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# **The Role of the Physician and Medication Issues in the Treatment of ADHD in Postsecondary Students**

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## **Abstract**

*In this article the role of the physician in working with students with ADHD at the postsecondary level is defined. The symptoms and etiology of ADHD are reviewed and gender differences are discussed. Criteria for diagnosis are presented and helpful worksheets and questionnaires are reviewed. An overview is provided of the multimodal treatment plan necessary to address the needs of the student with an in-depth discussion of medication and its side effects. Follow up visits are recommended, and the importance of the physician becoming more involved in postsecondary education to support the identification of this disorder is addressed.*

The role of the physician in working with postsecondary students is defined by four purposes: (a) assisting in or confirming the initial diagnosis of ADHD, (b) initiating a multimodal treatment program, (c) prescribing and monitoring the student's response to medication, and (d) working in collaboration with the postsecondary director of the disability office.

## **Diagnosing ADHD**

## **Causes of ADHD**

In order to diagnose ADHD it is important to look at its causes and some of the high risk populations in which it is found. ADHD is a neurobiological condition that affects learning and behavior. It is present in from 5% to 10% of the population. ADHD begins in childhood and was initially thought to be outgrown by adolescence. However, we now know that this is not the case, and that from 40% to 60% of individuals with ADHD continue to be bothered by symptoms into adulthood. Studies that have followed these children into adulthood have found a persistence of symptoms with less stability and satisfaction in areas such as employment. Underachieving and impulsivity with emotional lability have also been seen (Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1993; Weiss & Hechtman, 1993).

ADHD is usually diagnosed in males, but it can also be observed in females. However, ADHD in women can escape even the best clinician's detection as these women frequently lack the typical symptoms of hyperactivity and impulsivity (Berry, Shaywitz, & Shaywitz, 1985), and because socialization processes lead girls to develop more internalized symptoms such as anxiety and depression (Brown, Abramowitz, Madan-Swain, Eckstrand & Dulcan, 1989) rather than the conduct disorders more often seen in boys. Although females with ADHD have been found to have more pronounced cognitive deficits than their male counterparts (Berry et al., 1985), they tend to go undiagnosed longer. For many females with ADHD, more severe problems begin with the onset of puberty, with an increase in emotional overreactivity, mood swings and impulsivity due to an increase in hormones and to hormonal variation throughout the phases of the menstrual cycle (Huessy, 1990).

Despite this varied picture, investigators are becoming more certain that ADHD has a genetic basis. Studies of identical and fraternal twins (Gullies, Gilger, Pennington, & DeFries, 1992; Goodman & Stevenson, 1989) have substantiated a higher incidence of ADHD in identical rather than fraternal twins. Other studies (Biederman, Faraone, Keenan, & Tsuang, 1991) have found that the relatives of ADHD children have a greater risk for the disorder as well as having much higher rates of anxiety and depression. Research in this area also includes studies of the dopamine receptor gene. The dopamine D2 receptor locus was recently found to be a modifying gene in 46% of patients diagnosed with ADHD (Comings, et al., 1991).

## **Comprehensive Interview**

In establishing the diagnosis of ADHD the physician should always conduct a comprehensive interview with the student suspected of having the disorder. This includes a full medical and genetic history inquiring about other neuropsychiatric conditions as well as ADHD. A higher incidence of alcoholism has been noted in the families of individuals with ADHD (Goodwin, Shulsinger, Hermansen, Guze, & Winokur, 1975; Morrison & Stewart, 1973). Exposure to environmental toxins such as lead (Needleman et al., 1979) and prenatal exposure to alcohol (Hanson, Jones, & Smith, 1976) and cocaine (Brooks-Gunn, McCarton, & Hawley 1994) may also lead to hyperactivity in childhood and inattention and memory deficits in adults.

Neonatal problems such as prematurity and lower birth weights than expected for gestational age place the infant at risk for both learning disabilities and attention deficits in the future. Early childhood conditions such as meningitis, encephalitis, serious head trauma, early iron deficiency anemia, and severe malnutrition can also be causes of later disabilities and should be investigated during the initial interview.

