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The Retrospective Diagnosis of Attention-Deficit/ Hyperactivity Disorder in Adolescents: Family Physicians' Challenges

Adam M. Pechmann

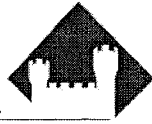
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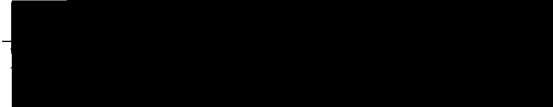
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**The Retrospective Diagnosis of Attention-Deficit/Hyperactivity
Disorder in Adolescents : Family Physicians' Challenges**

BY

Adam M. Pechmann

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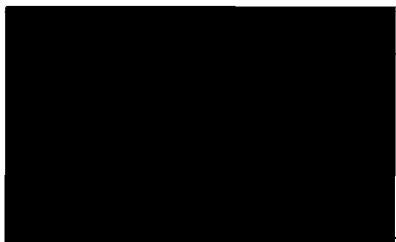
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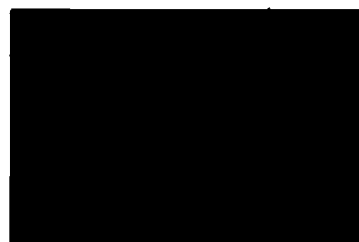
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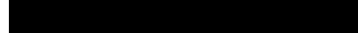
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The Retrospective Diagnosis of Attention-Deficit/Hyperactivity Disorder
in Adolescents: Family Physicians' Challenges

Adam M. Pechmann

Eastern Illinois University

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Abstract

The primary purpose of the study was to identify current retrospective practices used by family physicians in the diagnosis of Attention-Deficit-Hyperactivity Disorder (ADHD) in adolescents and young adults. In other words, do physicians adhere to best practices and examine information from childhood in order to diagnose ADHD in adolescents and young adults? In addition, this study aimed to examine the information physicians request for ADHD diagnosis, types of treatments they recommend, the type of information they use to assess treatment outcomes, and professional attitudes regarding the nature of ADHD. Participants completed a questionnaire designed to answer the research questions. Participants included a random sample of members of the American Academy of Family Physicians (AAFP, $N = 143$) and a convenience sample ($N = 84$). Results indicated discrepancies between participating physicians' current practices and best diagnostic practices, while these physicians generally reported treatment recommendations consistent with evidence-based practice. Reports of adherence to retrospective diagnostic practices and treatment outcome evaluation were limited, suggesting the need for training as well as collaboration with school professionals. Limitations of the current study and implications for future research are discussed.

The Retrospective Diagnosis of Attention-Deficit/Hyperactivity Disorder
in Adolescents: Family Physicians' Challenges

Attention-Deficit/Hyperactivity Disorder (ADHD) is a chronic and pervasive neurobiological and behavioral disorder that is commonly associated with young children. However, these symptoms typically persist well into adolescence and adulthood, but many individuals with ADHD are not diagnosed during childhood. Further, while family physicians have emerged as first responders for mental illness; there has been no standard of practice for the assessment and treatment of ADHD, especially for adolescents and young adults. Therefore, it is necessary to assess the type and amount of diagnostic information currently used by physicians in order to improve treatment outcomes for adolescent patients.

The purpose of this study was to identify current retrospective practices used by family physicians in the diagnosis and treatment of ADHD in adolescents and young adults. ADHD is one of the most common childhood neurobiological and behavioral disorder, and it is characterized by symptoms of inattention, impulsivity, hyperactivity, and functional impairments in multiple domains (American Psychiatric Association, 2013). Diagnostics for ADHD in adolescents do not, however, appear to be straight forward. Some researchers have suggested that adolescents present significant and unique challenges. For example, ADHD symptoms can be easily faked (Harrison, Edwards, & Parker, 2007; Booksh, Lee, Pella, Singh, & Drew Gouvier, 2010), and adolescents and college students may fake ADHD symptoms in order to gain access to additional academic accommodations (e.g., more time for taking tests) as well as stimulant medications (Harrison *et al.*, 2007). A comprehensive and accurate

retrospective diagnosis can remediate these concerns. In this study, *retrospective* diagnosis describes the process of identifying a medical condition originating in a previous period of time. During this process, physicians must rely on archeological data to determine if symptoms of ADHD continue to be present in order to make diagnostic decisions.

