ATTENTION DEFICIT HYPERACTIVITY DISORDER:

TIPS FOR TEACHERS

Miami-Dade County Public Schools
Department of Psychological Services

Office of Exceptional Student Education
And Student/Career Services

December 2005
PREFACE

Attention can be compared to a flashlight that illuminates certain aspects of our mental or physical surroundings in a world of competing distractions (Goldberg, 2000). The ability to guide the flashlight appropriately or to direct one’s attention toward a goal or action is essential to learning. In order to learn in school, at home, and in the community, students must be able to persist in paying attention. The problems associated with attention difficulties are experienced by a significant number of students. The challenge to address the needs of these students is the responsibility of teachers, parents and all school personnel.

Behaviors and cognitive characteristics associated with attention problems are often a part of the developmental profile of many students at some time in their education. The ability of a teacher to accommodate developmental differences in attention will benefit all students in the classroom. As educators continue to serve a diverse student population, the provision of modifications is essential for ongoing student achievement.

Understanding the behavioral and cognitive characteristics of AD/HD precedes effective intervention and management. This training manual is designed to provide educators with information and interventions for students who have attention problems. With appropriate accommodations, many students who exhibit these difficulties can be successfully educated in the general education classroom.

The Department of Psychological Services of the Miami-Dade County Public Schools believes that support, communication, and training for parents and school personnel are critical factors essential to the implementation of the recommendations in this manual. When educators, supportive personnel, and parents work together, enriched learning environments are created both at school and at home. As a result of the consistency provided in the school and home environments, students can overcome many of the attention deficits that interfere with their school adjustment and academic achievement.
ACKNOWLEDGEMENTS

Pediatric psychology is a changing science. New research and clinical experience broaden our understanding of developmental disorders such as Attention Deficit Hyperactive Disorder (AD/HD). The information contained in this manual reflects current scientific thinking. Given the rapid accumulation of new information about the disorder, the reader is encouraged to stay abreast of credible sources of information in the literature.

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AD/HD Terminology

The American Psychiatric Association developed a classification system for mental disorders. This manual is called the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revised [DSM-IV-TR] which describes three subtypes or patterns of behavior associated with attention disorders.

At present, the official term used to describe significant attention problems that meet DSM-IV-TR criteria is Attention-Deficit/Hyperactivity Disorder (AD/HD). The three patterns of behavior associated with the disorder are the predominantly inattentive type (without hyperactivity), the predominantly hyperactive-impulsive type, and the combined type. The term ADD has been used to describe children who have symptoms of inattention without hyperactivity. In this manual AD/HD will be used to refer to all three patterns of behavior as recommended by the American Psychiatric Association.
INTRODUCTION

Attention Deficit Hyperactivity Disorder (AD/HD) is a real disorder. For more than 100 years, we have gradually learned more about what was once called Hyperkinetic Disorder. AD/HD is the most commonly diagnosed developmental disorder of childhood affecting 3 to 7 percent of school-aged children in the United States (American Psychiatric Association, 2000). It begins in childhood and may continue into adolescence and adulthood (American Psychiatric Association, 2000). Although very little research exists regarding gender differences in AD/HD, there is approximately a 3 to 1 ratio of males to females identified with AD/HD (Szatmari, 1992). Generally, there are 1 or 2 children in every classroom who have the disorder (Barkley, 1998). AD/HD is a worldwide phenomenon. The disorder has been identified in a range from 2 to 13 percent of children in every nation or culture studied (Barkley, 1998).

BEHAVIORAL CHARACTERISTICS OF AD/HD

According to the DSM IV-TR, AD/HD is a pattern of behaviors in which a child shows developmentally inappropriate levels, and serious and persistent behavioral difficulties in the areas of inattention, impulsivity and/or hyperactivity. Children with AD/HD have many symptoms. These symptoms may vary in level of severity and can be mild, moderate or severe. Many of the children with AD/HD have at least average intelligence and have many strengths (U.S. Office of Special Education Services, 2003).

Inattention

Contrary to popular thinking, children with attention deficits can attend. The
problem is they attend to everything in their environment. They pay attention to all stimuli surrounding them, including irrelevant stimuli. As a result, they appear easily bored when, in reality, they are distracted by competing stimuli to which they shift their attention.

The attention of children with AD/HD varies according to a number of factors (Flick, 2000; Zentall, 1985). Their problems are related to what they are paying attention, how long they need to attend, and under what conditions. Other factors that influence attention include the complexity or novelty of the task, the classroom environment and internal thoughts and sensations.

In contrast, symptoms related to inattention are often not present during highly motivating or interesting tasks; however, they do occur when the tasks are repetitive, difficult, and not interesting to the child (Goldstein, 2003). For example, studies show that attention difficulties are most apparent when children with attention deficits are required to engage in repetitive tasks, such as homework, independent schoolwork or chores (Barkley, Dupaul, & McMurray, 1990; Luk, 1985).

In the classroom setting, children with attention deficits may exhibit the following behavioral characteristics:

- The consistency of their performance may vary. On one day, they complete tasks with little difficulty while on other days they are unproductive, which tends to lead others to unfairly label these children as “lazy.”

- They may have little difficulty attending in a one-to-one setting; however, in the classroom environment their distractibility is easily apparent.
• They can sometimes sustain attention for prolonged periods of time when they are able to engage in activities of their choosing.

• They have difficulty following instructions and paying attention to details, which often leads to careless mistakes.

• They frequently lose school materials and misplace homework.

• They have trouble organizing and planning tasks, as well as completing work in the classroom.

**Impulsivity**

A hallmark of children with attention deficits is their inability to think before they act. Difficulty inhibiting or delaying their responses to environmental stimuli often results in their being inappropriately labeled as behaviorally disordered. In social situations, they may look like the aggressor due to their inability to stop their immediate reaction to being hit, teased, or called names. They usually get caught by the teacher and are often baffled as to why they are in trouble.

Children who are less impulsive have the ability to inhibit their reactivity by planning to retaliate when the teacher turns her back (Flick, 1998).

