisy, or about something they are interested in such as nature programs (early elementary age ADD boys are especially interested in sharks, dinosaurs, bugs, snakes or other exciting creatures). They are often able to spend long periods of time with something that is interesting to them, such as a model or game they like, but are unable to sit still at all for something which is of little interest. They are in better control in small groups or by themselves. When they are with larger groups, they are more likely to lose control. They are at their worst when they are at birthday parties, Cub Scout events, church meetings, little league practice or at school.

Children with ADD also seem to be unable to predict outcomes or consequences. They are on “cruise control” or act as if they are not thinking. As a result of this, they are unable to acquire learning strategies and adopt an impulsive trial-and-error method of learning, repeatedly guessing until they accidentally get the answer right. They hate to have to think on purpose, or apply “mental effort”.



They have terrible organizing abilities. They may not remember to take a pencil to school or to bring a school book home. They are oblivious to corrective disciplinary measures (understanding consequences) and appear to have difficulty learning from typical parenting practices. They may do the



same wrong thing over and over again despite correction or punishment, and even be remorseful that they can not behave better. They may develop poor self images, with attendant guilt and anger.

They seem unable to get their work started and, once started, to finish it. Because of their inability to wait, they may demand that things go or are done their way, and are unwilling to compromise. Because of this “out of control” life and learning style, children with ADD may have trouble learning appropriate social skills and making and keeping friends. Their peers find them annoying because of their constant motion and demanding behaviors.

Some may also have trouble controlling their anger or frustration, and this adds to their problems getting along with parents, teachers, or friends. It is no wonder that these children attract so much attention. It is hard to miss them in any elementary classroom or principal’s office. The cartoon characters Dennis the Menace and Bart Simpson are stereotypical ADHD (“combined type”) children.

Inattentive Type

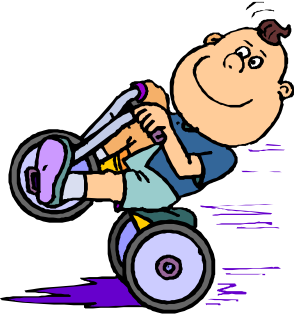
There is another group of children with attention problems that are harder to detect. These children are not hyperactive but rather are quiet and compliant but they cannot maintain attention long enough to learn academic skills or complete tasks. These children are accused of laziness or lack of motivation. They may find school boring and stop trying. They may realize they have trouble paying attention, or they may simply be daydreamers who never seem aware of anything around them, even the time of day or the day of the week. Girls with ADD more commonly fit this category and are seriously under diagnosed and untreated.

ASSOCIATED DISORDERS



Attention problems can co-exist with other emotional or neurologically based problems. There are several possible reasons for this. Attention problems are very common and so are other disorders which affect behavior and learning (just as it is common to see people with big noses and big feet, for example). In fact, almost all people, especially males, have some ADD symptoms. When attention problems occur in someone with poor emotional control, both conditions are made worse, and that person will be more “disordered”. Attention skills are particularly stressed by problems such as learning disorders and emotional problems like anxiety or depression. Although attention problems occur in otherwise completely normal children, there are

also some commonly associated emotional or neurologically based difficulties. These are:



- Specific learning disabilities
- Anxiety or depression
- Oppositional-defiant disorder (excessively argumentative behavior)
- Conduct disorder (excessively anti-social behavior)
- Coordination problems
- Enuresis (bed wetting) or other sleep problem
- Mental retardation.

A recent study of children referred to a university center for evaluation and treatment of ADD found that by the criteria used by these investigators, 74% were also depressed, and 80% were learning disabled. Only 4% had pure attention problems to account for their learning or behavioral problems. Other studies have not shown nearly this prevalence of learning and mood disorders, but all have found high rates of co-existing problems in children with ADD. These conditions are called “co-morbid”, and since they are so common, they are of great importance in any discussion of ADD.

Many symptoms of ADD are quite common in males, young or old. Most boys have trouble sitting still very long, hate boring things (church or school), are distracted by “interesting” things, have trouble completing boring tasks, or engage in risky activities. An argument could be made that almost all boys have ADD, but only those “who have it bad” or have other problems (like emotional or learning problems) have enough trouble that they come to the attention of parents, teachers, school psychologists or physicians.

Questions and Concerns about ADD.



The subject of attention deficiency is surrounded by so much controversy and there are so many differing opinions and myths, that it is difficult to talk about ADD without first addressing some of the common areas of disagreement. The following are some of the areas about which most parents have questions:

Is ADD a disease, and if it is, how do you get it?



This is one of the most important and fundamental question of all. While some authorities consider people with the traits mentioned above to have a specific “disease” caused by a specific brain anatomic or metabolic abnormality, other authorities look at people who have ADD as being those who are at the end of a spectrum or continuum of ability. We all have some skill areas which are strong and some which are weak. We expect variability within one person’s set of skills, so when a person displays a marked weakness in some area, we do not necessarily consider that to be a disease or disorder. For example, we do not consider someone who has no athletic ability (a “klutz”) to have a brain disorder, we simply do not expect him or her to be any good at sports. Similarly, a person with no musical ability is not thought to have a disease; instead he or she is considered to be an unlikely prospective member of the choir or band.

