

# **An Update on the Diagnosis and Treatment of Attention-Deficit/Hyperactivity Disorder in Children<sup>1</sup>**

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## Abstract

*What are the most appropriate empirically supported diagnostic and treatment approaches to children with the Attention Deficit/Hyperactivity Disorder (ADHD)? This article summarizes the nomenclature, prevalence and course, comorbidity, etiology, assessment and federal laws associated with ADHD. We then review clinical research and consensus guidelines for treatment of ADHD, including the largest randomized treatment study completed on ADHD (MTA Cooperative Group, 1999a). The empirical evidence supports either a behavioral/psychosocial or a combined behavioral/psychosocial and medication intervention in the treatment of children with ADHD.*

Thomas S. Kuhn (1962) wrote eloquently regarding the process and structure of scientific change 40 years ago. Initial interpretation of the Multimodal Treatment Study (MTA Cooperative Group, 1999a) presented somewhat of a Kuhnian crisis to the accepted and empirically supported approaches to the treatment of ADHD, with its finding that medical management was significantly more effective for the *core* symptoms of ADHD than behavioral/psychosocial treatment. However, subsequent analyses of the Multimodal Treatment Study (MTA) study, as well as previous, and subsequent, research and consensus guidelines support behavioral/psychosocial and combined behavioral/psychosocial and medication interventions as empirically supported treatments for ADHD. This article, drawing upon these findings and guidelines, describes the active roles psychologists take in providing the most reliable and valid diagnostic and treatment services for ADHD.

## The Nomenclature of the ADHD

The nomenclature for ADHD has undergone extensive conceptual change since 1980 when the Diagnostic and Statistical Manual, 3rd Edition (DSM-III, American Psychiatric Association, 1980) was first published. DSM-III promulgated a new name (Attention Deficit Disorder with Hyperactivity and Attention Deficit Disorder without Hyperactivity) and new diagnostic criteria for this disorder. For the first time, practicing psychologists had specific behavioral criteria to consider in their diagnosis of this disorder. While there seemed to be much anecdotal support for this dichotomy, Barkley (1998) indicates there was little empirical support for these labels when they were created. In 1987, the Diagnostic and Statistical Manual no longer recognized the Attention Deficit Disorder without hyperactivity which was relegated to a poorly defined category, without diagnostic criteria, called Undifferentiated Attention Deficit Disorder. All that remained officially was Attention Deficit Hyperactivity Disorder,

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which was considered a unidimensional disorder. The Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) was published by the American Psychiatric Association in 1994 and enumerated three subtypes for Attention-Deficit/Hyperactivity Disorder:

1. Predominantly Inattentive Type
2. Predominantly Hyperactive/Impulsive Type
3. Combined Type (which includes significant hyperactivity/impulsivity and inattention symptomatology)

In DSM-IV, children must have 6 of 9 symptoms to qualify for either the inattentive and/or hyperactive-impulsive subtypes of ADHD, and 6 of 9 symptoms of both subtypes to qualify for the combined type. In addition, these symptoms have to have been present before the age of 7 years old, must create impairment in two or more settings (e.g. home, school, neighborhood), must cause clinically significant impairment in social, academic or occupational functioning and not be better accounted for by various other disorders, e.g. post traumatic stress disorder. There are several associated problems, such as speech and language delays, motor in-coordination, poor regulation of emotion and low frustration tolerance, and increased risk of accidental injury (American Psychiatric Association, 2000; Farmer & Peterson, 1995).

The predominantly hyperactive/impulsive and combined subtypes have been more thoroughly researched both in terms of their core symptoms and associated characteristics as well as diagnostic and treatment issues (Barkley, 1998). Research has been supportive of the predominately inattentive subtype being a separate clinical entity, although there are unresolved issues, i.e. referral age, co-morbid learning disabilities, and gender ratio (Morgan, et al., 1996). Children with either the predominately hyperactive/impulsive or combined subtypes of ADHD often, as they mature, change in their presentation and meet the diagnostic criteria for the predominantly inattentive type of ADHD, as hyperactive and impulsive symptomatology are reduced or brought under better control (Goldstein & Goldstein, 1998). The younger the child, the more likely he/she will be diagnosed as predominantly hyperactive/impulsive (American Psychiatric Association, 2000; Barkley, 1998). The issue of the rate of age-dependent decline in ADHD remains unsettled within the professional literature particularly since the DSM-IV criteria are the same for children and adults. Many support a progression of the disorder, wherein children who are originally diagnosed with the impulsive-overactive type are found to display more of the inattentive symptomatology as they become older adolescents/adults (Resnick, 2000; Wender, 1995). This disorder is not "outgrown" in adulthood. Faraone et al. (2000) estimate that 10 to 60% of young adults with ADHD had the disorder as children. Further, they believe that up to 5% of adults have ADHD.

