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# An ADHD Primer

A combination of medication and behavioral interventions tends to yield the greatest improvement in social skills and school performance for students with ADHD.

By George J. DuPaul and George P. White

**A**DHD is a disruptive behavior disorder characterized by levels of inattention, impulsivity, and overactivity that are well beyond what is expected and appropriate for a given student's sex and age. Students with ADHD may have difficulty concentrating on schoolwork, frequently interrupt conversations or activities, and have difficulty remaining seated when required to do so.

Approximately 3%–7% of school-age children in the United States have this disorder. Children with ADHD typically first exhibit symptoms of this disorder during their preschool or early elementary school years, and it is highly likely that these symptoms will continue throughout their lives. Boys are three times more likely to be diagnosed with ADHD than girls.

There are three subtypes of ADHD: individuals who exhibit problems only with inattention and concentration (ADHD Predominantly Inattentive Type); individuals who exhibit problems only with hyperactivity and impulsivity (ADHD Predominantly Hyperactive-Impulsive

Type); and individuals who exhibit problems in both areas (ADHD Combined Type). ADHD is not a learning disability nor is it a manifestation of bad parenting or an impoverished environment; however, other behavioral and emotional problems and many learning disorders include symptomatic behaviors that may mimic ADHD. A trained mental health professional must conduct a thorough evaluation to ensure an accurate diagnosis.

## Possible Causes

It is likely that students differ with respect to the specific underlying cause of their ADHD symptoms. There is growing evidence that these symptoms are at least partially caused by genetic factors. Specifically, the brains of individuals with and without ADHD may differ with respect to the balance of certain chemicals, referred to as *neurotransmitters*, as well as the size and operation of specific brain components such as the prefrontal cortex. Further, other biological factors such as pregnancy and birth complications and

environmental toxins (e.g., early lead exposure and prenatal exposure to alcohol and tobacco smoke) are thought to cause ADHD symptoms in some individuals.

Although genetic and biological factors account for ADHD symptoms to a large degree, environmental factors—such as the nature of classroom tasks and the behavior management style at home and school—also affect the expression of the disorder. Although these factors do not directly cause ADHD, they can make symptoms better or worse. In general, it is best to view this disorder as having both biological and environmental influences, thereby indicating that both medical and psychosocial treatments could be helpful.

## Characteristics

The inattentive, impulsive, and hyperactive behaviors that compose ADHD often lead to significant academic and social difficulties that affect how a student functions at home and at school. Students with ADHD frequently do not achieve their academic potential, may be at higher than average risk for grade retention and school drop out, and are less likely to pursue postsecondary education. Because achievement problems are highly related to rates of inattention and disruptive behavior, the academic underachievement of students with ADHD most

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likely represents a performance problem rather than an ability deficit. About 25% of children with ADHD also have learning disabilities.

Individuals with ADHD typically have difficulties making and keeping friends, primarily because of their higher levels of verbal and physical aggression. Family relationships can become problematic because students with ADHD are less likely to follow through on parental directives and are more likely to argue with adults. Approximately 50%–60% of individuals with ADHD exhibit significant symptoms of other disruptive behavior disorders including oppositional defiant disorder (ODD) and conduct disorder (CD). Thus, interventions not only must address ADHD-related behaviors but also must focus on improving academic and behavioral functioning.

### School Inspections

Although most students with ADHD experience many difficulties in elementary school, these problems typically increase and worsen in middle level and high schools because of unique secondary school practices. Specifically, secondary school students must learn the expectations and meet the standards of multiple teachers. In addition, they must coordinate a more complex time schedule that involves changing classes frequently throughout the day and the year. Further, there is a greater emphasis on independently completing long-term assignments and more freedom to organize materials and prepare homework assignments. The peer group becomes particularly important for secondary school students, which potentially compounds the social relationship problems associated with ADHD. Finally, students are expected to develop

long-term goals and develop career interests. Because of their impulsivity, students with ADHD typically focus on the present and have great difficulty realistically envisioning their long-term future. Multiple intervention strategies must be used across the secondary school years to address these difficulties.

### Effective Interventions

The two most effective interventions for reducing the symptomatic behaviors of ADHD are central nervous system (CNS) stimulant medications and behavior modification procedures. Although most adolescents respond positively to medication, the combined use of medication and behavioral interventions tends to yield the greatest improvement in their social skills and school performance.

**Medication.** CNS stimulants include methylphenidate (Ritalin,

## CASE STUDY

Barry, a 12-year-old seventh-grader, was diagnosed with ADHD-Combined Type when he was in the second grade and experienced chronic difficulties with inattentive, impulsive, and highly active behavior throughout most of his school career. Since elementary school, Barry received a psychostimulant medication, methylphenidate, to reduce his ADHD symptoms. Although this treatment was effective in helping Barry control his attention and behavior in the classroom, he continued to have problems organizing his materials, keeping track of assignments, and being prepared for class.