Unfortunately, children who are not good at paying attention have a weakness which can adversely affect a wide range of academic and social activities. Their weakness has more widespread consequences than a lack of athletic or musical ability. They do not do well at many academic tasks because selective or discriminating attention is very important when it comes to all types of learning. Poor attention skills, therefore, can become a “disorder” or “disease” because the consequences of this misfortune affects so many important functions of life.

There are recent studies using PET scans that correlate metabolic activity with anatomy, which show that adults with ADD have slower prefrontal lobe metabolism than normal people. These studies make sense, because a variety of evidence from other sources suggest that the frontal lobes (especially the right frontal lobe) are involved in brain functions such as sequencing, reviewing, impulse inhibition, and general reflective or monitoring functions, which are poor in people with ADD.



It has long been felt that children with ADD were deficient in certain neurotransmitters, the chemicals which transmit messages from nerve cell to nerve cell in the brain, especially dopamine and norepinephrine. The main evidence for this has been that the medications which are effective in ADD are thought to act by increasing the levels of these neurotransmitters in important areas of the brain.

Variations in attention ability are, like most other traits, inherited as well as learned. In the past hyperactivity, learning disabilities, and attention problems were thought to be due to subtle brain damage, but we now know that these are almost always inborn characteristics and abilities which are modified by

experiences. Many parents of children with ADD see the same traits in themselves or their spouse as they see in their children.

Are there more ADD children now than in the past and how common is ADD?



ADD seems to be more common now than in past decades, or at least it is being diagnosed more often. Since ADD is not an easily definable medical condition like diabetes or sickle cell anemia, it is not possible to know exactly which children actually have it, and exact numbers of affected children are not available. Recent studies of school children found a diagnosed incidence of ADD of around 5%. Most of these are boys, and therefore the rate increases to almost 10% of school age boys. Interestingly, the rate of ADD increases in higher income areas, suggesting a bias towards this diagnosis these areas.

Whether ADD is more common now or is simply being recognized more often is simply not known. ADD children have always been around, but in the past were not recognized as such. Only in recent years have teachers and school psychologists recognized that children can have learning difficulties because of primary problems with attention. Since there are medications available to stimulate attention, there is pressure to provide that service to those students who might benefit from it.

Is ADD associated with any positive characteristics?

Many children (not all) with ADD do quite well when they are out of school. Some even excel when they are able to use their talents fully. Most people who have the traits we associate with attention problems actually have associated valuable skills, such as artistic ability and creativity. They are often able to see the “big picture” and have good imaginations. They often have mechanical skills, and the restlessness that is represented as hyperactivity in childhood can later be channeled into ingenious problem solving. Many ADD children are “late bloomers” and do well once they get out of high school and go on to work or college. In rural Montana, it is common for ADD children to excel in farm or ranch work while failing in school.



Do children outgrow ADD?

Attention skills improve with age, and some, maybe most, of children with ADD will improve to the point that they can function normally in school by adolescence or adulthood. There is no way of knowing in advance which children will mature and which children will continue to have problems.



Some people with ADD remain restless and impulsive throughout life and suffer as a result. They can have trouble with relationships later in life. Divorce is more common in ADD adults.

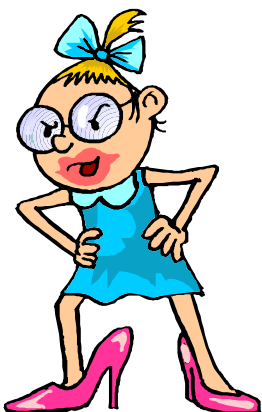
Other problems said to occur in ADD adults are trouble keeping jobs, and alcohol or chemical abuse. Most seriously dysfunctional adults (criminals, drug or alcohol abusers) have ADD, usually in association with other personality or psychiatric disorders. Obviously, many factors go into whether or not these problems will occur. The family support structure, the quality of a child's educational program, and the talents which he or she has to compensate for deficits (whatever they might be) are all important.

Because children with attention problems are not all the same, it is impossible to know in any individual case what the ultimate prognosis is. In general, it can be said that people who have better self-esteem and better social and adaptive skills do better in the long run than those who do not. The other important unknown factor is what effect our current educational and medical treatments have on ultimate outcome. Good studies on these kinds of children are difficult to do because they take so long and because the affected children are so different in their disabilities and talents. Nevertheless, there are now data appearing that show that children with attention problems do benefit from educational and medical treatment.

What is the most common school problem associated with ADD?

The main long term problem faced by children with attention problems (or any problem that affects school performance) is that they find school frustrating, boring, and painful. When children are continually frustrated, they give up and withdraw, or act out. Those who give up may develop a passive and ultimately disastrous attitude towards school. If this group discovers drugs such as pot or alcohol, it further complicates their problems. Those who act out are disruptive or oppositional and can become what is known as "conduct disorder". In any case, a cycle of failure may develop. School failure and drop-out or delinquency may be the ultimate result of this cycle.

