This is a reprint of the Journal on Postsecondary Education and Disability, *volume 11, #2 & 3, Spring/Fall 1995, published by the Association on Higher Education And Disability.*

Diagnosis and Assessment of ADD in Postsecondary Students

Kathleen G. Nadeau

Abstract

Attention Deficit Disorder (ADD) is a complex disorder that can be manifested in a variety of ways and is most often accompanied by other disorders of a neurodevelopmental or psychological nature. Without diagnosis, treatment, support and accommodations, many bright and capable postsecondary students with ADD are at risk for poor academic performance and lack of degree completion. This population shares characteristics with both children and adults with ADD, however, those students whose ADD is not identified until the postsecondary level is a group with some unique characteristics that need to be understood in order to correctly diagnose and assess them. A good assessment should include recommendations for accommodations, compensatory strategies, and needs for counseling, psychotherapy and/or referral to other professionals regarding related disorders. A staff physician well trained in the needs of postsecondary students with ADD is an essential member of the treatment team. By identifying, diagnosing, treating, supporting and accommodating these students during their college years we have the opportunity to help students with ADD manage their neurochemical disorder, succeed educationally, and make appropriate and adaptive career choices as they leave the postsecondary environment.

The awareness of Attention Deficit Disorder (ADD) in postsecondary students is a recent phenomenon, and for this reason few guidelines exist for diagnosis and treatment. Most research on the assessment of Attention Deficit Disorder addresses the assessment of children. The term ADD is used throughout this article to refer to all subtypes and varieties of attention deficits, both with and without hyperactivity. The use of the term ADD has become common parlance in the field despite the fact that the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV), published in 1994, continues to use a confusing array of terms including ADHD - Primarily Hyperactive Impulsive Type, ADHD - Primarily Inattentive Type, and ADHD - Combined Type. Attention Deficit Disorder, previously known by a variety of terms including Attention Deficit/Hyperactivity Disorder, Minimal Brain Dysfunction and Hyperkinetic Reaction of Childhood, has historically been considered a disorder of childhood (Weiss & Hechtman, 1993). Because hyperactivity was considered the most salient feature of this disorder, and because hyperactivity often remits at puberty, it was mistakenly believed that all symptoms of the disorder were "outgrown" (Weiss, Minde, Werry, Douglas, & Nemeth, 1971). Although we now know that ADD is a lifespan disorder, the DSM-IV continues to

list it among disorders of childhood with a brief, passing mention that this disorder may persist into later years.

Recognition of ADD as a Lifelong Condition

The general recognition of ADD as a lifelong condition is very recent. Paul Wender, a widely respected researcher in the field of Attention Deficit Disorder, published in 1987 The *Hyperactive Child, Adolescent and Adult*, one of the first books for the general public providing information regarding ADD in adulthood. Wender reported earlier research by Hechtman and Weiss that followed the development into adulthood of children and adolescents who had been diagnosed with Attention Deficit Hyperactivity Disorder. Their study, as is true of many studies of Attention Deficit Disorder, focused exclusively upon those individuals who met the guidelines of the Diagnostic and Statistical Manual of Mental Disorders (3rd edition) (American Psychiatric Association, 1980) for Attention Deficit Hyperactivity Disorder which emphasized the symptoms of hyperactivity and impulsivity. It is now recognized that Attention Deficit Disorder can exist without the hyperactive-impuIsive component. This recognition of ADD without hyperactivity and impulsivity will almost certainly lead to the identification of more females (who are less likely to be hyperactive and/or impulsive) and of more adults (who are also less likely to be hyperactive and/or impulsive) with Attention Deficit Disorder. Conservative estimates of the incidence of ADD in childhood are 3%-5% (CH.A.D.D., 1993). It has been suggested that 1 % to 3% of the college population has Attention Deficit Disorder of significant severity to warrant treatment and accommodations (Barkley, 1993).

Making the ADD Diagnosis
Misunderstandings and Stereotypes

The name by which we call attentional problems has shifted repeatedly as we increase our understanding of this complex disorder. With each new edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) a new label and set of diagnostic criteria are introduced. Despite the general agreement that Attention Deficit Disorder without hyperactivity exists, the most recent DSM-IV (American Psychiatric Association, 1994) persists in referring to the disorder as Attention Deficit/Hyperactivity Disorder, listing the non-hyperactive-impulsive subtype as AD/HD, Primarily Inattentive Type. Given the confusion and debate among the experts, it is small wonder that the broader community of mental health professionals and members of the educational community may harbor misperceptions about ADD. Most individuals hold a stereotypic view of a child with ADD as a hyperactive child, usually male, who is loud, boisterous, impulsive, and who experiences behavioral and academic problems (Jaffe, 1995). Such children certainly exist and are most readily identified because of their obvious and difficult symptomatology. It is the group of students who do not conform to this hyperactive-impulsive clinical picture who are likely to go unidentified longer, or who may never become identified. These are the students who are most likely to be referred for diagnosis and assessment in the postsecondary setting. A full understanding of the "primarily inattentive type" of ADD student, as well as an understanding of how ADD may present in a "residual" state in older students, is essential for the service provider attempting to work effectively with the college ADD population.

