9-2010

Diagnosing and Treating ADHD: Discipline Differences

Lisa Marie Lliteras

LOMA LINDA UNIVERSITY
School of Science and Technology
in conjunction with the
Department of Psychology

Diagnosing and Treating ADHD: Discipline Differences

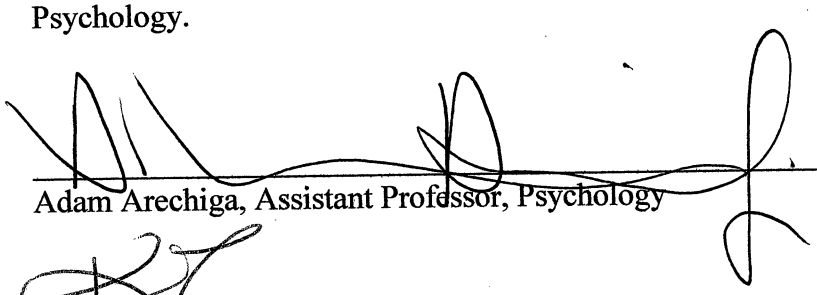
by

Lisa Marie Lliteras

Project submitted in partial fulfillment
of the requirements for the degree of
Doctor of Psychology

September 2010

Each person whose signature appears below certifies that this doctoral project in his/her opinion is adequate, in scope and quality, as a doctoral project for the degree Doctor of Psychology.



, Chairperson

Adam Arechiga, Assistant Professor, Psychology

Kim Freeman, Associate Professor, Social Work & Social Ecology

ACKNOWLEDGEMENTS

I would like to thank the individuals who helped me complete this project. In particular, I would like to thank Kiti Freier for encouraging me and helping with the initial conceptualization of this project and to Adam Arechiga for his support and commitment to helping me finish it. I would also like to thank my committee member, Kim Freeman, for her thoughtful comments and encouragement. I dedicate this project to my husband, Robert, and my children, Joshua and Matthew, for their understanding, love and patience over the years.

CONTENTS

LIST OF TABLES

Table Page

ABSTRACT

DIAGNOSING & TREATING ADHD: DISCIPLINE DIFFERENCES

by

Lisa M. Lliteras

Doctor of Psychology, Graduate Program in Psychology
Loma Linda University, September, 2010
Dr. Adam Arechiga, Chairperson

According to Barkley (2005), attention deficit hyperactivity disorder (ADHD) is one of the most common reasons children are referred to mental health workers in the United States and is now one of the most prevalent psychiatric disorders associated with childhood. The diagnostic criteria and labels for ADHD have changed over the last several decades, and with each change the prevalence rate for ADHD has increased (Wolraich & Baumgaertel, 1997). This increase in the prevalence of ADHD has led to a need for clinicians from different disciplines to assess and treat ADHD. As such, several guidelines from professional associations have been published in effort to create some consistency in the assessment and treatment of ADHD. Nevertheless research indicates that there is still substantial variability in diagnosis and treatment strategies within disciplines as these guidelines have proven difficult to implement. This variability suggests that there are likely differences in how the different disciplines, i.e., medicine and psychology, approach diagnosing and treating ADHD. However, no research exists at this time which has looked at this issue. The purpose of this paper therefore is to investigate the history of how ADHD has been conceptualized over the years, as well as the various treatment options.

Introduction

Attention deficit hyperactivity disorder (ADHD) has become one of the most frequently diagnosed psychiatric disorders of childhood in the United States (Barkley, 2005) and there is indication that the prevalence rate continues to increase (Harpaz-Rotem & Rosenbeck, 2004). The most often cited prevalence rate for ADHD in the childhood population of the United States is 3-5% (American Psychiatric Association (APA), 1994; Barkley, 2005). However, recent estimates based on epidemiologic studies reveals prevalence rates ranging from 4 to 12% in the general childhood population (Brown et al., 2001). Varying prevalence estimates led Barkley (1998b) to state that "because ADHD cannot be strictly defined and precisely and objectively measured, its true prevalence cannot be accurately determined" (pg. 78). This has led parents, educators, psychologists and physicians to question why this problem seems to have increased in the last 30 years. The answer seems to lie in part, to changes that have occurred to the diagnostic criteria over the last several decades, as the prevalence rate of ADHD has increased with each publication. This has created a demand for professionals to assess, diagnose and treat ADHD, specifically psychologists and physicians. However with the variety of professionals involved in the diagnosis and management of ADHD they have introduced a wide variety of assessment methods and treatment options.

Historical Perspective of Attention Disorders

According to Singh (2002), the history of ADHD has been "characterized mainly by the pursuit of a clinical definition" (p. 361). This pursuit is often traced back to the 1902 lectures of George Frederic Still presented at the Royal College of Physicians in London that were subsequently published (Still, 1902; Armstrong, 1995). In Still's lecture, he described a group of children he had seen in his clinical practice who he described as often being aggressive, defiant, resistant to discipline, excessively emotional and showing little "inhibitory volition" (Armstrong, 1995). The association between behavioral difficulties and biological causes was hypothesized early in the history of attention disorders, with Sill attributing these attention and behavior problems to a "deficit in moral control" which was either genetic in origin or due to a pre- or post- birth injury.

The link between attentional difficulties and brain injury was again made in response to a post World War I outbreak of encephalitis in North America in 1917-1918 (Barkley, 1998a). Children who had suffered with Postencephalitic Behavior Disorder demonstrated a number of behavioral and cognitive symptoms related to attention and activity, including impaired attention, regulation of activity, impulsivity, memory disturbances and social/behavioral problems (Armstrong, 1995; Barkley 1998a). Eventually it was determined that there was a wide range of illnesses (e.g., measles, epilepsy) and traumatic injuries (e.g., head injury, birth trauma) that contributed to a variety of cognitive and behavioral disturbances, not just those related to attention and activity (Barkely, 1998a). Due to these events, it became popular to think that because symptoms of hyperactivity, inattention and impulsivity could arise as a result of brain

injury, then brain injury must be the present if these symptoms are evident (Barkley, 1998a).

In the 1940's, Strauss and Lehtinen (1947) produced some influential writings, asserting that restless and inattentive behavior was evidence of brain damage (Barkley, 1998a). However, the writings were based on their studies of brain injury in a group of mentally retarded children, who demonstrated symptoms of distractibility and hyperactivity confounding any meaningful interpretation (Armstrong, 1995). Soon the term "Minimal Brain Damage" was developed to refer to these children, reflecting the thought that brain damage was a primary feature associated with symptoms of hyperactivity, inattention, and impulsivity (Armstrong, 1995). According to Armstrong, use of the term "Minimal Brain Damage" was later replaced with the term "Minimal Brain Dysfunction" due to a lack of empirical evidence to show brain damage existed in children showing ADHD-like symptoms. In actuality, those children labeled as MBD were a heterogeneous group, with children suffering from a variety of disorders such as dyslexia, language and learning disorders and hyperactivity (Barkley, 1998a)

In the late 1950'as and early 1960's, the idea that brain damage in children was causing attentional and behavioral difficulties began to fall out of favor due to critical reviews (Barkley, 1998a). According to Barkley, the argument against this view was the lack of evidence of an actual brain lesion in the children exhibiting difficulties. Furthermore, the 1960's were distinctive in the history of ADHD in that not only marked the first time Ritalin was used to control symptoms of hyperactivity, but 1968 marked the sanction of the forerunner to ADHD "hyperkinetic reaction of childhood" by the American Psychiatric Association (APA) (Armstrong, 1995).

Attentional difficulties and hyperactivity in children have a long history dating back to the early 1900s. At that time, these difficulties with attention and hyperactivity, were thought to have a biological basis. Specifically, the problem was thought to lie within the brain. This hypothesis persists into the present day. However, when there was little evidence to support physiological dysfunction in the 50s and 60s, research began to focus more on environmental contributors. Nevertheless, despite evidence to support a brain dysfunction, treatment was aimed at changing the child's physiology to control inattention and hyperactivity as the advent of stimulants changed the course of treatment to the present day.

DSM and Attention Disorders

The Diagnostic and Statistical Manual of Mental Disorders, now in its fourth edition (DSM-IV, 1994), is generally considered the "gold standard" for defining and classifying mental disorders and is used by psychiatrists and psychologists throughout the United States (Carson, Butcher, & Mineka, 1998). Due to the importance of the DSM in the conceptualization of the ADHD diagnosis, it is important to understand the changes that have taken place with regard to the criteria that must be met for a diagnosis of ADHD to be established.

"Hyperkinetic Reaction of Childhood" is generally thought of as the first diagnostic label of what is today is known as ADHD and appeared in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-II) (1968). The description of hyperkinetic reaction of childhood provided in the DSM-II was far from comprehensive, however, consisting of only a single sentence: "The disorder is

characterized by overactivity, restlessness, distractibility, and short attention span, especially in young children; the behavior usually diminishes by adolescence" (p. 50).

With the next revision of the DSM the diagnostic label changed from "Hyperkinetic Reaction of Childhood" to "Attention Deficit Disorder" (ADD) (APA, 1980). With the changes in diagnostic labels, the criteria for the diagnosis also changed. The conceptualization presented in the DSM-III was considered tridimensional in nature, requiring deficits in each of three areas: attention, impulsivity and hyperactivity (Lahey et al., 1994). This, however, was a problem is that the definitions of inattention, impulsivity and hyperactivity overlapped to such an extent that their validity as independent constructs was questioned (Newcorn, 1988). Also included in the DSM-III were more specific symptom lists, numerical cutoff scores for symptoms, guidelines for onset and duration of symptoms, and an emphasis on the importance of excluding other childhood psychiatric disorders before making a diagnosis of ADD (Barkley, 1998a), However, these improvements were of little real value in clarifying the ADD diagnosis in that the description of ADD was based on little more than clinical impressions without empirical support (Lahey, 1998). Furthermore, one of the major changes in the ADD diagnosis that occurred with the change from the DSM-II to the DSM-III, was that the DSM-III allowed a diagnosis of ADHD even if the individual did not display symptoms of motor hyperactivity (ADD/WO) (Lahey et al., 1994). This change seemed to be done arbitrarily, however, as there was little empirical literature existing at the time to support the existence of this ADD/WO diagnosis (Lahey & Carlson, 1991).

The publication of the DSM-III-R (APA, 1987) again marked a dramatic change in the conceptualization of ADD. Given a lack of empirical evidence to support the

tridimensional conceptualization of ADD presented in the DSM-III, the DSM-III-R combined the three lists of symptoms in the DSM-III into a single list (Morgan, Hynd, Riccio, & Hall, 1996). In order for a diagnosis of ADD, the individual had to have eight out of the fourteen symptoms. Because no subtypes were included, the diagnosis of ADD without hyperactivity was not possible (Greenhill, 1998). Instead, a separate category of Undifferentiatied Attention Deficit Disorder (UADD) was created which had no diagnostic criteria and was described as applicable to ADD not specified by the ADHD criteria (Lahey, McBurnett & Pfiffner, 1993). The result of which, according to Lahey, McBurnett and Pfiffner, was that UADD became an ill-defined, heterogenous category. Furthermore, as Lahey et al. (1988) asserted, the ADHD and UADD diagnoses were based on contradictory assumptions. The ADHD diagnosis conceptualized the disorder as unidimensional, with symptoms of inattentiveness, impulsivity, and hyperactivity coexisting, while the UADD diagnosis presented a disorder where inattentiveness exists independently of impulsivity and hyperactivity. Given these criticisms, it is the general consensus among researchers in this area that the DSM-III-R was published prematurely, before adequate empirical tests of the DSM-III criteria could be conducted (Morgan et al., 1996; Frick and Lahey, 1991; Schaughency and Rothlind, 1991; Lahey, 1988).