What tests can be done to diagnose ADD?



There are no laboratory, educational, or psychological tests that can definitively diagnose ADD. Some testable functions, such as short term memory and skill at sequential reasoning are correlated with attention skills, but the correlation is not perfect. Psycho-educational testing can be helpful in defining why a child is not able to learn, and can suggest attentional problems or specific learning disabilities. These evaluations are available at no expense

through all local school systems. There are currently no blood, psychological or other tests that reliably diagnose ADD. The diagnosis of an attention problem is usually based on an evaluation of the types of problems a child is having. This is determined, ultimately, by a physician, through a “diagnostic interview” which involves a review of all available data. Because ADD is considered a neurological rather than a psychological diagnosis, and because only physicians can prescribe the medications which treats it, current school law requires that only a physician can make the diagnosis.



Most children with attention problems have predictable types of problems. These are the same problems which are mentioned above in the DSM criteria. The most commonly used diagnostic tools are questionnaires that attempt to answer whether a child is excessively hyperactive, impulsive, or distractible when compared to other children of the same age, and whether he or she is significantly dysfunctional as a result. These questionnaires are usually given to the child’s teacher, other school personnel, and parents. Teachers are in a unique position to evaluate the student because they can see how each student performs in relation to his/her peers. Occasionally physicians will do tests (EEG’s, thyroid or other blood tests) to help rule out diseases that might cause similar behavioral problems, but there are no specific medical or neurological tests to rule in or rule out ADD. This is not surprising, since ADD is not a disease but a symptom complex (a “disorder”).

What other conditions does the doctor look for which could be confused with ADD?

Attention problems may result from other conditions. There are a few rare medical problems such as brain tumors, thyroid problems, or seizure disorders which can mimic hyperactivity or inattention. Depression and anxiety can cause inattention and school failure. A child preoccupied with serious family problems has difficulty paying attention.

A very common cause of inattention is “task dependent attention disorder”, which is inattention associated with a specific learning disorder. For instance, a third grader who can’t read is unlikely to pay attention when reading is required for a class project. Students who don’t know math facts relevant to solving a math exercise are easily distracted from a math assignment.

Isn’t a response to Ritalin diagnostic of ADD?

For years it was assumed that only children with ADD will respond to taking stimulants by paying better attention, because the response of hyperactive children to stimulant medication was felt to be paradoxical. This assumption, however, is now clearly known to be false. Almost all children, whether they have school problems or not, will perform better in school when taking





stimulant medications. They will also be less fidgety (more focused). These medications, however, will generally cause the most improvement in those children whose attending skills are poorest.

Unfortunately, there is yet no sure way to tell in advance which children will benefit significantly from taking a stimulant medication and which will not. Some children with all the signs and symptoms of ADD have little beneficial response at all, whereas other children who have only a few symptoms of attention problems but have other learning or emotional problems actually respond quite favorably.

What is the treatment for ADD? Is medication always the answer?

There are several types of treatment for ADD, including educational, psychological, behavioral, and medical interventions. The American Academy of Pediatrics, with reference to when medication should be used, has written:

“Medication for children with ADD should never be used as an isolated treatment. Proper classroom placement, physical education programs, behavior modifications, counseling, and provision of structure should be used before a trial of pharmacotherapy [medication] is attempted.”

The preferred treatment for ADD is, then, a combination of interventions with medication being used when other types of interventions prove ineffective or insufficient.

The M.T.A. Study

Recently, an important study performed by the National Institute of Health, the M.T.A. Study (“**M**ultidisciplinary **T**reatment of **ADHD**”) was published which compared the use of only stimulant medication (specifically methylphenidate) to medication with or without counseling or behavioral therapies in ADD children. This study showed that counseling and behavioral therapy added little to treatment with stimulant medication alone. Counseling and behavioral therapy were, however, slightly better than doing nothing, and helped children who had other “co-morbid” conditions.



What medications are used to treat ADD?

The main medications used to treat ADD are the stimulant drugs methylphenidate and dextroamphetamine. Methylphenidate is the generic

name for Ritalin, and dextroamphetamine is the generic name for Dexedrine or Adderall.



