Viesia Novosielski

Self-Portrait. Acrylic on rag paper. 30 × 22 in.
Learners with Attention Deficit Hyperactivity Disorder

Let me see if Philip can
Be a little gentleman.
Let me see, if he is able
To sit still for once at table;
Thus Papa bade Phil behave;
And Mamma look’d very grave.
But fidgety Phil,
He won’t sit still;
He wriggles
And giggles,
And then, I declare
Swings backwards and forwards
And tilts up his chair,
Just like any rocking horse;
“Philip! I am getting cross!”
See the naughty restless child
Growing still more rude and wild
Till his chair falls over quite.
Philip screams with all his might.
Catches at the cloth, but then
That makes matters worse again.

Down upon the ground they fall.
Glasses, plates, knives, forks and all.
How Mamma did fret and frown
When she saw them tumbling down!
And Papa made such a face!
Philip is in sad disgrace.
Where is Philip, where is he?
Fairly cover’d up you see!
Cloth and all are lying on him;
He has pull’d down all upon him.
What a terrible to-do!
Dishes, glasses, snapt in two!
Here a knife, and there a fork!
Philip, this is cruel work.
Table all so bare, and ah!
Poor Papa, and poor Mamma
Look quite cross, and wonder how
They shall make their dinner now.

HEINRICH HOFFMANN
“The Story of Fidgety Philip”
Fidgety Phil, the character in the poem by the German physician Heinrich Hoffmann (see p. 000) is generally considered one of the first allusions in Western literature to what today is referred to as attention deficit hyperactivity disorder (ADHD) (Barkley, 1998). Phil’s lack of impulse control bears an uncanny similarity to today’s conceptualization of ADHD as not so much a matter of inattention as primarily a matter of regulating one’s behavior. We discuss this conceptualization more fully later, but it is also important to point out here that Phil’s excessive motor activity, or hyperactivity, may be characteristic of many children with ADHD, but not all. Interestingly, Hoffman also wrote another poem, “The Story of Johnny Head-in-Air,” about a child who fits to a tee children with ADHD who do not have problems with hyperactivity.

The fact that the condition was recognized as early as the mid-nineteenth century, albeit only in the form of a “poetic case study,” is important. Today, ADHD is often the subject of criticism, being referred to as a “phantom” or “bogus” condition—sort of a fashionable, trendy diagnosis for persons who are basically lazy and unmotivated. Such thinking is probably behind some of the reasons why ADHD is not recognized as its own separate category (as are mental retardation, learning disabilities, and so forth) by the U.S. Department of Education; students with ADHD are served by special education under the category of “other health impaired.”

Although there are undoubtedly a few persons who hide behind an inappropriate diagnosis of ADHD, evidence indicates that the condition is extremely real for those who have it. And as we point out in the next section, ADHD is not a recently “discovered,” trendy diagnosis.

**Brief History**

In addition to Hoffmann’s account of Fidgety Phil, published in the mid-nineteenth century, we have more scientific evidence of the existence of ADHD, dating back to the beginning of the twentieth century.

**STILL’S CHILDREN WITH “DEFECTIVE MORAL CONTROL”**

Dr. George F. Still, a physician, is credited with being one of the first authorities to bring the condition we now call ADHD to the attention of the medical profession. Still delivered three lectures to the Royal College of Physicians of London in 1902 in which he described cases of children who displayed spitefulness, cruelty, disobedience, impulsivity, and problems of attention and hyperactivity. He referred to them as having “defective moral control.” Moral control involves inhibitory volition—the ability to refrain from engaging impulsively in inappropriate behavior:

> Volition, in so far as it is concerned in moral control, may be regarded as inhibitory; it is the overpowering of one stimulus to activity—which in this connection is activity contrary to the good of all—by another stimulus which we might call the moral idea, the idea of the good of all. There is, in fact, a conflict between stimuli, and in so far as the moral idea prevails the determining or volitional process may be regarded as inhibiting the impulse which is opposed to it. (Still, 1902, p. 1088)

Although Still’s words are almost a century old, they still hold currency. For example, one of the most influential current psychological theories is based on the notion that the essential impairment in ADHD is a deficit involving behavioral inhibition (Barkley, 1997, 1998).
### MISCONCEPTIONS ABOUT

#### Learners with Attention Deficit Hyperactivity Disorder

<table>
<thead>
<tr>
<th>MYTH</th>
<th>FACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>All children with ADHD are hyperactive.</td>
<td>Psychiatric classification of ADHD includes (1) ADHD, Predominantly Inattentive Type, (2) ADHD, Predominantly Hyperactive-Impulsive Type, or (3) ADHD, Combined Type. Some children with ADHD exhibit no hyperactivity and are classified as ADHD, Predominantly Inattentive.</td>
</tr>
<tr>
<td>The primary symptom of ADHD is inattention.</td>
<td>Although the psychiatric classification includes an Inattentive Type, recent conceptualizations of ADHD place problems with behavioral inhibition and executive functions as the primary behavioral problems of ADHD.</td>
</tr>
<tr>
<td>ADHD is a fad, a trendy diagnosis of recent times with little research to support its existence.</td>
<td>Reports of cases of ADHD go back to the mid-nineteenth century and the beginning of the twentieth century. Serious scientific study of it began in the early and mid-twentieth century. There is now a firmly established research base supporting its existence.</td>
</tr>
<tr>
<td>ADHD is primarily the result of minimal brain injury.</td>
<td>In most cases of ADHD there is no evidence of actual damage to the brain. Most authorities believe that ADHD is the result of neurological dysfunction, which is often linked to hereditary factors.</td>
</tr>
<tr>
<td>The social problems of students with ADHD are due to their not knowing how to interact socially.</td>
<td>Most persons with ADHD know how to interact, but their problems with behavioral inhibition make it difficult for them to implement socially appropriate behaviors.</td>
</tr>
<tr>
<td>Using psychostimulants, such as Ritalin, can easily turn children into abusers of other substances, such as cocaine and marijuana.</td>
<td>There is no evidence that using psychostimulants for ADHD leads directly to drug abuse. In fact, there is evidence that those who are prescribed Ritalin as children are less likely to turn to illicit drugs as teenagers. However, care should be taken to make sure that children or others do not misuse the psychostimulants prescribed for them.</td>
</tr>
<tr>
<td>Psychostimulants have a “paradoxical effect” in that they subdue children rather than activate them. Plus, they have this effect only on those with ADHD.</td>
<td>Psychostimulants, instead of sedating children, actually activate parts of the brain responsible for behavioral inhibition and executive functions. In addition, this effect occurs in persons without ADHD, too.</td>
</tr>
<tr>
<td>Because students with ADHD react strongly to stimulation, their learning environments should be highly unstructured in order to take advantage of their natural learning styles.</td>
<td>Most authorities recommend a highly structured classroom for students with ADHD, especially in the early stages of instruction.</td>
</tr>
<tr>
<td>ADHD largely disappears in adulthood.</td>
<td>Authorities now hold that about two-thirds of children diagnosed with ADHD in childhood will continue to have the condition as adults.</td>
</tr>
</tbody>
</table>
Still’s cases were also similar to today’s population of persons with ADHD in at least five ways:

1. Still speculated that many of these children had mild brain pathology
2. Many of the children had normal intelligence
3. The condition was more prevalent in males than females
4. There was evidence that the condition had a hereditary basis
5. Many of the children and their relatives also had other physical problems, such as depression and tics

We return later to Barkley’s theory and to the above five points. Suffice it to say here that Still’s children with “defective moral control” today would very likely be diagnosed as having ADHD by itself, or ADHD with conduct disorder. (Conduct disorder, which we discuss more fully in Chapter 7, is characterized by a pattern of aggressive, disruptive behavior.)

**GOLDSTEIN’S BRAIN-INJURED SOLDIERS OF WORLD WAR I**

Kurt Goldstein reported on the psychological effects of brain injury in soldiers who had suffered head wounds in combat in World War I. Among other things, he observed in his patients the psychological characteristics of disorganized behavior, hyperactivity, perseveration, and a “forced responsiveness to stimuli” (Goldstein, 1936, 1939). Perseveration, the tendency to repeat the same behaviors over and over again, is often cited today by clinicians as a characteristic of persons with ADHD. Goldstein found that the soldiers’ forced responsiveness to stimuli was evident in their inability to concentrate perceptually on the “figure” without being distracted by the “ground.” For example, instead of focusing on a task in front of them (the figure), they were easily distracted by objects on the periphery (the background).

**THE STRAUSS SYNDROME**

Goldstein’s work laid the foundation for the investigations of Heinz Werner and Alfred Strauss in the 1930s and 1940s. Having emigrated from Germany to the United States after Hitler’s rise to power, they teamed up to try to replicate Goldstein’s findings. Werner and Strauss noted the same behaviors of distractibility and hyperactivity in some children with mental retardation.

In addition to clinical observations, Werner and Strauss also used an experimental task consisting of figure/background slides presented at very brief exposure times. The slides depicted figures (e.g., a hat) embedded in a background (e.g., wavy lines). They found that the children with supposed brain damage, when asked what they saw, were more likely than those without brain damage to say they had seen the background (e.g., “wavy lines”) rather than the figure (e.g., “a hat”) (Strauss & Werner, 1942; Werner & Strauss, 1939, 1941). After these studies, professionals came to refer to children who were apparently hyperactive and distractible as exhibiting the Strauss syndrome.

**CRUICKSHANK’S WORK**

William Cruickshank, using Werner and Strauss’s figure/background task, found that children with cerebral palsy were also more likely to respond to the background rather than the figure (Cruickshank, Bice, & Wallen, 1957). There were two important ways in which this research extended the work of Werner and Strauss. First, whereas Werner and Strauss had largely assumed that their children were brain damaged, Cruickshank’s children all had cerebral palsy—a condition that is relatively easy to diagnose. Cerebral palsy is characterized by brain damage that results in impairments in movement (see Chapter 12). Second, the children studied were largely of normal intelligence, thus demonstrating that children without mental retardation could display distractibility and hyperactivity.
Cruickshank is also important historically because he was one of the first to establish an educational program for children who today would meet the criteria for ADHD. (We discuss his educational program later in the chapter.) At the time (the late 1950s), however, many of these children were referred to as “minimally brain injured.”

MINIMAL BRAIN INJURY AND HYPERACTIVE CHILD SYNDROME

At about the same time as Cruickshank’s extension of Werner and Strauss’s work to children of normal intelligence, the results of a now classic study were published (Pasamanick, Lilienfeld, & Rogers, 1956). This study of the aftereffects of birth complications revived Still’s notion that subtle brain pathology could result in behavior problems, such as hyperactivity and distractibility. Professionals began to apply the label of minimal brain injury to children who were of normal intelligence but who were inattentive, impulsive, and/or hyperactive. Although popular in the 1950s and 1960s, the label of minimal brain injury fell out of favor, with professionals pointing out that it was difficult to document actual tissue damage to the brain (Birch, 1964).