DSM-IV Criteria for AD/HD
Primarily Inattentive Type

We will not consider in this context the criteria for "primarily hyperactive-impulsive" students with ADD. Such students are more easily recognized as having ADD, and are most likely to have been identified in early grade school. Rather, it is more important for our purposes here to consider the "primarily inattentive type" as they present during college years. The following is a list of diagnostic criteria published in the DSM-IV(American Psychiatric Association, 1994) for AD/HD - Primarily Inattentive Type.

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

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; and
i. is often forgetful in daily activities.

2. Some inattentive symptoms that caused impairment were present before age seven years.

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

4. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning. (p. 84.)

Note: This diagnosis can be made in adolescents and adults, even if they currently do not meet the criteria of demonstrating six of the nine listed symptoms. "In Partial Remission" should be specified.

In order to make a diagnosis of attention deficit disorder in students at the postsecondary level, there must have been evidence of attentional difficulties prior to the age of seven. The service provider should be very careful, however, in interpreting and understanding this diagnostic requirement. For some children whose intelligence is higher, whose symptoms are milder, and whose environments are supportive, ADD symptoms may not become readily apparent until a later age, when the structure in their life decreases and

the demands for concentration, focus, self-control, judgment, planning, and organization increase. The professional who only knows to look for more obvious and "classic" patterns of ADD runs the risk of overlooking many students greatly in need of both treatment and accommodations. College students are unlikely to have an accurate recall of their behavior patterns prior to age seven. Even parents can be quite inaccurate or defensive historians when questioned about their son's or daughter's behavior in early childhood. In fact, some parents adamantly deny that problems existed in childhood. Such parents may feel guilty if they believe their child had a disorder that went undiagnosed or untreated. Parents may also feel that their judgment is being questioned if their adult offspring suggests having had significant problems functioning as a child which went unrecognized by their parents. Some adults with ADD relate that their parents were not closely involved in their academic life as a child; others report that they experienced difficulties which they did not report to their parents. For all of these reasons, the service provider must attempt to gather information regarding early childhood functioning with a full realization that such retrospective reporting can be fraught with misinformation.

In non-hyperactive students of above average intelligence, the presence of ADD symptoms in high school or postsecondary school, as reported by the student, should be given stronger consideration than a parent's report that they were not aware of problems in early childhood.

The service provider should be familiar with the types of academic difficulties typically reported by a postsecondary student with AD/HD - Primarily Inattentive Type. Often such students may report having been a successful student in elementary school and even in high school. They may also describe, however, that they tend to be slow and inefficient. They may report a pattern of studying hard, but "blanking out" on exams. They may be highly creative and may love to read, but also may report that recall of material they have read is limited. These same students are likely to describe themselves as messy, disorganized, absent-minded, forgetful, and having a strong tendency to procrastinate. They may have enormous difficulty planning and prioritizing their time. The service provider who only sees evidence of childhood ADD in students who report poor grades, behavior problems, impulsivity and hyperactivity will unwittingly overlook many postsecondary students with ADD.

Special Concerns of the Postsecondary ADD Population

In order to develop a model for the assessment of postsecondary students with ADD certain aspects of both child and adult ADD evaluations should be included, in addition to consideration of concerns unique to the postsecondary population. Just as for children, a postsecondary ADD evaluation should address the potential educational impact of both attentional problems and any related cognitive deficits which may become evident in the evaluation process (Barkley & Murphy, 1993). The diagnostician also should be familiar with the more complex differential diagnosis issues and the likelihood of coexisting disorders for adults with ADD. For example, the likelihood of anxiety and depression secondary to ADD tends to increase with age. Other coexisting disorders such as

personality disorders (e.g., narcissistic, borderline, antisocial, and passive-aggressive), obsessive-compulsive disorder, substance abuse disorders, and impulse control disorders (Hallowell & Ratey, 1994) should be considered. In one self-referred clinic population, over half of the adults with ADD were found to have an additional psychiatric disorder (Schubiner, Tzelepis, & Warbasse, 1994). Among postsecondary students the possibility of alcoholism or other substance abuse should be considered routinely. Another study (Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990) found that among adults diagnosed with ADHD, 34% had histories of alcoholism, and 34% had histories of drug abuse or dependence. Some disorders may mimic ADD and require a careful differential diagnosis, including hyper- or hypo-thyroidism, caffeinism, chronic fatigue, seizure disorders, and certain medication side effects (Hallowell & Ratey, 1994).