As children enter adolescence and young adulthood, the detection of ADHD can become complicated due to increasingly complex biological, environmental and social factors (Sibley *et al.*, 2012; Bruchmuller *et al.*, 2012; Langberg *et al.*, 2008). Therefore, it is especially critical for physicians to gather sufficient information for ADHD diagnosis when working with adolescent clients (Bruchmuller *et al.*, 2012). For example, while the *Diagnostic and Statistical Manual- 5th Edition (DSM-V)* explicitly requires symptoms to be apparent prior to age 12, it is currently unknown how and if physicians are confirming this age of onset criterion (American Psychiatric Association, 2013). The current study attempted to assess the sources of information currently utilized by physicians for conducting a retrospective diagnosis of ADHD in adolescents as well as patterns of differences in treatment practices based on the preferred sources of assessment information utilized. For example, it would be beneficial to determine whether family physicians are more or less likely to prescribe stimulant medication, behavioral intervention, or a combination, stimulant medication and behavioral intervention, to adolescents based on various methods of assessment (e.g., behavior rating scales, comprehensive interview, and school records). Finally, this study sought to examine family physicians' attitudes regarding the nature of ADHD (e.g., "ADHD cannot be effectively treated without medication.") as well as how and if such attitudes are related

to diagnostic and treatment preferences. It is important to assess the type and amount of diagnostic information currently used by physicians in order to protect against potential misdiagnosis, false positive or false negative, which both have negative outcomes for patients, and to improve continuing education efforts, if indicated.

The study targeted adolescents because if ADHD symptoms were not recognized in childhood, they are more likely to be diagnosed during adolescence as social and academic demands mount and the symptoms become more evident. In this study, *adolescence* is defined as the ages between 11 and 24 years old. Because of the qualitative developmental difference adolescence presents, the American Academy of Child and Adolescent Psychiatry (as cited in the U.S. Department of Health and Human Services, 2013) identified three substages: early adolescence (11-13 years old), middle adolescence (14-18 years old), and late adolescence (19-24 years old). These ages straddle late middle school and the college years. This study also focused on family physicians because of their emerging role as mental health service providers. It appears that family physicians are typically the first health care professionals that people contact when they have a problem (Faghri, Boisvert & Faghri, 2010).

The Nature of ADHD, Diagnostic Criteria, and Prevalence

Nature of ADHD. ADHD has been recognized for a hundred years, although by different names, such as *minimal brain syndrome, hyperkinetic, and impulse disorder*. More recently the disorder was separated into two symptom domains, inattention and hyperactivity/impulsivity, and three classifications (Predominantly Inattentive Type, Predominantly Hyperactive/Impulsive Type, and Combined Type) in the DSM-VI, and it was named Attention Deficit Hyperactivity Disorder (Barkley, 2013). Despite significant

advancements being made in the topography and discriminate diagnosis of this common childhood disorder, the cause of ADHD continues to challenge researchers.

In fact, to date, no definitive etiological factors have been identified (Weyandt, Swentosky, & Gudmundsdottir, 2013). However, technological advancements have enabled researchers to identify genetic, neurological, and environmental factors which could affect (either directly or indirectly) the development of ADHD symptoms. For example, genetic studies, such as adoption and twin studies (Barkley, 2013, & Willcutt, 2005) and neurological studies, such as those involving magnetic resonance imaging (MRI) (Konrad, Neufang, Hanisch, Fink, & Herpertz-Dahlmann, 2006; Weyandt et al., 2013) have contributed useful knowledge regarding potential genetic and neurological factors of ADHD. More specifically, if one twin is diagnosed with ADHD, there is a greater likelihood that the other one will have the disorder as well. In addition, brain imaging studies have illustrated differences in brain activity between those individuals with and without an ADHD diagnosis (Barkley, 2013). Barkley further suggested that examination of executive functioning may help to better explain both the nature and etiology of ADHD. Although not yet conclusive, the theory suggests that executive functioning involves working memory (nonverbal), internalization of speech (verbal working memory), and self-regulation of affect, motivation, and arousal. These areas are related to inhibition, working memory, planning, self-monitoring, verbal regulation, motor control, maintaining and changing mental set, and emotional regulation (Barkley, 1997, 2013). Regarding environmental factors that are suspected to predispose a child for ADHD, low birth weight, fetal distress, and substance use (Willcutt, 2005) top the list.

In sum, although significant advancements have been made in understanding the nature and scope of the disorder, the etiology of ADHD remains essentially unknown.