Minimal brain injury was replaced in the 1960s by the label “hyperactive child syndrome” (Barkley, 1998). Hyperactive child syndrome was preferred because it was descriptive of behavior and did not rely on vague and unreliable diagnoses of subtle brain damage. This label’s popularity extended into the 1970s. By the 1980s, however, it too had fallen out of favor as research began to point out that inattention, and not hyperactivity, was the major behavioral problem experienced by these children. In fact, some exhibited attention problems without excessive movement.

This recognition of inattention as more important than hyperactivity is reflected in today’s definition of ADHD and its immediate predecessors. However, as we discuss later, some authorities are now recommending that deficits in behavioral inhibition replace inattention as the primary deficit in ADHD. In any case, most authorities do not view hyperactivity as the primary deficit in ADHD.

Definition

Most professionals rely on the American Psychiatric Association’s (APA’s) Diagnostic and statistical manual of mental disorders (DSM) for the criteria used to determine whether an individual has ADHD. Over the years, researchers and practitioners have debated whether ADHD was a single syndrome or whether there were subtypes. Partly as a result of this debate the name for the condition has changed from time to time. For example, for several years the APA used the general term attention deficit disorder (ADD) to refer to all people with the condition. It then allowed for the subtypes of ADD with Hyperactivity and ADD without Hyperactivity.

The current DSM uses ADHD as the general term and subdivides individuals into: (1) ADHD, Predominantly Inattentive Type; (2) ADHD, Predominantly Hyperactive-Impulsive Type; and (3) ADHD, Combined Type (American Psychiatric Association, 2000). See Table 6.1.

Prevalence

ADHD is widely recognized as one of the most frequent reasons, if not the most frequent reason, why children are referred for behavioral problems to guidance clinics. From one-third to one-half of cases referred to guidance clinics are for ADHD (Richters et al., 1995). Most authorities estimate that from 3 to 5 percent of the school-age population have ADHD (National Institutes of Health, 1998). However, because ADHD is not recognized...
TABLE 6.1 Diagnostic Criteria for Attention Deficit Hyperactivity Disorder

A. Either (1) or (2):
   (1) 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**
   (a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
   (b) often has difficulty sustaining attention in tasks or play activities
   (c) often does not seem to listen when spoken to directly
   (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
   (e) often has difficulty organizing tasks and activities
   (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
   (g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
   (h) is often easily distracted by extraneous stimuli
   (i) is often forgetful in daily activities
   (2) six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:
   **Hyperactivity**
   (a) often fidgets with hands or feet or squirms in seat
   (b) often leaves seat in classroom or in other situations in which remaining seated is expected
   (c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
   (d) often has difficulty playing or engaging in leisure activities quietly
   (e) is often “on the go” or often acts as if “driven by a motor”
   (f) often talks excessively
   **Impulsivity**
   (g) often blurts out answers before questions have been completed
   (h) often has difficulty awaiting turn
   (i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).

D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

**Code based on type**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>314.01</td>
<td>Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months</td>
</tr>
<tr>
<td>314.00</td>
<td>Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if Criterion A1 is met but Criterion A2 is not met for the past 6 months</td>
</tr>
<tr>
<td>314.01</td>
<td>Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type: if Criterion A2 is met but Criterion A1 is not met for the past 6 months</td>
</tr>
</tbody>
</table>

*Coding note: For individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, “In Partial Remission” should be specified.

Because ADHD is such a prevalent condition, one would think that it would be relatively easy to find out how many students with ADHD receive special education services. Federal law, after all, requires that schools report how many students with a given disability have been identified for special education services. However, when Public Law 94–142 (the Education for All Handicapped Children Act) was passed in 1975, ADHD was not included as one of the separate categories of special education. This was due in part to two interrelated factors: (1) the research on this condition was still in its infancy, and (2) the advocacy base for children with ADHD was not yet well developed. For example, the Diagnostic and Statistical Manual of Mental Disorders in effect at the time, the DSM-II (American Psychiatric Association, 1968), was vague in its criteria for identifying children with these problems. And the major advocacy organization for people with ADHD, CHADD (Children and Adults with Attention Deficit Disorder) was not founded until 1987.

By the time of the reauthorization of the law as the Individuals with Disabilities Education Act (IDEA) in 1990, however, there was substantial research on ADHD, and CHADD's membership was well on its way to its present level of 22,000 members. CHADD lobbied hard for ADHD to be considered a separate category, arguing that children with ADHD were being denied services because they could qualify for special education only if they also had another disability, such as learning disabilities or emotional disturbance. Their lobbying was unsuccessful. However, the U.S. Department of Education, in 1991, determined that students with ADHD would be eligible for special education under the category other health impaired (OHI) “in instances where the ADD is a chronic or acute health problem that results in limited alertness, which adversely affects educational performance.” And students with ADHD can also qualify for accommodations under another law (Section 504).

Many professionals are still disappointed with the decision not to include ADHD as a separate category because they say that using the OHI category is too roundabout a means of identification, and Section 504 is not completely satisfactory because it does not require an individualized education program (IEP). (See pp. 00–00 in Chapter 1 for a discussion of IEPs.)

However, the growth of the OHI category since 1991 suggests that more and more students with ADHD are being identified as OHI (see Figure A). Although numbers in the OHI category have more than tripled in ten years, the 0.35 percent reported for 1998–99 is still well below the prevalence estimates of 3 to 5 percent. Many authorities think that fewer than half of students with ADHD are receiving special education services. As long as ADHD is not recognized as a separate category of special education, however, it will be virtually impossible to know exactly how many school-age children with ADHD are receiving special education services.

FIGURE A
Percentage of students aged 6 to 21 receiving special education services in the category of “other health impaired.”

as a separate category of special education by the U.S. Department of Education, it is difficult to estimate how many students with ADHD are served in special education. (See the box on p. 000.)

ADHD occurs much more frequently in boys than girls, with estimates ranging from about 2.5:1 to 5.1:1 in community-based samples (Barkley, 1998). This has led some to suggest that boys may be overidentified as ADHD and/or that girls may be underidentified as ADHD. They hypothesize that boys tend to exhibit more aggressive behavior, which causes them to be more noticeable. Some gender bias in referral may exist, but our best research evidence suggests that it is not enough to account for the wide disparity in prevalence rates between boys and girls. Gender differences are likely due to constitutional, or biological, differences (Barkley, 1998).

Some critics have asserted that ADHD is primarily a U.S. phenomenon, a result of our society’s emphasis on achievement and conformity. However, statistics do not bear this out. Although it is difficult to compare prevalence rates cross-culturally because of differing diagnostic criteria, sampling techniques, and cultural expectations, the evidence strongly suggests that several countries have prevalence rates at least as high as that of the United States. For example, researchers have found prevalence rates of about 6 percent in Brazil (Rohde et al., 1999), 9 percent for boys and 3.3 percent for girls in Canada (Satzmari, 1992), 6 to 9 percent in China (Leung et al., 1996), 19.8 percent for boys and 12.3 percent for girls in Colombia (Pineda et al., 1999), from 4 to over 10 percent in Germany (Baumgaertel, Wolraich, & Dietrich, 1995; Esser, Schmidt, & Woerner, 1990), about 8 percent in Japan (Kanbayashi, Nakata, Fujiia, Kita, & Wada, 1994), 1 to 2 percent in the Netherlands (Verhulst, van der Ende, Ferdinand, & Kasius, 1997), and 2 to 6 percent in New Zealand (Fergusson, Horwood, & Lynskey, 1993; Schaugency, McGee, Raja, Freehan, & Silva, 1994).

**Assessment**

Most authorities agree that there are three important components to assessing whether a student has ADHD: (1) a medical examination, (2) a clinical interview, and (3) teacher and parent rating scales (Barkley, 1998). The medical examination is necessary in order to rule out medical conditions, such as brain tumors, thyroid problems, or seizure disorders, as the cause of the inattention and/or hyperactivity.

The clinical interview of the parent(s) and the child provides information about the child’s physical and psychological characteristics, as well as family dynamics and interaction with peers. Although essential to the diagnosis of ADHD, clinicians need to recognize the subjective nature of the interview situation. Some children with ADHD can look surprisingly “normal” in their behavior when in the structured and novel setting of a doctor’s office. In fact, researchers have referred to this Jekyll and Hyde–like phenomenon, wherein children who are hyperactive and inattentive at home and school appear to be perfect angels in the physician’s office, as the **doctor’s office effect** (Cantwell, 1979; Sleator & Ullman, 1981).

In an attempt to bring some quantification to the identification process, researchers have developed rating scales to be filled out by teachers, parents, and in some cases, the child. Some of the most reliable and popular are the Conners scales and the ADHD-Rating Scale–IV. There are now several versions of the Conners scale for parents or teachers in use (Conners, 1989a, 1989b, 1997). The ADHD-Rating Scale–IV (DuPaul, Power, Anastopoulos, & Reid, 1998) is based on the *DSM-IV* criteria. Raters, who can be either parents or teachers, rate the child on items pertaining to each of the eighteen criteria listed in the *DSM-IV* (see Table 6.1). For example, for the first item, “Fails to give close attention to details or makes careless mistakes in his/her work,” they rate 0 (never or rarely), 1 (sometimes), 2 (often), or 3 (very often), and so forth. Assessment scales for adults are more recent. An example is the Conners Adult ADHD Rating Scales (Conners, 1999).
The American Academy of Pediatrics has issued clinical practice guidelines for primary care physicians to use in diagnosing and evaluating children for possible ADHD (American Academy of Pediatrics, Committee on Quality Improvement, Subcommittee on Attention-Deficit/Hyperactivity Disorder, 2000). See Table 6.2.

**Causes**

As noted earlier, authorities in the early and mid-part of the twentieth century attributed problems of inattention and hyperactivity to neurological problems resulting from brain damage. When researchers were unable to verify actual tissue damage in cases of ADHD, many professionals soured on the idea that ADHD was neurologically based. However, as noted in our discussion of learning disabilities (see Chapter 5), the invention of neuroimaging techniques such as MRIs, PET scans, and fMRIs in the 1980s and 1990s allowed scientists for the first time to obtain more detailed and reliable measures of brain functioning. Using these techniques, researchers have made great strides in documenting the neurological basis of ADHD. Like learning disabilities, the research indicates that ADHD most likely results from neurological dysfunction rather than actual brain damage. Again like learning disabilities, evidence points to heredity as playing a very strong role in causing the neurological dysfunction, with teratogenic and other medical factors also implicated to a lesser degree.

**AREAS OF THE BRAIN AFFECTED: FRONTAL LOBES, BASAL GANGLIA, AND CEREBELLMUM**

Using neuroimaging techniques, several teams of researchers have found consistent abnormalities in three areas of the brain in persons with ADHD—the frontal lobes, basal ganglia (specifically, the caudate and the globus pallidus), and cerebellum (Aylward et al., 1996; Berquin et al., 1998; Castellanos et al., 1996; Filipek et al., 1997; Hynd, Semrud-Clikeman, Lorys, Novey, & Eliopoulos, 1990; Hynd et al., 1993; Teicher et al., 2000). (See Figure 6.1.) Specifically, researchers have found that the size of each of these areas is...
smaller in children and adults with ADHD compared to those who are nondisabled. Although not always consistent, several of the studies point to the abnormality occurring on the right side of the brain, especially the right basal ganglia (Castellanos, 1997). In addition, PET scans suggest reduced metabolic activity in the frontal lobes and basal ganglia in persons with ADHD (Lou, Henriksen, & Bruhn, 1984; Lou, Henriksen, Bruhn, Borner, & Nielsen, 1989).