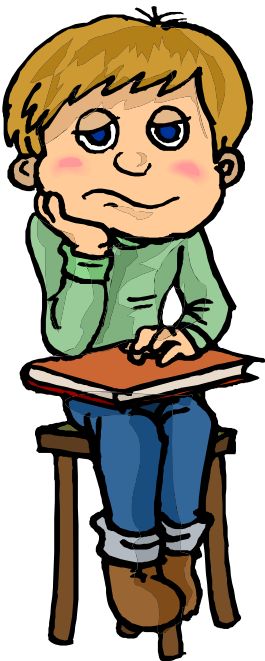
The first reported medical treatment for “hyperactive” children was in 1939, over 60 years ago. It was found at that time that children who had significant behavioral problems who were impulsive and hyperkinetic had remarkable improvement when given Bensedrine, an amphetamine medication developed in the 1920’s. This improvement was considered to be paradoxical because amphetamine is a stimulant drug meant to mimic the action of adrenaline. Stimulant drugs are supposed to make a person hyper, overly energetic and impulsive, so it was a surprise that these reported effects occurred. Despite this report in the psychiatric literature, little use of stimulants occurred until some use of amphetamine followed in the 40’s and 50’s, but in the 1960’s the medication methylphenidate (Ritalin) was developed. This medication is still in use, largely due to two factors. One was the fact that it was incredibly effective, and the other that it was heavily promoted by the pharmaceutical company that developed it. Until recently, these two drugs, methylphenidate and amphetamine, have been the only two medications available for the treatment of attention problems and hyperactivity/impulsivity.

Another stimulant medication called pemoline (Cylert) was developed in the 70’s, and is still available, but is now almost never used because it can cause liver damage. Neither methylphenidate or amphetamine cause serious medical or psychiatric long term problems.

Though methylphenidate and amphetamine are different drugs that work in different ways, their effects and side effects are almost exactly the same. Amphetamines have a higher risk for abuse as street drugs, so methylphenidate is often preferred as the first choice. Both methylphenidate and amphetamines are controlled medications (drugs that have addictive potential); they cannot be “called in” to pharmacies. A hand-written prescription is necessary to obtain these medications. Refills of prescriptions are not allowed, so most parents of ADD children must go through the process of obtaining and refilling their children’s prescriptions monthly.

New Medications

In the last few years, new preparations of stimulant medications have been introduced which have greatly improved the medical treatment of ADD. Most prescriptions now are for the newer “long acting” preparations. The most popular is the medication Concerta, which uses a plastic membrane capsule which osmotically absorbs water and smoothly releases methylphenidate over a twelve hour period. The second most popular is Adderall XR, which is a capsule that has granules of amphetamine which release medication in a predictable fashion over ten hours. Metadate CD and Ritalin LA are similar preparations which release methylphenidate smoothly over a eight to ten hour





period. These preparations allow the use of a single morning administration on school days so children don't need to take medication at school. This allows ADD children to be on stimulant medication without other children knowing.

Atomoxetine

In January of 2003, the first truly new medication for ADD in forty years became available. This medication is called Strattera (atomoxetine). This medication works by inhibiting the re-uptake of norepinephrine in certain areas of the brain, while not affecting the levels of dopamine which the "stimulant" medications effect. Dopamine enhancement results in some of the troublesome side effects of the stimulants, such as addictive potential, tics, and mood disturbance.

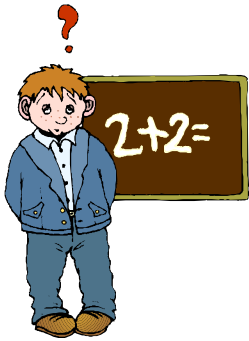
There are downsides to this new medication which make it somewhat less attractive than the standard stimulants already in current use:

- It takes two to three weeks to work. Stimulant drugs work immediately. No waiting is involved.
- It has to be swallowed as a capsule. Some of the current stimulants can be chewed or "sprinkled".
- It should be taken every day. Stimulants can be used selectively on days or times of day when they are needed.
- It is more expensive than the stimulants.
- A common problem has been moodiness, especially if the dose is too high.

There are several advantages to atomoxetine. Many ADD children have significant problems after school and in the evening. To treat these children adequately with stimulants requires multiple doses, and may interfere with sleep. Some children even need sleep medication. Some children become very moody when their stimulant medication wears off. Insomnia can be a serious problem, especially in children who were light sleepers to start with. Atomoxetine does not generally cause mood problems, corrects hyperactivity and inattention all hours of the day, and improves insomnia. Finally, since atomoxetine is not considered to be abuseable, it does not require a hand written prescription and refills of the prescription are allowed.



Other Medications



Clonidine, a blood pressure medication, is sometimes used because of its effectiveness in controlling tics, impulsiveness, and hyperactivity. Unfortunately, it does not improve attention, and almost always causes drowsiness. Guanfacine (Tenex) is a related drug which has fewer side effects.

Bupropion, (Wellbutrin), is a relatively new antidepressant which stimulates attention and is sometimes used to treat ADD. Like atomoxetine it has the disadvantage of requiring daily treatment for two to three weeks before an effect is seen. It also has some side effects which limit its use.

Tricyclic antidepressants such as desipramine, imipramine, and amitriptyline are medications which increase the effect of norepinephrine, like atomoxetine, and can improve attention. Unfortunately, these medications have many unpleasant side effects, and if taken in overdose can cause fatalities.

How much do these medications cost?

The expense of Ritalin and other such medications varies, of course, with the dose. There are generic preparations of methylphenidate and dextroamphetamine available which are less expensive than the brand name varieties and probably work as well.