In the classroom environment, children who have problems with impulsivity may exhibit the following behaviors:

• Excessive impatience
• Low frustration tolerance
• A tendency to be overly talkative and intrusive
• Verbal interruptions, such as blurting out answers
• Difficulty listening to directions
• Overly hurried completion of assignments, resulting in careless mistakes
• Risk-taking behaviors, which may result in many accidents
• High levels of emotional arousal and a tendency to quickly experience intense emotions, (e.g., anger or excitement) (Goldstein, 2003).

**Hyperactivity**

The most easily observable characteristic of AD/HD is the excessive or
developmentally inappropriate levels of motor or vocal activity seen in these children (Barkley, 1998). It is important to refrain from labeling age-appropriate, rambunctious activity as AD/HD in pre-school and young children. On the other hand, young children can display excessive levels of activity that are out of sync with their peers. Their restlessness and over activity usually become apparent in pre-school or kindergarten when some requirements for control of movement are imposed. Overall, boys are more affected than girls by hyperactivity (Barkley, 1998).

Children who display symptoms of hyperactivity in the school setting may exhibit the following behaviors:

- Difficulty staying in their seat when compared to others in their class; they oftentimes make up excuses to leave their seat, (e.g., to get a drink of water, throw paper in the trash can, sharpen their pencil)
- A tendency to squirm or fidget and play with their pencil or another object
- A tendency to run when they should walk
- A tendency to be overly talkative
- Sleep disturbances; parents complain that their children have difficulties in settling down to go to sleep, frequent awakenings during the night, and/ or difficulty waking up in the morning

**AN OUTPUT PROBLEM**

Children with AD/HD usually have tremendous difficulty in producing classroom assignments or homework. They have difficulty in starting tasks, sustaining attention to tasks, shifting focus to an alternative strategy when a particular strategy is not working, and problems in pacing and in timing their work.
Consequently, they are erroneously perceived as being “lazy.” Researchers are beginning to discover that the area of the brain that has to do with motivation may be affected, and therefore, may be directly related to their inability to follow through on tasks (McCandliss, 2002).

**A NEW VIEW OF THE DISORDER**

Contrary to popular belief, current research indicates that AD/HD is not usually caused by allergies, food additives, immunizations, or excessive sugar (American Academy of Pediatrics, 2000). Instead, neurobiological factors contribute to the development of the disorder (Tannock & Martinussen, 2001). Since the 1990’s, advances in imaging techniques and genetics have changed today’s view of AD/HD. Imaging techniques are now allowing scientists to unlock the secrets of the brain; and, consequently, to identify malfunctioning brain regions or processes that are involved in AD/HD.

**NEUROBIOLOGICAL CAUSES**

The causes and origins of AD/HD are not totally clear. However, research shows that several factors may be involved in the development of the disorder. Impairment in a variety of networks in a number of different parts of the brain, rather than a lesion in one particular part of the brain, has been implicated (Brown, 2002). Primarily, brain regions that may be affected include the prefrontal cortex and the basal ganglia (Goldberg, 2001). These brain structures help us inhibit behavior, sustain attention, and control our mood. Other neurobiological factors that have been studied include genetics, malfunctioning
neurotransmitters or chemicals in the brain, as well as structural and functional
differences (Tannock & Martinussen, 2001).

**Genetic Transmission**

AD/HD is one of the most inheritable disorders (Barkley, 1998). Recently,
scientists found a region on chromosome 16 containing a gene or genes that
may increase the risk for developing the disorder (Harvard Mental Health Letter,
2004). Previous studies suggest that there is a 57 percent chance that the
disorder will be genetically transmitted from one generation to another
(Biederman et al., 1995). Often a parent and child are diagnosed at the same
time. In addition, there is 5 to 7 times the risk that another child in the family will
develop the disorder (Barkley, 1998; Castellanos et al., 1996).

**Neurochemical Differences**

Researchers also believe that some symptoms of AD/HD are caused by
problems with neurotransmitters or chemical messengers of the brain. A lack of
production and impairment in the metabolism of neurotransmitters has been
implicated. Specifically, imaging techniques, such as MRIs, show differences in
the development or functions of brain systems modulated by dopamine and
norepinephrine. Both of these neurotransmitters appear to mediate self-
regulation processes including attention and impulse control (Castellanos et al.,
1996).

**Structural Differences**

Although most children who have AD/HD have neurologically normal brain
structures, some studies conducted by the National Institute of Mental Health using brain imaging techniques show a structural difference in the brains of children diagnosed with AD/HD (Castellanos et al., 1996). A normal brain is asymmetrical, with the right hemisphere being larger than the left. In children who have AD/HD, the right hemisphere has been shown to be 5.2% smaller than that of normal controls (Castellanos et al., 1996). These studies suggest that some children who have AD/HD have an abnormally symmetrical brain.

**Other Possible Causes of AD/HD**

Children may have a biological or genetic predisposition that increases their chances of developing AD/HD. Although 75 to 80% of AD/HD can be attributed to genetic factors, 25% of AD/HD is associated with environmental and biological risks such as neonatal hypoxia and exposure to toxic substances. Especially in the early years, both genetic and environmental factors influence neurological development. Therefore, biological factors alone cannot predict whether or not a child develops the disorder. Environmental factors can either protect or increase the likelihood of developing AD/HD. Rather than focusing solely on genetics or biology and thinking in terms of a deficit within the child, it is especially important to tease out psychosocial factors that operate in the child’s behalf. These psychosocial factors may include a positive school environment, parental support, and a well-informed, supportive teacher.

**AD/HD AS A DISORDER OF EXECUTIVE FUNCTIONING**

AD/HD affects self-control, not only in the physical or behavioral realm, but also
in cognitive realms which impact academic adjustment. The cognitive
dysfunctions observed in children who have AD/HD (i.e., poor planning ability or
difficulty in completing tasks) are attributable to underlying neurological control
processes. These control processes, which guide behavior behaviors, emotions
and learning, are known as executive functions (Barkley, 1998; Tannock &
Martinussen, 2001). New research demonstrates that these cognitive problems
are primary rather than secondary features of AD/HD (Tannock & Martinussen,
2001).