It is important to note that all children (and adults) have certain degrees of inattention, overactivity and impulsivity in various situations. Individuals who are diagnosed with ADHD by rating scales are found to have symptoms at the 95th to 98th percentile relative to others their age. Individuals who are at the 90th percentile relative to others their age may have significant adjustment problems but they may not meet the diagnostic criteria for ADHD. Ultimately, the diagnosis of ADHD depends on the clinical judgment of the psychologist taking into consideration data from several sources including rating scales.

We have noted that the language used in these labels confuses many patients, parents and schools. To be diagnosed as having ADHD of the inattentive type, you are still called hyperactive and to be hyperactive you are called hyperactive twice. As more

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than one parent of a child with the hyperactive/impulsive type of ADHD has stated: "So, if you say hyperactivity once you don't mean it, but if you say it twice, you do!"

### **Prevalence and Course**

The prevalence of ADHD is conservatively estimated as being from 3 to 7% of the school age children in the United States (American Psychiatric Association, 2000). Prevalence data on the frequency of ADHD in adolescence and adulthood is not conclusive. Barkley (1998) suggests that the instruments used to determine the disorder and the diagnostic criteria used affect prevalence data. The younger the child, the more likely he/she will be diagnosed as having the hyperactive/impulsive ADHD versus the inattentive or combined types of ADHD (Barkley, 1998).

While boys outnumber girls, the estimates of the ratio of males to females vary significantly. Ranges of 2:1 to 9:1 have been reported with the gender difference less obvious for the inattentive type of ADHD (American Psychiatric Association, 2000). Boys are more likely to be aggressive and have other behavioral problems (Gaub & Carlson, 1997). Girls can be overly talkative and or overly social (Nadeau et al., 2000). Females with ADHD demonstrate the same core symptoms and high levels of comorbid disorders, as do males (Biederman, et al., 1999). In community-based samples, the ratio of boys to girls is closer to 1 to 1; however, in clinic-based samples, it is about 6 to 1 due to the disruptive and noncompliant aspects of their behavior (Barkley, 1998). ADHD children comprise 30 to 40% of referrals to child mental health practitioners (Barkley, 1998).

Determining the prevalence of ADHD in other countries and cultures has been problematic. While there is general agreement that ADHD is a worldwide phenomenon (Barkley, 1998), it has been difficult to obtain and compare prevalence data<sup>1</sup>. As Gingerich et al., (1998) point out, while some level of inattention, impulsivity and overactive behaviors are unacceptable in most countries, the perception and severity of such behaviors vary greatly from culture to culture. Prevalence rates in other countries have been reported to be between 3 to 9.5%, roughly analogous to United States data (Gingerich, et al., 1998). It has been difficult to make comparisons of prevalence measures, because of differing criteria and methodology used in different cultures and ethnic groups in the United States (Gingerich et al., 1998).

In comparisons among African-American, Chicano, and Asian-American children, African-American children have the highest and the Asian Americans the lowest incidence of hyperactivity. Other studies have found African-American boys had a high rate of ADHD diagnosis, but it has been suggested that the symptoms may be better accounted for by environmental factors (Barbarin & Soler cited in Gingerich, 1998). Samuel et al., (1999), however, report that symptom presentation of ADHD among African-American children is very similar to symptom presentation in white children; family history and treatment approaches are similar as well.