The new long-acting preparations (Concerta, Adderall XR, Ritalin LA, and Metadate CD) all cost about \$3.00 per day; The new medication, atomoxetine, is about \$3.50 each day but for adolescents and adults the cost could more than double since they may require two or more capsules. Medication for most elementary age children will cost from twenty-five cents to three or four dollars a day.

What are the side effects of these medications?

The side effects of all these medications are of two types: those which are dose related and those which are unusual or unpredictable. The first type will be experienced by anyone on doses which are excessive and by some at low or regular doses. These main side effects are insomnia, loss of appetite, over-focusing, or over concentration.



Most parents notice that their children are more active, irritable, or moody after school as the medication is wearing off. This is probably the most common complaint physicians hear about from parents. It can become enough of a problem that parents decide to discontinue medication.

The second type of side effects occur rarely and unpredictably and are not necessarily dose related. The most common are stomach aches and headaches. These side effects will often go away with continued use. If they do not, sometimes substituting one of the other medications will solve the problem.



Occasionally children become emotionally labile during the time when the medication is working. They might become easily tearful or aggressive or angry. Sometimes they become anxious or panicky. Children who have an underlying anxiety disorder may get worse on stimulant medication. **These are not acceptable side effects**. Sometimes dose adjustments will solve these problems.

It is not unusual for depressed children to improve on stimulant medication if their depression was due to the frustration of school failure.

Children on high doses of stimulant medication may have slowing of their growth and weight loss. This is not a problem if the children are on low or average doses, or, if on high doses, they have “vacations” when they do not take medication and catch-up growth can occur. Studies now shown that this growth suppression is temporary and almost always normal height will be attained even if the medication is continued.

There is one serious side effect of stimulant medicines which should be mentioned. This is the appearance of tics, which are repetitive involuntary muscular jerks, facial twitches, or vocalizations. At one time, use of Ritalin was blamed for causing Tourette’s Syndrome, which is a condition characterized by multiple tics, both motor and vocal, that can persist throughout life. Children with Tourette’s syndrome are usually restless, distractible and impulsive prior to the appearance of the tics which characterize the syndrome, and many are treated with stimulant medication before the presence of the tic disorder is apparent. It is no longer believed that stimulant medications actually cause Tourette’s syndrome. However, there is concern that any of the stimulant medications might make tics worse, and therefore that they should be used with extreme caution when tics are present. Tics may also be an indication of over dosage. It now appears that atomoxetine is useful in patients with tics, since tics are not increased with this medication.

How do stimulants work?



Methylphenidate and amphetamine have been in use for over forty years and there is a great deal known about them because of this long use. While we still do not know exactly how they work, it is felt that all of the stimulant medications work either by altering levels of certain neurotransmitters

(chemicals that convey electrical impulses from nerve cell to nerve cell) or by acting as neurotransmitters themselves. As mentioned above, the two neurotransmitters which are effected are norepinephrine and dopamine. From a functional standpoint, we know that they work by stimulating those parts of the brain in the frontal lobes which are involved in focusing attention.

Myths and misconceptions:



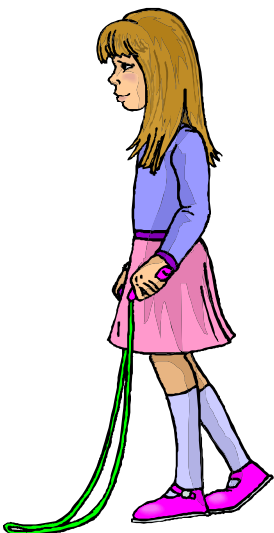
There are a number of misconceptions or fears about the use of Ritalin or other stimulant medication which need to be specifically addressed.

Ritalin in normal doses is not habit forming or addicting to children. Children who take Ritalin almost always say they feel exactly the same whether they take it or not. They do not feel “high”. Almost none of the children who take Ritalin like to take it. In fact, most will find reasons not to take it, forget it, or even hide it or pretend to take it and don’t. Some children will acknowledge that the medicine helps them to pay attention but insist that they feel no different. Studies on adults who take stimulant medications find that the adult subjects report pleasurable effects, and there have been instances of abuse particularly of adults on these medications, and of parents of children who are on these medications. For these reasons the Federal Drug Administration regulates these medications closely.

There are now studies which show that children with ADD who are prescribed stimulants are less likely to abuse drugs in adolescence or adulthood than those who have not been on medication.

There are no known long term side effects to Ritalin use. Regular methylphenidate has a therapeutic effect which lasts from 1 to 6 hours and then it is gone. It does not cause any problems later in life. Use of stimulant medication does not cause brain damage or mental illness.

Most children have no side effects from methylphenidate or dextroamphetamine use. In normal doses there are no long term side effects. These medications are, in normal doses, as safe as, or safer than, almost any other medications which are used in a long-term manner, including Tylenol, aspirin, vitamins, antihistamines, antidepressants, and ulcer or blood pressure medications. Despite this safety, these stimulant medications are extremely potent and effective.