How are Executive Control Functions Related to Learning?
Though traditionally not a part of academic instruction, executive functions are
central to learning. The relationship of executive functions to the processes of
learning can be compared to the interaction of a conductor and orchestra
(Levine, 1999; Luria, 1980). There is a cacophony of sounds coming from many
instruments when the orchestra is warming up. In order to produce beautiful
music, the conductor organizes all the players and their respective parts.
Similarly, children who have attention problems may have a conductor whose
performance is inconsistent. On some days, their conductor is able to integrate
and competently conduct the brain systems essential to the beautiful music of
learning, behaving, and relating well to others. While on other days, their
conductor is not able to successfully integrate brain systems essential to learning
and self-regulation (Levine, 1999).

Cognitive Characteristics of AD/HD
Researchers describe executive functioning in different ways. For example, Brown (2001) organized the various executive functions into the following six cognitive abilities:

(1) Activation

This executive function primarily organizes, prioritizes, and activates work. Children who have difficulty in this area may have problems in getting started on tasks, in understanding directions, and in organizing tasks.

(2) Focus

This executive function involves focusing, shifting attention to tasks, and sustaining attention. Children who have problems in this area may have difficulty maintaining focus when listening or planning as well as difficulty remembering what was read. They may be easily distracted by thoughts or environmental stimuli.

(3) Effort

This executive function involves alertness, effort, and processing speed. Children who have difficulty in this area may quickly lose interest in tasks and fail to complete tasks on time. Their efforts to complete tasks may be inconsistent rather than persistent.

(4) Emotion

This executive function modulates emotions and manages frustration. Children who have difficulty in this area are characterized by thoughts and actions which are too greatly influenced by emotions. They have difficulty inhibiting ideas or thoughts, and may overreact to frustration, hurts, or worries.

(5) Working Memory

This executive function refers to the ability to hold information in one’s mind while processing and manipulating it. This ability is required for many complex cognitive activities such as reading comprehension, mental arithmetic, planning, and problem solving. Children who have problems in this area may forget to do planned tasks, lose track of papers and belongings, or have difficulty recalling learned material as well as making associations between stored and new information.
(6) Monitoring and Regulating Action

This executive function refers to the ability to pause and reflect before taking action. It is the ability to be driven more by intention than by impulse. It helps us to consider the demands of a situation along with the rules. It also helps us to delay an immediate reward in order to receive a more meaningful reward at a later point in time. Children who exhibit this executive dysfunction may have difficulties in sitting still and being quiet and in completing tasks too quickly without attention to mistakes. They frequently interrupt others, such as speaking aloud in class, or touch the belongings of others without permission.

Executive functions play a critical role in learning and in adapting to the school environment. However, children do not enter school with these cognitive skills in place. The development of these essential skills takes place over time. The executive skills begin to develop within the first two years of life (Bruner, 1973) and a major thrust in development occurs between ages three and twelve (Bruner, 1973; Tranel, Anderson, and Benton, 1994). The developmental process of acquiring these executive skills has been called “learning how to learn” (Bernstein, 1998).

Oftentimes, children do not receive help in “learning how to learn,” the underlying executive skills that support academic progress. For example, when a child has difficulty with time management, all academic areas are affected. Therefore, when students exhibit attention problems, it is important to not only assess academic skills, but also executive abilities such as organizational skills, memory, and time management. The role of the teacher in facilitating the emergence of these skills is paramount.

IDENTIFICATION OF ATTENTION PROBLEMS, A MULT-FACETED PROCESS
**Teacher Interview and Rating Scales**

The identification of attention problems is a process that requires integrating information from a variety of sources. An interview with the child’s teacher is essential to the diagnostic and intervention process. Information should be gathered regarding both a child’s social and academic development. As a guideline, it is important to note that underachievement and poor acceptance of peers are two hallmarks of AD/HD (American Psychiatric Association, 2000). The teacher can provide specific information regarding the child’s academic performance levels in various subjects. Repeated curriculum-based assessments help measure the child’s knowledge of skills currently being taught. This information can also help determine whether attention problems stem from frustration associated with overly difficult material or academic work that is too easy.

The amount of class work completed compared to the work assigned and the accuracy rates of completed tasks provide a baseline prior to interventions. Comparison should also be made with the completion and accuracy rates of typical students in the classroom. The percentage of assigned versus completed homework and the accuracy rate of homework are also important data to compile.

The teacher may notice a number of behavioral symptoms, which may interfere with learning and social development. On the other hand, she can also provide information about the child’s strengths, as well as successful strategies that may
have been used to facilitate the child’s learning and positive behaviors. Other components of the interview may also focus on peer acceptance, social skills and social interactions. The events that come before (i.e., antecedents) and follow (i.e., consequences) problematic behaviors should also be identified because they may maintain or worsen the behavior. In order to establish whether the behaviors observed and reported by the teacher are developmentally different from those of peers, a teacher rating scale is recommended. Although all children may show, at one time or another, behaviors associated with increased motor activity, impulsivity, and inattention, the teacher rating scale can be used to make comparisons between normal and developmentally inappropriate behaviors.

**Classroom Observations**

In addition to parent and teacher ratings of student behaviors, direct observations by school psychologists are vital to the diagnostic process. These observations provide invaluable information about the frequency and severity of behaviors related to AD/HD. Interestingly, the following behaviors have been found to consistently discriminate between AD/HD and non-AD/HD children: off-task behaviors, gross motor activity and negative vocalizations (DuPaul & Stoner, 2003). Several observations should occur in the same setting for there to be valid estimates of the problematic behaviors.

**Assessing Cognitive Deficits (i.e., Executive Dysfunctions) Associated With Attention Problems**

Most students who have attention deficits also demonstrate underlying problems in executive functioning which disrupt their success in school. The cognitive
impairments associated with executive dysfunction may or may not be seen in combination with hyperactivity/impulsive behaviors. Executive skills are essential to “learning how to learn.” For example, executive functions include such skills as getting started on a task and being able to sustain the effort and attention needed to complete it. Teachers may be asked to complete rating scales, which can provide excellent preliminary information about a number of areas of difficulty including executive dysfunction.

**AD/HD AND ACADEMIC DEFICITS**

When students present with academic and attention problems, it is important to evaluate whether the academic problems are due to AD/HD, a learning disability (LD), or both. The following may be used as a guide in differentiating between AD/HD and academic skill deficits (DuPaul & Stoner, 2003):

1. Children with AD/HD who have both hyperactivity and impulsivity problems along with inattention typically exhibit disruptive behaviors and aggression. Children with LD do not usually exhibit these behaviors.