TABLE 6.2 American Academy of Pediatrics Clinical Practice Guidelines: Diagnosis and Evaluation of the Child with ADHD

The guidelines contain the following recommendations for the diagnosis of ADHD:

1. in a child 6 to 12 years old who presents with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems, primary care physicians should initiate evaluation for ADHD;

2. the diagnosis of ADHD requires that a child meet Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria;

3. the assessment of ADHD requires evidence directly obtained from parents or caregivers regarding the core symptoms of ADHD in various settings, the age of onset, duration of symptoms, and degree of functional impairment;

4. the assessment of ADHD requires evidence directly obtained from the classroom teacher (or other school professional) regarding the core symptoms of ADHD, duration of symptoms, degree of functional impairment, and associated conditions;

5. evaluation of the child with ADHD should include assessment for associated (coexisting) conditions;

6. other diagnostic tests are not routinely indicated to establish diagnosis of ADHD but may be used for the assessment of other coexisting conditions (e.g., learning disabilities and mental retardation).


**Frontal lobes.**

Two lobes located in the front of the brain; responsible for executive functions; site of abnormal development in people with ADHD.

**FIGURE 6.1**

Areas of the brain (frontal lobes, prefrontal lobes, cerebellum, globus pallidus and caudate of the basal ganglia) identified by some researchers as abnormal in persons with ADHD.
Frontal Lobes. Located in the front of the brain, the *frontal lobes*, and especially the very front portion of the frontal lobes—the *prefrontal lobes*—are responsible for what are referred to as executive functions. Executive functions, among other things, involve the ability to regulate one’s own behavior. (We discuss executive functions more fully later.)

Basal Ganglia. Buried deep within the brain, the *basal ganglia* consist of several parts, with the *caudate* and the *globus pallidus* being the structures that are abnormal in persons with ADHD. The basal ganglia are responsible for the coordination and control of motor behavior (Pinel, 2000).

Cerebellum. The *cerebellum* is also responsible for the coordination and control of motor behavior. Although it is relatively small, constituting only about 10 percent of the mass of the brain, the fact that it contains more than half of all the brain’s neurons attests to its complexity (Pinel, 2000).

NEUROTRANSMITTER INVOLVED: DOPAMINE

Much exciting research is being conducted on what neurotransmitter abnormalities might cause ADHD. Neurotransmitters are chemicals that help in the sending of messages between neurons in the brain. One team of researchers, for example, has pointed to *serotonin* as being the key neurotransmitter involved in ADHD (Gainetdinov et al., 1999). Others, however, have identified *dopamine* as being the culprit (Castellanos, 1997; Ernst, Zametkin, Matuchik, Jons, & Cohen, 1998; Ernst et al., 1999; Sagvolden & Sergeant, 1998). Evidence points to the levels of dopamine being too low in the frontal cortex, thus interfering with executive functioning, and too high in the basal ganglia, thus resulting in hyperactivity and impulsivity (Castellanos, 1997). More research is needed to determine if one or both of these neurotransmitters is abnormal in persons with ADHD.

HEREDITARY FACTORS

Most authorities agree that there is a hereditary basis to ADHD. Evidence for the genetic transmission of ADHD comes from at least three sources: family studies, twin studies, and molecular genetic studies.

Family Studies. Generally, studies indicate that if a child has ADHD, the chance of his or her sibling having ADHD is about 32 percent (Barkley, 1998). Children of adults with ADHD run a 57 percent risk of having ADHD (Biederman et al., 1995). In addition, several studies demonstrate that parents of children with ADHD are two to eight times more likely to also have ADHD than are parents of non-ADHD children (Faraone & Doyle, 2001).

Twin Studies. There are several studies comparing the prevalence of ADHD in identical (monozygotic, from the same egg) versus fraternal ( dizygotic, from two eggs) twins, when one of the members of the pair has ADHD. These studies consistently show that if an identical twin and a fraternal twin each have ADHD, the second identical twin is much more likely to have ADHD than the second fraternal twin (Gillis, Gilger, Pennington, & DeFries, 1992; Sherman, Iacono, & McGue, 1997; Stevenson, 1992).

Molecular Genetic Studies. With the mapping of the human genome have come advances in molecular genetics, the study of the molecules (DNA, RNA, and protein) that regulate genetic information. Molecular genetic research on ADHD is in its early stages, but several studies have already implicated several genes as possibly being involved in causing ADHD (Faraone & Doyle, 2001).

TOXINS AND MEDICAL FACTORS

In Chapters 4 and 5 we discussed *toxins*—agents that can cause malformations in the developing fetus of a pregnant woman—as the cause of some cases of mental retardation.
or learning disabilities. Although the evidence is not as strong as it is for heredity, some of these same substances have been shown to be related to ADHD. For example, exposure to lead and the abuse of alcohol or tobacco (Faraone & Doyle, 2001) by pregnant women does place the unborn child at increased risk of developing ADHD.

Other medical conditions may also place children at risk for having ADHD. Again, the evidence is not as strong as it is for heredity, but complications at birth and/or low birthweight are associated with ADHD (Levy, Barr, & Sunohara, 1998; Milberger, Biederman, Faraone, Guite, & Tsuang, 1997).

Psychological and Behavioral Characteristics

One can use the DSM-IV criteria discussed earlier (see Table 6.1) to get a sense of some of the typical behaviors of students with ADHD. Although most people think that inattention is the key characteristic of ADHD, there is a growing consensus that inattention, as well as hyperactivity and impulsivity, are actually the result of problems in behavioral inhibition.

BARKLEY’S MODEL OF ADHD

There is an abundance of research pointing to problems with behavioral inhibition in persons with ADHD (Barkley, 1997, 1998; Semrud-Clikeman et al., 2000; Schachar, Mota, Logan, Tannock, & Klim, 2000; Willcutt et al., 2001). As we noted earlier, Russell Barkley (1997, 1998), in particular, has proposed a model of ADHD in which behavioral inhibition is key. In its simplest form this model proposes that problems in behavioral inhibition set the stage for problems in executive functions, which then disrupt the person’s ability to engage in persistent goal-directed behavior.

Behavioral Inhibition

Behavioral inhibition refers to the ability to “withhold a planned response; to interrupt a response that has been started; to protect an ongoing activity from interfering activities; and to delay a response” (Rubia, Oosterlaan, Sergeant, Brandeis, & van Leeuwen, 1998). This can be reflected in the ability to wait one’s turn, to refrain from interrupting in conversations, to resist potential distractions while working, or to delay immediate gratification in order to work for larger, long-term rewards (Tripp & Alsop, 2001). In addition, there is evidence that problems with behavioral inhibition in children with ADHD is related to abnormalities of the caudate in the brain that we discussed earlier (Semrud-Clikeman et al., 2000).

Executive Functions

The delay allowed by behavioral inhibition permits the individual to self-regulate his or her behavior. This ability to engage in a variety of self-directed behaviors involves what are referred to as executive functions. The fact that there is a wealth of evidence that executive functions are controlled by the prefrontal and frontal lobes of the brain fits nicely with the neuroimaging studies pointing to these areas of the brain being abnormal in persons with ADHD.

In Barkley’s model, persons with ADHD can exhibit problems with executive function in four general ways. First, they often have problems with working memory (WM). As we noted in Chapter 5, WM refers to a person’s ability to keep information in mind that “can be used to guide one’s actions either now or in the near future” (Barkley & Murphy, 1998, p. 2). In the case of students with ADHD, deficiencies in WM can result in forgetfulness, a lack of hindsight and forethought, and problems with time management.

Second, persons with ADHD frequently have delayed inner speech. Inner speech is the inner “voice” that allows people to “talk” to themselves about vari-
RESPONSIVE INSTRUCTION

Meeting the Needs of Students with Attention Deficit Hyperactivity Disorder

Task Switching: Preparing Students with ADHD for Change

What the Research Says

Many researchers contend that the primary deficit of students with attention deficit hyperactivity disorder (ADHD) is deficient behavioral inhibition. In other words, once a student with ADHD begins a task it is difficult for him or her to mentally switch to a new activity. Researchers hypothesize that the executive controls needed to “inhibit” the current activity and “start up” the next are different for students with ADHD compared to students without ADHD.

Research Study

A group of researchers examined task-switching ability of students with and without ADHD. Results from the study indicated that clear performance deficits existed for unmedicated students with ADHD in the first trial after a “task switch,” even when the tasks were considered compatible, such as both tasks involving numbers. All students with ADHD, unmedicated or medicated, had higher “switch costs”—increased response time—when the new task was incompatible with the old task (e.g., switching from a number-identification task to a word-identification task). This type of task required the inhibition of thinking about numbers and the preparation for thinking about letters and sounds. The findings suggest that differences do exist between students with and without ADHD in the ability to efficiently and effectively task switch.

Applying the Research to Teaching

Studies such as the one presented here indicate the need to support students with ADHD as they transition from one activity to another. Cognitive support for such transitions can include:

- Allowing for time between asking a student to do or say something and expecting the response (i.e., increasing wait time)
- Avoiding overloading a student’s working memory by limiting the number of steps or sequence of procedures a student must keep in working memory or by providing a visual for students to refer to
- Creating routinized procedures for daily transitions
- Preparing students for the type of response that will be required when asking a question
- Dividing instruction into consistent, predictable sequences throughout the day

Third, children and adults have problems controlling their emotions and their arousal levels. They often overreact to negative or positive experiences. Upon hearing good news, for example, they may scream loudly, unable to keep their emotions to themselves. Likewise, they are often quick to show their temper when confronted with frustrating experiences.

Fourth, children and adults with ADHD have difficulty analyzing problems and communicating solutions to others. They are less flexible when faced with problem situations, often responding impulsively with the first thing that comes to mind.

Persistent Goal-Directed Behavior

The many problems with executive functions experienced by persons with ADHD lead to deficits in engaging in sustained goal-directed activities:
The poor sustained attention that apparently characterizes those with ADHD probably represents an impairment in goal- or task-directed persistence arising from poor inhibition and the toll it takes on self-regulation. And the distractibility ascribed to those with ADHD most likely arises from poor interference control that allows other external and internal events to disrupt the executive functions that provide for self-control and task persistence. The net effect is an individual who cannot persist in effort toward tasks that provide little immediate reward and who flits from one uncompleted activity to another as disrupting events occur. The inattention in ADHD can now be seen as not so much a primary symptom as a secondary one; it is the consequence of the impairment that behavioral inhibition and interference control create in the self-regulation or executive control of behavior. (Barkley, 1997, p. 84)

With diminished self-regulation or executive control abilities, students with ADHD find it exceedingly difficult to stay focused on tasks that require effort or concentration but which are not inherently exciting (e.g., many school-related activities).

Adaptive skills.
Skills needed to adapt to one’s living environment (e.g., communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work); usually estimated by an adaptive behavior survey; one of two major components (the other is intellectual functioning) of the AAMR definition.