While the DSM was undergoing these revisions, many researchers were conducting factor analyses on the symptoms thought to comprise ADHD. Results of these studies indicated that the symptoms of attention deficits and motor hyperactivity tend to load on separate factors, while symptoms of impulsivity loaded on both of these factors (Carlson and Lahey, 1983; Lahey et al., 1978). Given these results, in revising the criteria for ADHD for the DSM-IV (1994), the field committee ultimately decided that neither

the unidimensional nor three dimensional models fit the symptomology of ADHD (Lahey, Pelham, et al., 1988). Instead, ADHD was again reconceptualized, and this time the symptomology was described in two dimensions, the first composed of symptoms of inattention and the second consisting of symptoms involving excessive motor activity and impulsivity (Lahey et al., 1994). This new conceptualization was tested in the DSM-IV field trials (Lahey et al., 1993) where structured diagnostic interviews involving multiple informants were conducted on approximately 400 youths. Based on the results of the field trial, Lahey et al. felt this two dimensional conceptualization of ADHD was superior to that presented in the DSM-III-R.

According to the criteria set forth in the DSM-IV, to be diagnosed with ADHD an individual has to have symptoms of ADHD for 6 months, the symptoms must be developmentally deviant, and must have developed before the individual was 7 years of age. From the inattention symptom item list, 6 of the 9 items must be endorsed as developmentally inappropriate for a diagnosis Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type. Similarly, 6 of the 9 items from the hyperactivity-impulsivity symptom list must be endorsed as developmentally inappropriate for a diagnosis of Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type (ADHD-PHI). If the individual meets the criteria for both symptom lists, they are to be given the diagnosis of Attention-Deficit/Hyperactivity Disorder, Combined Type (ADHD-C). Additionally, a diagnosis of any subtype of ADHD requires that the child display symptoms of ADHD in two or more settings (e.g., school, home).

The new diagnostic criteria is far from perfect however. For instance, although the symptom lists were revised for the DSM-IV, empirical support was lacking regarding the

number of symptoms required for diagnosis (Goldman et al., 1998). It should also be noted that the development and testing of the DSM-IV criteria occurred with children seen in a psychiatric setting, therefore not as much is known about the typical child that presents with symptoms of hyperactivity and/or inattention to the pediatrician or family practitioner (APA). In fact, from the 440 subjects selected for the field trial, 75 were psychiatric inpatients, 26 were inpatients on a forensic psychiatry unit for juvenile sex offenders, and 56 were in a state juvenile detention facility (Frick et al., 1994). Thus, this is hardly the typical child that presents to their pediatrician with an attention or hyperactivity problem. This is important because in the United States, most of the children seen for ADHD symptoms are cared for by pediatricians and family practitioners, while only the more seriously impaired patients, and those that experience significant comorbidity that are seen by specialists (e.g., neurologists, child psychiatrists) (Goldman, Genel, Bezman, & Slametz (1998). Furthermore, it should also be noted that the population used for the DSM-IV field trials had 3 boys for every 1 girl, which suggests one should be cautious in generalizing the findings to girls (Frick, 1994).

One concern with the changes that have taken place with the DSM in regard to ADHD, has been that with each change in the diagnostic criteria for ADHD, more children have been identified as having the disorder. One study, conducted by Wolraich et al. (1996), identified the presence of ADHD using both DSM-III-R and DSM-IV diagnostic criteria in a group of elementary school. The findings indicate that 7.3 percent of the students met the DSM-III-R criteria for ADHD, while 11.4 percent of the students met the DSM-IV criteria. Similarly, Lahey et al. (1998) reported that in the DSM-IV field trials, 26% of children who met the hyperactive-inattentive type of ADHD did not meet

the DSM-III-R criteria for ADHD. Not only does this situation have potential to increase the prevalence of ADHD, but it creates confusion in generalizing from one diagnostic system to another as well as making research comparisons across studies (Biederman, Faraone, Weber, Russel, Rater & Park, 1997).

The DSM-V is anticipated to be released in 2013, but the preliminary versions are available on line for review (APA, 2010). Pilot testing for the DSM-V field trials is currently underway and they will be moving into the first phase of testing in May, 2010. As it stands, however, there are some changes already proposed for the ADHD diagnosis leading to year another conceptualization of the diagnosis. One criticism of the DSM-IV is that it does not reflect the current thinking that inattention and mpulsivity/hyperactivity are two separate factors under the ADHD umbrella. To address this criticism, several solutions are being considered. The first is to break the ADHD diagnosis into 3 subtypes, including a combined type, predominantly hyperactive type and a separate code for predominantly inattentive type. A second option is to use the existing structure without the subtypes, but to use behavior specific dimension scores. The third option is to go back to a unidimensional conceptualization by replacing the predominantly inattentive and predominantly hyperactive/impulsive types with a Combined ADHD diagnosis. The new DSM-V will likely include a change in the age of onset date from before the age of 7 to before the age of 12.

The ADHD diagnosis has a long history, characterized by dramatic changes in conceptualization. The pattern of change was from a unidimensional conceptualization, as specified by the Hyperkinetic Reaction of Childhood diagnosis in the DSM-II (1968), to a tri-dimensional conceptualization as indicated by the diagnosis of Attention Deficit

Disorder, in the DSM-III. This pattern was repeated in the DSM-III-R (1987), where a unidimensional ADHD diagnosis was presented followed by yet another return to the tri-dimensional conceptualization of the DSM-IV (1994). This debate is far from over as the next DSM to be published in 2013 is still considering both unidimensional and tri-dimensional conceptualizations. This lack of consensus on what symptomology comprises the ADHD diagnosis has led many to question the validity of the current ADHD diagnosis, and some to challenge the very existence of the ADHD diagnosis.

Medical Research on ADHD

Because ADHD is often diagnosed by a family physician or pediatrician it is important to understand how the medical model influences the conceptualization of behavioral disorders. According to McGuiness (1989), medically trained researchers are trained under a disease model, which emphasizes that diseases have a single cause. Research is generally of two designs; correlation, in which case no cause and effect relationship can be determined, or univariate in which one cause and one outcome are examined. As a result, medical students may become biased by the disease model and begin to think in terms of single causes and effects (McGuinness). According to Barkley (2005), the medical model has influenced the conceptualization of psychopathology as a disease state, where the individual either has it or does not (Barkley, 2005). As a result, when a child with symptoms of ADHD comes into the physician's office, his or her symptoms of difficulty paying attention are viewed through the disease model; i.e., if a child is having difficulty paying attention, and the brain regulates attention, then there must be something wrong with the brain (McGuinness, 1989). The result is that the

physician tends to view the child as having the problem, ignoring any familial or educational influences (McGuinness, 1989). The medical research that has been conducted on ADHD reflects this type of univariate conceptualization of the illness, typically focusing on determining either the neurological, physiological or biochemical causes. In general, the role of the environment and its contributions to the etiology of ADHD has been neglected (Carey, 1999).

Studies which have focused on finding neurological correlates for ADHD have focused on determining either the biochemical, structural, genetic or blood flow markers which differentiate between children with ADHD and those without. According to Mercugliano, Power and Blum (1999), the neurotransmitters dopamine and norepinephrine have been implicated in behaviors related to attention span and impulsivity, and most medications prescribed for ADHD work to increase the level of these neurotransmitters in the brain. Despite this, studies which measure the level of dopamine and norepinephrine or their metabolites in blood urine or cerebral spinal fluid have not demonstrated consistent results in differentiating between individuals with and without ADHD. Studies which seek to identify structural markers of ADHD rely largely on neuroimaging techniques. According to Barkley (1998b), coaxial tomographic (CT) scans have not been able to show gross neurological differences between children with and without ADHD. Although finer grained analysis with MRI some studies have found those with ADHD to have smaller corpus callosums and caudate nuclei (e.g., Hynd, Hern, Novey, Eliopulos, Marshall, Gonzalez & Voeller, 1993), these results have proven inconsistent across studies (Barkley, 1998b). Researches on the genetics of ADHD indicate that there is some genetic contribution to the diagnosis. According to Nakamura

(2002), approximately 50% of parents who had ADHD as a child have a child with ADHD and between 10 and 35% of children with ADHD have a first degree relative who has been diagnosed with ADHD. However, the specifics of this genetic contribution have not yet been identified. Banaschewski et al. (2005) reported that the known risk alleles are widely distributed in the population and only account for a small increase in risk, with no single allele considered necessary or sufficient for the development of ADHD. Other researchers have concentrated on demonstrating differences in cerebral blood flow between children with and without ADHD. Several researchers (e.g., Lou, Henriksen, & Bruhn,1984; 1990) have found diminished blood flow in the prefrontal regions as well as the pathways connecting these regions to the striatum and the caudate nucleus. However, these results have proven inconsistent when applied to non-adult populations, and it is thought differences are not indicative of deviations (Zametkin et al., 1990). Additionally, according to Zametkin et al., differences in brain function have been found in children without ADHD, therefore it is not possible to determine whether a brain variation is an indication of the presence of ADHD or just a normal variation. In general, most studies which have focused on the possible neurological indications of ADHD have lacked large sample sizes as well as proper methodological controls for inclusions of children with various psychiatric disorders (Brown et al., 2001).

According to McGuinness (1989), the fact that there are no "consistent physiological or biochemical indicators for any diagnostic category has been an intractable problem for modern psychiatry" (pg. 151). As a result, Mercugliano, Power and Blum (1999) suggest that ADHD should be viewed as strictly a behavioral diagnosis as there are no "medical tests, physical examination findings, office-based psychological

tests or neurological tests that are both sensitive and specific for ADHD" (pg. 7). As a result, the American Academy of Pediatrics (2000) recommended that laboratory and medical tests not be routinely used in evaluating a child for ADHD. Therefore, according to Mercugliano, Power and Blum, it is the clinician's responsibility to make judgments of whether the behaviors that are thought to comprise ADHD (i.e., hyperactivity, inattention, and impulsivity) are occurring with enough severity and at a level that is developmentally inappropriate. This requires therefore, that the person providing the diagnosis be familiar with normal development and behavior, that they gather information from several sources for the assessment of the child's behavior in a number of different settings, as well as determine a potential differential diagnosis that may explain the child's difficulties (Goldman, Genel, Bezman & Slanetz, 1998).

As of yet, no pathophysiological pathways have been identified as unique for ADHD and therefore, there are no definitive medical tests (Banaschewski et al., 2005). This is likely because there is no one cause of ADHD symptoms, but rather an interaction between physiological and environmental factors. The tendency of the medical community to view problems through a univariate causal model therefore is too simplistic to explain the complexity and variations of ADHD. This has likely contributed to lack of definitive progress in determining biological correlates for ADHD.