Factors Contributing to a Later Diagnosis of Attention Deficit Disorder

College teachers or administrators may question how such a disorder could go undetected for so long; skepticism may be especially strong if the student performed reasonably well during high school. One young woman's ADD diagnosis was refuted by the psychiatrist on her college campus to whom she had been referred after receiving the diagnosis at home. This psychiatrist believed the student could not have gained admission to a competitive postsecondary institution if she had an accurate ADD diagnosis. The psychiatrist attributed her extreme distractibility, hyperactivity, and disorganization to a bipolar disorder. Fortunately, this student sought consultation from another physician more familiar with ADD who treated her successfully. This student's experience with misdiagnosis is not uncommon and reflects the need for education in the medical and mental health communities.

It is critical that faculty members and disability support service providers be aware of several factors that can lead to a later diagnosis of Attention Deficit Disorder. In addition to the "primarily inattentive" pattern which is harder to detect and may delay diagnosis, factors such as degree of severity, home and school environment, and intelligence level can all influence a later ADD diagnosis.

Degree of Severity and Environmental Factors

Attention Deficit Disorder can be manifested in widely varying degrees in different individuals. Those more severely affected are more likely to be detected earlier, while those whose ADD is more moderate can often function on grade level, escaping detection far longer. The manifestation of ADD symptoms can be strongly affected by environmental factors. Those students with Attention Deficit Disorder who grew up in families that provided them with a high degree of stability and structure may function adequately for a longer period before their attention deficits have a significant impact. Likewise, those students with ADD who attended schools with smaller classrooms, more structure, and more support are likely to go longer before attention deficits are recognized.

Other important environmental factors influencing the emergence of underlying ADD symptoms are the degree of stress and the level of performance demands that are placed upon the individual. Such a pattern of late emerging symptoms of ADD was noted in one of the earliest adult ADD studies (Shelly & Riester, 1972). Young men in the Air Force who were retrospectively diagnosed with ADD did not become clearly symptomatic until they were placed in a very high demand situation. Under highly challenging circumstances their compensatory techniques proved inadequate, and their ADD symptoms emerged. For students whose ADD has not been previously diagnosed, college often presents a similar high demand situation in which ADD symptoms emerge.

Intelligence

Another mitigating factor, which must be taken into account is the intelligence level of the student with Attention Deficit Disorder. The more intelligent the student the easier it will be for him or her, despite problems with inattention, memory, and organization, to function reasonably well within the classroom. A pattern common for high IQ students with ADD in high school is to show a high degree of variability in grades, between courses, and even within a single course. These students may show a pattern of high exam grades, but of mediocre final grades resulting from missing homework assignments and from papers or projects turned in late. Many gifted ADD students can rely on their intelligence to earn high grades in courses that are more conceptual in nature, but may tend to do poorly in courses such as math or foreign languages that call for disciplined memorization, cumulative knowledge, and attention to detail. Highly intelligent students with ADD can function adequately, or even well, but the hidden cost for this higher performance is enormous if their ADD goes untreated.

Cognitive Deficits and Academic Needs of Postsecondary Students with ADD

Although hyperactivity in children has been recognized and treated for a number of decades, it is only perhaps during the past decade that a more in-depth understanding of the accompanying cognitive deficits has developed. These cognitive deficits become the more dominant ADD traits affecting postsecondary students as the hyperactivity often decreases or even disappears when the student goes through puberty. Very little has been written about appropriate services for the secondary school student with ADD (Nadeau, Dixon, & Biggs, 1993). Nadeau et al. suggested that one of the strongest needs of the student with ADD as he or she encounters the challenges of secondary school is daily mentoring and assistance with organization, planning, time management, prioritization, and follow-through. These needs become even greater in the postsecondary setting where structure is substantially reduced, daily schedules vary, and diversions and distractions abound. This is a very critical time in the educational life of the student with ADD, and often a time when prior educational success crumbles under the greater demands for self-structuring.

Academic Difficulties Typically Reported by Postsecondary Students with ADD

Many postsecondary students with ADD report much difficulty with time management and procrastination. Even those with the self-discipline to remain seated at their desk may report that studying takes them much longer due to disorganization and distractibility. A student with ADD often reports having to reread passages many times before being able to adequately register and retain the information they have read.