ADAPTIVE SKILLS

The concept of adaptive skills (e.g., self-help, community use, home use, and so forth) has traditionally been associated with the area of mental retardation. The AAMR definition, for example, stipulates that mental retardation be defined as impairments in intelligence and adaptive behavior (see Chapter 4). In recent years, authorities in the ADHD field have discovered that many children and adults with ADHD also have difficulties in adaptive behavior (Barkley, 1998). A good example is that they have more problems related to driving as adolescents and young adults, more accidents and traffic violations (Cox, Merkel, Kovatchev, & Seward, 2000; Woodward, Fergusson, & Horwood, 2000). Furthermore, those who do have problems with adaptive skills run a much greater risk of having a variety of learning and behavioral problems at school and home (Shelton et al., 2000).

PROBLEMS SOCIALIZING WITH PEERS

Some authorities have argued that the social problems experienced by students with ADHD are so common that they should be considered the defining characteristic of the condition (Landau, Milich, & Diener, 1998). Although the evidence may not warrant asserting that all persons with ADHD experience problems getting along with others, it is probably safe to say that the majority experience significant problems in peer relations. In fact, it usually does not take long for others to find students with ADHD uncomfortable to be around. For example, one team of researchers found that after just one day in a summer camp, many children with ADHD were rejected by other campers (Erhardt & Hinshaw, 1994).

Unfortunately, the negative social status experienced by students with ADHD is difficult to overcome and is usually long lasting. The enduring nature of social rejection leads easily to social isolation. The result is that many children and adults with ADHD have few friends even though they may desperately want to be liked. This can set up a vicious circle in which they attempt to win friends by latching onto the least chance for interaction with others. But their frantic need for friendship, coupled with their deficient impulse control, ends up leading them to bother or pester the very persons they are trying to befriend.

Given the problems in behavioral inhibition, it is not surprising that so many children and adults with ADHD end up socially ostracized. Unable to regulate their behavior and emotions, they are viewed as rude by others. It may not be that they do not know how to behave appropriately so much as that they are unable to do so (Landau et al., 1998). In other words, if asked what the appropriate behavior in a given situation should be, they can often give the socially acceptable answer. But when faced with choices in the actual sit-
COEXISTING CONDITIONS

ADHD often occurs simultaneously with other behavioral and/or learning problems, such as learning disabilities or emotional or behavioral disorders. In addition, persons with ADHD run a higher risk than the general population for substance abuse.

Learning Disabilities Studies using careful diagnostic criteria have found an overlap of 10 to 25 percent between ADHD and learning disabilities (Forness & Kavale, 2002). And some authorities maintain that the relationship is strongest for students who have ADHD, Predominantly Inattentive Type (Marshall, Hynd, Handwerk, & Hall, 1997; Willcutt, Chhabildas, & Pennington, 2001).

Emotional or Behavioral Disorders Estimates of the overlap with ADHD vary widely, but it is safe to say that 25 to 50 percent of those with ADHD also exhibit some form of emotional or behavioral disorder (Hallahan & Cottone, 1997; Forness & Kavale, 2002). Some persons with ADHD can exhibit aggressive, acting-out behaviors, whereas others can have withdrawn behaviors that accompany anxiety or depression.

Substance Abuse Adults with ADHD are about twice as likely as the general population to abuse alcohol or to become dependent on drugs, such as cocaine (Biederman, Wilens, Mick, Faraone, & Spencer, 1998; Lambert & Hartsough, 1998). And children with ADHD who also have externalizing types of behavior disorders are especially vulnerable for early drug use (Chilcoat & Breslau, 1999). In addition, adults with ADHD are about twice as likely to be cigarette smokers (Lambert & Hartsough, 1998). Some reports in the popular media have claimed that the treatment of ADHD with psychostimulants such as Ritalin leads children to take up the use of illegal substances. However, there is no research to back up this claim (DuPaul, Barkley, & Connor, 1998).

Exactly why ADHD co-occurs with so many other learning and behavioral disabilities remains largely a mystery. Researchers are just beginning to attempt to tease out which of several possibilities are the most likely reasons for so much overlap between ADHD and
other disabilities. For example, does having ADHD put one at risk for developing another disability, such as learning disabilities or depression? Or do ADHD and the other disability occur independent of each other? And is there a genetic basis to the coexistence of so many of these conditions? Research over the next few years should begin to provide more definitive answers to these questions.

Educational Considerations

In this section we consider two aspects of effective educational programming for students with ADHD:

- Classroom structure and teacher direction
- Functional behavioral assessment and contingency-based self-management

SUCCESS STORIES

Special Educators at Work

Salem, VA: High school sophomore Josh Bishop hopes to play football on a team in the National Collegiate Athletic Association’s Division I, despite his struggles with organization and time management. Like many students with ADHD, Josh does not find his schoolwork difficult to do, but finds it hard to get done. Jane Warner coordinates services for students with disabilities at a large university with a Division I football team. She guides many students like Josh and encourages all incoming freshman with ADHD to begin their self-advocacy early. Josh’s mother, Joni Poff, a special education supervisor, agrees and encourages her son to seek out structures to support his success.
CLASSROOM STRUCTURE AND TEACHER DIRECTION

William Cruickshank, whom we discussed earlier, was one of the first to establish a systematic educational program for children who today would meet the criteria for ADHD. Two hallmarks of Cruickshank's program were: (1) reduction of stimuli irrelevant to learning and enhancement of materials important for learning, and (2) a structured program with a strong emphasis on teacher direction.

Because Cruickshank assumed that children with attention problems were susceptible to distraction, irrelevant stimuli were reduced as much as possible. For example, students' workspaces consisted of three-sided cubicles to reduce distractions. On the other hand, teachers were encouraged to use attractive, brightly colored teaching materials.

The emphasis on classroom structure and teacher direction can be summed up by the following:

Specifically, what is meant by a structured program? For example, upon coming into the classroom the child will hang his hat and coat on a given hook—not on

between home and school has been close, but his mother remarks that high school has brought more difficulties. “Josh has made tremendous social gains since elementary school, but as the academic demands have increased over the last five to six years, it is harder to deal with the ADHD issues than when he was younger and more emotionally immature.”

Josh keeps an assignment book but admits that he does not use it faithfully. “When I’ve missed a deadline, sometimes I don’t turn the work in at all. I know that I need to do homework and I keep saying I’m going to do it, and then I don’t get my homework in and I get a zero. It’s not like it’s hard; it’s just getting it done! I can get work done at school, but I just can’t get it done at home.” Says Joni, “Josh does better with shorter time segments in a more structured setting. After school, he has trouble following through with sustained work. His pediatrician told me to back off. Josh takes medication during the day and it’s harder for him to concentrate in the evening.”

Josh mentioned his medication, but did not refer to his difficulties with completing written work, organizational skills, or attentiveness as being out of the ordinary. He would rather not be treated differently from other students, but he acknowledges that only a few teachers have provided the kind of structured instruction that benefits him. “Miss Mauney, in seventh grade, didn’t make exceptions. She always made an effort to organize every kid in the class!” added Josh. Joni Poff thinks the most successful teachers for Josh have been those who were very structured and made their expectations very clear. “They weren’t wishy-washy. They were sympathetic that some things were difficult for Josh. They understood that he wasn’t being purposefully lazy or disrespectful, but they still held high expectations for him,” says Joni. “Recently, I’ve asked Josh to take advantage of a tutor or some structured support, but he seems determined to do it alone.”

Doing it alone is not always the answer, says Jane Warner. Students with ADHD frequently need support when they move from high school to college. Says Jane, “Study skills and time management are troublesome for students with ADHD. Things can start to fall apart. Students might miss several classes and think they can never go back, so they just sit out and their grades go down, their self-esteem starts to slip, and they hit the wall.” Warner encourages students to disclose their learning needs confidently and make contact with the office for disability services on campus. Students with ADHD who have not received special services in high school are advised to get the documentation they need for colleges to provide them with appropriate accommodations. “We prefer current comprehensive evaluations that have been done by a qualified professional within the previous three years,” says Warner. Every accommodation recommended by an evaluator must be accompanied by a rationale based on the student’s current level of functioning. “Documentation completed in grade school or middle school doesn’t reflect developmental changes or tell us what the student can do now. IEPs are part of the puzzle, but you still can’t use an IEP as the only documentation for post-secondary accommodations.”

Warner points out that evaluations for students with ADHD can provide a clear picture of their strengths and weaknesses, especially if the professional evaluator explains what the results mean in laymen’s terms and makes specific educational recommendations. “Sometime between now and high school graduation,” suggests Jane Warner, “getting a current clinical evaluation will be a very important part of fostering self-advocacy for Josh.”

—Iby Jean Crockett
### What the Research Says

The majority of students with ADHD are served in general education classrooms. Through adding key modifications or supports to their traditional instructional routines, teachers can address the needs of students with ADHD without taking away from the instruction of students without disabilities in their class.

The following lesson sequence includes a description of research-supported supports that can be provided at each stage of instruction and a rationale for how those supports meet the needs of students with ADHD.

### Applying the Research to Teaching

#### Stage I: Pre-planning—Divide Instruction into Meaningful “Chunks”

**Description** Prior to instruction, break your instructional sequence into meaningful chunks or steps (Rosenshine, 1995). By dividing your instructional sequence into small, meaningful sections, you ensure that all students do not move on until they understand and that ample practice and teacher feedback has been provided at each step (Hudson, 1997).

**Rationale** Long tasks can be overwhelming for students with ADHD. Chunking allows for shorter periods of focused attention, activity changes as you move through the instructional sequence, focused practice, and reduced reliance on working memory (Kemp, Fister, & McLaughlin, 1995).

#### Stage II: Introduction

**Description** During this stage the teacher introduces the day’s instructional objectives. Information or activities that should be included in the introduction are: (1) a rationale for the lesson, (2) an explanation or presentation of a model of what the end result of the lesson will be, and (3) an advance organizer that informs students of the sequence of instructional activity (Allsopp, 1999).

**Rationale** A student with ADHD may have difficulty making connections between the instructional phase of a lesson and the activity, assignment, or worksheet that follows. By providing a clear model of what needs to be done, demonstrating the type of “inner speech” that should be guiding their thinking (via the “think aloud”), and checking students for understanding, the teacher increases the likelihood of students making connections between the instruction and the practice/application of the concept (Kucan & Beck, 1997).

#### Stage III: Instruction and Modeling

**Description** After the teacher has set the stage for learning, the instructional part of the lesson begins. During this stage, a teacher may demonstrate a procedure or phenomenon, present students with a problem scenario to be solved, or have students engage in an activity that will then be linked to key instructional concepts. Regardless of the particular method the teacher is using to teach, students should have a clear understanding of what the teacher is doing and what they should be doing in response. Strategies for effective teaching include the teacher: (1) “thinking aloud” as he or she presents the initial part of the lesson, (2) modeling the exact steps the students will complete, and (3) soliciting feedback from students during the instructional phase (Mercer & Mercer, 1998).

**Rationale** By providing a clear model of what needs to be done, demonstrating the type of “inner speech” that should be guiding their thinking (via the “think aloud”), and checking students for understanding, the teacher increases the likelihood of students making connections between the instruction and the practice/application of the concept (Kucan & Beck, 1997).