Difficulties in Diagnosing ADHD

One of the difficulties in diagnosing ADHD is related to the heterogeneous nature of the symptoms thought to comprise the illness. One controversy surrounding ADHD concerns whether its symptoms comprise what is considered a behavioral syndrome. The

term syndrome refers to a group of symptoms that co-occur (Carson, Butcher, and Mineka, 1998). As briefly discussed previously, some literature suggests that ADHD is actually comprised of two entirely different syndromes: One involving primarily symptoms of inattention and the others comprised of symptoms of hyperactivity and impulsivity (Lahey et al, 1994). In support of the idea that ADHD is actually comprised of two different syndromes, there is evidence to suggest that the two dimensions of ADHD are associated with different types of impairment. Specifically, Lahey et al. found the hyperactivity-impulsivity subtype to be associated with global ratings of impairment and the inattention subtype to be associated with academic impairment. Further research has demonstrated an association between the combined subtype and problems of persistence in effort and distractibility (Barkley, 1998b). Additionally, the different subtypes seem to have different trajectories at different developmental levels, with symptoms of hyperactivity tending to decline over time while symptoms of inattention decline less so (DuPaul et al., 1997) individuals that initially meet criteria for the hyperactive-impulsive subtype are sometimes reclassified as predominately inattentive as they get older (Barkley, 1998b). There are also age differences between the two types, with those individuals diagnosed as the predominantly hyperactive-impulsive (ADHD-PHI) being mainly preschool age children while those diagnosed with the combined subtype (ADHD-C) being primarily school-aged children (Lahey et al., 1994).

Another factor which makes the assessment of ADHD complex is that amount and type of disorders that commonly co-occur with ADHD. Bird, Gould, and Staghezza (1993) describe the current child psychiatric diagnosis as one that "leaves much to be desired in terms of the validation of diagnostic entities that can truly be distinguished

from one another" (pp. 361). According to the American Psychiatric Association (2000), those disorders that most often co-occur with ADHD include oppositional defiant disorder, conduct disorder, depression, anxiety, and several developmental disorders, such as speech and language delays as well as learning disabilities. In fact, according to Szatmari, Offord and Boyle (1989), up to 44% of children diagnosed with ADHD have at least one other psychiatric disorder, 32% have two disorders, and 11% have at least three other disorders. The issue of comorbidity is further complicated by the fact that different disorders tend to co-occur with different subtypes (Eiraldi, Power, & Nezu, 1997). Further complicating the issue is that the main symptoms of ADHD (i.e., inattentiveness, hyperactivity, and impulsivity) are commonly seen in children with other psychiatric disorders such as schizophrenia, bipolar disorder and the pervasive developmental disorders (Perry et al., 2000)

The issue of comorbidity has both diagnostic and treatment implications and adds a degree of complexity to the process. To determine if a comorbid condition exists requires the clinician to obtain a thorough history of behavioral symptoms, an assessment of cognitive, achievement and speech and language functioning, as well as a physical and neurological examination, including an evaluation of motor abilities (Wolraich & Baumgaertel, 1997). According to Wolraich and Baumgaertel, this is particularly important when working with children who are suspected of having mood or anxiety symptoms, or who have a learning disability, because these problems can actually cause ADHD-like symptoms. A clinician or physician must be aware of subtle behavioral differences that exist in children who have a comorbid condition(s) for a correct diagnosis to be made. For example, children with anxiety may exhibit features such as

restlessness, irritability and difficulty concentrating (Searight, Nahlik, & Campbell, 1995). However, a child with an anxiety disorder will be less likely to be impulsive and act out behaviorally and more likely to be socially withdrawn and exhibit somatic complaints.

Some researchers have stated that symptoms of ADHD are not readily distinguishable from normal variations in temperament (Carey, 1998). In fact, the DSM-IV-TR (APA, 2000) does not specify the degree of impairment the child needs to have to warrant the ADHD diagnosis. According to Armstrong (1997), 10 to 20% of children can be considered as having a difficult temperament, which involves the child possessing characteristics such as high activity level, distractibility, high intensity, and low sensory threshold to name a few. However, by themselves, these traits do not necessarily mean the individual has a disorder (Carey, 1998). It is when there is a poor fit between the child and his environment, i.e., parents, teachers, classroom, exposure to multiple stressors, etc., that the child exhibits behavioral disturbances (Armstrong, 1995; Carey, 1998). The difficulty lies in that a diagnosis of ADHD relies on a subjective determination of whether a child's symptoms constitute a behavioral disorder or a normal variation in temperament.

ADHD has a number of characteristics that make it particularly difficult to diagnose. The symptoms can sometimes be subtle and difficult to distinguish from normal variations in temperament and there are comorbid conditions and differential diagnoses to consider when assessing for ADHD. With so much to consider, it is important to have a thorough approach when arriving at an ADHD diagnosis.

How an ADHD Diagnosis is Established

Given the degree of ambiguity surrounding the diagnosis of ADHD, it is unfortunate that process of assessing for the presence of ADHD is equally ill defined. Although most research suggests that a comprehensive evaluation incorporates different informants and a variety of procedures, such as interviews, rating scales, educational assessments and observation, there is no specific test for ADHD (Greenhill, 1998; Schaughency & Rothlind, 1991). Therefore, the clinician is left to determine their own protocol for evaluating children for ADHD. Even those organizations that have put forth guidelines for the assessment and treatment of ADHD, have stated that they are not to replace the judgment of the clinician (AACAP, 2007). Unfortunately, the result is that there is a lot of variability in how assessments are done. The likely outcome is that some children are receiving comprehensive evaluations, while others are being diagnosed with ADHD without much assessment at all. While this variability presents the problem of inaccurate diagnoses, this becomes especially important when considering the cost and potential side effects that may be a result of taking medication for ADHD.

One thing most clinicians are able to agree upon is the need for several types of assessments for establishing a diagnosis of ADHD, commonly referred to as a multi-method assessment (Anastopoulos & Shelton, 2001). Specifically, a multi-method approach utilizes both multiple assessment methods and multiple informants (Weyandt, 2001). According to Anastopoulos and Shelton, these methods generally include clinical interviews, behavior rating scales, psychological tests, observational techniques and various medical procedures. However, because the DSM-IV does not specify which assessment methods or procedures should be utilized for establishing a diagnosis, the

decision about what methods to use lies with the clinician and is therefore subject to interpretation (Anastopoulos & Shelton, 2001). Schaughency and Rothlind (1991) recommend the diagnosis of ADHH be considered a "best estimate" diagnosis and should be based only on a multimethod assessment strategy.

According to Anastopoulos & Shelton, 2001, the clinical interview is the foundation of mulitmethod assessment and is generally administered to parents or caretakers, the child or adolescent who is suspected of having a disorder, and/or teachers. Clinical interviews differ in the way they are conducted. Structured interviews follow a standard format of administration, in which the clinician reads all the questions exactly as they're written and in the order in which they are intended to be read (Anastopoulos & Shelton, 2001). According to Anastopoulos & Shelton, one structured interview that has dominated the field for the past 20 years is the Diagnostic Interview Schedule for Children-IV (DISC-IV). The DISC-IV is a highly structured interview designed to assess more than 30 psychiatric disorders in children and adolescence (Shaffer, Fisher, Lucas, Dulcan & Schwab-Stone, 2000). The DISC-IV was designed to elicit responses that are relevant to a number of DSM-IV defined psychiatric diagnoses for children and adolescents (Anastopoulos & Shelton, 2001). While this is generally viewed as a strength of these instruments, it assumes that the DSM-IV criteria are valid and reliable.

One difficulty with the use of structured clinical interviews has to do with their length and therefore the time required for their administration, which can take 2 to 3 hours (Jensen & Weisz, 2002). For that reason, according to Jensen and Weisz, their use is often restricted to the research setting, where diagnostic comprehensiveness is an important goal. This is in contrast to the clinical setting, in which third party

reimbursement requires a diagnosis, and at the same time creates workload and time constraints that prohibit a comprehensive assessment. Even if clinical interviews were feasible given the setting, their utility is questionable in that there is generally poor agreement between clinician diagnoses and diagnoses derived standardized interviews (Jensen and Weisz, 2002). Furthermore, given that there is no gold standard for valid diagnoses, it is impossible to tell which diagnoses are more accurate (Jensen & Weisz, 2002). Additionally, Jensen and Edelbrock (1999) found that the respondent to the DISC interview is likely to deny the existence of a particular symptom as a function of the question placement within the interview. More specifically, as the respondent gets further into the interview, they are less likely to endorse a particular symptom. Jensen and Edelbrock (1999) propose that this phenomenon results because the respondent becomes aware that endorsing another item will generate many additional questions they must answer.

As an alternative to structured interviews, there are semi-structured and unstructured interviews, which require much less time for administration that do structured interviews and are therefore more commonly utilized in the clinical setting (Jensen & Weisz). Semi-structured interviews involve the clinician asking the parent preplanned questions regarding the child's history and current functioning, but do not follow a standard format. One of the most well-known semistructured interviews is the Semistructured Clinical Interview for Children and Adolescents (SCICA) (McConaughy & Auchenbach, 1994). However, the SCICA has low inter-rater reliability for the Attention Problems scale (.57) and does not map closely with the DSM-IV criteria (Anastopoulos & Shelton, 2001). Unstructured interviews are probably the most popular

among clinicians because they allow complete freedom and flexibility in what is asked (Anastopoulos & Shelton, 2001). However, Anastopoulos & Shelton caution against using unstructured interviews for the diagnostic portion of the assessment because there is too much variability in what information is covered during the interview as well as how the material is covered.

Rating scales and child behavior checklists are another type of assessment instrument which allow the clinician a means of quantifying the opinions of parents and teachers and compare them to standardized norms (Barkley, 1998b). Two of the most commonly used broad band rating scales are the Connors Rating Scales (Conners, 2008) and the Achenbach System of Empirically-Based Assessment (ASEBA). The Conners Rating Scales consist of both long and short forms for parents, teachers and adolescents, as well as an ADHD index (Anastopoulos & Shelton, 2001). According to (Anastopoulos & Shelton, 2001) the ADHD index consists of 12 items that are thought to distinguish those children with ADHD from those children without it. Additionally, this index is combined with the DSM-IV criteria to form several shorter scales called the Conners' ADHD/DSM-IV scales (CADS) of which there are versions for parents, teachers and adolescents to complete. The ASEBA, like the Conners' scales also includes different rating scales for specific informants. Specifically, there is a Child Behavior Checklist for Parents (CBCL), A Teacher's Report Form (TRF), and a Youth Self Report (YSR) for the older children and adolescents (Kronenberger & Meyer, 1996). The CBCL includes items that are essential features of ADHD (e.g., Attention Problems Subscale) as well as associated features (e.g., Aggressive Behaviors and Social Problems Subscales (Kronenberger & Meyer, 1996).

Because the diagnosis of ADHD requires that the individual display impairment in two or more settings, such as school, home, and/or extracurricular activities, the rating scales are particularly useful. In fact, only about 20% of children with ADHD exhibit symptoms in the physician's office (Sleator & Ullman, 1981), and clinicians typically have time constraints which make it impossible for he or she to observe the child firsthand at school and in the home. Therefore, these rating scales serve as an important means of determining the child's typical behaviors, as well as the scope of impairment, in multiple settings. Of course this raises concerns regarding the validity and reliability of these reports. In a study conducted by Biederman, Faraone, Milberger and Doyle (1993), they found only a .22 agreement between parent and teachers for specific symptoms of ADHD. One reason for this low correlation may be that it is often difficult to obtain a meaningful teacher's report due to time constraints (on the part of both teachers and clinicians), teacher unavailability, as well as limited time spent with the student due to multiple teachers (Faraone, Biederman, & Milberger, 1995; Mitsis, McKay, Schultz, Newcorn, & Halperin, 2000). Additionally, when symptom reports are compared between the parent and child with the suspected disorder, it has been found that parents report symptoms of ADHD nearly twice as high as those made by children and adolescents (Gittelman and Mannuzza, 1985).