How much Ritalin is an appropriate dosage?



Most Pediatricians who treat children with ADD feel that the smallest dosage which is effective is the best dosage. Most parents (and most children) dislike the idea of using medication for educational or behavioral purposes. This is probably a healthy attitude. It is appropriate to stop the medication periodically to see if it is still needed. Of course, there are some children who need to take these medications daily for prolonged periods, but they are actually a minority. Hyperkinesis and impulsivity seem to require relatively higher doses of stimulant medications, whereas inattention is more sensitive to lower doses.

How is medication use monitored?

There are many different ways to monitor the effectiveness of stimulant medication. Ultimately the physician has the responsibility to determine the appropriate dose. The physician makes these decisions by the analysis of information provided by those who see the child when he or she is taking it. This includes the child's teacher, and sometimes the school principal, teaching aides, school psychologist, or other school personnel are involved. Parents and friends also provide useful information. The observations of the child can be very helpful, especially with adolescents. Each child must be evaluated with regard to his or her individual problems. Children who are not disruptive or hyperactive will not have a dramatic response to medication, but it should be possible to assess whether they experience improvement in task completion or become less distractible, and should ultimately get better grades in school. Some physicians like to use questionnaires for follow-up. If there is a question of effectiveness, placebo therapy can be used with an evaluation process which is done by someone who does not know if the child is on medication or not.

How effective is the use of medication in treating ADD?



As shown in the MTA study discussed above, stimulant medication is the most effective single method of treating ADD. There are many children for whom medication works dramatically. Some of these children will see their grades go from D's and F's to A's and B's, usually because of an increase in work completion. Some children on medication will begin to have friends for the first time and will find school interesting and fun instead of boring or painful.

The need to use of stimulant medication as treatment for ADD symptoms depends upon the problems of the particular child. Many "normal" children



(especially boys) have short attention spans and are extremely active and impulsive. However, most of these children are functional in school, at home, and in later life. Obviously these children do not need medication, even though they may fit most of the diagnostic criteria for ADD. There are other children who have such severe difficulties with attention and impulse control that they simply can not function without medication even in adult years. Other children have differing degrees of dysfunction and may or may not need medication.

Ritalin and the other stimulant medications are among the most effective medications in use today. Controlled studies have repeatedly found marked effectiveness in measurements of attention and conduct when these medications are used. Seventy to ninety percent of children with attention related school problems will be helped dramatically by stimulant medications.

If a child takes medication, shouldn't he or she be on medicine all the time since he or she has ADD all the time?

There are some authorities who feel that continuous, seven days a week medication is essential for all children on stimulant medication. Other authorities feel that the least medication which will result in reasonable success is best. These same authorities differ on appropriate doses of medication. Some feel that the medication dose should be increased until maximum improvement in concentration and behavior is achieved, even if side effects are produced. Others feel that the smallest dose which is effective should be used, and that there should be few, if any, side effects. In general, most pediatricians side with the second group.

Most children with attention problems have difficulty primarily in school or in educational settings where control of their attention is most important. There are some children, however, whose impulsivity and aggressiveness cause significant problems outside of school, and these children need medication daily to live normal lives. Very young hyperactive children (age 3 to 6) are in this group, because their uncontrolled behavior is a problem at home or wherever they are.



There are a few teachers who are extremely good with ADD children, but many teachers deal poorly with ADD children. As a result, there are children who seem to need medication one school year but not the next, only to need it again later. How much medication a child receives and how often he or she takes medication depends on many factors. Decisions about when and how to change dosages depends upon the experiences and opinions of the child, the parents, the child's teachers and, ultimately, on the assessment of the managing physician.

If a child is put on Ritalin, will he or she have to take it for a lifetime?



How long someone will take medication depends on many things. As has been mentioned, attention skills improve with time, and many children simply don't need medication after one or two years. The average number of years for children taking methylphenidate in one study was two to three years. Most stopped taking it because it was no longer necessary. Others stopped it because parents and children tired of the process of refilling and dispensing the medication. Most children or adults have trouble taking medication even when their lives depend on it, and it is natural to look forward to a time when taking medication is no longer necessary. For these and other reasons, most children with ADD take medication for only a few years.

A relatively new area of medicine and psychiatry involves treating adults with ADD. Many parents of ADD children realize that they had the same problems in the past that their child is currently having, and that they still have trouble compensating for their inability to control attention. Most psychiatrists are familiar with treating adults with this disorder, and some neurologists, internists, and family practice physicians will see adults for this problem.

Does excessive sugar intake cause hyperactivity?

There have been a number of studies on the relationship between diet and activity levels in normal and in ADD children. According to these studies, sugar does not seem to affect attention or cause hyperactivity, even in large amounts. Some studies even show improved attention when sugar is eaten. Diabetic children who have very high blood sugars do not become hyperactive or inattentive. There are some studies which show that some food additives do seem to have an effect on some hyperactive children, especially very young ones (age 2-5). Unfortunately, these studies have not determined just which foods or food additives are to blame. Hopefully, this information will some day be available.