Gingerich, et al., (1998) and Barkley (1998) among others have reported increased incidence of ADHD in the lower socioeconomic class. Perhaps because of social drift (Barkley, 1998), lower SES populations tend to have a higher incident of ADHD. That is, children with ADHD are less likely to benefit from their education and adapt less well in various situations and as a result are under-employed with the commensurate lower income causing them to drift toward the lower socioeconomic class. Thus, while it is clear there are cultural and ethnic differences in the "objective" assessment of ADHD, practitioners and researchers should be cognizant of and sensitive to the

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interaction and acceptance of ADHD symptoms and deviance within different cultural/ethnic groups.

Historically, it was believed that ADHD was outgrown in mid to late adolescence. It is now clear that two-thirds of children with ADHD will continue to have problems attributable to ADHD as adults, and, because ADHD is a chronic disorder, will require treatment throughout their lives (Resnick, 2000).

### **Comorbidity**

About 44% of children with ADHD have a comorbid disorder, almost a third have two other disorders and approximately one in ten have three comorbid disorders (Szatmari, et al., 1989). Goldstein & Goldstein (1998) report that Conduct Disorder and Oppositional Defiant Disorder are the most common comorbid disorders. Green et al., (1999), indicate that about one-quarter of children diagnosed with ADHD will also meet the criteria for a Conduct Disorder, while about one-third of the ADHD children will meet the criteria for the Oppositional Deviant Disorder. The rates of Conduct Disorder and Oppositional Deviant Disorder for girls are about half that of boys. Some of these children may no longer meet criteria for Conduct Disorder and /or Oppositional Deviant Disorder when the ADHD is appropriately treated. Similar high levels of comorbidity are found in both ADHD boys and girls (Biederman et al., 1999). Anxiety disorders and depression are seen about 25% of the time with ADHD children, with somatization disorder being expressed in about one third of the ADHD adolescents. Biederman, et al. (1995) have identified a number of children who will have bipolar disorder as a comorbid disorder. Faraone, et al. (1997) have suggested that ADHD with bipolar disorder is a distinct subtype of ADHD. The question of comorbidity and prevalence remains very controversial (for further discussion see Barkley, 1998 or Goldstein & Goldstein, 1998).

Learning disabilities (LD) are also a common comorbid disability for children with ADHD. An academic problem (often a suspected learning disability) frequently precipitates an evaluation that leads to a finding of an inattentive ADHD child. In a recent study Snider et al., (2000) completed a national survey of LD teachers and found 22% of students diagnosed with LD also were diagnosed with ADHD. They also report that the incidence of this dual diagnosis has a national range of between 2 and 38%. Mental retardation may be a comorbid disorder; individuals who are mentally retarded and are being assessed for ADHD must be compared to other individuals with mental retardation in regards to their ADHD symptomatology. ADHD is found at comparable rates in individuals who are intellectually gifted. ADHD children are at significantly greater risk to have expressive language problems, but no greater risk for receptive language problems.

A central auditory processing (CAP) disorder may be defined as "a deficiency in one or more of the following processes: sound localization and lateralization; auditory discrimination; auditory pattern recognition; temporal aspects (resolution, masking, integration, ordering) of audition; and auditory performance decrements with competing and degraded acoustic sounds" (Gomez & Condon, 1999). A CAP disorder involves seemingly inattention and distractibility and thus the differential diagnosis with ADHD may be confusing. In one study, the authors note that central auditory processing disorder is more associated with learning disabilities than ADHD (Gomez and Condon, 1999). However, Riccio et al., (1994) found in a small sample a significant co-morbidity of ADHD and CAP disorder using DSM-III and /or DSM-III-R criteria. For the practitioner, differential diagnosis of ADHD should include elimination of a central

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auditory processing disorder as being the primary cause of ADHD symptomatology. Such a rule out can be completed by professionals who do audiometric testing and are familiar with the diagnosis (Chermak, Hall & Mussiek, 1999).