#### Stage IV: Guided Practice

**Description** The guided practice (GP) stage is the critical transition stage between instruction and independent practice (IP). During GP, students have the opportunity to practice or work with the concept being taught while the teacher is actively providing feedback (Allsopp, 1999; Kemp et al., 1995). GP can consist of students working several problems at the board or on white boards at their desks, students explaining (in their own words) to the class what was previously presented, or groups of stu-
any hook of his choice, but on the same hook every day. He will place his lunch box, if he brings one, on a specific shelf each day. He will then go to his cubicle, take his seat, and from that point on follow the teacher’s instructions concerning learning tasks, use of toilet, luncheon activities, and all other experiences until the close of the school day. The day’s program will be so completely simplified and so devoid of choice (or conflict) situations that the possibility of failure experience will be almost completely minimized. The learning tasks will be within the learning capacity and within the limits of frustration and attention span of the child.... If it is determined that he has an attention span of four minutes, then all teaching tasks should be restricted to four minutes. (Cruickshank, Bentzen, Ratzeburg, & Tannhauser, 1961).

It is rare today to see teachers using all the components of Cruickshank’s program, especially the cubicles. Many authorities now believe that not all children with ADHD are distracted by things in their environment. For those who are distractible, however, some authorities recommend the use of such things as cubicles to reduce extraneous stimulation.

The degree of classroom structure and teacher direction advocated by Cruickshank is also rarely seen today. First, this intensity of structure could only be achieved in a self-contained classroom. As we discuss later, most students with ADHD are in general education settings. Second, most authorities today believe that a structured program is important in the early stages of working with many students with ADHD but that these students gradually need to learn to be more independent in their learning.

Nevertheless, many of the ideas of Cruickshank are still alive in the educational recommendations of today’s professionals. For example:
All children, and particularly, those with ADHD, benefit from clear, predictable, uncomplicated routine and structure. It helps if the day is divided into broad units of time and if this pattern is repeated daily. Within each block of lesson time there should be a similar breaking down of tasks and activities into sub-tasks/activities. Presenting the student with an enormously detailed list of tasks and subtasks should be avoided. An important goal should be to create a simple overarching daily routine that the student will eventually learn by heart. The number of tasks should be kept small and tight timelines should be avoided. Complexities of timetabling and working structures merely confuse students with ADHD, because a major difficulty that goes with this condition is a poorly developed ability to differentiate between and organize different bits of information. This clearly makes the formal curriculum difficult to manage, without having to struggle with the organizational arrangements that surround the curriculum. Once a workable daily timetable has been established this should be publicly displayed and/or taped to the student’s desk or inside his or her homework diary. (Cooper, 1999, p. 146)

Functional Assessment and Contingency-Based Self-Management

As we noted in Chapter 4, functional behavioral assessment (FBA) is an important aspect of dealing with behavioral problems of students with mental retardation. It is also extremely useful in educational programming for students with ADHD. FBA involves determining the consequences, antecedents, and setting events that maintain inappropriate behaviors (Horner & Carr, 1997). Examples of typical functions of inappropriate behavior of students with ADHD are (1) to avoid work and (2) to gain attention from peers or adults (DuPaul & Ervin, 1996).

Contingency-based self-management approaches usually involve having persons keep track of their own behavior and then receive consequences, usually in the form of...
rewards, based on their behavior (Davies & Witte, 2000; Shapiro, DuPaul, & Bradley-Klug, 1998). For example, the teacher might have students use self-monitoring (see Chapter 5) to record how many times they left their seats during a class period.

A combination of FBA and contingency-based self-management techniques has proven successful in increasing appropriate behavior of elementary and secondary students with ADHD (DuPaul, Eckert, & McGoey, 1997; Ervin, DuPaul, Kern, & Friman, 1998; Shapiro et al., 1998). In one study, for instance, a combination of FBA and contingency-based self-management increased the on-task behavior of two adolescents with ADHD. For example, for one of the students the FBA phase consisted of interviews with the teacher and observations in the classroom, which led the researchers and teachers to conclude that an adolescent boy’s disruptive behavior was a function of gaining peer attention (Ervin et al., 1998). They based this assumption on evidence that the antecedents to his inattentive behavior consisted of such things as peers looking his way, calling out his name, making gestures toward him, and that the consequences of his inattention were such things as the peers laughing or returning comments to him.

The contingency-based self-management phase involved the student evaluating his on-task behavior on a 5-point scale (0 = unacceptable to 5 = excellent) at the end of each math class. The teacher also rated his behavior, and the student was awarded points based on how closely the ratings matched. During writing class, the teacher awarded negative or positive points to members of the class depending on whether or not they responded to attention-seeking behaviors from any member of the class. In both classes, the points could be used for privileges.

The Role of Reinforcement

Authorities have pointed to the crucial role that contingency plays in contingency-based self-management. In other words, they point out that reinforcement of some kind, such as social praise or points that can be traded for privileges, is especially important in order for self-management techniques to be effective. For example, an extensive review of research found that contingency-based self-management strategies were more effective than self-management strategies without contingencies in leading to positive behavioral changes in students with ADHD (DuPaul & Eckert, 1997).

Although the use of behavioral procedures such as reinforcement and punishment is somewhat controversial—that is, there are those who are opposed to their use (Kohn, 1993)—many authorities consider them almost indispensable in working with students.

Photo 6-5
TO COME
# Meeting the Needs of Students with Attention Deficit Hyperactivity Disorder

## The Benefits of Self-Monitoring and Group Contingency

### What the Research Says

Many students with ADHD lack the ability to self-monitor. Self-monitoring requires the ability to appraise a situation and consider alternative ways of responding as well as possible outcomes associated with the various forms of responding (Shapiro, DuPaul, & Bradley-Klug, 1998). This inability to “think” before acting creates problems for students with ADHD in the areas of paying attention in class, responding to social situations appropriately, and finishing assigned tasks. To address these issues, teachers can teach students to use self-management procedures wherein the student monitors, records, analyzes, and reinforces her or his own behavior (Davies & Witte, 2000). Many studies have been conducted in the area of self-management and these studies have repeatedly demonstrated the effectiveness of teaching students such strategies (Cole & Bambara, 1992; Lloyd, Hallahan, Kauffman, & Keller, 1998; Mathes & Bender, 1997; Reid & Harris, 1993; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999; Smith, Nelson, Young, & West, 1992).

Although teaching self-management to students with ADHD has been proven to be effective, many teachers prefer whole-class or group-contingency plans. Within a group-contingency model the behavior of one student is tied to the outcome of the whole group. Group-contingency models promote interdependence as group members must work together to meet their goal (Tankersley, 1995). Under a group contingency, teachers can use the same behavior-management approach for all students and do not have to differentiate their treatment of the few students who need help with self-management. Thus, group contingencies can be very effective for general education teachers who have students with ADHD in their classrooms.

### Research Study

One study examined the effects of a management program with third-graders that included both self-management and group contingency on the behaviors of students with ADHD in a general education classroom (Davies & Witte, 2000). All students—those with ADHD as well as nondisabled students—were responsible for monitoring their own behavior, and contingencies were established for group performance. Sample procedures for the group intervention were:

1. If any student displayed the target behavior [inappropriate verbalizations], he or she moved one dot from his/her group’s chart from the green section into the blue section. If the child did not move the dot after about 10 seconds, then the teacher moved a dot into the red section of the chart.
2. The rewards a group received were related to how many dots the group had in the green section of their chart at the end of the intervention period. Each group needed to have at least one dot left in the green section at the end of the intervention period to receive the reinforcer. [Each group started with five dots.] (Davies & Witte, 2000, p. 141)

### Research Findings

Results from the study demonstrated a decrease in the talking out behaviors of the four students with ADHD. In addition, there was no evidence of possible negative side effects of peer-pressure, such as threats or negative verbal comments (Davies & Witte, 2000).

### Applying the Research to Teaching

Findings from this study demonstrate the effectiveness of using self-management within the context of a group contingency. Teachers can implement similar management strategies through: (1) targeting specific undesirable behaviors to be eliminated or specific desirable behaviors to be reinforced, (2) creating a chart for students to use for self-management, (3) communicating the procedures for recording behaviors on the chart (e.g., “If you do X, mark your chart” or “When the beeper beeps, check to see if you are doing X, then mark your chart accordingly”), or (4) connecting the self-management procedures to a group contingency (e.g., “If all students get over X points during the lesson, all students will get a homework pass”).
with ADHD. For example, they are an integral part of a set of intervention principles advocated by one team of authorities (see Table 6.3 on p. 000).

**SERVICE DELIVERY MODELS**

Because ADHD is not recognized as a separate special education category by the U.S. Department of Education, we do not have statistics on how many students are served in different classroom environments. It is safe to assume, however, that one can find students with ADHD across the entire continuum, from residential schools to full inclusion in general education classrooms. But because, as we noted earlier, there is reason to believe that fewer than half receive any special education services (Forness & Kavale, 2002), it is logical to assume that most students with ADHD spend most of their time in general education classrooms.

As with all students with disabilities, the best placement for students with ADHD should be determined on an individual basis. Although full inclusion in a general education classroom may be appropriate for some students with ADHD, the estimate that over half do not receive any special education services can be viewed with some concern. This is especially true in light of the fact that studies have shown that positive behavioral changes in students with ADHD are much more likely to occur in special education than in general education settings (DuPaul & Eckert, 1997).

**Medication Considerations**

One of the most controversial topics in all of special education is the treatment of ADHD with medication. Psychostimulants, which stimulate or activate neurological functioning, are by far the most frequent type of medication prescribed for ADHD. The most common stimulant prescribed for ADHD is methylphenidate, or Ritalin. The fact that physicians would prescribe a psychostimulant for someone who exhibits hyperactivity is, at first blush, counterintuitive. In fact, for years professionals referred to the paradoxical effect of Ritalin because its effects appeared to be the opposite of those one would expect in the case of someone without ADHD. Researchers have concluded, however, that Ritalin influences the release of the neurotransmitter dopamine, thus enabling the brain’s executive functions to operate more normally (Swanson, Castellanos, Murias, LaHoste, & Kennedy, 1998; Swanson et al., 1998). Furthermore, it is now believed that Ritalin has the same chemical and behavioral effect on persons without ADHD as it does on those with ADHD (Solanto, 1998).

Ordinarily, Ritalin takes about one hour to take effect, with the optimal effect occurring at about two hours. The effects of Ritalin usually wear off after about four hours. Responsiveness to Ritalin is highly individualistic, so the dosage level and number of doses per day vary from person to person. A relatively new stimulant, Adderall, is growing in popularity because it is at least as effective and its effects are longer lasting, meaning that it does not have to be administered as often (Faraone, Pliszka, Olvera, Skolnik, & Biederman, 2001; Manos, Short, & Findling, 1999; Pliszka, Browne, Olvera, & Wynne, 2000).