Children with ADD do have trouble with “deferral of gratification” and as such are likely to binge on foods they like, and sweet foods fall into that category, so it is not surprising that parents of ADD children report their children seem to crave sugar.

Caffeine, according to recent studies, can improve attentional skills, but the effect is not predictable, and many children are made worse. Caffeine is found in large amounts in some soft drinks, and these probably should be avoided.

It is important to emphasize that attention problems are not caused by diet, even if they seem to be made worse by eating certain foods. There is no



dietary treatment currently known that is effective as treatment for children with attention problems, nor is there any scientific evidence that food allergy (or other allergies) can cause ADD or other learning or behavioral problems.

Are Alternative Therapies helpful for ADD?

There are currently a number of “alternative” treatments available through health food stores, chiropractors, and naturopathic providers. A variety of herbal, vitamin, and even magnetic therapies are touted as effective treatments for attention deficit disorder. These therapies are best described as “untested”, because they have not been subjected to testing by scientific methods. It is the experience of most physicians who treat patients with ADD that there are few successes from these alternative therapies, and that most are “scams” designed to make money by preying on people who distrust standard medical practices.

What other types of intervention besides medication may be necessary for children with ADD?

As has been indicated, not all children with ADD require medication or benefit from receiving it. However, children with serious symptoms of hyperactivity, inattention or distractibility do require assistance and they often do benefit from some type of intervention, whether it is psychological, behavioral or educational.

Those children with or without attention problems who are doing poorly in school for whatever reason need evaluation to see if there is some correctable problem interfering with their ability to learn. It is not acceptable to say that a child simply does not apply himself or that he is lazy.



Almost all children who are so described actually have real educational , emotional, or attentional problems. Sometimes the problem is simple and can be easily addressed. More often it is complicated and needs to be approached from several angles. Stimulant medication often helps these children when nothing else will. For other children, educational or psychological intervention is sometimes sufficient.

What specific kinds of interventions are helpful in school for children with ADD?



Besides medication, there are educational and behavioral approaches that can be used to help a child with attention problems in school. Some of the techniques are listed below.

1. **Decreasing distractions.** Teachers have always given distractible or disruptive children preferential seating, usually as close to themselves as possible. For children who are distracted by visual stimuli, the use of a study carrel which blocks out visual distractions is helpful. Other preferential seating to avoid visual distractions (away from windows and the door to the hallway) can also be useful. Since some children with ADD are distracted by noise more than visual stimuli, they sometimes benefit from using ear plugs to block out sound. Surprisingly, a few ADD children do better in a noisy, chaotic environment.

2. **Providing feed-back** to the child about his state of control. Sometimes a prearranged signal can be arranged between the child and the teacher for this purpose.

3. **Help with specific learning disabilities.** As mentioned before, many children who have attention problems and school dysfunction also have specific learning problems which can be identified and addressed through special education.

4. **“Harnessing” a child’s areas of interest** to use to motivate attention. Most children with ADD are inquisitive and intellectually curious. They are usually naturally creative. They may become expert in things that they find interesting (almost all elementary age boys with ADD at some point have a rock or bug collection). It is possible to use these interests and hobbies as “hooks” to other educational tasks, such as reading or writing. Parents should encourage any hobby or interest that seems at all positive or creative.



5. Children with ADD usually do better with **one-on-one teaching** in which they get constant feed-back to help focus their attention. Unfortunately, this is often not possible in regular or even in special education programs, so parents may wish to hire a private tutor. Peer tutoring programs in which the ADD child tutors other, younger or more handicapped children can be very beneficial to both.



6. **Behavior modification programs.** School psychologists are sometimes very helpful in arranging for programs which help a child to learn to increase control of his or her actions. Unfortunately, the usual methods used by teachers or parents are primarily punitive, and these are generally ineffective or even harmful for children with ADD. Most children with ADD are actually very conscientious and feel bad when they are letting their teachers and parents down by their impulsive or disruptive behavior. Behavior modification programs that reward positive actions are generally more effective and less harmful than punitive measures. Feedback and exploration of alternative behaviors often turns a negative behavior into a positive one, with benefit to the child's esteem.

If a child is labeled as ADD, doesn't the school have to meet his or her educational needs?

School districts do have to address the needs of children with ADD if the children qualify for services under either special education law or Section 504 of the Rehabilitation Act of 1973.

Many children with significant attentional problems who are doing poorly at school also have learning disabilities which can qualify them for the special education process and an individualized education program. Under another federal law—**Section 504 of the Rehabilitation Act**—school districts are required to evaluate children who are suspected of being disabled and to provide children with identifiable disabilities with appropriate accommodations in the regular classroom. Classroom accommodations can include such things as modified or shortened assignments, oral testing, individual behavior programs or contracts and other such changes which help the student to be successful. The definitions of disabilities under Section 504 are much broader than under the special education law, so children who have ADD can be considered disabled under Section 504 when they are not considered disabled under the special education law.