### **Etiology**

When a diagnosis of ADHD is made, the first treatment strategy is educating the family and patient about the disorder. The following information is provided particularly to provide practitioners with relevant information to facilitate this educational process with the patient and their family. One in three to one in four biological parents of children with diagnosed ADHD are affected by ADHD themselves, suggesting a significant genetic component (Barkley, 1998; Biederman et al., 1992). The risk of parents with a child who has ADHD having another child with ADHD is about 1 chance in 3 (Biederman et al., 1992). A dopamine transmitter gene (DAT-1) and a dopamine receptor gene (DRD-4), among others, have been linked to ADHD children and families (Elia, et al., 1999). Twin studies demonstrate a heredity factor between 64 and 91% (Elia, et al., 1999; Gillis, et al., 1992; Goodwin & Stevenson, 1989). For a time interest was directed to the role of the thyroid-releasing hormone (TRH) suggesting a causal link to ADHD (Hauser et al., 1993). Those findings have not been replicated and resistance to TRH is quite rare among ADHD children; it is unlikely that thyroid disease/malfunction is a significant cause of ADHD (Elia, et al., 1994). It is mentioned here as the authors have found that some parents continue to ask about this possible cause of ADHD.

Electrophysiological research (Cohen, 1993) shows that autonomic indices, such as orienting response habituation of individuals with ADHD are less responsive to salient informative stimuli than non-ADHD persons. EEG event-related potentials suggest an arousal dysfunction related to hyporeactivity to salient informative stimuli. Thus the individual with ADHD is relatively unaware of his/her sensations of salient informative stimuli. This results in the paradoxical reaction to stimulant medication where individuals with ADHD become less instead of more active after taking stimulant medication, as they become more attentive to salient informative stimuli.

Environmental toxins may have an etiological role in the development of ADHD. Consumption of lead, usually from lead based wall paint, has been linked to the development of ADHD (see Goldstein & Goldstein, 1998). Prenatal exposure to alcohol and tobacco are considered risk factors as well any significant anomaly that occurs during gestation and/or delivery. Biederman et al., (1995) indicated that family-environment variables such as severe marital discord, large family size, paternal criminality, maternal mental disorder and foster care placement are all significant risk factors in the development of ADHD.

### **The Assessment of ADHD**

The child having a recent physical exam is desirable to rule out medical problems that may cause or relate to ADHD symptomatology. The physical would also serve to alert the psychologist to any co-existing medical problems that will need ongoing medical management or impact on the treatment of an ADHD child, as well as to establish the physician as a member of the diagnostic/treatment team process.

The assessment of ADHD involves establishing that the child has significant developmentally inappropriate levels of inattention and/or impulsivity/overactivity

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which are not better accounted for by learning disabilities, trauma, stress, depression, anxiety, etc. Information can be gained through interview from at least three sources: parent(s), child, and teacher(s). These clinical interviews can be structured or unstructured and are the most important part of the evaluation process. The use of child behavioral rating scales by parents and teachers is, also, an important part of an assessment. A fourth source of information is the review of the child's complete school and health records, including report cards, achievement testing, psychoeducational assessments and medical and psychological treatment records.

Psychological tests are a fifth source of data. Some of the instruments that have been used in assessing ADHD include: Continuous Performance Tests (CPT), the WISC - III's Freedom from Distractibility Index, Porteus Mazes, Rey-Osterrieth, Trail Making Test A&B, Matching Familiar Figures Test, Wisconsin Selective Reminding Test, Wisconsin Card Sort Test, Controlled Oral Word Association Test, Stroop Word-Color Association Test, and the Hand Movements Test. In their recent review of the CPT, the most popular and most frequently used test for ADHD, O'Laughlin and Murphy (2000) concluded that it is a valuable measure that provides useful information when used in conjunction with other assessment data. The CPT, these authors point out, is also effective in monitoring response to medication. The predictive power of the CPT and other psychological/neuropsychological tests are not at the level where the diagnosis of ADHD can be ruled in/out solely by these instruments (Barkley, 1994; McGee et al., 2000) and, thus, they have greater predictive validity when used in combination with other measures (Perugini, et al., 2000). The CPT has a high rate of false-negatives (Barkley, 1998). Psychological testing using the CPT provides important descriptive information regarding a child's ability to sustain their attention and inhibit their impulsivity, their flexibility in thinking and reasoning, their ability to shift their attention, and their ability to continuously perform tasks. Additional psychological testing may be necessary to assess whether the individual has learning disabilities or psychological disorders which may better account for what seemingly are ADHD symptoms. Such testing is helpful in the assessment process, although these measures do not allow the practitioner to differentially diagnose ADHD without other assessment information as reviewed above.