These students also frequently report memory retrieval problems. That is, they are unable to produce on demand, such as during a test situation, information which they studied and committed to memory. Such retrieval problems are often due to poor memory strategies. Information is "filed" in haphazard fashion in long-term memory making the retrieval process difficult and unreliable. Such retrieval difficulties may be referred to as the "tip-of-the-tongue" phenomenon. The student "knows" the information, but can't produce it. The memory system in students with ADD tends to be "divergent" rather than "convergent." If students with "divergent memory associations" are presented with a specific term or name, they may be able to develop rich, unique, and highly varied set of associations, demonstrating both depth and breadth of knowledge. These same students, however, may encounter great difficulty retrieving a specific term or name from long-term memory if given a short-answer question on an examination. (It is for this, among other reasons, that alternative exam formats are necessary for many students with ADD in order to accurately measure their knowledge.)

The organizational problems encountered by individuals with ADD often make it difficult for them to write papers in a structured, cogent manner. Due to their "divergent" thought processes, ideas may come flooding from all angles with little coherency. Such students need extra support to learn to organize their thoughts into an outline form. Even with the benefit of an outline, their creative, divergent thoughts may make it difficult for them to categorize ideas. They may see so many possibilities that they struggle to reduce their "creative chaos" to a more organized set of possibilities. Many students with ADD are able to see the "big picture," but may experience much frustration and difficulty memorizing names, facts, sequences, and rules of grammar.

The Physician as a Critical Member of the Treatment Team

In addition to the need for structured support, students with ADD also need a physician well versed in the treatment of college students. With the exception of a few highly trained developmental pediatricians and child psychiatrists, the preparation of physicians regarding the treatment of ADD has been minimal. Many physicians know the rudiments of using stimulant medication in treating ADHD, but have little or no training in the behavioral management or educational supports needed by these students. As a result, an important, but often missing piece in the team of ADD service providers is a medical consultant who is knowledgeable about ADD on the postsecondary level. (See Quinn article in this volume for a more complete discussion of the role of the physician in the postsecondary treatment team.) Because of the high incidence of coexisting psychiatric and neurobiological conditions in the college population with ADD, the background and

training of the physician needs to extend beyond a familiarity with the use of stimulant medication. Ideally, each college and university should have a medical consultant or staff member at the student health center who can play this critical role.

Referral Routes and Presenting Problems

Some students are fortunate to encounter an astute teacher who recognizes signs of Attention Deficit Disorder. Sometimes this maybe a professor whose own child has ADD, or who otherwise has personal experience with its manifestations. Such a faculty member can serve a critical role, both in identifying students who need diagnosis and assessment, and in supporting these students after they have been diagnosed. More faculty awareness and education programs would promote the likelihood that faculty members could routinely and appropriately aid in the identification of students who need to be evaluated for ADD.

Often a student may be identified by a fellow student who has been diagnosed with ADD or LD and recognizes similar patterns in a friend. In other instances, students self-refer for an ADD evaluation after reading an article about ADD, or talking to a peer who has been identified with ADD.

Quite commonly, however, students may refer themselves to the counseling center, student health center, or resident advisor in a dormitory completely unaware that ADD is a primary contributor to the stress and anxiety which they are experiencing. Like other students experiencing failure, such students often feel overwhelmed, anxious, discouraged, and are perhaps even contemplating dropping out of school. Due to the now-recognized prevalence of undiagnosed ADD in the postsecondary population, service providers in student health services or counseling centers should routinely screen not only for the range of emotional issues that may lead to such an academic crisis, but also for symptoms of Attention Deficit Disorder.

A brief ADD/LD screening questionnaire should be automatically administered to all students whose troubled academic performance plays a part in their presenting complaints. (See Richard's article in this issue for a more complete discussion of screening procedures.) There are a number of these questionnaires available to Counseling Centers and DSS offices, and some have been developed for the adult population (Brown & Gammon, 1991; Copeland, 1989; Wender, 1985). The College Level ADD Questionnaire (Nadeau, 1993) is one of the first specifically designed to assist in the diagnosis of the college student with attentional difficulties. It is a comprehensive, structured-interview questionnaire that covers a wide range of issues including: inattention, impulsivity, hyperactivity, distractibility, hyper-focusing, time management, self-discipline, sleep-arousal problems, organization, memory, substance abuse, anger, frustration tolerance, emotional lability, anxiety, depression, self-esteem, interpersonal problems, and family and academic history. If the student's responses to a structured interview or questionnaire suggest that there may be reason to suspect ADD, an appropriate referral should be made for a full evaluation by an educational, clinical or neuropsychologist well trained in assessing ADD in the postsecondary population.