2. Children with AD/HD usually have more problematic behaviors across environments than do those with LD.

3. When they are observed while doing independent seatwork, children with LD without AD/HD usually exhibit rates of on-task behavior and work completion that are similar to normal classmates.

4. Children who exhibit problems with behavior and attention related to academic deficits usually do not have the early history of hyperactivity and behavior problems associated with AD/HD.

5. Attention problems associated with academic deficits usually emerge in 3rd or 4th grade and only in specific situations such as during academic instruction and/or when completing work in a problematic subject areas. On the other hand, children with
AD/HD usually exhibit AD/HD symptoms across most academic situations.

(6) Children with AD/HD do not differ from their peers on individual academic achievement tests, in contrast to below average scores usually obtained by students with learning deficits.

**GENDER DIFFERENCES IN AD/HD**

Very little research exists regarding gender differences in AD/HD. There is approximately a 3 to 1 ratio of males to females identified with AD/HD (Szatmari, 1992). Current research suggests that girls with the disorder are often overlooked and diagnosed at a later age, because they may not display the typical hyperactive behaviors that draw attention to boys. When girls have both inattentive and hyperactive symptoms, their disorder is more easily recognizable because their behavior appears far from the normative behavior of other girls (Rief, 2003).

On the other hand, a large study (Biederman, Faraone & Mick, 1999) revealed that AD/HD girls are often similar to their male peers. For example, they tend to have social problems, poor family relationships, greater vulnerability to substance abuse than boys and serious learning problems. Approximately 50% of girls with AD/HD also have co-occurring conditions, particularly anxiety, depression and bipolar disorder.

Overall, the majority of girls with AD/HD have symptoms of the inattentive subtype of AD/HD. They tend to be compliant in school and often do not exhibit aggressive and/or disruptive behaviors more common in boys. They may try to
make themselves invisible so that attention will not be drawn to their problems. According to Nadeau, Littman and Quinn (1999), girls with the disorder also tend to have more internal than external symptoms, anxiety and/or depression that accompany the disorder, experience academic problems, peer rejection, and poor self-esteem, and talk excessively rather than move around excessively as seen in hyperactivity.

Oftentimes, girls may display classic as well as gender-specific symptoms of AD/HD. They may present with the following behaviors: shyness, irritability, self-criticism, excessive giggling and “silly behavior,” hypersocial and hyperverbal behaviors, and moodiness. Their symptoms tend to continue and increase during puberty and adolescence. In addition, hormonal influences may worsen symptoms (Rief, 2003).

**AD/HD AND OTHER CONDITIONS**

**Conditions That Look Like AD/HD**

It is important to be able to distinguish between AD/HD symptoms and other symptoms that look like the disorder. For example, two important characteristics of AD/HD, inattention and impulsivity, are also associated with depression and delinquency. AD/HD can also be mistaken for a variety of psychological problems, such as anxiety (situational or biologically-based), child abuse and neglect, post-traumatic stress, mood disorders, and schizophrenia. In addition, AD/HD can also be mistaken for a variety of medical problems (e.g., sleep disorders, thyroid gland malfunctions, lead toxicity, pinworm infestation,
substance abuse, undetected seizures, and medication side effects (e.g., allergy/asthma medication).

**AD/HD and Coexisting Conditions**

Although any condition can occur along with AD/HD, the most common coexisting conditions are Oppositional Defiant Disorder and Conduct Disorder (Goldstein, 2003). Other common disorders that can occur with ADHD include learning disabilities, depression, and anxiety disorders. Twenty to 30 percent of children with AD/HD have learning disabilities (NIMH, 2003). Without intervention, academic problems tend to worsen as the child gets older and more responsibility is placed upon him/her, with less external structure and more multi-step tasks.

**DEVELOPMENTAL COURSE OF AD/HD**

It is important to recognize typical ways in which symptoms of AD/HD emerge at various ages and levels of child development. It is important to remember that having some, but not all symptoms of the disorder can still cause problems at school and require intervention (Brown, 2002).

**Developmental Lag**

Teachers are often the first person to recognize AD/HD symptoms because of their knowledge of attention and self-regulatory behaviors needed to succeed in the classroom. A look at the typical presentation of symptoms at pre-school, middle childhood, and adolescent stages can be helpful, especially when comparisons are made to normal development. According to Barkley, a
developmental lag of approximately 30% has been found in children with AD/HD in the areas of self-control and inhibition (Rief, 2003). For example, a ten year old child with AD/HD may function like a 7 year-old in his ability to inhibit impulses, to control his emotions, and to self-regulate. Although children with AD/HD may lag behind their peers, they will eventually develop in these areas.

**Toddler/Preschool Stage**

Behavioral characteristics of preschool children who may be diagnosed as AD/HD often include: excessive activity; noncompliance and possible temper tantrums; difficulty in toilet training; shifting of activities in free play; high activity levels during structured activities; impulsivity; rejection by peers; and stress in the mother-child relationship (Teeter, 1998).

Commonly seen problems with toddlers/preschoolers with AD/HD are the following (Rief, 2003):

- Over activity and restlessness
- Picky eater
- Sleep problems
- Temper tantrums
- Difficulty listening to stories
- Avoidance of fine-motor tasks and writing
- Poor adaptation to changes
- High degree of crying
- Highly impulsive
- Short attention span
- Moodiness
- Speech and language difficulties
- Has trouble following one or two step directions
- Overly sensitive to noise or touch
- Fearless behavior
- Accident prone
- Becomes over-stimulated easily and has trouble calming down
Elementary/Middle Childhood Stage

As academic and social demands increase during this time period, the struggles of students with AD/HD are more apparent. As they strive to master the curriculum and to interact with others, delays in executive functioning complicate their school adjustment further. They may experience difficulty dealing with the many expectations of multiple teachers, organization demands, and heightened responsibilities.