Behavioral observations of the child and parent-child interactions, both informally while in the waiting room and as part of the interview, as well as formally through assigned tasks for parent and child to complete together may be useful. They may aid in assessing ADHD symptoms as well as comorbid Oppositional Defiant Disorder and Conduct Disorder symptoms.

An encouraging recent development in the assessment of individuals for ADHD is the quantitative electroencephalographic (QEEG) procedure. While it requires specialized equipment and training, Monastra et al., (2001) have demonstrated electrophysiological "slowing" that differentiates ADHD from non-clinical controls with significant specificity. However, the sensitivity and specificity of the QEEG with patients with ADHD and comorbid conditions, and with psychiatric patients with disorders other than ADHD, has not been demonstrated.

### **ADHD and Federal Law**

A child diagnosed with ADHD has certain rights under three federal statutes. Section 504 of the 1973 Rehabilitation Act prohibits schools from discriminating against people with handicaps. Schools receiving any federal funds must provide an "equal education" for individuals with ADHD under this statute. The Individuals with

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Disabilities Education Act (IDEA) is similar to Section 504 in that it provides for a free and appropriate public education for the ADHD child and adolescent. IDEA goes further and mandates a multidisciplinary evaluation process and the development of an individualized educational plan for each ADHD student. The Individuals with Disabilities Act (ADA) requires "reasonable accommodations" be made for individuals who have a substantial limitation of a major life activity. Learning (which can be impaired by ADHD) has been defined as a "major life activity" (for further discussion see Latham & Latham, 1992 and Roberts & Mather, 1995). Local bar associations can provide names of attorneys who have expertise in such matters. State departments of education also can be a helpful resource to clinicians and parents.

### **Clinical Research and Consensus Guidelines Supportive of Behavioral/Psychosocial Treatment for ADHD**

Clinical research and consensus guidelines on the treatment of ADHD<sup>2</sup> over the past few years have increasingly clarified the most effective treatment approaches for ADHD. This review supports the primary thesis of this article, which is that behavioral/psychosocial treatment is empirically supported in treating many types of patients with ADHD. We survey below several studies/guidelines and provide a more in depth review of the Multimodal Treatment Study (MTA Cooperative Group, 1999a). Reviews by Hinshaw, et al. (1998), Pelham and Hinshaw (1992) and Pelham and Murphy (1986), as reviewed in Wells (2000), suggest that empirically validated behavioral/psychosocial treatments for ADHD are of two broad types:

*Clinical behavioral psychotherapy* - these studies involve parent and teacher training and consultation in outpatient settings and have found significant improvements in child behavior across a wide range of domains in both home and school settings on behavior checklists and through observation. Aggressive classroom behavior has been found to be normalized with clinical behavioral psychotherapeutic treatment alone. There is evidence from these studies that combined clinical behavioral psychotherapeutic treatment and medication treatment are superior over either alone. An example of a manualized clinical behavioral psychotherapy program is Barkley's defiant children parent training program (Barkley, 1987).

*Direct contingency management* - these studies have been completed in institutions where close control of contingencies is possible and generally yield more significant results than clinical behavior psychotherapy. Improvements found are typically at the same levels as low-dose medication alone; when low-dose medications and direct contingency management are combined the effects are similar to those produced with high-dose medication. An example of a direct contingency management program is Pelham's summer treatment program (Pelham, 2000).

The American Academy of Child and Adolescent Psychiatry (1997) parameters for treating ADHD stress the importance of support and education of parents and teachers in effective behavioral/psychosocial treatment of ADHD. They recognize the need for psychological assessment when appropriate. This Academy recently offered practice parameters for the use of stimulant medications derived from a detailed literature review and expert consultation (AACAP, 2002).