Most children with poor attentional skills do not need special services or classroom accommodations. Each child's situation should be considered individually, and interventions should occur only when the child needs them in order to benefit from instruction.

What is the role of the physician in treating a child with ADD or other learning problems?



The function of a doctor in the treatment of children with learning problems is three-fold. The doctor first needs to eliminate specific medical problems which can cause learning problems. These medical problems are actually



quite rare, the most common being thyroid disease and seizure disorders. Occasionally other medical conditions (such as brain tumors) might present as daydreaming or inattentiveness. Psychiatric diagnoses, usually depression or anxiety disorders, can cause attention problems, and the doctor's role may involve an appropriate referral for the treatment of these conditions. Besides anxiety and mood disorders, other psychiatric conditions which might present as school problems include movement disorders, obsessive-compulsive disorders, psychosis, personality disorders, or conduct or oppositional disorders.

The second duty of the medical doctor is to decide whether or not the child can be helped by taking medication. The physician needs to decide whether the child is having enough problems (dysfunction) to justify medical intervention.

If the physician should decide medication might be helpful and is indicated, he or she then decides which medication would be most likely to help. It is the responsibility of the physician to explain to the parents and the child what might be expected in terms of effects and side effects from the medication.

The doctor's third duty is to monitor the effect of the medication: that the medication is doing no harm and that there is a beneficial effect. The doctor also has an obligation to be a member of the child's educational team, which means he or she needs to communicate with the school about plans and opinions concerning the child's treatment. The physician must also reassess periodically the need for dosage adjustments or for continuation of medical treatment.

SUMMARY

Children with Attention Deficit Disorder have difficulties with hyperactivity, attention control, and impulsivity. They may or may not have trouble in school, home or other social situations. Those who have trouble in school may have other associated learning or behavior problems.

ADD problems are often hereditary, as are many other physical or emotional traits. Children with ADD symptoms which are predominantly attentional tend to have mainly academic problems, whereas ADD children whose problems involve predominantly hyperactivity and impulses control tend to have social and behavioral problems.

Treatment of attention and hyperactivity/impulsivity is multi-faceted. There are many educational and behavioral methods which help to decrease distractions and aid with control and planning. Stimulant medication is extremely helpful and is often very dramatically effective.

It is hoped that with appropriate treatment with medication and behavioral and educational programs, children with these problems will experience better





success and be better adjusted both during the school years and later in adult life.

RESOURCES FOR PARENTS

Written material:

Friedman , Doyal GT, **Attention Deficit Disorder and Hyperactivity**, ed 2. Danville, Ill, Interstate Printers and Publishers, 1987

Ingersoll B: **Your Hyperactive Child: A parent's Guide to Coping with Attention Deficit Disorder**. New York, Doubleday, 1988

Parker HC: **The ADD Hyperactivity Workbook for Parents, Teachers, and Kids**. Plantation, Fl, Impact Publications, 1988

Wender EH: **The Hyperactive Child, Adolescent, and Adult**. New York, Oxford University Press, 1987

Hallowell, E.M.; and Ratey, J.J.: **Driven to Distraction**. Touchstone Books, 1995.

National Organizations:

Association for Children and Adults with Learning Disabilities, 4156 Library Rd., Pittsburgh, PA 15234, 1-412-341-1515
Orton Dyslexia Society,
724 York Rd.,
Baltimore, MD 21204,
1-800-222-3123 (1-800-ABCD-123)

Children with Attention Deficit Disorders (CHADD). 1859 N. Pine Island Rd., Suite 185, Plantation, FL 33322, 1-305-384-6869

Parents Lets Unite for Kids (PLUK), 514 North 32 Street Billings, MT 59101
800-222-7585, or 255-0540



PLUK is an organization that helps parents of children with disabilities work with schools to achieve appropriate educational programs. It is funded by a federal grant to help assure that parents are aware of their child's rights under current educational law.



PLUK also has an extensive library of books and videotapes on such topics as ADHD, autism, learning disabilities, Tourette's Syndrome, and Down Syndrome, as well as other behavioral and psychiatric disorders which can affect learning.

PLUK also has the capability to assist with computer and other assistive technologies for children or adults with such problems as deafness, blindness, cerebral palsy, dyslexia, and other cognitive or neurological deficits.

Internet Sites:

<http://WWW.PLUK.ORG> PLUK's website.

<http://WWW.CHADD.ORG> CHADD's website.

<http://WWW.RFBD.ORG> Recorded books for blind and dyslectic, ADD.

<http://WWW.ADDWAREHOUSE.COM> Information on ADD, books, etc.

<http://WWW.NCLD.ORG> National center for learning disabilities.

<http://WWW.LDONLINE.ORG> Good information on ADD and LD.

<HTTP://WWW.PBS.ORG/WGBH/MISUNDERSTOODMINDS/> LD and ADD, videos, interviews.

<HTTP://WWW.SCHWABLEARNING.ORG/INDEX.ASP> Lots of practical information on ADD and other learning problems.