Commonly seen problems of children with AD/HD during the elementary/middle school years are the following (Barkley, 1998; Rief, 2003):

- Restlessness
- Short attention span
- Immaturity
- Difficulty doing homework
- Difficulty accepting responsibility for household chores
- Erratic educational performance
- Incomplete assignments
- Disorganization of materials
- Difficulty with extracurricular group activities such as sports, clubs, music lessons and scouts
- Social rejection
- Aggressive behaviors
- Talkative

High School/Adolescence

Some of the symptoms experienced during earlier childhood years, such as hyperactivity, impulse control and attention span may change during adolescence. Hyperactivity and impulsivity may decline while attention improves. However, these symptoms continue to be a problem in 70 to 80% of AD/HD adolescents. It should be noted that even though some adolescents have few
behaviors associated with AD/HD, their behaviors may be quite debilitating and require intervention.

Commonly seen problems of AD/HD adolescents are the following (Rief, 2003):

- Forgetfulness
- Disorganization
- Difficulty waking up and falling asleep
- Irritability
- Poor planning
- Immaturity
- Academic difficulty
- Bored easily
- Gravitates to high risk behaviors
- Time management issues
- Impulsive
- Social difficulties
- Emotional reactivity

**THE IMPORTANCE OF INTERVENING**

Treatment of children with AD/HD is imperative, because untreated AD/HD can result in many negative, long-term outcomes (e.g., altercations with the law, teen pregnancy, school dropout rates, and early experimentation and use of alcohol and tobacco) (Rief, 2003). In addition, children with AD/HD are at risk for developing Oppositional Defiant Disorder, Conduct Disorder, impaired social relationships, being retained in a grade at least once, and dropping out of school before completion. During the first years of independent driving, AD/HD adolescents are at risk for having four times as many auto accidents and three times as many citations for speeding as young drivers without AD/HD (Rief, 2003). Early intervention and treatment can prevent these common negative
outcomes from occurring. The development of an individualized intervention plan should be a collaborative problem-solving process among teachers, parents, and other school professionals (DuPaul & Stoner, 2003).

**MEDICATION MANAGEMENT**

**Stimulants**

The medications found to be most effective for AD/HD are psychostimulants. These medications increase the arousal level of the central nervous system of children with AD/HD (DuPaul & Stoner, 2003). They improve the ability to focus and they strengthen executive functions such as planning, organizing, and prioritizing (Hallowell & Ratey, 2005). Among the most commonly prescribed stimulant medications used in the treatment of attentional disorders are the following: Ritalin (Methylphenidate), Ritalin LA (Methylphenidate HCl)-extended release capsules, Concerta (Methylphenidate), Dexedrine (dextroamphetamine sulfate), Cylert (magnesium pemoline), and Adderrall XR (mixed amphetamine). Focalin (dexamethylphenidate HCl), a short acting medication, Methylin (Methylphenidate HCl) chewable tablets and Methylin (Methylphenidate HCl) oral solution, have all been recently added to the market.

The most common side effects to stimulant medications are appetite reduction, particularly at lunch, and insomnia, usually with delayed onset of sleep (DuPaul & Stoner, 2003). Other side effects include increased irritability, stomachaches, headaches, and sometimes motor/vocal tics (DuPaul & Stoner, 2003). Teachers should also be aware that some children respond to the medication by being
overly focused (DuPaul & Stoner, 2003). Contrary to popular thinking, increased vulnerability to substance abuse does not appear to be a side effect for children with AD/HD who receive appropriate medication management. In fact, research suggests that appropriate medication management of children who have AD/HD results in fewer incidences of substance abuse as compared to children with AD/HD who do not receive pharmacotherapy (Brown, Dingle & Dreelin, 1997).

Non-Stimulants
In addition to psychostimulants, Strattera is the first non-stimulant medication approved for the treatment of AD/HD. Unlike Ritalin and other stimulants, which work on the neurotransmitter dopamine, Strattera works on the neurotransmitter norepinephrine. Therefore, the insomnia and decreased appetite reported with the stimulants is avoided.

CREATING AN AD/HD FRIENDLY CLASSROOM
In a typical classroom, several students may display executive skill deficits and problems in attention. Intervening on an individual basis is often complicated and time consuming. In contrast, developing classroom-wide procedures can meet the needs of multiple problems in many children. The following classroom-wide strategies may be helpful to all children:

Teacher Style
The performance of children with AD/HD is enhanced by a teaching style that is flexible and accommodating. A teacher who is open to making accommodations to address problems will have more success in dealing with these children. For
example, a flexible teacher might accommodate a child with AD/HD by dividing the assignment into two or three shorter assignments.

Teachers who are successful with AD/HD children are those whose teaching style may reflect the following:

- A steady, unhurried pace of instruction
- A preplanned and organized manner of presenting lessons
- Distribution of the teacher’s attention to include quiet students who do not stand out
- An authoritative approach that reduces conflict by involving the AD/HD student in problem solving.

**Classroom Routines**

In the beginning establishing classroom routines may initially appear time consuming. However, once the routines are learned, teachers report that routines become time savers. Having routines at the beginning and ending of the day can accomplish such things as: (1) handing in homework, (2) getting materials ready for class work, (3) planning for tasks to be accomplished throughout the day, (4) cleaning out and organizing desks periodically (5) making sure students have books and folders necessary for homework and (6) tidying work spaces for the next day (Dawson & Guare, 2004; Dendy, 2000).

**Preventing Homework Struggles**

Homework should encourage children to love and enjoy learning. When AD/HD students are overwhelmed with homework assignments, there is often a negative impact, not only on the child but also on the family. The struggle over homework completion can damage family relationships and cause accompanying feelings of defiance, defeat, and depression in the child. It is important to prevent homework
from becoming a part of the problem rather than a part of the solution.

Students with AD/HD usually have difficulty with homework. The length of time that students with AD/HD need to finish homework should be compared to classmates. The amount of homework should be reduced if the AD/HD student is taking significantly more time and/or is experiencing frustration. If reducing the amount of homework does not improve the situation, the following alternatives can be tried (Dendy, 2000):

1. Allow the AD/HD student to begin homework prior to going home. This will ensure that he or she understands the material.

2. Schedule math and reading homework on alternate days.

3. Allow other ways in which students may demonstrate their understanding of a concept, such as using computers, tape recorders, oral tests or graphs.