A consensus statement issued by The National Institutes of Health (1998) on the diagnosis and treatment of ADHD noted that studies (primarily short-term - approximately 3 months), including randomized clinical trials, have established the efficacy of behavioral/psychosocial and stimulants treatments for alleviating the symptoms of ADHD. Behavioral/psychosocial treatment programs were reported to be

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effective in the management of many ADHD comorbid conditions, e.g. a child's deviant behavior. The authors of this article have found in our practice, similar to Anastopoulos (2000) and Hinshaw (2000) that the core symptoms of ADHD are seldom the sole focus of treatment interventions. This consensus statement suggests that the dispute between managed care companies and educational agencies regarding the responsibility for coverage of the costs of special educational services for ADHD represents a considerable long-term cost to society.

The National Institutes of Mental Health and Department of Education sponsored Multimodal Treatment Study (MTA) of Attention Deficit/Hyperactivity Disorder is the largest randomized treatment study that has ever been undertaken of any childhood psychological/psychiatric disorder (MTA Cooperative Group, 1999a). At each of six sites around the United States and Canada at least 96 children (total sample = 579) between 7 and 9.9 years of age having the Combined Type of ADHD were randomized to four treatment groups. The Community Care (CC) group (which served as a contrast/control group) subjects were referred to existing community mental health resources (67% of whom received some type of psychiatric medication). The second group received medication alone (MED) with a rigorous double blinded protocol for 28 days for different levels of methylphenidate and were subsequently seen monthly for medication monitoring. The third group received a behavioral/psychosocial treatment program (BEH) which included three components: 1) parent training classes, 2) an intensive eight week all-day summer treatment program (STP), based mainly on Pelham's (2000) STP approach, 3) school based interventions including teacher consultation, a classroom aide and a daily school report card. The fourth treatment group (COMB) received a combination of the BEH and MED group treatment procedures.

In the initial report, the MTA group used an "intent-to-treat" analytic approach examining multiple measures of various domains of functioning. These outcome measures allowed for measurement of specific effects from each of the various treatments. They found that COMB and MED groups had significantly greater improvement than BEH or CC on core ADHD symptoms, although COMB and MED didn't differ statistically in the level of improvement (MTA Cooperative Group, 1999a). However Conners et al. (2001) subsequently used a single outcome "composite score" analytic approach obtained from combining parent and teacher measures. This outcome measure allowed for measurement using a single composite outcome measure. They found COMB to be superior statistically to all other treatment. The COMB treatment approach produced about 12% more successes than the MED treatment approach alone (68% versus 56%), which represented a 21.4% increase in the rate of excellent response (Swanson et al., 2001). Also the COMB outcomes were achieved with significantly lower medication doses than used in MED (MTA Cooperative Group, 1999a). Conners et al. (2001) review various reasons for the increasing use of single composite outcome measures of treatment effects in medical and psychiatric conditions; they argue that a composite measure should be particularly applicable to ADHD.

While recognizing the many strengths of the MTA cooperative study, psychologists have raised several concerns regarding the research design of the study. Anastopoulos (2000) points out that the MED treatment always preceded the BEH treatment within the COMB treatment group raising the question if this "ordering effect" made any difference in the findings. The decision to fade the psychosocial intervention in the BEH and COMB treatments and to continue the MED intervention at the treatment level throughout the study may have biased the outcome in favor of the effects of medication (National Institutes of Health, 2000). Hoza (2001) noted the following concerns: a) the MED and BEH treatment groups were not individualized to comparable degrees, b)

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cognitive-behavioral interventions were not incorporated to an adequate extent, and c) core ADHD symptoms were overemphasized relative to other functional domains, both as treatment targets and outcome measures. Secondary analyses (Swanson et al., 2001) suggested that the inability to show that BEH was superior to CC may relate to 'local conditions', e.g. the frequency and quality of BEH treatments used within the MTA study at the six different study sites. Their reanalysis of the data showed that moderate to large positive effects occurred at three of the study sites from BEH treatment relative to CC treatment in contrast to small to large negative effects at the other three sites.

The American Academy of Pediatrics (2000; 2001) provide guidelines for the diagnosis and treatment of ADHD in school-age children. These guidelines recommend applying DSM-IV diagnostic criteria, obtaining information from teachers and parents and using rating scales to establish the level of developmental inappropriateness of ADHD symptomatology. They recognize that ADHD is a chronic disorder necessitating ongoing medication and behavioral/psychosocial treatment.