**OPPOSITION TO RITALIN**

Not all professionals, parents, and laypeople are in favor of using Ritalin. In fact, Ritalin has been the subject of numerous assaults by the media. Starting in the late 1980s and continuing into the 1990s, several critics appeared on nationally broadcast television shows, such as Oprah, Donahue, and Geraldo, and 20/20, as well as evening and morning news shows. And while some criticisms have been relatively mild, others have ranged from assertions that ADHD is a bogus diagnosis to claims that professionals are trying to control children and make them overly docile.
More recently, some of the most extreme critics of Ritalin have turned to the courts to make their case, claiming that the pharmaceutical industry, the psychiatric profession, and the major parent and advocacy organization have colluded to promote more sales of Ritalin (see the box on p. 000). In emotionally charged debates like this, it is advisable that we turn to research for guidance.

**THE RESEARCH EVIDENCE**

Dozens of research teams around the world have been studying the effects of several medications on ADHD. Most of this research has focused on the psychostimulant, Ritalin.

**TABLE 6.3  Pfiffner and Barkley’s Intervention Principles for ADHD**

1. Rules and instructions must be clear, brief, and often delivered through more visible and external modes of presentation.
2. Consequences must be delivered swiftly and immediately.
3. Consequences must be delivered more frequently than for students without ADHD.
4. The types of consequences must often be of a higher magnitude, or more powerful than for students without ADHD.
5. An appropriate and often richer degree of incentives must be provided.
6. Reinforcers, or particularly, rewards must be changed or rotated more frequently.
7. Anticipation is the key. Teachers must be mindful of planning ahead, particularly during phases of transition across activities or classes, to ensure that the children are cognizant of the shift in rules (and consequences) that is about to occur.

Effectiveness

Despite all the negative publicity in the media, most authorities in the area of ADHD are in favor of Ritalin’s use. After hundreds of studies, the research is overwhelmingly positive on its effectiveness in helping students have more normalized behavioral inhibition and executive functioning (Barkley, 1998; Crenshaw, Kavale, Forness, & Reeve, 1999; Evans et al., 2001; Forness, Kavale, & Crenshaw, 1999). Moreover, Ritalin not only results in better ratings on parent- and teacher-rating scales, but it leads to improved performance in academic achievement as well as classroom behavior, such as better note-taking, on-task behavior, quiz scores, homework completion, and written-language work (Evans et al., 2001).

In fact, even though there had been a wealth of evidence showing the effectiveness of Ritalin and other medications, the National Institute of Mental Health decided to play it safe because of the controversy surrounding medication for ADHD. It embarked on a large-scale, well-controlled, extensive study on the effects of medication and behavioral management treatments (see the box on p. 000). Again, the results demonstrated the effectiveness of medication.

Nonresponders and Side Effects

Ritalin is not effective for everyone. Somewhere around 30 percent of those who take Ritalin do not have a favorable response (Spencer et al., 1996). In addition, some side effects are possible, including insomnia, reduction in appetite, abdominal pain, headaches, and irritability. There has also been speculation on the possibility that in a very small number of cases Ritalin may cause tics or increase their intensity in those who already have tics (DuPaul, Barkley, & Connor, 1998). There have also been many anecdotal reports of a “rebound effect,” in which a child exhibits irritability as the Ritalin wears off. In most cases, these side effects are mild and can be controlled. For example, in the case of the two most common side effects—insomnia and reduction in

Parallel Teaching

In parallel teaching, the two teachers split the class into two groups and teach the same content to a smaller group of students. This model provides the same opportunities as station teaching, along with the chance to modify the instructional delivery of the same content material to meet the needs of the student.

Alternative Teaching

The alternative teaching model includes content instruction by one teacher to a large group of students and remedial or supplementary instruction by the other teacher to a small group of students. In this model, the teacher of the small group can modify delivery of content, control the delivery of consequences and rewards, and closely monitor and observe students. In addition, the teacher of the small group can incorporate instruction in strategies such as self-monitoring.

Team Teaching

In team teaching, co-teachers alternate or “tag team” in delivering instruction to the entire class. In this model, co-teachers can both be on the lookout for misconceptions, confusion, inattention, and disruption. These can then be addressed in the flow of instruction rather than afterward or on an individual basis. In addition, co-teachers can work together to both present content and learning strategies in unison to better meet the needs of all students.

In All Models

Teachers working together can discuss and better evaluate whether rules and instructions are clear, brief, and delivered in appropriate formats for students with ADHD. Co-teachers can also work together to better anticipate “rough spots” for students with ADHD, particularly during transition times, changes in routines, or complex tasks (see Table 6.3). The varying models of co-teaching provide the flexibility for teachers to adjust instructional delivery to meet the objectives of the teachers and the needs of the students with ADHD.

Cautionary Note

All too often, co-teachers fall into the habit of using one model to the exclusion of others. This is unfortunate in that it may mean that one teacher does not participate actively in instruction and/or planning. This nonparticipation can lead to a lack of interest on the teacher’s part and a disregard for that teacher on the students’ part. The models of co-teaching were developed to match the needs of instruction. Both teachers should participate in instruction in a way that matches their expertise.

Psychostimulants, especially Ritalin, have sparked a national controversy over the treatment of ADHD. Although Ritalin is not effective for everyone and can have side effects, the bulk of research evidence supports its effectiveness.
Use of Ritalin Leads to Lawsuits

The following are two news releases pertaining to several lawsuits brought against Novartis AG (the manufacturer of Ritalin), the American Psychiatric Association, and Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD). Thus far, the courts have ruled in favor of defendants.1

AD/HD Drug Ritalin Faces Court, Capitol Hill, Marketplace Skirmishes2

Washington—Ritalin manufacturer Novartis AG is under fire from several directions this month as the longstanding debate over medicating children with Attention-Deficit/Hyperactivity Disorder rages on. In the wake of two new class-action lawsuits filed Sept. 13 against Novartis and the American Psychiatric Association, the House Education and Workforce Subcommittee on Oversight and Investigations has scheduled a hearing for Friday on the use of Ritalin in schools. Meanwhile, two Novartis competitors have stepped up their efforts to unseat the top-selling medication.

The lawsuits, led by Washington, D.C., attorney John Coale and Pascagoula, Miss., attorney Richard Scruggs, who won fame for leading similar lawsuits against the tobacco industry in the late 1990s, allege Novartis and the APA conspired to create a bloated market for Ritalin, the most prescribed drug for AD/HD. The suits were filed in a federal court in California and a state court in New Jersey; they mirror a suit filed last spring in a state court in Texas. . . That suit also names the national advocacy group, Children and Adults with AD/HD, as a defendant.

Novartis called any allegations that it conspired with APA, CHADD or any other organization “unfounded and preposterous.” A company spokeswoman said Wednesday Novartis had not yet seen the lawsuits filed in New Jersey and California. However, the company said, “any charge that ADHD is not a medically valid disorder is contrary to medical evidence and scientific consensus.” Forty years of research, documented in the New England Journal of Medicine and the Journal of the American Medical Association, as well as acknowledgements by the National Institutes of Health and the U.S. Food and Drug Administration that ADHD “is a commonly diagnosed behavioral disorder of childhood,” validates Novartis’ development of Ritalin to treat it, the company added.

CHADD Vindicated by Lawsuit Dismissals and Withdrawal3

Landover, MD—CHADD, the nation’s leading advocacy organization serving children and adults with Attention-Deficit/Hyperactivity Disorder (AD/HD) is pleased by recent developments confirming that lawsuits filed against it, Novartis and the American Psychiatric Association are completely without merit or basis. Plaintiffs withdrew their complaint in Florida and decided not to appeal in Texas.

To date, three of five class action lawsuits filed in 2000 against the organizations have been eliminated. Two were dismissed (Texas and California) and one was withdrawn entirely (Florida). The suits allege that CHADD conspired with Novartis, the manufacturer of Ritalin, and the American Psychiatric Association (APA) to improperly broaden the diagnostic criteria for (ADHD) and thereby increase Ritalin sales. CHADD has always maintained that the allegations are preposterous, and has vigorously defended these lawsuits.

“CHADD’s message has always been one of sharing science-based information about AD/HD,” said CHADD Chief Executive Officer E. Clark Ross. “Removing the cloud of doubt created by such baseless claims allows CHADD to continue its science-based education and advocacy.”

On March 9, 2001, Judge Rudi Brewer of the United States District Court in San Diego dismissed the lawsuit filed in his court, finding that the plaintiffs had failed to set forth any allegations to support their claims. Although the plaintiffs in this California lawsuit have appealed. . . , CHADD remains optimistic that his decision will be upheld. . .

On May 17, 2001, Judge G. Tagle of the United States District Court in Brownsville, Texas dismissed the lawsuit pending in her Court, also finding that the plaintiffs . . . had failed to come forward with even the most basic information to support their conspiracy allegations. Notably, the Texas plaintiffs chose not to appeal. . .

On July 3, 2001, the plaintiffs in a similar action filed in Florida federal court quietly withdrew their lawsuit. Judges in lawsuits filed in Puerto Rico and New Jersey have not yet decided whether the cases pending in their Courts should be dismissed. CHADD is confident that these judges will follow the lead of Judges Brewster and Tagle.

1As of the printing of this text, some of the lawsuits were still pending. Moreover, there may be appeals. Interested readers should keep their eye out for further court actions. A good source would be the CHADD Web site: http://chadd.org/


appetite—care should be taken not to take the Ritalin too close to mealtime or bedtime. In the case of the rebound effect, some physicians recommend using a time-release form of Ritalin.

Drug Abuse A popular misconception is that, by taking Ritalin, children with ADHD are more likely to become abusers of drugs such as marijuana or cocaine as adolescents or young adults. However, there is little, if any, documented evidence that this occurs (Barkley, 1998). In fact, there is suggestive evidence that those with ADHD who are prescribed Ritalin as children are less likely to turn to illicit drugs as teenagers (Biederman, Wilens, Mick, Spencer, & Faraone, 1999). Some have speculated that perhaps those who

Is Medication Effective for Children with ADHD?
The National Institute of Mental Health’s MTA Study

The NIMH Collaborative Multisite Multimodal Treatment Study of Children with Attention-Deficit/Hyperactivity Disorder (MTA), co-sponsored with the U.S. Department of Education, has been the most ambitious study yet conducted on the efficacy of medication for children with ADHD. It involved a total sample of 579 children between the ages of 7 and 9.9 years from seven sites around North America: Berkeley, CA; Durham, NC; Irvine, CA; Montreal, Quebec, New York City; Pittsburgh, PA; and Queens, NY.

Researchers randomly assigned students to one of four groups:

• Medication Management (MedMgt)—This group received carefully monitored medication. Most received Ritalin, but those who reacted unfavorably to Ritalin were given an alternative medication.

• Behavioral Treatment (Beh)—This intensive behaviorally oriented program involved a school-based intervention, involving teacher training in behavior management, a classroom aide, and a daily report card linked to home consequences; twenty-seven sessions of parent training in child behavior management; individual parent training sessions; child-focused therapy; and an eight-week all-day behaviorally oriented summer program.

• Combined Medication Management and Behavioral Treatment (Comb)

• Community Care (CC)—Families in this group were provided a list of mental health resources in their community. (Sixty-seven percent ended up on medication, at some point; however, the medication was not managed as closely.)