His middle school team met with the school psychologist and guidance counselor to discuss how to help Barry with his organizational skills. They decided to use a self-monitoring strategy that would help Barry track his class preparation activities (e.g., being in his seat when class began, stopping other activities when class instruction started, having pen or pencil on his desk, having a notebook or textbook available and open, and completing homework). A checklist of these behaviors was created for this purpose. The school psychologist met with Barry before school on three occasions to help him with organizational skills, train him to use the self-monitoring procedures, and provide him with an opportunity to practice the specific skills. As part of the training, Barry was taught to set goals with respect to being prepared for class and to evaluate how well he met these goals on a daily basis.

When training was complete, Barry first used the self-monitoring strategy in the subject area he had the most difficulty with: English. For the two weeks before beginning to use the self-monitoring strategy, Barry's English teacher indicated that he had successfully completed about 53% of the required class preparation behaviors. After the second day of self-monitoring training, Barry increased his completion rate to 75%. Within a few days of using this strategy, Barry met 100% of the expected behaviors. Barry's other team teachers helped him use these skills in all of his classes. Given his consistent performance, the school team decided to phase out the self-monitoring checklist with the expectation that Barry would continue to monitor his behavior on a less formal basis. Barry remained relatively consistent in being prepared for his classes for the remainder of the year.

This case study demonstrates the effectiveness of combining a medical intervention, which for Barry was methylphenidate, with a classroom-based strategy, such as self-monitoring, to treat students with ADHD. One important element in Barry's success was the unified and consistent support of his entire team of teachers. Because ADHD is a chronic disorder, it should be assumed that students like Barry will require a combination of interventions throughout their school years.

Concerta, Metadate), dextroamphetamine (Dexedrine), and mixed amphetamine compound (Adderall). Numerous studies have found that stimulants enhance attention, reduce impulsive behavior, and increase academic productivity among the majority of children and adolescents who are treated. For the most part, side effects are relatively benign and include appetite reduction, insomnia, headaches, and stomachaches. In very rare cases, motor or vocal tics may develop. Contrary to popular lore, stimulants are just as effective for adolescents as they are for younger children with ADHD. Further, adolescents who are treated with stimulant medication are at no higher risk for substance abuse than are untreated individuals. In fact, some research indicates that medicated students are less likely to abuse substances than students with ADHD who are not receiving medication (Wilens, Faraone, Biederman, & Gunawardene, 2003). There are anecdotal reports of adolescents possibly abusing stimulant medications, presumably after obtaining the latter from students with ADHD, so it may be prudent to have a school nurse or administrator dispense medication during the school day and to include these drugs as part of the school's overall drug and alcohol policy.

Several other psychotropic medications are available for those children who do not respond to stimulants or who experience significant side effects. These include atomoxetine (Strattera), bupropion (Wellbutrin), and clonidine (Catapres). The response to medication varies among individuals and requires ongoing monitoring to determine the optimal medication and dosage. Further, medication should always be used in combination with academic and behavioral interventions. It is advisable to have the school nurse and the school psychologist stay current with research related to med-

## Strategies for Students With ADHD

The most effective strategies for promoting school success in students with ADHD include both proactive strategies/procedures that are implemented before the student becomes disruptive or experiences failure and reactive approaches/procedures that are used after a student exhibits a specific behavior.

- ¥ The most effective reactive procedure is a written behavioral contract that specifies what the student is expected to do (i.e., responsibilities) and what the student will get if responsibilities are met (i.e., privileges at home or school).
- ¥ Whenever possible, students with ADHD should be taught to monitor and evaluate their own behavior, particularly if they have been successful with more intrusive interventions, such as medication or behavioral contracts.
- ¥ Classroom interventions for students with ADHD are most effective when implemented in schools that employ schoolwide behavior support plans for all students.
- ¥ Instruction in effective ways to take notes, study for tests, and complete homework should be provided either during or after school.
- ¥ Students with ADHD typically do not understand the connection between their school performance and their long-term futures. In-school group sessions coordinated by a school counselor or a school psychologist can help students understand their aptitudes and interests, develop long-term goals, and appreciate the importance that school success will have in meeting their long-term goals.

## Identifying Students With ADHD

Students should be evaluated for possible ADHD if they exhibit chronic (for more than six months) problems with inattention, impulsivity, or excessive physical activity.