Diagnosis versus Assessment

Much debate occurs at present over the role of testing in the process of diagnosing ADD. Some feel that only a thorough clinical history taken by a knowledgeable professional is necessary. Others feel most comfortable relying upon "scientific" evidence such as performance on one of the electronic continuous performance tests designed to test ADD symptoms. While a simple "yes-no" ADD diagnosis may be made through a clinical interview by a highly skilled and knowledgeable professional, the assessment process involves much more than a simple question as to the presence or absence of inattention. Such an assessment should be done by an educational, clinical or neuropsychologist who is highly experienced in assessing not only ADD, but the whole range of coexisting conditions often found in conjunction with ADD. Testing allows the psychologist to assess both the nature and degree of cognitive problems associated with ADD and the very commonly found coexisting neurodevelopmental and psychological conditions that may affect the student.

Beginning the ADD Diagnostic and Assessment Process

The diagnostic process should begin with a clinical interview. If a structured questionnaire has not been previously administered by the referring professional, it can be very useful for the evaluating psychologist to structure the interview through the use of an ADD questionnaire. Such a questionnaire can efficiently guide the diagnostician to briefly touch upon a wide range of concerns that may bear further investigation as the assessment process continues. Responses to the questionnaire can guide the diagnostician in selecting the most appropriate test battery for a full assessment and can also assist in subsequent treatment planning. In this initial assessment phase, it is important that the psychologist not become so over focused upon ADD that he or she neglects to adequately explore the possibility of anxiety disorders, major affective disorders, personality disorders, or the range of adjustment disorders so often seen in students as they make the transition from home life to more independent campus life.

A complete medical and educational history should be obtained. It often may be necessary to query the parents of the postsecondary student about early childhood development, medical and educational history if the student is unable to provide such information in detail. It can also be very useful for the parents to complete a College Level ADHD Questionnaire describing their son or daughter. The diagnostician should be sensitive to the student's attitude toward parental involvement in the evaluation process. Contact with parents should only be undertaken if the student is fully in agreement. Copies of the student's report cards from elementary and secondary school, as well as any educational or psychological evaluations that may have been done during childhood, and records of standardized tests can be important sources of information for the diagnostician in beginning to put together the pieces of the diagnostic puzzle.

Based on the information gathered in this initial phase of evaluation, the psychologist can proceed to construct a test battery designed to answer specific questions which have arisen. Do the memory problems reported by the student go beyond the forgetfulness so

typical of ADD- Which tests and questionnaires can best measure the extent and type of memory problems- Is there a history of psychological problems- Is the student's report of reading problems the result of inattention, or is there a possible learning disability that combines with ADD to hinder the student's reading comprehension and retention- The psychologist should develop such a set of diagnostic questions and hypotheses while interviewing the student and gathering background information.

Tests to Consider for Inclusion in an ADD Test Battery

Beyond the initial ADD questionnaire and a thorough social, educational, psychological and medical history, there are a number of tests that can be useful in an ADD assessment. While the referring service provider does not need to be trained in the administration and detailed interpretation of these tests, it is useful for the service provider to be familiar with the range of tests available and the questions which may be answered by specific tests. Armed with such knowledge, the service provider will be prepared to review psychological reports as well as to assess whether the test batteries administered are appropriate and are adequate to answer to questions posed by the referring service provider.

The Wechsler Adult Intelligence Scale Revised (WAIS-R) (Wechsler, 1981) is valuable to include in most test batteries. WAIS-R results can provide not only information about attentional problems, but also a performance baseline against which to measure possible learning disabilities. Valuable information about a range of cognitive functions related to ADD can be gleaned from WAIS-R results as well. Often students with ADD show Arithmetic and Digit Span subscale scores that are low relative to other subscale scores. It is also common for the Digit Symbol score to be relatively lower. The clinician should be aware, however, that good performance on these subtests does not rule out ADD. It is a well-known phenomenon in neuropsychological testing that under time-limited circumstances, in a structured environment, working one-on-one with an examiner, test performance can be deceptively high in contrast to daily functioning outside the examiner's office.

In addition to comparing subscale scores it can also be very useful for the examiner to carefully observe the student during WAIS-R administration. Even when the pattern of subscale scores does not suggest ADD, the student may show strong behavioral signs of ADD during test administration such as fidgeting, impatience, visual and auditory distractibility, difficulty remembering verbal instructions, impulsive responding, hyperverbalization, tangential speech, and rapid mental fatigue.

A number of continuous performance tests have been developed specifically to measure focused attention, sustained attention, and impulse inhibition. Among these are the Gordon Diagnostic System (Gordon, 1983), and the Test of Variable Attention (T.O.V.A.) (Greenberg & Waldman, 1993). The caveat must be stated again, however, that adequate performance on any of these tests cannot rule out ADD. The structure, novelty, and relative short-term nature of the continuous performance testing situation can enable an otherwise highly distractible, disorganized student to perform in a focused

and effective manner. Unfortunately, ideal measures of attentional difficulties have yet to be devised. Especially for the postsecondary student, measures of more complex attentional tasks are needed. The continuous performance tests measure focused and sustained attention without requiring the subject to perform tasks requiring divided and/or alternating attention. Typically these more demanding attentional functions are the ones that can pose much difficulty for postsecondary students and adults.