The study lasted for fourteen months, during which an extensive battery of measures and ratings were taken.

Results Using a composite score of teacher and parent ratings of core ADHD symptoms, the researchers rated whether each of the treatments could be considered a “success” (Swanson et al., 2001). The ranking of the groups with respect to success rates at the end of the fourteen months was:

1. 68%—Comb
2. 56%—MedMgt
3. 34%—Beh
4. 25%—CC

Conclusions The findings clearly point to the impressive effects of medication. They also suggest that using medication in combination with behavioral method is the most powerful treatment.

The findings are a bit less clear with respect to the value of the behavioral treatment alone. Although a 34 percent success rate is not as high as one would like, some have noted that this is an average of the seven sites studied (Swanson et al., 2001). Some students improved much more than others. Furthermore, there was considerable variability in how intensively the behavioral treatment was delivered from school to school within each site (Pelham, 2000). In other words, it still makes sense for teachers to use behavior management, especially because we know that the behavior problems of many children with ADHD are likely to deteriorate without intensive behavioral interventions.

are not medicated with Ritalin turn to other drugs to try to find “peace of mind” or to “mellow out.”

CAUTIONS REGARDING RITALIN

Although the research is overwhelmingly positive on the effectiveness of Ritalin for increasing appropriate behavior, there are still a number of cautions:

- Ritalin should not be prescribed at the first sign of a behavioral problem. Only after careful analysis of the student’s behavior and environment should Ritalin be considered. The use of psychostimulants for ADHD in the United States has doubled every four to seven years since 1971 (Wilens & Biederman, 1992). Furthermore, rates of Ritalin usage vary substantially from one country to another. For example, Ritalin is administered in the United States at more than twice the rate of Great Britain and Australia (Kewley, 1998). Although it is possible that the lower rates of Ritalin usage in other countries indicate that many persons with ADHD are not being treated properly, it is also very likely that at least some children in the United States are being medicated inappropriately.

- Although research has demonstrated the effectiveness of Ritalin on behavioral inhibition and executive functions, the results for academic outcomes have not been as dramatic. Although important academic measures, such as work completed or accuracy on assignments, have improved substantially, the impact on achievement tests has been much less (Forness et al., 1999). Thus, teachers should not assume that Ritalin will take care of all the academic problems these students face.

- Parents, teachers, and physicians should monitor dosage levels closely so that the dose used is effective but not too strong. Proper dosage levels vary considerably (Hale et al., 1998).
• Teachers and parents should not lead children to believe that the medication serves as a substitute for self-responsibility and self-initiative.
• Teachers and parents should not view the medication as a panacea; they, too, must take responsibility and initiative in working with the child.
• Parents and teachers should keep in mind that Ritalin is a controlled substance. There is the potential for siblings, peers, or the child himself or herself, to attempt to “experiment” with it. (See the box on p. 000.)
• The final key to the effective use of Ritalin is communication among parents, physicians, teachers, and the child himself or herself.

**Early Intervention**

Diagnosis of young children with ADHD is particularly difficult because many children without ADHD tend to exhibit a great deal of motor activity and a lack of impulse control. For the very reason that excessive activity and impulsivity are relatively normal for young children, preschoolers with ADHD can be particularly difficult to manage. Thus, those preschoolers who really do have ADHD are a great challenge to parents and teachers.

Because of the severity of the symptoms of preschoolers who have been diagnosed with ADHD, the importance of the educational principles of classroom structure, teacher direction, functional behavioral assessment, and contingency-based self-management that we discussed above are all the more important. Given that even young children without ADHD do not have fully developed self-management skills, most recommend an even stronger emphasis on the use of contingencies in the form of praise, points, and tangible rewards.

In the case of preschoolers with ADHD and high rates of aggression, even implementing very intensive early intervention procedures, including highly structured classrooms with strong contingencies, leads only to limited behavioral and academic improvements that do not endure (Shelton et al., 2000). In other words, even high-quality early intervention is not likely to remediate completely the symptoms of children with ADHD and severe aggression. Such children need long-term programming.
Transition to Adulthood

It was not too long ago that most professionals assumed that ADHD diminished in adolescence and usually disappeared by adulthood. Authorities now recognize about two-thirds of individuals diagnosed with ADHD in childhood will continue to have significant symptoms in adulthood (Faraone & Doyle, 2001). And with the greater recognition of ADHD by the scientific community as well as by the popular media, many persons are being diagnosed with ADHD in adulthood. The few studies of prevalence that have been conducted report a prevalence rate of about 4 to 5 percent (Barkley, 1998), which mirrors that for children.

DIAGNOSIS IN ADULTHOOD

The diagnosis of ADHD in adults is controversial. Because of the long-held assumption that ADHD did not persist into adulthood, there is not a very long history of research on ADHD in adults. In recent years, however, professionals have begun to make progress in identifying and treating ADHD in adults. Because there is no “test” for ADHD, most authorities hold that the person’s history is of utmost importance. As one authoritative team has put it:

An Adult with ADHD: Ann’s Story

I grew up not feeling very good about myself. In school, it was hard for me to stay on the subject or to finish anything. . . . Teachers would be on my back. They said I was such a good child—they couldn’t understand it. And I tried so hard. I just couldn’t finish anything. . . . I was distracted very easily by practically everything. If someone sneezed, I’d look at him and my mind would go off in a million directions. I’d look out the window, wondering why he had sneezed. . . .

The situation has persisted into adulthood. I’m very disorganized. Take housekeeping, for example. After dinner, when I start the dishes, I’ll wash a little, then run and wipe off the table, wipe the cabinet, talk on the phone, and never get anything completed. I have to really concentrate and tell myself “You are going to get the dishes done.” Then they get done, but I still get the urge to stop and go wash off the dining room table. Just like someone is pulling me. My closet and drawers are still a mess, just like when I was a kid.

What’s really hard is to stay with any kind of paper work—bills, for example. It’s my husband’s job to do the bills. If it were mine, we’d probably be in jail. . . . Only recently at age forty-five have I been able to sit down and write a letter. I usually write small postcards.

I’m the most impulsive person in the world. It gets me in trouble. If I see something I know I shouldn’t buy, I’ll buy it anyway. Or, I’ll say something that I know the minute it comes out of my mouth I’m going to regret. . . . I wish I could just slow down and relax. I have problems sitting still. . . . People say I make them nervous, but I don’t even realize I’m doing anything. That hurts my feelings. I don’t want to be different.

My mood swings from high to low. I either feel very good or very down. I feel up if the house looks good. If I get everything done that I think I should, it makes me feel good about myself. I feel responsible for a lot of people. If my husband is in a bad mood, or if things aren’t going right for my kids, my mother, or my sister, I feel bad. I don’t know what’s wrong with me.

—Ann Ridgley

This is old-fashioned medicine, not high-tech. This is a doctor talking to a patient, asking questions, listening to answers, drawing conclusions based on getting to know the patient well. These days we often don’t respect or trust anything medical that doesn’t depend upon fancy technology. Yet the diagnosis of [ADHD] depends absolutely upon the simplest of all medical procedures: the taking of a history. (Hallowell & Ratey, 1994, pp. 195–196)

The best test for [ADHD] is the oldest test in the history of medicine: the patient’s own story. . . . If possible, the history should always be taken from at least two people—the identified patient plus a parent or spouse or friend. (Hallowell & Ratey, 1996, p. 188)

An abbreviated history of an adult with ADHD is presented in the box on page 000. As crucial as the history is, however, its subjective nature does make it vulnerable to misinterpretation. Thus, clinicians have come up with guidelines for diagnosis. Table 6.4 on page 000 is a set of suggested diagnostic criteria for adults.

### TABLE 6.4  Suggested Diagnostic Criteria for Attention Deficit Disorder in Adults

**Note:** Consider a criterion met only if the behavior is considerably more frequent than that of most people of the same mental age.

**A.** A chronic disturbance in which at least twelve of the following are present:

- A sense of underachievement, of not meeting one’s goals (regardless of how much one has actually accomplished).
- Difficulty getting organized.
- Chronic procrastination or trouble getting started.
- Many projects going simultaneously; trouble with followthrough.
- A tendency to say what comes to mind without necessarily considering the timing or appropriateness of the remark.
- A frequent search for high stimulation.
- An intolerance of boredom.
- Easy distractibility, trouble focusing attention, tendency to tune out or drift away in the middle of a page or a conversation, often coupled with an ability to hyperfocus at times.
- Often creative, intuitive, highly intelligent.
- Trouble in going through established channels, following “proper” procedure.
- Impatient; low tolerance of frustration.
- Impulsive, either verbally or in action, as in impulsive spending of money, changing plans, enacting new schemes or career plans, and the like; hot-tempered.
- A tendency to worry needlessly, endlessly; a tendency to scan the horizon looking for something to worry about, alternating with inattention to or disregard for actual dangers.
- A sense of insecurity.
- Mood swings, mood lability, especially when disengaged from a person or a project.
- Physical or cognitive restlessness.
- A tendency toward addictive behavior.
- Chronic problems with self-esteem.
- Inaccurate self-observation.
- Family history of ADD or manic-depressive illness or depression or substance abuse or other disorders of impulse control or mood.

**B.** Childhood history of ADD. (It may not have been formally diagnosed, but in reviewing the history, one sees that the signs and symptoms were there.)

**C.** Situation not explained by other medical or psychiatric condition.

ADULT OUTCOMES

Many adults with ADHD have antisocial, anxiety, and depression disorders and experience more school failure, employment problems, and automobile accidents than adults without ADHD (Faraone et al., 2000). Those who have a coexisting condition, such as depression or aggression, tend to have less positive outcomes than those who do not. Although persons with ADHD are at risk for poorer outcomes, it is important to point out that there are many adults with ADHD who have highly successful careers and jobs, and many have happy marriages and families.

Employment

One of the keys to successful employment for all people, but especially for persons with ADHD, is to select a job or career that maximizes the individual’s strengths and minimizes her or his weaknesses. Success is often dependent on pursuing a job that fits a person’s needs for structure versus independence. For those who work best with structure, it is recommended that they look for jobs with organizations that have a clear mission and lines of authority, with an emphasis on oversight from supervisors who have an understanding of ADHD. Those who find formal structures too confining should look for work environments that are flexible, have variety, and allow one to be independent (Hallowell & Ratey, 1996).

Marriage and Family

Given some of the behavioral characteristics of ADHD, it is not surprising that husbands and wives of persons with ADHD frequently complain that their spouse is a poor listener, preoccupied, forgetful, unreliable, messy, and so forth (Murphy, 1998). A person’s ADHD can have a negative impact on the entire family. Parents who have ADHD may find it difficult to manage the daily lives of their children. As one parent put it, “I couldn’t remember to brush my teeth when I was a kid, and now I can’t remember to tell my kid to brush his teeth.” (Weiss, Hechtman, & Weiss, 2000, p. 1060).