Another way clinicians have attempted to test for the presence of ADHD is with the use of Continuous Performance Tests (CPTs) (Kronenberger & Meyer, 1996). According to Kronenberger and Meyer, there are many types of CPTs, but they all involve having the child sit in front of a computer screen while letters or numbers appear quickly on the screen. The child is required to press a button when a certain sequence of

stimuli appears. Then the amount of correct responses, or hits, is calculated, along with the amount of misses (when the child was suppose to respond but did not), and errors of commission (when the child was not supposed to respond but did not) (Kronenberger & Meyer, 1996). According to Kronenberger & Meyer, 1996, hits are thought to measure sustained attention, misses are a measure of distractibility, and errors of commission are a measure of impulsivity. Despite the perceived usefulness of CPTs, the American Academy of Child and Adolescent Psychiatry (1997) does not recommend their use in the assessment of ADHD because they have problems with low specificity and sensitivity. Similarly, the American Academy of Pediatrics (2000) has also warned against their use because CPTs are not consistently able to distinguish between children with ADHD and normal controls. Nevertheless, CPTs are commonly used.

Part of the responsibility of the clinician who assesses children for ADHD is to rule out other potential diagnoses. The DSM-IV (2000) recommends that any medical disorders that may associated with the inattention and impaired behavioral control should be ruled out prior to making an ADHD diagnosis. Specifically, the child's prenatal and birth histories should be reviewed and it should be noted if the child has ever been evaluated for allergies, seizure disorder, hyperthyroidism, diabetes, anemia and hypoglycemia (Monastra, 2008; Greenhill, 1998: AACAP, 1997). Additionally, it is important for the clinician to note any brain injuries since traumatic brain injury is considered a risk factor for ADHD and ADHD-like behavior (Morgan, 1999).

In addition to ruling out any medical causes that may mimic the symptoms of ADHD, the clinician needs to be aware of any comorbid conditions that may exist. As stated previously, there are many psychological conditions which often co-occur with

ADHD including oppositional defiant disorder, conduct disorder, depression, anxiety, several developmental disorders, such as speech and language delays as well as learning disabilities (APA, 2000). It is therefore very important that the clinician assessing the child is familiar with the symptoms of each of these possible comorbid conditions as well as assessment tools for evaluating these conditions. While it is beyond the scope of this paper to discuss assessment tools and techniques for each of these disorders, however there are some general guidelines. Morgan (1999) recommends assessing the child's cognitive and academic abilities to rule out possible learning disabilities that may be contributing to, or even causing the child's problem. Intelligence in a child suspected of having ADHD can be evaluated using the Wechsler Intelligence Scale for Children. For the purpose of ruling out a learning disability an achievement test can be administered such as the Woodcock Johnson, Wide Range Achievement Test, or WIAT-III. The presence of other disorders, such as oppositional defiant disorder, conduct disorder, depression, and/or anxiety can be assessed by the Child Behavior Checklist or other broad-band instrument and additional syndrome specific tests on an as-needed basis (Kronenberger & Meyer, 1996).

The assessment process for ADHD is long and can be complicated. There is no one standardized approach, but at the same time, there are certain factors that must be considered. Specifically, the assessment process must involve multi-method assessment with multiple informants. However, it is up to the clinician to be familiar with the variety of assessment tools and methods, and to be able to draw valid conclusions from the results. However, when one considers how many different disciplines diagnosis ADHD

and the variations in training between the disciplines it becomes apparent that there is not much consistency in how ADHD is assessed.

Who Diagnosis ADHD

ADHD has historically been considered a psychiatric disorder and as such, ADHD cases were managed by psychiatrists (Koonce, 2007). However, the increased prevalence of ADHD has resulted in increasing numbers of different professions managing the number of cases (Centers for Disease Control and Prevention, 2005). These professionals are typically school psychologists, clinical psychologists, general practice physicians, pediatricians and individuals with advanced nursing degrees. While this increase in professionals has been necessary from a practical standpoint, it should be noted that diagnostic practices vary greatly according to the specialty of the person making the diagnosis (National Institute of Health, 2001). A lack of standardization of assessment for ADHD makes conclusions about individual cases difficult and prevalence rates almost impossible to accurately determine.

In effort to standardize the care of children being seen for ADHD within the medical care setting, several organizations have sought to establish guidelines for the assessment and treatment of ADHD. The American Academy of Pediatrics (AAP) published evidenced based guidelines for the diagnosis and treatment of ADHD in 2000. The most recent practice parameters were published in 2007 by the American Academy of Child and Adolescent Psychiatry (AACAP). According to these guidelines, the child must meet the DSM-IV criteria for ADHD and as such a general assessment should include a review of the child's medical, family, social and academic history, a thorough

parental interview, behavioral checklists from teacher and caregivers and an evaluation for comorbid disorders. Neurological, neuropsychological or any laboratory tests are not indicated unless there is a rationale behind it, such as head injury or lead exposure.

While no research as of yet has focused on adherence to the AACAP guidelines, the AAP guidelines proved difficult to implement in everyday practice (Rushton, Fant and Clark, 2004). Specifically, Leslie, Weckerly, Plemmons, Landsverk and Eastman (2004) implemented the AAP guidelines in seven primary care offices in the San Diego area for the purpose of evaluating the feasibility of adopting these guidelines in a working practice. Leslie et al. found that individuals in primary practice felt they had limited information regarding guidelines for diagnosing ADHD, specifically with regard to assessment instruments, comorbid conditions and guidelines for referring for psychoeducational testing. There was a sense among these primary care providers that if they explored psychosocial issues in too much detail they would be ill-equipped to assess or manage coexisting conditions. This issue is especially a concern within the context of a typical physician appointment, which allows 7 to 15 minutes per child. As such, Kwasman, Tinsley, and Lepper (1995) reported that 60% of physicians surveyed reported the necessity of setting aside time to care for ADHD patient.

Other research has confirmed that the AAP guidelines are difficult to successfully put into practice. One of the recommendations of both the AACAP and the AAP is that the child must meet the DSM-IV criteria for a diagnosis of ADHD. Studies that have surveyed pediatricians regarding diagnostic practices found that 20 to 36% adhered to DSM-IV criteria (Copeland et al., 1987; Wolraich et al., 1990). Furthermore, the application of practice guidelines varies within medical specialties. Specifically, Rushton,

Fant and Clark (2004) investigated the use of practice guidelines between pediatricians and family practice physicians. Rushton et al. found that 91.5% of pediatricians were familiar with the guidelines, and 78.1% they had incorporated these guidelines into their practice. In contrast, 59.8% of the family practice physicians were familiar with the guidelines with only 39% having put those guideline to practice. This difficulty in utilizing the guidelines is not limited to physicians, but extends to other health care providers such as nurse practitioners. For example, Vlam et al, found that only 64% of respondents utilized DSM-IV criteria in arriving at a diagnosis of ADHD and only 22% reported using multiple measures in arriving at a diagnosis of ADHD.

This variability in diagnostic practices is not limited to the medical field, but extends to psychologists as well. Researchers who have surveyed how psychologists arrive at a diagnosis of ADHD have found that 61% strictly adhere to the DSM-IV criteria (Handler and DuPaul, 2005). Furthermore, Handler and DuPaul found that 93% of psychologists surveyed indicated they regularly used parent interviews and 92% stated they used child interviews and standardized rating scales. Variations in practice also exist within the field of school psychology. For example, Handler and DuPaul (2005) reported that school psychologists tend to use more direct school observation than do clinical psychologists. Furthermore, school psychologists tend to use more intelligence and achievement testing for the purpose of assessing possible learning disorders (Koonce, 2007).

When assessing ADHD symptoms professionals tend to agree that the "best practice" involves a multimethod approach across multiple settings and informants to gather information regarding the presence, pervasiveness, chronicity and impairment as

specified in the DSM-IV-TR (2000) (Handler & DuPaul, 2005). Nevertheless, research indicates there is still a lot of variability in the way ADHD is assessed both between and within professions (See Table 1 for Adherence to DSM-IV criteria by discipline). Some of this variability seems to have to do with not being aware of current guidelines as well as with the time required to conduct a thorough ADHD assessment. These differences in diagnostic practices make prevalence rates difficult to determine and result in children either being underdiagnosed or provided treatment they do not need.

Table 1

Adherence to DSM-IV Criteria When Making an ADHD Diagnosis by Practitioner Type

Nurse Practitioners	64%[a]
Psychologists	61%[b]
Pediatricians	20-36%[c,d]

[a] Vlam, 2006
[b] Handler & DuPaul, 2005
[c] Copeland et al., 1987
[d] Wolraich et al., 1990

As the prevalence of ADHD is increased, there have been a variety of professionals who have become involved in the diagnosing ADHD. In effort to standardized the process, several organizations such as the AAP and the AACAP have created guidelines. However, these guidelines still allow a certain amount of freedom in how they are applied in practice leasing to variation in practice. Furthermore, it does seem unlikely, that these guidelines can be incorporated into the 7 to 15 minutes window that comprised the typical physician appointment. Therefore, the physician who evaluates

and treats ADHD will have to institute changes in how their practice operates. Psychologists, who are treated in assessment and treatment, and who typically have longer appointments may be a more appropriate choice for the management of ADHD.

Treatment of ADHD

Treatment for ADHD typically involves medication, behavior therapy and/or parent training. According to the AACAP (2007) pharmacological treatment involves the use of a stimulant or one of the newer non-stimulant medications used to treat ADHD. Less commonly, an anti-depressant may be tried in cases where stimulant treatment is contraindicated or ineffective. The medications used to treat ADHD are usually divided into short and long acting preparations and both are thought to be equally efficacious (AACAP, 2007). However, the short acting medication often requires multiple administrations throughout the day, but is safer to use with younger children. Psychosocial interventions typically consist of behavior therapy which includes parent training, classroom interventions, academic interventions and peer interventions (Brown et al., 2008). According to Anastopoulos and Shelton (2001), most parent training consists of teaching parents to use positive reinforcement of appropriate behaviors, response cost for inappropriate behaviors, and the use of time-outs. There are a number of classroom interventions, with the most common being the use of daily report cards and some type of point or token system (DuPaul & Stoner, 2004). Academic interventions or accommodations involve the modification of task demands, providing the child choice in deciding what task to work on and tutoring (Brown et al., 2008). According to Brown et al. (2008), peer intervention typically focus on social skills and problem solving and is

provided either in an after school, weekend or camp setting. Psychosocial interventions are typically carried out by a psychologist, social worker, or marriage and family therapist.

Given that nonpharmacological treatments have been shown to be effective in the treatment of ADHD, and pharmacological treatments have been associated with a large number of aversive and potentially dangerous side effects, it would seem that behavioral treatments would be the treatment of choice. However, this has not been shown to be the case. In a survey conducted by Wolraich et al. (1990) of pediatricians and family practitioners, it was found that stimulant treatment is the main treatment prescribed for children with ADHD. The DEA (2000) reported that more than 50 percent of all methylphenidate and amphetamine prescriptions were written by pediatricians. In fact, most children diagnosed with ADHD by a physician during a visit are prescribed a stimulant during that same visit (Zito et al, 1999), and the lifetime prevalence of stimulant treatment for children diagnosed with ADHD is 60 to 75% (Safer, 2000). According to Wolraich et al. (1990), in the primary care setting there is a "serious underuse" of systematic behavioral treatments. Because the frequency with which children with psychosocial problems being treated by primary care physicians is growing, while the number of those children receiving specialty mental health services is declining (Gardner et al.; 2000), the use of pharmacological treatments for ADHD will likely continue to increase.

Not surprisingly, pharmacological treatments are more common for those children who have a physician monitoring their care (Table 2 shows the type of treatment associated with each of the disciplines) (Zito et al, 1999). Behavior therapy is typically

provided by a psychologist, master's level therapist, or social worker (Brown, Antonuccio, DuPaul, Firstad & King (2008). Therefore, a parent's approach to treatment is largely determined by the type of professional they initially consult. It seems a better standard of care could be provided if there was more integration and collaboration between disciplines.