- ¥ No single test, questionnaire, or source of information (parent, teacher, or student) is sufficient for the accurate diagnosis of ADHD. Current best practice in evaluating students for ADHD requires the use of multiple assessment methods and sources of information that include diagnostic interviews with parents, teachers, and students; behavior rating scales that are completed by parents and teachers; and data (e.g., report card grades and test scores) that indicate whether a student is impaired by ADHD symptoms.
- ¥ Psychologists or physicians conducting ADHD assessments must ensure that diagnostic decisions are made based on DSM-IV criteria and should also consider alternative hypotheses for a student's inattentive, impulsive, and hyperactive behavior (e.g., symptoms caused by other learning, behavioral, or emotional disorders).
- ¥ The diagnostic decision must take into account all relevant information from the student's school, home, and community sources. The diagnosis should never be made without input from both parents and teachers.
- ¥ The evaluation should not end with the diagnosis but rather should lead to the design of effective interventions. This type of assessment considers environmental factors that trigger and reinforce specific behaviors.
- ¥ Assessment information should be collected periodically to determine whether interventions are working and whether changes in treatment are necessary.



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ication and provide information to other staff members about this topic.

**Behavioral interventions.** There are two types of behavioral interventions—classroom and schoolwide—that can be implemented in secondary school settings. Classroom behavioral interventions involve systematic changes to antecedent events—activities occurring prior to a target behavior—or consequent events—activities that follow a target behavior. The most effective treatment plans are those that include a balance between antecedent-based and consequence-based procedures. Such interventions as behavioral contracts (e.g., earning privileges for appropriate school behavior) are particularly effective when they are used consistently in both the home and the school settings. There is some evidence that self-monitoring and self-evaluation strategies can be effective for adolescents with less severe ADHD symptoms. Self-monitoring may be particularly helpful in enhancing organization skills.

Schoolwide positive behavior support plans have the advantage of helping all students, not just those with ADHD, comply with school rules and engage in appropriate social interactions. Typically, these plans include a three-tiered disciplinary model ranging from schoolwide strategies for all students, specialized group strategies for at-risk students, and individualized interventions for students exhibiting high-risk behavior. Because of the severity of their behavior difficulties, students with ADHD may require the full range of interventions in this model. Other treatments that may benefit students with ADHD include academic interventions (e.g., direct instruction in areas of deficit) and training in note taking, study skills, and test-taking strategies.

**Accommodations**

The diagnosis of ADHD does not by itself qualify a student for special education services. However, many

students with ADHD will meet criteria for an educational disability (such as being other health impaired or having a learning disability or a social-emotional disorder) and may benefit from the services of special education to address learning and behavior factors that interfere with school performance. If academic progress is limited or behavioral difficulties are present, parents or school personnel can request an evaluation by the special education team to determine eligibility and the need for these services.

Section 504 plans may also benefit some students with ADHD. Federal law mandates these plans for individuals with a physical or mental impairment that interferes with a major life activity, such as learning. A 504 plan for a student with ADHD might provide extra time (or no time limits) during testing or testing in a quiet space to compensate for distractibility. Again, if learning or behavior problems interfere with the school progress of a child with ADHD, parents or school personnel can request that the school provide a Section 504 evaluation.

### Summary

Throughout the course of an academic year, principals must deal with many issues that affect the lives of students. The more that principals know about the unique characteristics of different populations, the better they will be prepared to provide an environment that serves all students. Principals should work with school nurses, school psychologists, and the special education staff to gather additional information about ADHD. PL

### Reference

□ Wilens, T. E., Faraone, S. V., Biederman, J., & Gunawardene, S. (2003). Does stimulant therapy of Attention Deficit/Hyperactivity Disorder beget later substance abuse? A meta-analytic review of the literature. *Pediatrics*, *111*(1), 179–185.

## ADHD Resources

### Print:

- *ADHD in the schools: Assessment and intervention strategies* (2nd ed.). G. DuPaul & G. Stoner. 2003. New York: Guilford.
- *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). R. Barkley. 1998. New York: Guilford.
- *Behaviorally effective school environments*. M. Shinn, H. Walker, & G. Stoner (Eds.). 2002. Bethesda, MD: National Association of School Psychologists.
- *An ADHD Primer*. L. Weyandt. 2001. Boston: Pearson, Allyn, and Bacon.
- Efficacy of a school-based treatment program for middle school youth with ADHD. S. Evans, J. Axelrod, & J. Langberg. 2004. *Behavior Modification*, *28*, 528–547.
- *Helping the Student With ADHD in the Classroom*. Bethesda, MD: National Association of School Psychologists. Retrieved July 15, 2004, at [www.naspcenter.org/pdf/special%20needs%20template.pdf](http://www.naspcenter.org/pdf/special%20needs%20template.pdf)
- *Homework success for children with ADHD: A family-school intervention program*. T. Power, J. Karustis, & D. Habboushe. 2001. New York: Guilford.
- *Taking charge of ADHD: The complete, authoritative guide for parents* (rev. ed.). R. Barkley. 2000. New York: Guilford.

### Internet:

Challenging Horizons, <http://chprogram.jmu.edu>  
National Resource Center on ADHD, [www.help4adhd.org](http://www.help4adhd.org).

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