4. Homework should help the AD/HD student apply learned knowledge and to be able to transfer learning to new settings.

5. Allow the AD/HD student to have a choice of varying topics for written reports.

6. Homework should be brief and meaningful. It should not be repetitive, boring, or too difficult.

7. Select a student (e.g., “homework captain”) from each table/row in the classroom to be in charge of making sure that homework is collected at the beginning of the day and copied down in their homework agenda before going home.

8. Ask students to copy their homework from the board at the same time the teacher writes the assignments on the board. Writing the assignments on the board slows the teacher down, which allows the student more time to write down the assignments, as well as provides a visual cue.

9. Students should be asked to place completed homework assignments in the same specific spot each day.
Students could have designated folders where their homework can be placed each evening after completion.

Some students may prefer color-coded folders for each subject.

**Classroom Rules**

 Teachers can design classroom rules to help students develop executive skills, particularly those related to inhibition of behavior and self-regulation of affect. In the beginning, the rules need to be taught and practiced. Select approximately three to five rules. State the rules positively, e.g., “When you come into the classroom, check the assignment board and start working quietly.” In addition, rules should be displayed in an important place where everyone can see. Praise should follow compliance with the rules. For mild or infrequent infractions of the rules, it is best to ignore or mildly reprimand the students, e.g. “Remember our rule about raising hands before speaking?” A mild reprimand is generally a reminder of what a student should be doing. Daily or weekly classroom meetings can be used to revise the rules as needed and to solve problems that occur in the classroom. Using a problem solving format to address issues of concern helps to develop executive skills associated with identifying and solving problems.

**Using the Classroom to Develop Executive Skills**

When teachers understand the important connection between executive skill development and learning, they easily integrate this knowledge into their daily instruction of basic concepts. The use of questioning is a good format for
encouraging students to think about the process of thinking, learning, and planning (Dawson & Guare, 2004). For example, teachers can ask the following questions:

- How can you remind yourself to raise your hand before you talk?
- What are some things you can do to keep yourself working on an assignment until it is completed?
- If you have trouble understanding the assignment, what can you do to gain a better understanding of what you need to do?
- Since this is a large assignment, can you write down all the steps you need to follow to complete it?

**Teaching Thinking Skills**

Initially, students may sometimes have difficulty generating alternative problem solving solutions so the teacher may need to give some demonstrations. The solutions can be written on the board and their effectiveness can be evaluated by the students after the solutions have been tried (Dawson & Guare, 2004). In addition, the important skill of time management can be built into the teaching process by having students estimate the amount of time they need to complete tasks as opposed to the actual time used. Reinforcement of accurate estimates should occur.

Another strategy for teaching thinking skills is to have the teacher model “thinking aloud” when there is a problem to be solved (Dawson & Guare, 2004). This method has been recognized as an effective strategy to use when teaching mathematics (Dawson & Guare, 2004). It can also be applied to other subjects (e.g., grammar, projects, or science experiments). Teachers model how they
might think their way through a problem.

**Teaching Study Skills**

Beginning in elementary school, the use of cooperative learning strategies can enhance executive skill development (Dawson & Guare, 2004). Teachers can pair a student who has difficulty completing projects with others who are goal-directed. Through support and modeling, the opportunity to learn executive skills is provided.

In middle school and high school, students are often asked to accomplish work that requires the use of executive skills that have not been learned or developed (Dawson & Guare, 2004). These skills include studying for tests, completing long-term projects and/or organizing long-term writing assignments such as term papers. For example, lengthy projects should be broken down into parts with specific requirements given for each part and due dates assigned for each part.

A written checklist or rubric can be provided as a visual reminder or cue. In addition, students should be closely monitored to make sure they are acquiring the skills.

How to study for tests is another executive skill that needs to be addressed through instruction (Dawson & Guare, 2004). Rather than being just an exercise, students should be tested on the suggested study strategies. In addition, the effectiveness of different study methods should be evaluated on an ongoing basis as students try various methods in preparing for tests.
Classroom Set-Up

There are a number of strategies that a teacher can use in order to help her student with AD/HD learn more effectively. A teacher may want to seat a student next to his/her desk in order to increase attention. However, sometimes the teacher’s desk may provide too many distractions, as it may be the center of activity. Instead, a student may be seated close to the center of instruction, not necessarily next to the teacher’s desk. In the seating arrangement, students should be surrounded by positive role models. In addition, they should be far from noisy and high-traffic areas (e.g., air conditioners). Desks should not be clustered with children facing each other, as it is too distracting, particularly for AD/HD students. A teacher should also have easy access to the classroom and be able to move easily among students. In addition, there should be an informal area in the classroom, with partitions used to divide space. Some students may need extra workspace and/or storage bins to help with organization. Cluttered space should be minimized. Environmental support should also include sensitivity to the students’ need for a drink of water, snack or having to go to the restroom, which may interfere with their learning (Rief, 2003).

Transitions

At times, most AD/HD students have difficulty with transitions such as moving from one class to another, changing activities or subjects of study within the classroom, returning from P.E. to do seat work, and going to lunch or leaving at the end of the day. In general, students with AD/HD experience the most
difficulty when transitioning from unstructured activities (e.g., recess) to structured activities (e.g., math class). Some suggestions to help make transitions occur more smoothly are the following:

1. Allow enough time for transitional activities (e.g., putting away books and papers, sharpening pencils, or generally assembling materials needed for the next phase of instruction).

2. When class starts, help students with AD/HD to transition into work by having activities prepared for them to start as soon as they enter the classroom, (e.g., an activity on the overhead projector that is part of the classroom routine). Vary the “start up” activity by asking questions related to riddles, current events, or fun topics.

3. Praise students who move quickly from one activity to another.

4. Talk with the class about transitions and develop solutions that might be tried and evaluated.

5. Reinforce and reward group compliance by setting up a point system for the whole class. The class can help decide which privileges they might earn, such as free time, quiet talking time, time when the teacher reads a favorite novel, or a class pizza party.

Preventing Discipline Problems in the Classroom

Proactive classroom management is always the best strategy to use in preventing discipline problems with students who have AD/HD. Some preventative strategies are as follows:

- Make an effort to get to know each student. Build rapport and find something you like about each student. Greet students by name when they come into the class.

- Provide routine, structure, and rules that are clear and concise.

- Provide work that is not too difficult relative to a student’s level of academic development.
• Schedule challenging work before less demanding work or fun activities.