Table 2

Practitioner Type by Typical Treatment Strategies

	Pharmacological Treatments	Behavior Therapy	Parent Training	Psychoed	Child Therapy	Classroom Interven.	Peer Interven.
Physicians	√						
Psychiatrists	√						
Psychologists		√	√	√	√	√	√
Therapists		√	√	√	√	√	√
Social Workers		√	√	√	√	√	√

The use of medication to treat ADHD-like symptoms is certainly not new. According to Mayes and Rafalovich (2007), the first time stimulant medication was used with children was in a home for children with emotional problems in 1937called The Bradley Home (See Appendix B for a timeline). The medication, an amphetamine called benzadrine, was used to relieve the headaches in children who had undergone a spinal tap. The benzadrine did little to help the headaches, but resulted in better behavior overall in these children. Specifically, Mayes and Rafalovich reported that the children exhibited better work habits, an increased interest in school, and a reduction in disruptive behavior. Furthermore, according to Schachar (1986), this effect on improving behavior was not limited to a particular disorder, so it was soon used with children who had a wide range of diagnoses. According to Mayes and Rafalovich (2007), these findings opened areas of

research on stimulants and their calming effect on behavior and the stimulant effect on academic performance.

According to Conrad (1975) the treatment for ADHD was available long before a disorder was conceptualized. In fact it was not until the 1950's when researchers that worked at The Bradley Home developed the diagnosis of Hyperkinetic Impulsive Disorder. Hyperkinetic Impulsive Disorder was characterized by a short attention span and poor concentration, particularly at school and was thought to be the result of some type of brain dysfunction. In the 1940's, a Swiss pharmaceutical firm called, J.R. Geigy (now known as Ciba) began working on a drug that had a similar stimulant effect to amphetamine, but with less side effects and potential for abuse. Geigy succeeded in 1955 in creating methylphenidate, brand name Ritalin (Freedman, Effron & Bender, 1955). In 1961, the Federal Drug Administration approved the use of Ritalin for the treatment of disturbed children (Swanson, McBurnett, Christian & Wigal, 1995). The 60's and 70's were marked by aggressive marketing in medical journals for medical treatment of ADHD symptoms (Smith, 2008). Between 1972 and 1987 the rate of stimulant treatment for ADHD rose fivefold (Safer and Krager, 1992)

There are other indications that the pharmaceutical companies are very influential in what information the public gets regarding the treatment of ADHD. According to the DEA (1995), CHADD began in 1987 and became the nation's largest ADHD support group, currently boasting over 20,000 members across the country. Also according to the DEA, Ciba-Geigy (the manufacturer of methylphenidate or Ritalin) contributed $748,000 to CHADD from 1991 to 1994. This contribution has led some individuals to question whether CHADD is biased towards the medical treatment of ADHD (Hearn, 2004). One

such indicator is that the literature produced by CHADD strongly supports the use of medication for the treatment of ADHD and minimizes side effects and issues of abuse (Hearn, 2004). In fact, Hearn reported that Shire Pharmaceuticals, the makers of Adderall, buys 65,000 to 100,000 copies of CHADD's magazine Attention! and distributes them in doctors' offices. When leading ADHD researcher William Pelham was interviewed by the magazine, his discussion of the risks of stimulant treatment and the recommendation that psychosocial treatments should be tried before using medication was left out (Hearn, 2004). Furthermore, CHADD, in conjunction with the American Academy of Neurology, submitted a petition to change Methylphenidate from a Schedule II to Schedule III, thereby making it easier to prescribe (DEA, 1995). Furthermore, The DEA reported that in 1993 the production quotas for Methylphenidate had not been revised to keep up with demand and there was a revision pending to manufacture more. However, Ciba-Geigy issued a press release and 400,000 letters to health care professionals stating that the DEA was creating a shortage of Ritalin. Also according to the DEA (1995) Ciba-Geigy contacted CHADD asking them to write their congressional representatives and the DEA to complain about the shortage. At the same time, parents whose children who were taking methylphenidate became worried about the possibility of not being able to get the medication. This resulted in parents seeking multiple prescriptions for methylphenidate in order to ensure they did not run out ultimately resulting in more sales for Ciba-Geigy (DEA, 1995).

Despite the popularity of medication it is not without drawbacks. Specifically, the medications that are usually prescribed for the treatment of ADHD are stimulants, such as methylphenidate (Ritalin) and amphetamine (e.g, Adderall and Dexidrine), and are on the

Drug Enforcement Agency's (DEA) Schedule II substances because they have the highest potential for abuse and dependence of medically useful drugs (DEA, 2000). Because these stimulant medications are classified as schedule II substances, the DEA keeps careful track of their rate of production. According to the DEA (2000), the United State's production of amphetamine (primarily Adderall) has increased 2,000 percent in the last nine years. The effects of both methylphenidate and amphetamine are nearly identical to those of cocaine (DEA, 2000). In fact, in animal studies, rats have been shown to prefer methylphenidate (Ritalin) over cocaine (DEA, 1995). This has not gone unnoticed by individuals with legal prescriptions for the medication, as well as those seeking to use the drugs recreationally. In fact, the DEA reported that in 1994, more high school seniors in the United States were abusing methylphenidate than those with legitimate prescriptions (DEA, 2000). These stimulants are often abused by crushing and snorting the tablets for a quick and powerful effect (DEA, 1995). Because methylphenidate is only available by prescription, unlike other amphetamines which are often manufactured in individual labs, the only way to obtain it is by diverting it from legitimate sources (e.g., individuals with a prescription (DEA, 2000). This is often accomplished by theft, of individuals, pharmacies, schools, etc., as well as by scams involving doctor shopping and faking of ADHD symptoms for the purpose of obtaining a prescription (DEA, 2000).

ADHD medications are associated with many side effects. The short-term side effects of ADHD medications include increase in blood pressure and heart rate, insomnia, weight loss, loss of appetite and motor tics (DEA, 1995). However, it may be the long-term side effects of stimulant use in children and adolescents that are more concerning.

One of the concerns over stimulant use for children and adolescents is the long-term effects have not been researched extensively (Bennett, Brown, Craver and Anderson, 1999). According to Bennett et al. this is due to methodological issues and the reluctance of parents to enroll their child in a controlled study in which there is chance their child might be assigned to a control condition. Therefore, what is known about the long-term effects of stimulants is limited to follow up studies. According to Hearn (2004), the MTA follow up study found that the long-term use of stimulant stunts growth in children at a rate of approximately one inch every two years. Brown and Sawyer (1988) found no long-term stimulant effects on academic achievement, interpersonal functioning, aggression or delinquency. One of the more troubling long-term side effects of long-term stimulant medications is its effect on the cardiovascular system. The short term cardiovascular effect of stimulant medication is an increase in heart rate, blood pressure and respiration (Bennett et al., 1999). Long term use of methamphetamine (a type of stimulant) can result in myocardial infarction, stroke or sudden death (Nissen, 2006). Therefore, when cases of children and adults being treated medically for ADHD died suddenly, the FDA began an investigation. The FDA found that between 1990 and 2000, there have been 186 sudden deaths of individuals taking amphetamine and dextroamphetamine (Adderall), methylphenidate or atomoxetine (Strattera) (Baughman, 2001). After investigating these deaths, the Food and Drug Administration (FDA) requested a "black box" warning in the form of a package insert for stimulant medications warning that the medication not be used in children with known cardiac problems (Vitiello and Towbin, 2009).

In effort to develop a standard approach to treatment of ADHD, several

conferences have convened in an attempt to determine the best approach. The first of such conferences was convened by the National Institutes of Mental Health in 1990 and is generally referred to in the literature as the MTA study (Multisite Multimodal Treatment Study) (MTA Cooperative Group,1999a). This study examined the response of 579 children diagnosed with ADHD Combined Type to medication, behavioral treatment, medication and behavioral treatment, and community care over a period of 14 months. The MTA Cooperative Group reported findings that the children receiving medication and combined medication and behavioral treatments had significantly better outcomes than those children who received behavior therapy alone or community care. This study, although ten years old now, was important in that the results were widely publicized and used to justify the use of stimulants for the treatment of ADHD. Unfortunately, the significant methodological flaws of the study did not receive the same publicity. Two of the most glaring flaws were the omission of a placebo control group and the lack of double blind procedures (Breggin, 2000).

The more recent practice parameters for the treatment of ADHD recommended a comprehensive approach using pharmacology, behavior therapy, school-based interventions, and family and individual therapy (AACAP, 2007). The most widely used intervention for ADHD is pharmacological treatment because of its efficacy (Brown et al., 2008). Greenhill (2002) reported that double-blind, placebo controlled trials which examined the efficacy of stimulant treatment in children and adults yielded an effect size averaging almost 1.0. Specifically, 65 to 75% of children and adults treated with stimulants in comparison with 4 to 30% of subjects treated with placebos. Behavioral treatments have an effect size between .5 and .7 (Fabiano, Pelham, Coles, Chronis-

Tuscano, O'Conner, & Gnagy, 2009). However, it should be noted that there are an abundance of research on the medical treatment of ADHD compared with that on behavioral treatments. One of the main reasons for this is that medical studies are funded by the pharmaceutical companies as they stand to lead to profit (Hearn, 2004).

Given that there is evidence for the efficacy of behavioral treatments for ADHD as well as concerns regarding the safety of pharmaceutical intervention, it would seem that there would be a preference of behavior interventions. However, research indicates that medication seems to be a reasonable and acceptable option for many parents. What these parents do not realize however, is that their choice of healthcare provider likely influenced to a great extent the treatment strategy used. Furthermore, parents are not being fully informed of the risks associated with stimulant treatment. Therefore, it is not uncommon for a parent to take their child to a pediatrician, who then prescribed medication without informing the parent about side effects or alternatives such as behavioral therapies.

Future Research

Given the complexity of arriving at the diagnosis of ADHD as well as the variety of different treatment strategies, it is important that there is some standardization between disciplines. As of now, research has focused on assessing differences within disciplines (i.e., assessment strategies within different medical specialties, or different type of psychologists) rather than comparing how psychologists and physicians arrive at the diagnosis. Furthermore, it seems likely that treatment strategies tend to differ between the two disciplines. Specifically, pharmaceutical intervention is likely favored by physicians and behavioral treatment options are probably most often recommended by psychologists. However, there has yet to be a study published that has examined this issue. For this reason, a questionnaire was developed by this author for potential use to survey those individuals who evaluate children for ADHD on a regular basis. This questionnaire can be found in Appendix B.

Conclusion

The history of ADHD as a diagnosis has been characterized by ambiguity and a search for a consensus. According to Lahey et al. (1987), "no term in the history of childhood psychopathology has been subject to as many reconceptualizations, redefinitions, and renamings as the disorder referred to now as ADHD. From its origins in the concept of minimal brain damage, through hyperkinesis, to attention deficit disorder with hyperactivity (ADD/H), little has remained constant in our understanding of this disorder, except the belief that children manifest such a disorder and that we have never defined it adequately" (p. 330). The latest practice parameters, published by the AACAP (2007) have tried to respond to some of the questions surrounding ADHD as it pertains to diagnosis and treatment. Despite this concern for general consensus, there is a limited amount of current research focusing on how various professional disciplines vary in their assessment and treatment practices. What is clear from the research in this area is that there is considerable variability in diagnostic and treatment practices between disciplines (Handler & DuPaul, 2005).