Executive functions should be investigated in addition to specific measures of attention. These functions include the ability to plan, to initiate, to maintain effort, to evaluate and correct efforts, to shift the focus of attention and effort as appropriate, and to inhibit responses. The evaluator should keep in mind that the tests often used to measure executive functioning may not be challenging enough for the postsecondary student who may perform perfectly adequately on these tests, and yet experience much difficulty with executive functioning in daily life. Some of the tests considered to measure executive functions include the Halstead Category Test (Halstead, 1947), the Wisconsin Card-Sorting Test (WCST) (Grant & Berg, 1984), and the Porteus Maze Test (Porteus, 1950). Another type of test used to evaluate executive functioning involves tasks that require strategic planning. Most of these are subjective/qualitative measures rather than tests which compare scores against established norms. One of the best known of these tasks is the Tower of London Puzzle (Shalice, 1982) which requires both sequencing and planning. Poor performance on this test has been correlated with poor planning ability in daily life.

The Letter Cancellation Task (Lezak, 1983) is a simple task in which the examinee is presented with a sheet of paper printed randomly with letters of the alphabet with instructions to circle all of the "A's." While this test is normally given without a time limit, the author has found it very useful in the college population to allow only a 60 second time period in order to add an element of time pressure. Typically many students with ADD show markedly reduced performance level under time pressure. The examiner observes how organized, planful, and consistent the examinee is while scanning the page. An accuracy measure (number of target stimuli overlooked) is also made. Among students with ADD scanning often begins in a very organized, planful fashion but quickly deteriorates into a random, frantic search for target stimuli. Out of 45 possible correct responses, on a 60 second trial, 10 or more omissions would strongly suggest problems with inattention to detail suggestive of attention deficit.

While memory problems are often found in postsecondary students with ADD, the tests of memory which are commonly part of a psychological or neuropsychological battery may not address the most salient areas of memory deficiency. Little attention has been paid to the issue of memory problems in adults with ADD, although such problems are widely reported in the adult ADD population. The evaluator should be aware that a student may perform quite well, even in the superior range, on a standard measure of memory such as the Wechsler Memory Scale - Revised (WMS-R, 1987), and yet experience memory difficulties on a daily basis which severely impact his or her functioning. These memory failures typically fall in the categories of poor prospective memory (forgetfulness), poor short-term verbal memory, and what Broadbent, Cooper,

Fitzgerald and Parkes (1982) termed it "cognitive failures" (absentmindedness), doing things without awareness and without subsequent memory of having done them. In addition to administering the WMS-R, it can be useful to administer a self-report questionnaire regarding memory functions in everyday activities. One such questionnaire is the Cognitive Symptoms Checklist: Memory (O'Hara, Harrell, Bellingrath, & Lisicia, 1993). Since these questionnaires have been developed to assess everyday memory in a more impaired, brain-injured population, the evaluator who uses such a tool must take into account that some of the questions are inappropriate for the relatively well-functioning postsecondary population. Nevertheless, until a questionnaire is devised specifically to assess memory difficulties in the adult ADD population, the evaluator must rely on existing screening measures and make interpretations appropriate to a higher functioning population.

Differential Diagnosis and Assessment of Disorders Coexisting with ADD

Although the service provider relies upon the assessing psychologist to answer the questions of differential diagnosis and to assess the presence of conditions commonly found to coexist with ADD, it is very important for the referring service provider to be familiar with the general range of concerns which should be addressed in a comprehensive evaluation. There are a number of neurological and psychological conditions which are not ADD, but which may produce ADD-like symptoms. In addition, there is a long list of possibly coexisting conditions, psychological, neurological and neurodevelopmental which need to be considered.

Neurological Differential Diagnosis

The task of neurological differential diagnosis is outside of the scope of the assessment described here. It is important, however, that the diagnostician always considers the possibility of other neurological conditions that may mimic symptoms of Attention Deficit Disorder, and that may coexist with Attention Deficit Disorder. The diagnostician should take a complete medical history with specific inquiry into accidents, head trauma, exposure to toxins, seizures, serious, prolonged substance abuse, high fevers, and significant pre- and perinatal history. Input from parents may be important, particularly if the student mentions the possibility of such incidents earlier in life but is vague regarding details. A simple, brief neurological screening questionnaire may be most useful to the diagnostician to efficiently screen for possible neurological concerns, enabling him or her to recommend a neurological consultation when indicated. One such screening device is the Neuropsychological Symptoms Checklist (Shinka, 1983).