## **Questionnaires**

Questionnaires are now becoming available, and these can be useful tools in establishing the diagnosis of ADHD. In his workbook for clinicians, *Attention-Deficit Hyperactivity Disorder: A Clinical Workbook*, Barkley has provided an Interview Form and Rating

Scales for ADHD adults. These forms are used in the adult ADHD clinic at the University of Massachusetts Medical Center for evaluating adult referrals. Permission is given to photocopy these pages for personal use. Forms include a Semistructured Interview for Adult ADHD that inquires about current symptoms, past history (medical and psychiatric), current medications, family history, and social history. Also provided are a series of self-rating checklists including a Self-Rating Symptom Checklist, a Physical Complaints Checklist, and a Patient's Behavior Checklist. These forms may be useful in providing a framework for physicians to obtain background information, elicit symptoms, and establish a baseline against which to evaluate the success of various treatment interventions.

Nadeau (1994) has developed a checklist, *College Level ADHD Questionnaire*, designed especially for students at the postsecondary level. A *Sample Adult ADD Assessment Interview* and an *ADD Checklist* are also provided by Weiss (1992), but these are not as structured as Barkley's. Other checklists are being developed or are just becoming available at this time.

## **Symptoms of ADHD**

The structured interview presents the opportunity for the physician to inquire about the symptoms of ADHD not only as they present at this time but as they affected the student in earlier years. Young adults with ADHD continue to have difficulty with sustained attention, impulse control, decision making, and distractibility. Hyperactivity remains a symptom, but this may be "outgrown" by adolescence and appear more as a fidgety restlessness and/or inability to sit for long periods. The most common areas of continued disturbance are academic and social. Underachievement in school is frequently the presenting complaint. Impulsivity when found impairs the young adult's ability to make decisions or to stick to a course of action. It may be difficult for him or her to inhibit behaviors as the situation demands or to keep from changing plans. Emotional reactions secondary to ADHD may also be present. These include denial, temper tantrums, poor self-esteem, and depression. It is important to identify and address these secondary problems as well as the underlying attention deficits.

## **Criteria for Diagnosis**

By 1985, Wender, observing these symptoms in adults with a previous history of ADHD, referred to the syndrome as Attention Deficit Disorder-Residual Type (Wender, Reimherr, & Wood, 1981, Wender, Reimherr, & Wood 1985) and developed criteria for the diagnosis of ADD-RT. These criteria consisted of the following: (a) the individual must have had a history of the disorder in childhood; (b) the adult must have symptoms of both hyperactivity and attentional deficit; and, in addition, (c) must have two of the following characteristics: 1) poor organization, 2) poor concentration to task persistence, 3) impulsivity, or 4) emotional lability.

The Diagnostic and Statistical Manual of Mental Disorders (DSM- III) (American Psychiatric Association, 1980) used the term Attention Deficit Disorder, Residual Type

(314.8), and stated that the individual must have at one time met the criteria for ADD with hyperactivity; that signs of hyperactivity may no longer be present, but that others signs have persisted into adulthood. These symptoms must also have resulted in some impairment of social or occupational functioning, and the disorder must not be due to other causes. This diagnosis was not listed in the DSM III-R published in 1987. Likewise, the new DSM IV (1994) offered no separate listing for residual type but divided ADHD into three categories: (a) ADHD, Predominantly Inattentive Type; (b) ADHD, Predominantly Hyperactive-Impulsive Type; and (c) ADHD, Combined Type. Criteria included the use of a coding note that stated that adolescents and adults who currently have symptoms of ADHD that no longer meet the full criteria should be diagnosed according to the new categories but have the terms "in partial remission" added.

## **Physical Examination and Routine Tests**

A complete physical examination should be carried out by the physician to rule out other causes of presenting symptoms (e.g., hypoglycemia, drug abuse, frontal lobe epilepsy, etc.) and to establish the presence of other medical conditions such as hypertension, allergies, asthma, or headaches. Tests such as an electroencephalogram (EEG), magnetic resonance imaging (MRI) or computerized tomograms (CT) scans are not necessary as part of a routine evaluation for ADHD. However, a vision and hearing screening as well as routine blood testing should be performed. These blood tests should include thyroid studies as Attention Deficit Disorder has been associated in children (70%) and adults (50%) with generalized resistance to thyroid hormone (Hauser et al., 1993).