Research has demonstrated that a "best practice" multi-method approach is the most comprehensive assessment strategy we currently have. However, the AAP and AACAP guidelines have proven difficult to put into practice (Rushton, Fant & Clark, 2004). Typical problems with instituting guidelines include unfamiliarity with the guidelines and/or assessment measures, a lack of awareness of resources, and the amount of time a thorough diagnosis requires (Leslie et al., 2004). If one is to consider that the average physician visit lasts roughly 7 to 15 minutes, these best practice approach is impossible to implement in that setting. It therefore makes more sense to utilize

psychologists for assessing for ADHD. Not only do psychologists work in a structure in which they are able to devote several hours to the assessment process, but they also have advanced training in using the assessment instruments necessary in arriving at a diagnosis. Furthermore, psychologists are not likely to be influenced by the pharmaceutical companies when considering treatment options. With these factors in mind, the following are steps that should be taken by psychologists to ensure they utilize the best practice approach to the assessment and treatment of ADHD.

To begin, all psychologists who diagnose and/or treat ADHD should be familiar with both the AACAP guidelines and the DSM-IV criteria. The most efficient approach when meeting with a concerned parent is to gather a medical, family, social and academic history that focuses on the DSM-IV criteria for ADHD. Figure 1 provides an illustration of the diagnostic process (see Appendix A). If significant symptoms of inattention, impulsivity and/or hyperactivity are present the clinician should assess how they impair functioning, if they have been present for at least 6 months and if they emerged before the age of 7. To assess the presence of ADHD behaviors in multiple settings one should familiarize themselves with several different commonly used behavioral checklists (e.g., Conner's, CBCL) and choose the one they best understand and that meets their needs. Also one needs to consider the scoring process as it can be complicated and/or time consuming. In addition, behavior checklists should be completed by at least one parent and the child's teacher to assess for the behavior in multiple settings.

The psychologist also needs to note if any of the child's symptoms can be better accounted for by a medical or psychological disorder. If this disorder is out of the clinician's scope of practice, an appropriate referral should be made for assessment. If

this disorder is something that the clinician can easily assess and treat, a follow-up appointment should be scheduled to discuss the results and make changes to the treatment regimen as needed. Similarly, the clinician needs to assess for possible comorbid disorders such as a language or learning disorder, which may also require a referral to an outside source for appropriate assessment.

Parents of those children who do meet the criteria for ADHD as outlined in the DSM-IV-TR (2000) as assessed using the methods outlined above, should be provided a range of treatment options including both pharmacological and behavioral options. The risks of pharmacological treatment should be explained fully. At the time of diagnosis the parent and child should also receive psychoeducation regarding ADHD. If the parents desire a treatment that a particular clinician does not provide, an appropriate referral should be made. Pharmaceutical intervention should appropriately and necessarily be referred to a physician. And finally, the clinician needs to assess the child's progress in treatment and make adjustments as needed which can be accomplished using rating scales from parents and teachers.

In closing, the number of ADHD cases is not likely to decrease any time soon, but the way in which we diagnose and treat ADHD needs to change. Thus far, the medical community has largely pushed the idea that ADHD has a biological basis and therefore the best treatment is medication, but with little evidence. However, what is known about stimulant treatment for ADHD is troubling. Its use has been linked to impaired growth, cardiac issues and even death and there is still not much data on the long term effects of treatment. It is clear that a new approach is needed given these concerns over side effects of stimulant treatment and the pharmaceutical companies' involvement in treatment.

Psychology seems like the ideal discipline to be diagnosing and treating ADHD, as psychologists have much more assessment training than physicians and appointments are typically long enough to accommodate the essentials of a good assessment. As the public as a whole seems to becoming more aware of ADHD, and the controversial use of stimulants to treat it, parents are more likely to seek out behavioral treatments. When this shift occurs, psychologists as a discipline are trained and ready to serve population ultimately resulting in better ADHD management overall.

References

American Academy of Pediatrics (2000). Clinical practice guidelines: Diagnosis and evaluation of the child with attention-deficit/hyperactivity disorder. *Pediatrics, 105*, 1158-1170.

American Academy of Child and Adolescent Psychiatry (1997). Practice parameters for the assessment and treatment of children, adolescents and adults with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 36 (supplement),* 85S-121S.

American Academy of Pediatrics (2000). Clinical practice guidelines: Diagnosis and evaluation of the child with the attention-deficit hyperactivity disorder. *Pediatrics, 105*, 1158-1170.

American Psychiatric Association (1957). *Diagnostic and Statistical Manual of Mental Disorders*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (1968). *Diagnostic and Statistical Manual of Mental Disorders, 2nd edition (DSM-II)*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (1980). *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III)*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (1987). *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition-revised (DSM-III-R)*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders, 4th edition-TR (DSM-IV-TR)*. Washington, DC: American Psychiatric Association.

American Psychiatric Association (2010). *Diagnostic and Statistical Manual of Mental Disorders, 5th edition Development*. Retrieved April 6, 2010, from http://www.dsm5.org/Pages/Default.aspx

Armstrong, T. (1996). ADD: Does it really exist? *Phi Delta Kappan, 77,* 22-32.

Armstrong, T. (1995). *The Myth of the A.D.D. Child.* New York: Penguin Books.

Barkley, R. (2005). *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment, 3rd edition.* New York: The Guilford Press.

Barkley, R. (1998a). *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment, 2nd edition.* New York: The Guilford Press.

Barkley, R. (1998b). Attention-Deficit/Hyperactivity Disorder. In E. J. Mash. & R. A. Barkley (Eds.), *Treatment of Childhood Disorders, 2nd edition* (pp. 55-110). New York: The Guilford Press.

Baughman, F.A. (2001). The case against diagnosis and treatment of adhd. Paper presented to the Parliamentary Assembly, Council of Europe.

Bennett, F.C., Brown, R.T., Craver, J., and Anderson, D. (1999). Stimulant medication for the child with attention-deficit/hyperactivity disorder. *Pediatric Clinics of North America, 46*, 929-944.

Biederman, J., Faraone, S.V., Milberger, S., & Doyle, A. (1993). Diagnosis of attention deficit disorder from parent reports predicts diagnoses based on teacher reports. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 315-317.

Biederman, J., Faraone, S. V., Weber, W., Russel, R. L., Rater, M., & Park, K. S. (1997). Correspondence between DSM-III-R and DSM-IV attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 1682-1687.

Bird, H. B., Gould, M. S., & Staghezza, B. M. (1992). Patterns of diagnostic comorbidity in a community sample children aged 9 through 16 years. *Journal of the American Academy of Child and Adolescent Psychiatry, 32,* 361-368.

Breggin, P. R. (2000). A critical analysis of the NIMH multimodal treatment study for attention-deficit/hyperactivity disorder (The MTA study). *Ethical Human Sciences and Services, 2,* 63-71.

Brown, R. T., Antonuccio, D. O., DuPaul, G. J., Firstad, M. A. & King, M. A. (2008). Attention-deficit/hyperactivity disorder. In *Child mental health disorders: Evidenced based and contextual factors for psychosocial, psychopharmacological and combined interventions* (pp 15-32). Washington, DC: American Psychiatric Association.

Brown, R. T., Freeman, W. S., Perrin, J. M., Stein, M. T., Amler, R. W., Feldman, H. M., Perce, K., & Wolraich, M. L. (2001). Prevalence and assessment of Attention-Deficit/Hyperactivity Disorder in primary care settings. *Pediatrics, 107,* e43.

Brown, R.T. & Sawyer, M. (1988). *Medications for school-age children: Effects on learning and behavior.* New York: Guilford Press.

Carey, W. B. (1999). Commentary: Problems in diagnosing attention and activity. *Pediatrics, 103,* 664-666.

Carey, W. B. (1998). Is attention deficit disorder a valid disorder. *National Institute of Health Consensus Conference Program,* 33-36.

Carlson, C. L., & Lahey, B. B. (1983). Factor structure of teacher rating scales for children. *School Psychology Review, 12,* 285-91.

Cohen, D. (2004). Leading ADHD researcher blows whistle on Concerta and CHADD. Retrieved March, 15, 2010, from http://www.ahrp.org/infomail/04/12/03.php

Conners, C. K. (2008). *Conners' Rating Scales Manua-3rd edition.* North Tonawanda, NY: MHS.

Conners, C. K. (2008). *Conners' Rating Scales-Revised; technical manual-3rd edition.* North Tonawanda, NY: Multi-Health Systems.

Conrad, P. (1975). The discover of hyperkinesis: Notes on the medicalization of deviant behavior. *Social Problems,* 12-21.

Copeland, L., Wolraich, M., Lindgren, S., Milich, R. and Woolson R. (1987). Pediatricians reported practices in the assessment and treatment of attention deficit disorders. *Journal of Developmental and Behavioral Pediatrics, 8,* 191-197.

Carson, R. C., Butcher, J. N. & Mineka, S. (1998). *Abnormal Psychology and Modern Life.* New York: Longman.

Costello, E. J. (1985). Primary care pediatrics and child psychopathology: A review of diagnostic, treatment, and referral practices. *Pediatrics, 78,* 1044-1050.

Drug Enforcement Agency (2000). DEA congressional testimony: Hearing before the Committee on Education and the Workforce: Subcommittee on Early Childhood, Youth and Families, May 15, 2000. Available: www.usdoj.gov:80/dea/pubs/cngrtest/ct051600.htm

Drug Enforcement Agency (1995). DEA press release: Methylphenidate. Available: www.usdoj.gov:80?dea/pubs/pressrel/pr951020.htm

DuPaul, G. J., Anastopoulos, A. D., McGoey, K. E., Power, T. J., Reid, R., & Ikeda, M. J. (1997). Teacher ratings of attention deficit hyperactivity disorder symptoms: Factor structure and normative data. *Psychological Assessment, 9,* 436-444.

DuPaul, G. J. & Stoner, G. (2004). *ADHD in the schools: Assessment and intervention Strategies-2nd ed.* New York: Guilford Press.

Eiraldi, R.B., Power, T.J., Nezu, C.M. (1997). Patterns of comorbidity associated with subtypes of attention-deficit/hyperactivity disorder among 6- to 12-year-old children. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 503-514.

Faraone, S. V., Biederman, J., Milberge, S. (1995). How reliable are maternal reports of their children's psychopathology? One year recall of psychiatric diagnosis of ADHD children. *Journal of the American Academy of Child and Adolescent Psychiatry, 34,* 1001-1008.

Fabiano, G.A., Pelham, W.E., Coles, E., Chronis-Tuscano, A., O'Conner, B.C., & Gnagy, E.M. (2009). A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder. *Clinical Psychology Review, 29,* 129-140.

Freedman, A., Effron, A., and Bender, L. (1955). Pharmacotherapy in children with psychiatric illness. *Journal of Nervous and Mental Disease, 122,* 479-486.

Frick, P. J., Lahey, B. B., Applegate, B., Kerdyck, L., Ollendick, T., Hynd, G. W., Garfinkel, B., Greenhill, L., Biederman, J., Barkley, R. A., McBurnett, K., Newcorn, J., Waldman, I. (1994). DSM-IV filed trials for the disruptive behavior disorders: Symptom utility estimates. *Journal of the American Academy of Child and Adolescent Psychiatry, 33,* 529-539.

Frick, P. J., & Lahey, B. B. (1991). The nature and characteristics of attention-deficit hyperactivity disorder. *School Psychology Review, 20,* 163-174.

Gardner, W., Kelleher, K. J., Wasserman, R., Childs, G., Netting, P., Lillienfeld, H., & Pajer, K. (2000). Primary care treatment of pediatric psychosocial problems: A study from pediatric research in office settings and ambulatory sentinel practice network. *Pediatrics, 106,* e44.