Psychological Differential Diagnosis

Hypotheses regarding possible co-existing psychological conditions should be developed as the diagnostician conducts the initial interview. The most common psychological conditions for which the diagnostician should screen are anxiety and depression. The coexistence of such conditions will determine which medications or combinations of medication may be most effective in treating both the student's ADD symptoms in

combination with other symptoms. For this reason, the diagnostician who finds evidence of significant emotional issues will not only appropriately recommend psychotherapy for the student, but should also include this information in any recommendation for a medication consultation as part of the student's treatment for ADD. Other coexisting psychological conditions which may be found include mood disorders, somatization disorders, and eating disorders (Schubiner, Tzelepis, & Warbasse, 1995). Normally, in the course of a standard ADD assessment a single psychological test such as the Minnesota Multiphasic Personality Inventory - II (MMPI-2) (Hathaway & McKinley, 1989) is recommended as a screening tool. If the MMPI-2 profile suggests significant areas of concern, then the diagnostician may elect to conduct a more extensive psychological evaluation.

Neurodevelopmental Assessment

A complete neurodevelopmental (learning disability) evaluation should be considered as a follow up to an ADD assessment if the diagnostician observes signs of probable learning disorders during the process of interview and testing. The student's self-report is very important in this screening process. Attentional difficulties may, in fact, be reflective of learning problems in addition to or even instead of ADD. For example, a student who reports having a short attention span when reading or studying, may, in fact, be experiencing a primary difficulty with reading or writing which results in restlessness and distractibility. While estimates vary, the incidence of learning disabilities among the ADD population is significant and should always be considered as part of the evaluation of ADD.

Recommendations Based on Assessment

No matter how accurate and thorough an assessment may be, its usefulness lies in the recommendations which are developed as a result of the assessment. These recommendations should include:

1. A list of services and accommodations that should be provided by the office of disability services, or by other learning support services on campus.

2. Suggestions for areas of remediation (such remediation will involve organization, time management skills, and study skills as well as more academic skills such as reading, writing, and mathematics).

3. Compensatory strategies and approaches to be developed over time by the student.

4. Discussion of the need for medication consultation, counseling, or psychotherapy.

Support, Guidance and Mentoring

A critical element in the usefulness of any assessment is the provision of consistent guidance and support to the student as he/she implements recommended actions. It is this essential element which can be provided by the disability service provider, or by the service provider in conjunction with others on campus. Since planning, organization, and follow-through are typically areas of significant difficulty for students with ADD, it will be very rare that such a student can effectively act upon the recommendations made in a diagnostic report without ongoing structured support. Their poor ability to initiate, plan, and follow-through is not a product of immaturity or irresponsibility but is a symptom of the disability itself. A school that is committed to developing an effective program for students with ADD needs to think seriously about the provision of such ongoing support, either individually, or in groups, to structure and monitor recommended plans of action.

Conclusion

ADD is a complex disorder that can be manifested in a variety of ways and is most often accompanied by other disorders of a neurodevelopmental and psychological nature. Without diagnosis, treatment, support, and accommodations many bright and capable postsecondary students with ADD are at risk for poor academic performance and lack of degree completion. The professional community that treats adults with ADD commonly encounters adults in their middle years who did have the benefit of diagnosis and treatment of their ADD during college years and who are struggling against enormous odds to belatedly complete their education. In light of our growing knowledge about ADD, we have the opportunity to assist the current generation of postsecondary students with ADD and to prevent them from experiencing the often disastrous "domino effect" that begins with college drop-out is followed by frustrating and disappointing job performance, and ultimately leads to despair and depression. By identifying, diagnosing, treating, supporting, and accommodating these students during their college years we have the opportunity to help them manage their neurochemical disorder, to succeed educationally, and to make appropriate and adaptive career choices as they leave the postsecondary environment. A comprehensive assessment of ADD is an important initial step in developing a comprehensive treatment plan. The disability service provider who is knowledgeable about the important elements of a comprehensive ADD evaluation can both assist the student in seeking such an evaluation, and can later assist the student in understanding the results of such an evaluation and in following through on the recommended courses of action.

References

Barkley, R. (1993). *Attention deficit hyperactivity disorder: Workshop manual*. Worcester, MA: Author

Barkley, R., & Murphy, K. (1993, October). Guidelines for a written clinical report concerning ADHD adults. *ADHD Report*, 1(5), 8-9.

Brown, T.E., & Gammon, G.D. (1991) *The Brown Attention-activation Disorder Scale: Protocol for clinical use*. New Haven: Yale University.

Broadbent, D.E., Cooper, E.F., Fitzgerald, P., & Parkes, K.R. (1982). The Cognitive Failures Questionnaire (CFQ) and its correlates. *British Journal of Clinical Psychology. 21,* 1-16.