## **Comorbid Conditions**

Physicians play an important role in identifying ADHD but must also be aware of the other related conditions that commonly occur with this syndrome. Individuals with ADHD have been found to have comorbid conditions in as many as 40% of the cases. These include Obsessive Compulsive Disorder (OCD) (Rapoport, 1986), anxiety disorders, depression, oppositional or conduct disorders (Beiderman, Newcorn, & Sprich, 1991; Pliszka 1992), tics, and Tourette's Syndrome (Comings & Comings, 1984). The physician must be sure to rule out or become aware of these disorders as well. In a sample of adults with ADHD, 53% were diagnosed as having a general anxiety disorder, 34%, alcohol abuse or dependence, 30%, drug abuse, 25%, dysthymic disorder, and 25%, cyclothymic disorder (Shekim, Asarnow, Hess, Zaucha, & Wheeler, 1990). In addition, a large percentage of individuals with ADHD also have learning disabilities (LD) (Barkley, 1991). The physician should be sure that this area is addressed by thorough educational and psychological evaluations. A referral should be made if these tests have not already been performed.

## **Multimodal Treatment Program**

Following the observation of significant difficulties, the physician may recommend appropriate treatment from among a variety of modalities. The treatment of ADHD requires a comprehensive program that addresses all of the young adult's needs. This

includes medical, educational, psychological, and behavioral interventions. While the medical treatment remains in the hands of the physician, other aspects of this program usually come under the domain of the disability service provider who, in most institutions, assumes the role of case manager. Coordination with this postsecondary service provider and a team of other care-givers including mental health professionals, educational specialists, tutors, and counselors is imperative.

The student may likewise benefit from individual therapy, support groups, college and career counselling, academic accommodations, auxiliary aids, metacognitive and other self-regulatory strategies, as well as medication. The degree to which a student is affected by ADHD will vary considerably; not all students will need each of these interventions.

### **Counseling and Behavior Management**

Other treatments should be recommended in conjunction with medication to assure the most positive outcome for students with ADHD at the postsecondary level. Psychotherapy and supportive counselling are critical not only in dealing with the symptoms of ADHD but also the secondary emotional and social problems. A structured behavior management program with written contracts can be useful in dealing with difficulties with task completion, and can be effective in modifying target behaviors. Research has shown that behavior therapy combined with stimulant medication can be more effective than either treatment modality alone (Pelham, 1990).

### **Cognitive Therapies**

Various cognitive therapies have recently gained much attention for use in the treatment of ADHD symptoms, particularly overactivity and impulsivity. The goal of cognitive therapy is to develop improved self-control skills and reflective problem solving strategies. While several initial small studies appeared to lend promise to this technique, recent reviews have found they have little or no effect on cognitive functioning and academic performance (Abikoff, 1991). Some improvement in self-control behavior in the classroom as measured on the Conner's Teacher Rating Scale was seen (Reid & Borkowski, 1987). Other studies have suggested an increase in on-task classroom behavior (Barkley, Copeland, & Sivage, 1980; Cameron & Robinson 1980).

For the professional interested in learning more about these treatment modalities in a text that goes beyond the scope of this brief review, Goldstein and Goldstein's book (1990) is particularly relevant.

### **Supportive Therapies and Tutoring**

Supportive special education services and tutoring programs should continue if they were necessary for the successful completion of a secondary curriculum. These combined with postsecondary accommodations will make the academic challenges easier for the young adult with ADHD. Referral should be made to the college counselling center or facility

for students with special needs. The physician should make sure that the student is accessing these services at the routine followup visits.