• Provide work that does not take too long to complete and/or exceeds the general ability level of most students to sustain attention.

• Provide frequent, direct feedback from the teacher.

• Provide interesting, novel work that creates interest and elicits attention.

• Eliminate work that is perceived as boring, repetitive, and instructionally irrelevant.

• Seat inattentive students away from distractions such as hallways, the pencil sharpener, or an aquarium.

• Avoid overcrowded classrooms whenever possible.

• Communicate behavioral and academic expectations that are explicit and clear.

Organizational Systems

Developing a uniform system in the classroom helps students with AD/HD organize their school work organized, which is often a challenge for these students (Dawson & Guare, 2003). Such classroom routines as writing homework assignments or important information in the same spot on the board every day, and having a “homework bin” or separate bins where students can place their homework assignments at the same time on a daily basis teaches students how to organize their work. In addition, students with AD/HD benefit from being taught how to keep their notebooks organized, how to develop an organized system with color-coded folders for completed/uncompleted homework, how to keep track of their material and how to keep their work space
neat. Teachers may also want to discuss with students ways to organize their materials and study space at home. By teachers helping students learn how to organize their schoolwork, they pave the way for them to be productive at school, as well as have positive experiences.

Although a number of teachers may have specific routines within their own classrooms, these types of routines vary from teacher to teacher. Thus, students with AD/HD are particularly vulnerable during Middle School, when they are exposed to a number of different teachers and varying organizational systems in the classrooms. Some schools have adopted a “grade-wide or school-wide” system for students to make sure that they are able to learn basic organizational skills, and as a result, be more productive in school (Dawson & Guare, 2003).

**Humiliation Control**

Particularly for children with AD/HD and learning difficulties, the fear of being embarrassed in public is paramount throughout the school day (Levine, 1999). Although AD/HD students are admittedly a challenge, teachers need to make every effort to ensure that AD/HD students are not embarrassed publicly due to their developmental deficits. Instead, it is imperative that their strengths or “islands of competence” (Brooks & Goldstein, 2001) be recognized, enhanced, and developed. Focusing on their strengths can often result in improved self-esteem, motivation, and performance at school.

**INTERVENTION STRATEGIES FOR EXECUTIVE DEFICITS**

The following interventions are broad interventions used for a variety of
difficulties related to executive skills. These interventions can be used for AD/HD students of all ages.

**Problems with Impulsivity**

- Behavior management in the classroom to facilitate impulse control, such as functional assessment of behaviors to develop an intensive behavioral intervention plan.

- Develop positive coping strategies to use when frustrated or overwhelmed by stress or academic challenges, such as asking for assistance from adults, relaxation exercises, verbally expressing emotions, generating alternative problem solving interventions.

- Parental consideration of medical management for moderate to severe levels of impulsivity.

- A highly structured classroom with clear rules and behavioral expectations.

- Immediate and consistent consequences for inappropriate behaviors.

- Positive feedback and reinforcement for compliance with classroom expectations.

- Positive reinforcers need to be changed on a frequent basis to reduce boredom.

- Daily or weekly communication between the teacher and parent to promote collaborative planning.

- When reviewing a student’s past inappropriate behavior or poor academic performance, apply problem solving strategies by guiding the child to think of alternative ways to solve past problems, (i.e., “What could you have done to make your paper better?”)

- In order to prevent impulsive behavior, interventions should be implemented when and where behaviors occur.

**Problems with Flexibility and Shifting**
- Problem solving to help the child develop alternative ways to solve problems when stuck on one idea or way of thinking about social or academic issues.

- Help the child anticipate an upcoming change in schedule or routines related to academics.

- Help the child anticipate changes related to people and places.

- The teacher can give a very explicit reminder when it is time to change focus.

- Work directly with the student for the first few steps of the task.

- Implement task sharing with a peer to help support student effort.

**Problems with Emotional Control**

- Use praise generously. Praise the child when he/she does not overreact to events and/or does not exhibit emotional outbursts.

- Provide clear and concise classroom expectations and consequences.

- Make sure to enforce rules consistently.

- Look for signs of frustration. If signs of frustration are observed, immediately place the child in an area where he/she can “cool off” before he/she overreacts.

- Avoid criticizing the student.

- Avoid the use of confrontational techniques.

**Problems with Self-Monitoring**

- Remind the student to assess the quality of his/her work mid-way through the assignment in order to catch careless mistakes and monitor progress toward task completion.

- Have the child grade his/her own work before turning in tests or assignments. Provide extra credit if self-appraisal is correct.

- If a child has problems interpreting social cues or the impact of his behavior on others, guide him/her in developing social problem-solving strategies.
• Discuss various strategies students can use to monitor the quality of their work.

• Provide a simple check-off form outlining work standards and expectations specific to a particular task (e.g., “Did I check spelling and follow directions?”).

**Problems with Initiation or Getting Started**

• Find out if the task is appropriate, both in length and in level of difficulty and adjust accordingly.

• Give additional cues (which may have been missed) related to beginning tasks within a specific time framework.

• Encourage the child to come up with a plan before beginning a task which may include drawing, writing, and visualizing the outcome.

• Determine the baseline level of work production relative to school work and gradually increase production levels in comparison to baseline (e.g., if the student is able to complete 5 addition problems, do not expect the completion of 20).

• Give assignments that can be completed within short time limits. Use a timer to challenge the child to complete the task before it goes off.

• Provide interest by using different modalities and stimulating hands-on activities.

• Break down assignments into smaller components.

**Problems with Working Memory or Holding Onto Information**

• Use multi-sensory techniques to help facilitate the acquisition of new information. For example, techniques such as colors, songs, visual pictures, or movement may be used.

• Mnemonics can be used to enhance retention of materials. For example, “Dear Miss Sally Brown” can help a child remember the main steps in long division: divide, multiply, subtract, and bring down.

• Reduce the number of concepts presented at one time.

• Review previously learned material before introducing new material.
• Relate new material to the student’s experiential base.
• Use concrete examples before teaching abstract examples.