Many authorities recommend that the first step to treatment is to have all family members become educated about the facts associated with ADHD. Because ADHD is a family issue, they also recommend that all members of the family should be partners in its treatment:

Unlike some medical problems, [ADHD] touches everybody in the family in a daily, significant way. It affects early-morning behavior, it affects dinner-table behavior, it affects vacations, and it affects quiet time. Let each member of the family become a part of the solution, just as each member of the family has been a part of the problem. (Hallowell & Ratey, 1996, p. 303)

Table 6.5 provides twenty-five tips on the management of ADHD in couples, when one of the partners has ADHD. With current high rates of divorce and single-parent families in the United States, many of these suggestions would also be applicable to the general population.

IMPORTANCE OF COACHING

One highly recommended therapeutic technique is that of coaching (Hallowell & Ratey, 1994). Coaching involves identifying someone whom the person with ADHD can rely on for support. The term coach is used because this person can be visualized as someone “standing on the sidelines with a whistle around his or her neck barking out encouragement, directions, and reminders to the player in the game” (Hallowell & Ratey, 1994, p. 226). The coach, who can be a therapist or a friend, is someone who spends ten to fifteen minutes each day helping to keep the person with ADHD focused on his or her goals. The coach provides the structure needed to plan for upcoming events and activities, and heaps on praise when tasks are accomplished.

Although ADHD is a lifelong struggle for most people with the condition, with the appropriate combination of medical, educational, and psychological counseling, satisfac-
TABLE 6.5  Twenty-Five Tips on the Management of ADHD in Couples

1. Make sure you have an accurate diagnosis. Once you are sure of the diagnosis, learn as much as you can about ADHD.
2. Keep a sense of humor! At that psychological branch point we all know so well when the split-second options are to get mad, cry, or laugh, go for the laughter. Humor is a key to a happy life with ADHD.
3. Declare a truce. After you have made the diagnosis and have done some reading, take a deep breath and wave the white flag.
4. Set up a time for talking.
5. Spill the beans. Tell each other what is on your mind. Tell each other just how you are being driven crazy, what you like, what you want to change, what you want to preserve. Try to say it all before you both start reacting. People with ADHD have a tendency to bring premature closure to discussions, to go for the bottom line. In this case, the bottom line is the discussion itself.
6. Write down your complaints and your recommendations. Otherwise you’ll forget.
7. Make a treatment plan. You may want some professional help with this phase, but it is a good idea to try starting it on your own.
8. Follow through on the plan. Remember, one of the hallmarks of ADHD is insufficient follow-through.
9. Make lists for each other. Try to use them constructively, not as threats or evidence in arguments.
10. Use bulletin boards. Messages in writing are less likely to be forgotten.
11. Put notepads in strategic places such as by your bed, in your car, in the bathroom and kitchen.
12. Consider writing down what you want the other person to do. This must be done in the spirit of assistance, not dictatorship. Keep a master appointment book for both of you.
13. Take stock of your sex lives. ADHD can affect sexual interest and performance. It is good to know the problems are due to ADHD, and not something else.
15. Avoid the pattern of pesterer and tuner-outer.
16. Avoid the pattern of the victim and the victimizer. You don’t want the ADHD partner to present himself or herself as a helpless victim left at the merciless hands of the all-controlling non-ADHD mate.
17. Avoid the pattern of master and slave. In a funny way it can often be the non-ADHD partner who feels like the slave to his or her mate’s ADHD.
18. Avoid the pattern of a sadomasochistic struggle as a routine way of interacting. Many couples spend most of their time attacking and counterattacking each other. One hopes to get past that and into the realm of problem solving. What you have to be aware of is the covert pleasure that can be found in the struggle. Try to vent your anger at the disorder, not at the person.
19. In general, watch out for the dynamics of control, dominance, and submission that lurk in the background of most relationships, let alone relationships where ADHD is involved.
20. Break the tapes of negativity. The “tapes of negativity” can play relentlessly, unforgivingly, endlessly in the mind of the person. They play over and over, grinding noises of “You can’t,” “You’re dumb,” “It won’t work out.” The tapes can be playing in the midst of a business deal, or they can take the place of making love. It is hard to be romantic when you are full of negative thoughts.
21. Use praise freely.
22. Learn about mood management. Anticipation is a great way to help anyone deal with the highs and lows that come along. If you know in advance that when you say “Good morning, honey!” the response you get might be “Get off my back, will you!” then it is easier to deal with that response without getting a divorce.
23. Let the one who is the better organizer take on the job of organization.
24. Make time for each other.
25. Don’t use ADHD as an excuse. Each member of the couple has to take responsibility for his or her actions.

Attention Deficit Hyperactivity Disorder, or ADHD, was first recognized as early as the mid-nineteenth century, though the term ADHD did not appear until over a hundred years later. Early “cases” of the disorder were represented by children described as impulsive, fidgety, or generally lacking in the ability to control their behavior. In 1902, Dr. George F. Still referred to children whose behavior would now be seen as symptomatic of ADHD as having “defective moral control,” or an inability to refrain from inappropriate behavior. To this day, ADHD is considered to be primarily a deficit involving behavioral inhibition.

The concept of ADHD has been subject to criticism, often being referred to as a convenient catchall for persons who are simply lazy, disobedient, or unmotivated. ADHD is not recognized as its own special education category, such as mental retardation, learning disabilities, and so forth. However, many students with ADHD are served by special education under the category of “other health impaired.”

Research and clinical observations during the middle part of this century suggested compelling evidence for a connection between brain injury and the presence of behaviors now associated with ADHD. Professionals began to apply the label of “minimal brain injury” to children who were inattentive, impulsive, and/or hyperactive. However, while clinical evidence seemed to connect brain injuries and ADHD, actual tissue damage in the brain was difficult to document. Thus, labeling and diagnoses of the disorder continued to rely on behavioral observations, with the primary focus being hyperactivity—the “hyperactive” child. By the 1980s, “inattention” began to be recognized as the primary deficit in cases of ADHD, sometimes accompanied by hyperactivity and sometimes not.

Most professionals rely on the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM) for the criteria used to determine whether an individual has ADHD. The current DSM uses ADHD as the general term and subdivides individuals into (1) ADHD, Predominantly Inattentive Type; (2) ADHD, Predominantly Hyperactive-Impulsive Type; and (3) ADHD, Combined Type.

Actual prevalence figures for ADHD are difficult to obtain, though estimates are that 3 to 5 percent of school-age children have ADHD. ADHD is recognized widely as one of the most frequent reasons that children are referred for behavioral problems to guidance clinics. It occurs much more frequently in boys than in girls. There may be some gender bias in referral, with boys being more likely referred because of aggressive behavior. However, the gender differences are also likely due to biological, or constitutional, differences. ADHD also occurs at least as frequently in a variety of other countries.

Assessment of whether a student has ADHD should include three components: (1) a medical examination to rule out other reasons for the child’s behavior problems; (2) a clinical interview to obtain as much relevant information as possible about the child’s physical and psychological characteristics; and (3) teacher and parent rating scales, as a means of quantifying observations. The American Academy of Pediatrics has published guidelines to help primary care physicians diagnose ADHD. Among other things, they recommend that physicians obtain information from parents and teachers regarding the core symptoms of ADHD, the age of onset, the duration of the symptoms, and the degree of functional impairment.

Advances in neuroimaging techniques during the 1980s and 1990s allowed scientists to more accurately document the neurological basis of ADHD. Research has found abnormalities in three areas of the brain in persons with ADHD: the frontal lobes, the basal ganglia, and the cerebellum. The frontal lobes are responsible for executive functions, or the ability to regulate one’s behavior. The basal ganglia and cerebellum are involved in coordination and control of motor behavior. Research has also revealed abnormal levels of the neurotransmitter dopamine in persons with ADHD, suggesting that levels of dopamine are too low in the frontal cortex, thus interfering with executive functioning, and too high in the basal ganglia, resulting in hyperactivity and impulsivity.

Family studies, twin studies, and molecular genetic studies indicate that heredity may also be a significant cause of ADHD. Also involved, though to a lesser degree, are toxic factors such as exposure to lead and abuse of alcohol and tobacco, as well as medical factors such as complications at birth and low birthweight.

While the most obvious psychological and behavioral characteristics of ADHD are inattention, hyperactivity, and impulsivity, the more basic problem is the inability to inhibit or regulate one’s own behavior. The inability to withhold, interrupt, or delay responses tends to under-
mine executive functioning. Persons with ADHD find it difficult to engage in a variety of self-directed behaviors or to stay focused on tasks that require sustained effort or concentration.

Children and adults with ADHD also appear to experience problems in adaptive behavior and in their relationships with peers. It is not uncommon for students with ADHD to experience social isolation, though they desperately might want to be liked. ADHD often occurs simultaneously with other behavioral and/or learning disorders, such as learning disabilities and emotional or behavioral disorders. Persons with ADHD are also at a higher risk for substance abuse, with adults being twice as likely as the general population to become dependent on alcohol, drugs, or tobacco.

Educational programming for students with ADHD usually has two components: (1) classroom structure and teacher direction; and (2) functional assessment and contingency-based self-management. A high degree of classroom structure and teacher direction, first advocated by William Cruickshank, is rarely seen today, partly because the intensity with which Cruickshank thought it should be practiced cannot practically be delivered in general education settings, where most students with ADHD are placed. In addition, today’s educators believe that while a high degree of structure is important in the early stages of working with students with ADHD, the ultimate priority is for them to become independent in their learning.

Functional behavioral assessment of students with ADHD involves determining the consequences, antecedents, and setting events that maintain appropriate behaviors. Such approaches might also include self-monitoring or self-management programs, wherein students record their own behaviors. These approaches are often contingency-based, with persons keeping track of their own behavior and then receiving consequences, usually in the form of rewards. Reinforcement in the form of social praise or points that can be traded for privileges plays an important role in the effectiveness of self-management techniques.

The treatment of ADHD with medication is one of the most controversial issues in all of special education, both within and outside the profession. Ritalin and Adderall, psychostimulants, are by far the most commonly prescribed medications for ADHD. Scientific studies support their effectiveness (including a large-scale NIMH-sponsored study), and most authorities in ADHD favor their use. Ritalin and Adderall stimulate the release of the neurotransmitter dopamine, thereby enabling more normal operation of the brain’s executive and motor functions. Responsiveness to psychostimulants is highly individualistic, so dosages may vary greatly from person to person. And it may not be effective for some people. Possible side effects, including insomnia and reduction in appetite, can usually be addressed very simply. Psychostimulants should not be prescribed at the “first sign” of behavior problems, nor should they be viewed as a panacea for all of a child’s academic and social problems.

Early detection of ADHD is difficult, partly because symptoms of ADHD are hard to distinguish from typical behaviors of very young children. Moreover, even high-quality early interventions have not proven to be very effective in the remediation of ADHD. Long-term programming for such children will in most cases still be needed.

The diagnosis of adult ADHD is controversial. For a long time it was assumed that children “outgrew” ADHD, and there has yet to be developed any real “test” for ADHD. Therefore, an interview or history is most crucial in identifying ADHD in adults, though interviews are subjective in nature and might be vulnerable to misinterpretation. Adults with ADHD tend to have less positive outcomes that the general population in terms of employment, marriage and family, and general social well-being, although many exceptions do exist. A recommended therapeutic technique for adults with ADHD is to establish a relationship with a coach, most likely a therapist or a friend, who will spend time regularly with them and help them keep focused on their goals.