## **Exercise and Diet**

The student with ADHD should be counselled on the need for plenty of exercise on a routine basis to help deal with hyperactivity, frustration, and stress. The physician also needs to stress the importance of a proper diet for all students with ADHD but particularly those on stimulant medication who may experience appetite suppression. The best course for all students is a well balanced, nutritionally sound diet with meals evenly spaced throughout the day. In my practice, I am always amazed at the number of patients who are not eating breakfast or are "skipping meals." The life style of a college student does little to reinforce good nutritional habits, but good habits are essential for the individual with ADHD who needs to carry on effectively and efficiently. The physician further needs to be on guard for the student who is using the appetite suppressing side effect of stimulant medication for weight control. Frequent weight checks and nutritional counselling can help to avoid this particular problem.

## **Medication**

Stimulant medication is one of the most useful tools in dealing with ADHD. Although the use of medication does not cure the disorder it certainly can reduce many of the symptoms. Stimulants are effective in both teenagers and adults with ADHD and can be used in these populations contrary to popular belief. Higher doses may be necessary in this population with best results occurring at a level of 1.0 mg/kg/day dose. This correlates somewhat to the need for moderate (20 mg/day) and higher dose (30 mg/day) methylphenidate treatment in 71% of the subjects with attention deficit disorder with hyperactivity reported by Barkley and coworkers (1991). In this sample 95% were found to be positive responders to the stimulant medication. While the majority of individuals with ADHD respond to stimulant medication the physician must now look carefully at other treatment regimes in order to treat the complex symptoms and comorbid conditions associated with ADHD in this age group. It is the biochemical models that have been proposed and the recent documentation of CNS dysfunction that allow the physician to evaluate a student's symptoms and prescribe treatments that will be effective in alleviating them. Knowledge of the specific neurotransmitter systems which control and regulate particular anatomical areas can be useful in determining the medication that is best suited for the patient.

Individuals who appear to have mainly frontal lobe deactivation have been found to respond best to stimulants. While the exact mechanism of action of the stimulants is not known, they appear to improve symptoms of ADHD by allowing better use of the chemical neurotransmitters. These medications may regulate and stabilize the neurobiochemical system and thus improve brain functioning. The frontal lobes become "stimulated" and are thus able to perform their inhibitory capacity, and motor restlessness is decreased. Rapoport et al., (1978) reported that a single dose of dextroamphetamine given to a group of normal boys resulted in a marked decrease in motor activity and

reaction time and improved performance on cognitive tests, thus ending the theory that children with ADHD had a "paradoxical" response to stimulants.

Patients who are overaroused and hypervigilant may be more responsive to alpha-2-noradrenergic agonist drugs such as clonidine. Since the work of Hunt, Minderaa, and Cohen (1985), clonidine has been proposed as an alternative treatment in patients with ADHD. Clonidine, in addition, can be highly effective in controlling tics and therefore has been proposed as an alternative medication in patients with ADHD and a comorbid tic disorder. In studies conducted by Steingard, Biederman, Spencer, Wilens, and Gonzalez (1993), clonidine resulted in improvement in both ADHD (72%) and tic (75%) symptoms. Their findings also suggest that children with ADHD and tic disorder responded better (96%) than children with ADHD alone (53%).

The role of serotonin in ADHD has not been clearly established biochemically. Newer serotonin agents, such as fenfluramine and fluoxetine, have been useful in treating comorbid symptoms such as depression and anxiety when they occur in an individual diagnosed with ADHD. However, these agents do not appear to address the core symptoms of ADHD.

Tricyclic antidepressants have also been used for many years as an alternative psychopharmacologic agent for treating the symptoms of ADHD in children (Beiderman, Baldessarini, Wright, Nee, & Harmatz, 1989). Dosages in adults for treatment of ADHD have not yet been well established with two opposite camps advocating effectiveness at either 3mg/kg/day or higher (Beiderman et al., 1989) or low dose therapy of between 10 to 30 mg/day advocated by Ratey (Jaffe, 1993).