CH.A.D.D. (1993). Not just for children anymore: ADD in adulthood. *CH.A.D.D.er*, 19-21.

Copeland, E.D. (1989). *Copeland Symptom Checklist for Adult Attention Deficit Disorders*. Atlanta: Southeastern Psychological Institute.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Gordon, M. (1983). *The Gordon Diagnostic System*. DeWitt, NY: Gordon Systems.

Grant, D.A., & Berg, E.A. (1984). A behavioral analysis of reinforcement and ease of shifting to new responses in a Weigl-type card-sorting problem. *Journal of Experimental Psychology*, 38, 404-411.

Greenberg, L.M., & Waldman, I.W. (1993). Developmental normative data on the Test of Variables of Attention (T.O.V.A.). *Journal of Child Psychology and Psychiatry 34*, 1019-1030.

Hallowell, E., & Ratey, J. (1994). *Driven to distraction*. New York: Pantheon.

Halstead, W.C. (1947). *Brain and intelligence*. Chicago: University of Chicago Press.

Hathaway, S.R., & McKinley, J.C. (1989). *Minnesota Multiphasic Personality Inventory-II*. Minneapolis: National Computer Systems.

Jaffe, P. (1995). History and understanding of ADD as a neurobiological disorder. In K. Nadeau (Ed.), *A comprehensive guide to ADD in adults: Research, diagnosis, and treatment* (pp. 3-17). New York: Brunner/ Mazel.

Lezak, M. (1983). *Neuropsychological assessment*. New York: Oxford University Press.

Nadeau, K. (1993). College level ADHD questionnaire. in P. Quinn (Ed.) *ADD and the college student* (pp. 718). New York: Brunner/Mazel.

Nadeau, K., Dixon, E., & Biggs, S. (1993). *School strategies for ADD teens*. Annandale, VA: Chesapeake Psychological Publications.

O'Hara C., Harrell, M., Bellingrath, E., & Lisicia, K. (1993). *Cognitive Symptom Checklist: Memory*. Odessa, FL: Psychological Assessment Resources (PAR).

Porteus, S.D. (1950). *The Porteus Maze Intelligence Test*. Palo Alto, CA: Pacific Books.

Schubiner, H., Tzelepis, A., & Warbasse, L. (1995). Differential diagnosis and psychiatric comorbidity patterns in adult ADD. In K. Nadeau (Ed.) *A comprehensive guide to ADD in adults: Research, diagnosis and treatment* (pp. 35-57). New York: Brunner/Mazel.

Shalice, T. (1982). Specific impairments of planning. In P. Broadbent & L. Weisknartz (Eds.), *The neuropsychology of cognitive function* (pp. 199-209), London: The Royal Society.

Shekim, W.O., Asarnow, R.F., Hess, E., Zaucha, K., & Wheeler, N. (1990). A clinical and demographic profile of a sample of adults with attention deficit hyperactivity disorder, residual state. *Comprehensive Psychiatry, 31*, 416-425.

Shelly, E.M., & Riester, A.A. (1972). *A syndrome of minimal brain damage in young adults*. Diseases of the Nervous System, 33, 335-338.

Shinka, J.A.(1983). *Neuropsychological Symptom Checklist*. Odessa, FL: Psychological Assessment Resources (PAR).

Wechsler, D. (1987). *Wechsler Memory Scale: Revised*. New York: The Psychological Corporation.

Wechsler, D. (1981). *Wechsler Adult Intelligence Scale: Revised*. San Antonio, TX: The Psychological Corporation.

Weiss, G., Minde K., Werry, J. S., Douglas, V.I., & Nemeth, E. (1971). Studies on the hyperactive child: VIII. Five year follow up. *Archives of General Psychiatry, 2*, 409-414.

Weiss, G., & Hechtman, L. (1993). *Hyperactive children grown up, - ADHD in children, adolescents, and adults* (2nd ed.). New York: The Guilford Press.

Wender, P.H. (1985). Wender Adult Questionnaire-Childhood Characteristics (AQCC) Scale. *Psychopharmacology Bulletin, 21*, 927-928.

Wender, P H. (1987). *The hyperactive child, adolescent, and adult -Attention Deficit Disorder through the lifespan*, New York: Oxford University Press.

About the Author:

Kathleen G. Nadeau, Ph.D. edited the just published text, A comprehensive Guide to Attention Deficit Disorder in Adults: Research, Diagnosis and Treatment. *She is also the author of* A College Survival Guide for Students with ADD and LD. *Dr. Nadeau heads a private clinic in Bethesda, Maryland, where she specializes in the treatment of adolescents and adults with attentional and learning problems. She has a strong interest in working with undergraduate students as well as with students in graduate or professional training who are diagnoses with ADD and/or LD.*