Problems with Planning and Organization

• Have students stop and plan before starting tasks, instead of planning as they go along.
• Guide the student in stating the goals of each assignment, (e.g. to learn long division or word families).
• Teach children how to underline, circle, place asterisks, or highlight important ideas while reading assignments.
• Teach the student how to identify key words, phrases, or key operation signs (in mathematics).
• Divide tasks into parts or stages and estimate the amount of time needed for each stage.
• Teach students how to schedule appropriate breaks while doing longer assignments, rather than using numerous avoidance tactics.
• Develop a homework checklist and teach the child to self-monitor his homework behaviors, such as bringing appropriate materials home and assignments, going to work without being reminded, focusing on the homework and taking scheduled breaks, showing a positive attitude toward homework, and proofreading their work.
• Avoid abrupt changes, which may cause panic and disorganization.

Problems with Organization of Materials

• The teacher should demonstrate how to organize materials in the student’s desk and backpack.
• Schedule a weekly time to organize desks and backpacks.
• The teacher should make sure that enough time is allotted to copy homework assignments into a homework notebook. When possible, homework assignments can be posted on the internet for easy access.
• For older children, provide a binder with headings of due dates for current and future assignments which may include: “Assignments Due Today,” “Assignments Due on Friday” and “Long-Term or Ongoing Assignments.”

• For younger children, color code assignments according to their urgency. For example, students could designate “red hot assignments” that are due the next day.

• Establish a school routine which gives the child predictability and clear expectations on a daily basis.

• Do not accuse students of being “disorganized.” Instead, think about the issue as a problem that needs to be worked on with specific strategies outlined to make improvements.

• Have the teacher sign an assignment notebook to indicate the required homework is properly written down.

• Design a checklist to guide students through independent homework or class assignments. The checklist may include: get out pencil and paper, write the date and your name, read directions, ask teacher if further explanation is needed, do work, and put work in appropriate section of notebook.

• The parents may wish to provide an extra supply of paper and pencils in the classroom with the teacher.

• If possible, an extra set of classroom texts that remain at home would be beneficial.

• Label and store materials in an efficient way so that the child can find them easily.

**INTERVENTIONS TO IMPROVE ATTENTION**

The following interventions are broad interventions used for difficulties related to various types of attention

**Problems with Distractibility**

• Place the child at front of class or close to teacher in order to decrease distractibility level.
• Encourage the use of hands for physical activity (small ball in hand) while concentrating.

• When possible, reduce assignments into small “chunks” or shorten class assignments.

• Provide opportunity for movement. Parents and teachers should allow breaks for homework and class work.

• Seat the child in an area free of distractions at home and at school.

• Keep the child’s work area/desk free of unnecessary materials which may be distracting.

Problems with Focusing on Important Information

• Help the child with developing paraphrasing and summarization skills.

• Give students outlines to help them preview the most important information for future assignments.

• Give students a list of questions which highlight the most important information to be learned from the lecture.

• Place the child at front of class or close to teacher in order to decrease the distractibility level.

• Use verbal cues/key phrases to gain student’s attention such as, “This is important,” “Today, we will cover three important concepts.”

• Connect presentations to students’ experiences/existing information.

• Teach the child how to cross out unimportant information (e.g., word problems containing too many words, too many irrelevant numbers).

• Keep the child’s work area/desk free of unnecessary materials which may be distracting.

• Encourage underlining, highlighting, and circling skills during reading.

Problems with Sustained Attention or Attention Span

• Praise the child whenever he/she sustains attention.

• Use computer software for learning to extend attention.
• Use areas of strong interest in school to improve focus/sustain attention.

• Place the child close to the teacher in order to decrease distractibility and increase the level of attention.

• Give frequent feedback regarding assignment accuracy and progress.

• Use physical proximity (e.g., a tap on child’s desk) to help refocus.

• Provide a variety of modalities to present materials (i.e., use both visual and verbal cues).

INTERVENTIONS TO IMPROVE SOCIAL SKILLS

Encourage the child to get involved with social skills training in order to help increase social cognition and to decrease interpersonal difficulties.

• A functional assessment of behavior could analyze what specific area of social development the child is lacking, particularly in school.

• Try to differentiate whether the child’s social difficulty is a skill deficit (not knowing the skill) or a performance deficit (not using a known skill).

• Open and consistent communication between teacher and parents regarding child’s social difficulties is imperative.

• Encourage child to participate in social activities in which a child is likely to succeed and like.

References


McCandliss, B. (2002, October). *Brain plasticity and AD/HD: What can we learn from reading disabilities?* Paper presented at the annual meeting of the Children and Adults with Attention Deficit Hyperactivity Disorder Convention, Miami Beach, Florida.


RECOMMENDED READINGS


Silver Springs, MD: Advantage Books.


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**CREDIBLE INTERNET RESOURCES**

[www.nimh.nih.gov](http://www.nimh.nih.gov)- National Institute of Mental Health website, the lead Federal agency for research on mental and behavioral disorders.

[www.kidsmentalhealth.org](http://www.kidsmentalhealth.org)- Center for the Advancement of Children’s Mental Health (CACMH) website. Founded at Columbia University and committed to identifying best practices to effectively treat children’s mental health.
www.chadd.org - Children and adults with Attention-Deficit/Hyperactivity Disorder website, a non-profit organization aimed at helping parents and their children with ADHD.

www.nami.org - National Alliance for the Mentally Ill website, a nonprofit advocacy organization for individuals with mental illnesses.

www.ncgiadd.org - The National Center for Gender Issues and ADHD website.

www.apa.org - American Psychological Association website, a national organization which promotes health and education to the public.

www.ldonline.org - Website on learning disabilities for parents, teachers and professionals.

www.SparkTop.org - Website made by Schwab Learning, for children who have different learning disabilities.

www.allkindsofminds.com - All Kinds of Mind was founded by Dr. Mel Levine and Charles Schwab in order to help children in school become more successful learners. Informational website to help children who struggle with learning.

www.addresource.com - informational website which focuses on issues related to the ADHD/LD community.

www.borntoexplore.org - informational website which focuses on issues related to ADHD.

www.addwarehouse.com - website on mail order and online catalogue of ADHD resources.

www.SchwabLearning.org - informational website/guide for parents to help them with children who have learning difficulties and ADHD.

CREDIBLE INTERNET RESOURCES
ADHD INFORMATION PUBLISHED BY PHARMACEUTICAL COMPANIES

www.strattera.com

www.alliantpharma.com