Conners, et al., (2001), note that ADHD is diagnosed and treated quite variably in primary care settings. They, with other colleagues, developed expert consensus guidelines (which were influenced by the MTA study) for the diagnosis and treatment of ADHD through surveying 50 psychologists and 51 physicians who were considered to be expert clinicians and/or researchers in the field of ADHD. These Guidelines indicate that behavioral/psychosocial treatment is an appropriate first level treatment for:

- Milder ADHD
- Preschool age children with ADHD
- When there is the presence of comorbid internalizing disorders
- When there is the presence of comorbid social skill deficits
- When the family prefers psychosocial treatment

Experts agreed that starting with the combination of both medication and psychosocial treatment is favored in most situations, especially for:

- More severe cases of ADHD
- Where significant aggression or severe problems in school are present
- Where there is severe family disruption caused by ADHD symptoms
- Where there is a need for a rapid response
- For all three types of ADHD, especially the combined type
- For all age groups except preschool
- With the presence of comorbid externalizing disorders, mental retardation or CNS problems (e.g. epilepsy, migraine)

### **Treatment Implications**

A behavioral/psychosocial treatment intervention is often the preference of parents and, as reviewed above, has strong empirical support for children with ADHD of a mild to moderate severity level, for preschool age children, for children with comorbid internalizing disorders e.g. anxiety disorders and for children with social skill deficits.

A combined behavioral/psychosocial and medication approach, when preferred by parents, is appropriate for more severe cases of ADHD, when aggression management problems are present, when there is severe family disruption caused by ADHD symptoms, when a rapid response is needed and when there are significant comorbid

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externalizing disorders, mental retardation, reading achievement or CNS problems (e.g. epilepsy, migraine) present. The satisfaction levels of parents and teachers with treatment is greater when a behavioral/psychosocial treatment component is part of the treatment program for the child with ADHD, thus likely increasing treatment compliance (MTA Cooperative Group, 1999a; Pelham, 2000; Pelham et al., 2000). Given the widely recognized chronicity of ADHD (American Academy of Pediatrics, 2000), including a ongoing behavioral/psychosocial treatment component in the treatment of children with ADHD will lead to increased treatment compliance and the child more quickly developing effective behavioral/psychosocial skills. A combined behavioral/psychosocial and medication approach allows significantly lower doses of medication than a medication only approach in achieving treatment outcomes, thus minimizing side effects (Pelham, 2000; Whalen, 2001).

A medication only approach, if this is the parent's preference, also has empirical support for the *core* symptoms of ADHD. However, as noted a behavioral/psychosocial or combined behavioral/psychosocial and medication approach is more effective for dealing with the various comorbid problems that a large proportion of children with ADHD have, and to enhance treatment compliance. Families in the MTA study (1999a) found the systematic, placebo-controlled trial of medication more acceptable and reassuring than an open titration of medication. Barkley (1977) has documented the robust response to a placebo dosage of stimulant medication, finding that from 10 to 50% of adults rank children as improved on a placebo dosage of stimulant medications. Thus, as described by Barkley (1988) and Root et al., (1988), psychologists have a significant professional role in carrying out multi-method blind studies determining the effectiveness of various levels of medications through their work with primary care providers. Psychological assessment provides the most reliable and valid assessment of the effects of medication and parents, primary care providers, child psychiatrists, teachers and others appreciate this level of assessment of the effects of medication on their child.

In conclusion, psychological evaluation or consultation, which includes psychological testing, is an empirically proven, highly reliable and valid, as well as descriptive diagnostic procedure for the assessment of a child suspected of having ADHD. A behavioral/psychosocial intervention as the first level of treatment is supported in the literature for the child with mild to moderate levels of ADHD, for the pre-school age child and where there are comorbid internalizing disorders or social skill deficits. Parents often prefer this treatment approach as the first level of treatment for their child. Psychologists can have confidence that they are providing empirically supported psychotherapeutic services to clients when they provide behavioral/psychosocial interventions as outlined above with, or without, medication. Children who have more severe levels of ADHD symptomatology will benefit from a combination medication and behavioral/psychosocial treatment paradigm.

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