### **Prescribing medication.**

Stimulants are by far the most frequently used treatment modality for ADHD. They are rapidly absorbed with food enhancing absorption (Greenhill, 1992). Methylphenidate is the most commonly used medication for ADHD. Dextroamphetamine is also used, particularly in adults. If there is no response to the initial stimulant prescribed then the other should be tried (Elia & Rapoport, 1991). These medications are available in both short and long acting preparations. While initial reports indicated that the long acting preparation was not significantly different from the standard form (Whitehouse, Shah, & Palmer, 1980), some have suggested that the long acting methylphenidate is not as effective (Dulcan, 1990). In my experience the latter has been the case. The short acting preparations last approximately four to six hours, and this dosage delivery appears to be particularly effective to coordinate medication delivery around blocks of class and/or study time.

Other medications can also be used to treat of symptoms of ADHD. These include the antidepressants which although not as effective as the stimulants can have other beneficial effects. Potential cardiac complications necessitate that a EEG be obtained prior to starting this group of drugs and be repeated after each increase in dose (Elliott & Popper, 1991). The availability of blood levels helps the physician establish treatment

and monitor dosage to assure that medication levels stay within the therapeutic range. The practitioner should be aware that controversy exists regarding the dose of the tricyclics in adults and refer to the previous discussion of this topic.

Clonidine may be used alone or in conjunction with the stimulants. This combination appears to be particularly effective in treating the overaroused, hypervigilant, and/or aggressive patient. Its main side effect of sedation necessitates initial therapy at bedtime with gradual introduction during the day in very small doses. Individual doses should be increased very gradually over several weeks to months until effective levels are reached. Clonidine has proven particularly useful for the patient with ADHD and tics.

### **Side effects of stimulant medication.**

Stimulants can produce side effects with some being more common than others. Physicians should be prepared to discuss these with the student prior to beginning a trial of medication. Short term side effects of decreased appetite, insomnia, stomachaches and headaches were found to increase significantly in severity and frequency during dose trials with stimulants (Ahmann et al., 1993; Barkley, McMurray, Edelbrock, & Robbins, 1990).

### **Follow Up Visits**

Once established on a stable dose of medication with a good therapeutic response, the student should be followed at regular intervals. If stimulants are prescribed, a quick check can be done monthly as each prescription is refilled. Compliance with dosage schedule can also be monitored in this way by keeping track of frequency of refills. Height, weight, and blood pressure checks should be monitored every three to six months or more often if anorexia or weight loss is a problem. The physician should also inquire as to compliance with the other aspects and recommendations made as part of the total treatment program. Additions or deletions in this program may be made as necessary to ensure the student's success in all aspects of college life.

### **Coordination with the Disability Services Office**

Although the physician is responsible for the diagnosis and/or treatment of ADHD, he or she usually does not assume the role of case manager at the postsecondary level. On most campuses this role falls to the director or staff of the disability services office. It is therefore critical that there be communication between these two parties and a spirit of collaboration. In most instances, it is the service provider who has first contact with a student in academic difficulty presenting with the symptoms of possible ADHD. Referral to the physician for diagnosis would then be appropriate.

Likewise, the service provider on campus will most likely be responsible for initiating and implementing those aspects of a total treatment program that involve dealing with academic regulations, faculty, and/or tutoring services. Individual and career counselling may also be carried out through this office.

Medication effectiveness can be monitored during regularly scheduled follow up meetings. The disability service provider may also arrange for medication follow up for the student who comes to campus already on medication.

### **Conclusion**

In conclusion, it is the role of the physician to monitor progress in students with ADHD and to make referrals to other professionals as the situation warrants. The physician should be responsive to the multifaceted needs of the student with ADHD at the postsecondary level and do all that can be done to provide information and guidance to the individual student. However, this role should not merely be limited to prescribing medication, as this is only part of the picture. The physician should work closely with the director of the disability office to insure that the student is taking advantage of available services and responding positively to therapeutic interventions. Regularly scheduled meetings between the physician and the disability service director will assist in a well coordinated program for students with ADHD at the postsecondary level. The physician should also take an active role in educating the faculty and administration as to the symptoms, prognosis, and needs of patients with ADHD at the postsecondary level.

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