Gittelman, R., Mannuzza, S. (1985). Diagnosing ADHD in adolescents. *Pychopharmacolgical Bulletin, 21,* 237-242.

Goldman, L.S., Genel, M., Bezman, R. J., & Slanetz, P. J. (1998). Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *JAMA, 279,* 1100-1107.

Greenhill, L.L. (1998). Diagnosing attention-deficit/hyperactivity disorder in children. *Journal of Clinical Psychiatry, 59 (supplement 7),* 31-41.

Handler, M.W., & DuPaul, G. J. (2005). Assessment of ADHD: Differences across psychology specialty areas. *Journal of Attention Disorders, 9,* 402-412.

Harpaz-Rotem, I., & Rosenbeck, R. A. (2004). Changes in outpatient psychiatric diagnosis in privately insured children and adolescents from 1995 to 2000. *Child Psychiatry and Human Development, 34*, 329-340.

Hearn, K. (2004). Here, kiddie, kiddie. Retrieved May 15, 2010 from http://www.alternet.org/story/20594

Hynd, G. W., Hern, K. L., Novey, E. S., Eliopulos, D. Marshall, R., Gonzalez, J. J., & Voeller, K. K. (1993). Attention-deficit hyperactivity disorder and asymmetry of the caudate nucleus. *Journal of Child Neurology, 8,* 339-347.

Jensen, P. S., Kettle, L., Roper, M. T., Sloan, M. T., Dulcan, M. K., Hoven, C., Bird, H. R., Bauermeister, J. J., & Payne, J. D. (1999). Are stimulants overprescribed? Treatment of ADHD in four U.S. communities. *Journal of the American Academy of Child and Adolescent Psychiatry, 38,* 797-804.

Jensen, P. S., & Edlebrock, C. (1999). Subject and interview characteristics affecting reliability of the Diagnostic Interview Schedule for Children. *Journal of Abnormal Child Psychology, 27,* 413-415.

Jensen, A. L., & Weisz, J. R. (2002). Assessing match and mismatch between practitioner-generated and standardized interview-generated diagnoses for clinic-referred children and adolescents. *Journal of Consulting and Clinical Psychology, 70,* 158-168.

Koonce, D. A. (2007). Attention deficit hyperactivity disorder assessment practices by practicing school psychologists: A national survey. *Journal of Psychoeducational Assessment, 25*, 319-333.

Kronenberger, W. G., & Meyer, R. G. (1996). *The child clinician's handbook.* Allyn and Bacon: Needham Heights: Massachusetts.

Kwasman, A., Tinsley, B. J., & Lepper, H. S. (1995). Pediatricians' knowledge and attitudes concerning diagnosis and treatment of attention deficit and hyperactivity disorders: A national survey approach. *Archives of Pediatric and Adolescent Medicine, 149,* 1211-1216.

Lahey, B. B., & Carlson, C. L. (1991). Validity of the diagnostic category of attention deficit disorder without hyperactivity: A review of the literature. *Journal of Learning Disabilities, 24,* 110-120.

Lahey, B. B., Carlson, C. L., & Frick, P. J. (1994). Attention deficit disorder without hyperactivity: A review research relevant to the DSM-IV. In T. A. Widiger, A. J. Frances, W. Davis, & M. First (Eds.), In *DSM-IV Sourcebook, Vol. 1.* Washington D.C.: American Psychiatric Press.

Lahey, B. B., McBurnett, K., Pfiffner, L. J. (1993). The diagnosis of attention deficit disorders in DSM-IV: Scientific basis and implication for education. *Exceptional Children, 60,* 108-121.

Lahey, B. B., Pleham, W. E., Schaughency, E. A., Atkins, M. S., Murphy, H. A., Hynd, G. W., Russo, M., Hartdagen, S., & Lorys-Vernon, A. (1988). Dimensions and types of attention deficit disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 27,* 330-335.

Leslie, L. K., Weckerly, J., Plemmons, D., Landsverk, J., & Eastman, S. (2004). Implementing the American Academy of Pediatrics Attention-Deficit/Hyperactivity Disorder Diagnostic Guidelines in Primary Care Settings. *Pediatrics, 114*, 129-140.

Lou, H. C., Henriksen, L., & Bruhn, P. (1984). Focal cerebral hypoperfusion in children with dysphasia and/or attention deficit disorder. *Archives of Neurology, 41,* 825-829.

Lou, H. C., Henriksen, L., & Bruhn, P. (1990). Foal cerebral dysfunction in developing learning disabilities. *Lancet, 335,* 8-11.

Mayes, R. & Rafalovich, A. (2007). Suffer the restless children: The evolution of adhd and paediatric stimulant use, 1900-80. *History of Psychiatry, 18*, 435-457.

McGuiness, D. (1989). Attention Deficit Disorder: The Emperor's Clothes, Animal "Pharm", and Other Fiction. In S. Fisher & R. P. Greenberg (Eds.), *The Limits of Biological Treatments for Psychological Distress.* Hillsdale, New Jersey: LEA.

Mercugliano, M., Power, T. J., Blum, N. J. (1999). *The clinician's practical guide to attention deficit/hyperactivity disorder.* Baltimore: Paula Brookes Publishing Company.

Mitsis, E. M., McKay, K. E., Schulz, K. P., Newcorn, J, H., & Halperin, J. M. (2000). Parent-teacher concordance for DSM-IV attention-deficit/hyperactivity disorder in a clinic-referred sample. *Journal of the Academy of Child and Adolescent Psychiatry, 39,* 308-313.

Monastra, Vincent J. (2008). *Unlocking the potential of patients with ADHD: A model for clinical practice.* (pp. 49-66). Washington, DC: American Psychological Association.

Morgan, A. M. (1999). Diagnosis of attention-deficit/hyperactivity disorder in the office. *Pediatric Clinics of North America, 46,* 871-884.

Morgan, A. E., Hynd, G. W., Riccio, C. A., & Hall, J. (1996). Validity of DSM-IV ADHD predominantly inattentive and combined types: Relationship to previous

DSM diagnosis/subtype differences. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 325-333.

MTA Cooperative Group. (1999a). A 14 Month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1073-1086.

MTA Cooperative Group. (1999b). Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1088-1096.

Nakamura, R. K. (2002). Attention deficit/hyperactivity disorders: Are children being overmedicated? Retrieved April 6, 2010 from http://olpa.od.nih.gov/hearings/107/session2/testimonies/attndef.asp

National Institutes of Health. *Diagnosis and treatment of Attention-Deficit/Hyperactivity Disorder.* Washington D.C.; US Government Printing Office; 1998.

Newcorn, J. H., Halperin, J. M., Healey, J. M., O'Brien, J. D., Pascualvaca, D. M., Wolf, L. E. (1988). Are ADDH and ADHD the same or different? *Journal of the American Academy of Child and Adolescent Psychiatry, 285,* 734-738.

Perrin, J.M., Friedman, R.A., & Knilans, T. K. (2008). Cardiovascular monitoring and stimulant drugs for attention- deficit/hyperactivity disorder. *Pediatrics, 122,* 451-453.

Perry, R. (2000). Are stimulants overprescribed: Letters to the editor. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 269-270.

Rushton, J. L., & Fant, K. E. (2004). Use of practice guidelines in the primary care of children with attention-deficit/hyperactivity disorder. *Pediatrics, 114,* 23-28.

Safer, D. J. (2000). Commentary: Stimulant treatment in the community. *Journal of the Academy of Child and Adolescent Psychiatry, 39,* 989-990.

Safer, D.J., & Krager, J.M. (1992). Effect of a media blitz and a threatened lawsuit on stimulant treatment. *Journal of the American Medical Association, 268,* 1004-1007.

Schaughency, E.A. & Rothlind, J. (1991). Assessment and classification of attention deficit hyperactive disorders. *School Psychology Review, 20,* 187-205.

Searight, H. R., Nahlik, J. E., & Campbell, D. C. (1995). *The Journal of Family Practice, 40,* 270-279.

Singh, I. (2002). Biology in context: Social and Cultural perspectives on ADHD. *Children and Society, 16,* 360-367.

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry, 39,* 28-38.

Sleator, E. K., & Ullman, R. K. (1981). Can the physician diagnosis hyperactivity in the office. *Pediatrics, 67,* 13-17.

Still (1902). *Lancet,* 1008-12, 1077-82, 1163-68.

Smith, M. (2008). Psychiatry limited: Hyperactivity and the evolution of American psychiatry. *Social History of Medicine, 21*, 541-559.

Swanson, J. McBurnett, K., Christian, D. & Wigal, T. (1995). Stimulant medications and the treatment of children with adhd. (T. Ollendick and R. Prinz). New York: Plenum Press.

Szatmari, P., Offord, D. R., & Boyle, M. H. (1989). Ontario child health study: Prevalence of attention deficit disorder with hyperactivity. *Journal of Child Psychology and Psychiatry, 30,* 219-30.

Vlam, S. L. (2006). Attention-deficit/hyperactivity disorder: Diagnostic assessment methods used by advanced practice registered nurses. *Pediatric Nursing, 32*, 18-24.

Weyandt, L. 2001. *An ADHD Primer.* Allyn and Bacon: Needham Heights, Massachusetts.

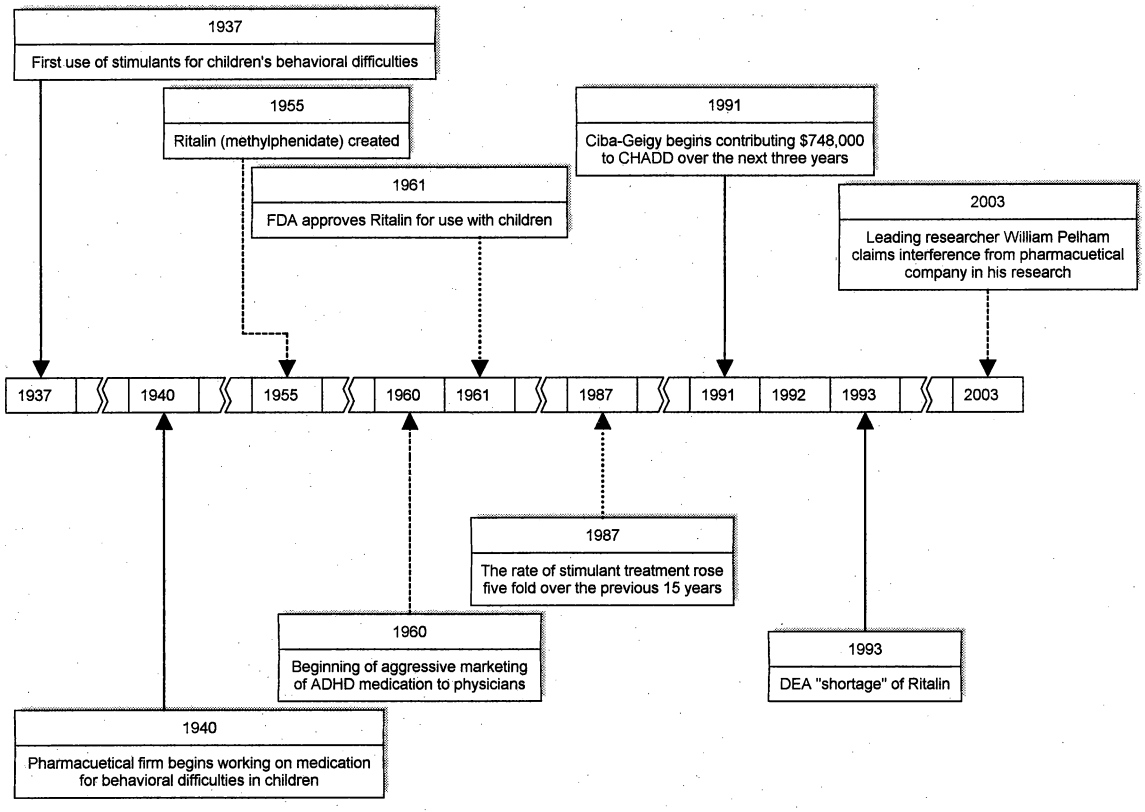
Wolraich, M. L., Baumgaertel, A. (1997). The practical aspects of diagnosing and managing children with attention deficit/hyperactivity disorder. *Clinical Pediatrics, 2,* 497-504.

Zametkin, A. J., Nordahl, T. E., Gross, M., King, A. C., Semple, W. E., Rumsey, J., & Cohen, R. M. (1990). Cerebral glucose metabolism in adults with hyperactivity of childhood onset. *New England Journal of Medicine, 15,* 1361-1366.

Zito, J. M., Safer, D. J., dosReis, S., Gardner, J., Johnson, R. E., Lynch, F., Boles, M. (1999). *Ten year prevalence trends for psychotropic medication form two health service systems.* Presented at the 39th meeting of the New Clinical Drug Evaluation Unit Program, Boca Raton, FL, June.

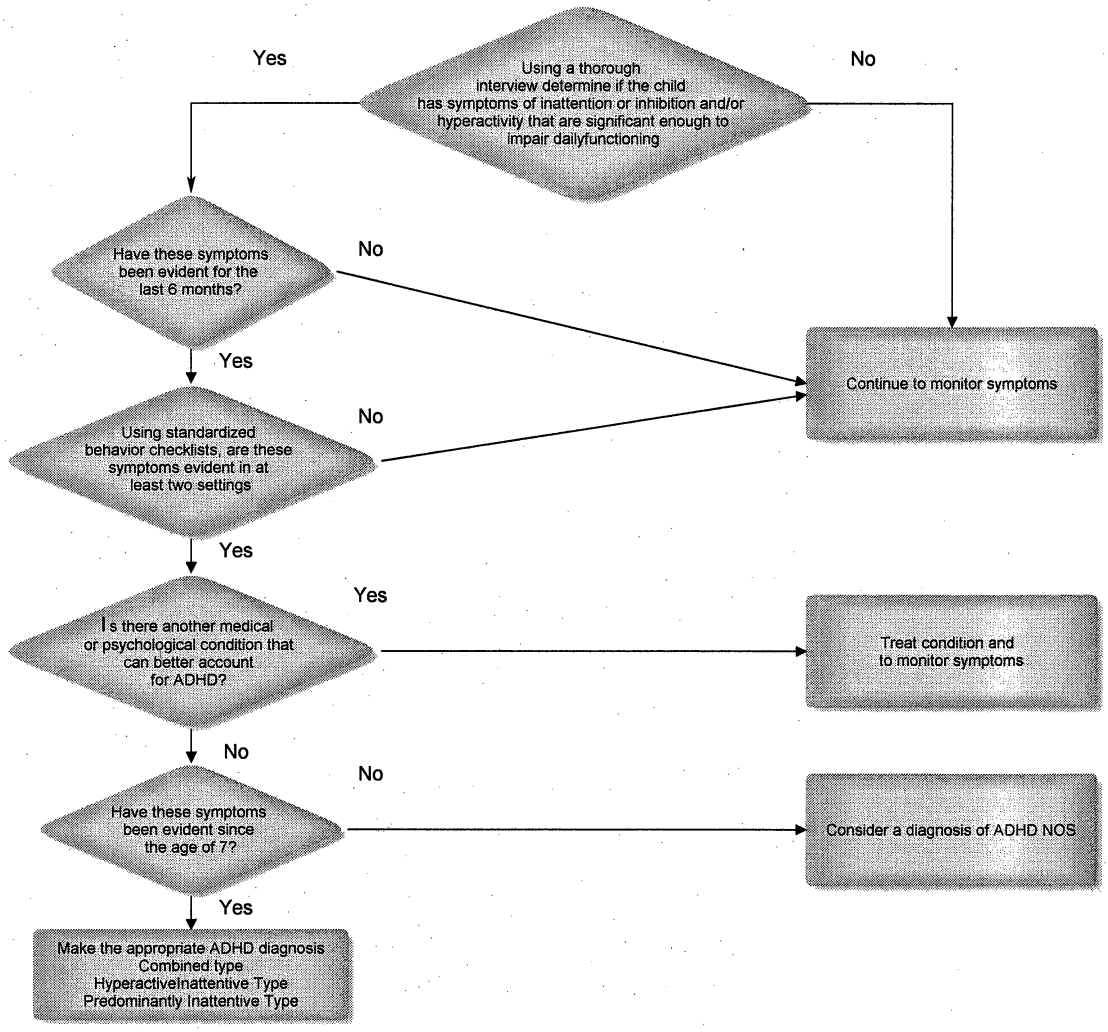
Appendix A

Timeline of Stimulant Treatment for ADHD



Appendix B

Process for arriving at an ADHD diagnosis.



Appendix C

Questionnaire

Please take 10 minutes to complete this short questionnaire. Most of this questionnaire can be answered by checking the appropriate boxes to save you time. Thank you in advance for your participation.

1. Please check one of the following to indicate your primary profession

- ☐ M.D. Psychiatrist
- ☐ M.D. Pediatrician
- ☐ M.D. Neurology
- ☐ M.D. Family practice
- ☐ University based researcher
- ☐ Ph.D. Clinical psychologist
- ☐ Ph.D. Counseling psychology
- ☐ Ph.D. Family therapy
- ☐ Ph.D. School psychology
- ☐ Ph.D. Counseling psychology
- ☐ ED.D. School psychology
- ☐ ED.D. Education
- ☐ M.A. or M.S. School psychology
- ☐ M.A. or M.S. Family therapist
- ☐ Other (please explain):_____

_____

2. How long have you been working in your profession? _____

3. Please estimate what percentage of the professional time you spend working with children, adolescents or adults who come to you for services primarily for problems involving attention and/or hyperactivity:

_____

4. Please check the following items that you believe are necessary for an accurate diagnosis of ADHD:

- ☐ Patient meets all DSM-IV criteria
- ☐ Patient Interview
- ☐ Parent Interview
- ☐ Teacher Interview
- ☐ Have parents fill out a scale or assessment instruments (e.g., Auchenbach, Conners)
- ☐ Have teacher fill out a scale or assessment instruments (e.g., Auchenbach, Conners)
- ☐ Gather information from multiple sources (e.g., school, counselor, coach, etc.)
- ☐ Educational assessment – reading, writing and math skills.
- ☐ Cognitive assessment (e.g., WISC-III, K-BIT)
- ☐ CPT (Continuous Performance Test)
- ☐ Observation of parental interactions with child.
- ☐ Observation of teacher/student interaction
- ☐ Assessment of martial satisfaction and life stressors.
- ☐ Assessment of parental discipline techniques, consistency, styles, etc.
- ☐ Assessment of parental drug/alcohol abuse, domestic violence, and/or child abuse.
- ☐ Developmental history
- ☐ Psychosocial history
- ☐ Medical history
- ☐ Medical exam
- ☐ Speech evaluation.
- ☐ Hearing evaluation.
- ☐ Vision exam.
- ☐ Neurological exam
- ☐ Neurological testing (e.g., PET, SPECT, FMRI)
- ☐ Blood work
- ☐ Other (please specify): _____

_____

_____

5. When a patient comes to your office/work who presents with symptoms of ADHD, what are diagnoses do you consider?
   a. _____
   b. _____
   c. _____

   In your work with ADHD patients, what do you consider to be the most powerful diagnostic tool, assessment, or observation for determining the presence of ADHD?

6. Do you know of any psychological or educational diagnostic tests that are reliable and valid in diagnosing ADHD?

   Yes ☐ No ☐

   If yes, please list them (in descending order of helpfulness):_____
   _____
   _____

7. Do you believe ADHD or ADD has a genetic component?

   Yes ☐ No ☐

   If yes, please list at least 2 or 3 research studies you feel helps substantiate this position:_____
   _____
   _____

   How would this genetic component be assessed?_____
   _____
   _____

8. If you believe ADHD is the result of an interaction between genetic and environmental factors, what percentage of contribution would you give to the following factors.
   _____ Genetic
   _____ Family
   _____ School
   _____ Other environmental factors (e.g., SES)

9. Do you believe that ADHD or ADD is caused by some type of biochemical imbalance?

   Yes ☐ No ☐

   If yes, please list at least 2 or 3 research studies you feel helps substantiate this position:
   _____
   _____
   _____

   How would you assess a biochemical imbalance related to ADHD (e.g., would you refer out, who would you refer to, what test(s) would you use use)?_____
   _____
   _____

10. Do you believe ADHD or ADD is caused by a neurotransmitter deficit?

Yes ☐ No ☐

If yes, please list at least 2 or 3 research studies you feel best substantiate this position:

_____
_____
_____

How would you assess a neurotransmitter deficit in relation to ADHD?

_____
_____
_____

11. Do you believe ADHD or ADD is a biologically or medically caused disorder?

Yes ☐ No ☐

If yes, please list at least 2 or 3 research studies you feel best substantiate this position:_____
_____
_____

How would you assess the biological or medical component to ADHD?_____
_____
_____
_____

12. To the best of your knowledge, is there any medical diagnostic procedure or test (e.g., CAT scans, PET scans, MRI's, blood tests, genetic tests, etc.) that could accurately differentiate a child with ADHD from one without ADHD.

Yes ☐ No ☐

If yes, please indicate the specific test(s) or procedure(s):_____
_____
_____

13. What is your typical treatment plan for a child with an ADHD diagnosis (check all that apply)?

Individual Therapy	Family Therapy
☐ Cognitive behavioral	☐ Brief family intervention
☐ Gestalt	☐ Functional family therapy
☐ Play Therapy	☐ Structural family therapy
☐ Biofeedback	☐ Strategic family therapy
☐ Other: _____	☐ Solution oriented family therapy
_____	☐ Other: _____
_____	_____

School/Teacher Intervention

- ☐ Assertive discipline
- ☐ Behavior modification
- ☐ Positive discipline
- ☐ Adlerian
- ☐ Jones and James
- ☐ Glasser
- ☐ Modification of classroom environment
- ☐ Modification of instruction or curriculum
- ☐ Other: _____

_____

Social Skills Training

- ☐ Goldstein
- ☐ Parent training workshops
- ☐ Other: _____

_____

Medication

- ☐ Methlphenidate (Ritalin, Ritalin-SR)
- ☐ D-Amphetamine (Dexedrine, Dexedrine spanules)
- ☐ Pemoline (Cylert)
- ☐ Bupropion (Wellbutrin)
- ☐ Tricyclic antidepressants
- ☐ Venlafaxine (Effexor)
- ☐ MAOI – tranylcypromine (Parnate), Selegiline (Eldepryl)
- ☐ Fluoxetine – Prozac

15. What is your primary method of treatment?
    - ☐ Child based
    - ☐ Family based
    - ☐ School based

16. Do you have a specific amount of time before medication is considered?

    - ☐ Typically, medications are recommended right away.
    - ☐ Yes, 2-4 months
    - ☐ Yes, 4-6 months
    - ☐ Yes, 6 months to 1 year
    - ☐ Other (please provide a specific amount of time before you consider the use of medications):_____