Diagnosis. The same criteria are currently used for diagnosing ADHD in children, adolescents, and adults in the current medical field, with several distinct differences established for adolescents and adults in particular. The core symptoms of ADHD are inattention, impulsivity, and hyperactivity. The American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders V* (5th ed.) criteria stipulate that symptoms should occur in two or more settings of an individual's life and be present for more than 6 months (APA, 2013). There are presently four ADHD subtypes: ADHD-combined presentation characterized by inattentive, hyperactive, and impulsive symptoms; ADHD-predominately inattentive presentation; ADHD-predominately hyperactive/impulsive presentation; and other specified ADHD, and unspecified ADHD (APA, 2013).

The *DSM-V* outlines five criteria for a diagnosis of ADHD: (1) number and severity of symptoms, (2) age of onset, (3) setting where impairment occurs, (4) clear evidence of impairment, and (5) exclusion of other causes (APA, 2013). In order to be formally diagnosed with ADHD, one must demonstrate at least six symptoms of hyperactivity, inattention, and impulsivity. These symptoms must occur to a degree that is inappropriate and disruptive for the person's developmental level and must have been observed for a minimum of 6 months. Appendix A, *DSM-V Diagnostic Criteria* presents the ADHD diagnostic criteria in full.

To diagnose adolescents with ADHD, at least some of the symptoms must have been present at school or home before the age of 12. This does not mean that a child

must have been diagnosed with ADHD prior to age 12; rather, evidence must be obtained and established to demonstrate that at least some symptoms were present related to inattention, impulsivity, or hyperactivity before the child reached the age of 12 (APA, 2013). Unlike the previous *DSM-IV-TR*, there is no longer a requirement that the symptoms create marked impairment by age 12, only that they were present. In addition, while the *DSM-IV-TR* required “clear evidence of clinically significant impairment in social, academic or occupational functioning” (APA, 2000), this has been changed to “clear evidence that the symptoms interfere with, or reduce the quality of social, academic or occupational functioning” (APA, 2013). Finally, the physician must rule out any other suspected mental or physical disorders that may be primarily responsible for symptoms of inattention, impulsivity, or hyperactivity. The most common psychiatric disorders or related symptoms that can be confused with ADHD include adjustment disorders, anxiety disorders, bipolar disorder, post-traumatic stress disorder, and learning disorders (Harrison *et al.*, 2011); a list of comorbid condition with ADHD is provided in Appendix B.

Prevalence. There is currently a lack of agreement within the literature on the true prevalence of ADHD. In some studies conducted worldwide, the estimated ADHD prevalence rate was between 3 and 7% among school-aged children (Dopfner *et al.*, 2008; Langberg *et al.*, 2008; Salmeron *et al.*, 2008), while in other studies a prevalence rate of 9% had been reported for school age children (Wolraich *et al.*, 2011). It is estimated that anywhere from 65 to 80% of children diagnosed with ADHD continue to meet diagnostic criteria well into adolescence (Langberg *et al.*, 2008). However, only 25% of adults with ADHD receive a diagnosis during childhood (Ritter & Setter, 2011).

Nonetheless, about 2.5% of the adult population worldwide is supposed to suffer from ADHD (Simon, Czobor, Balint, Meszaros, & Bitter, 2009). Others argue that ADHD affects an estimated 4.4% of adults (Ritter & Setter, 2011; Hines *et al.*, 2012) and 2 to 8% of college students (Weyandt & Dupaul, 2008). These researchers suspected that diagnostic problems might have contributed to the inconsistent prevalence rate and underestimation of ADHD in adults.

In addition, while ADHD is diagnosed in boys more commonly than girls (by a ratio of 3 to 1), the gender ratio in adults is much lower, 1.6 to 1 (Ritter & Setter, 2011), and for adolescents, the ratio is reported to range anywhere between 2 to 1 and 3 to 1 (Willoughby, 2003). These authors posit that because girls demonstrate the inattentive rather than hyperactive ADHD symptoms, there is bias or failure to identify symptoms in girls that may prevent them from receiving appropriate diagnosis and treatment during childhood. Overall, issues related to diagnostic criteria, the inconsistencies associated with establishing prevalence rates for both children and adults, and the gender differences in diagnosis are likely to contribute to the difficulty of diagnosing ADHD. In the following sections, current diagnostic practices and related issues are discussed.

Diagnostic Protocol, Current Practice Issues, and Theoretical Framework

Diagnostic Protocol. Because the diagnosis and treatment of adolescent and adult ADHD is complex, a multi-method, multi-informant, and multi-disciplinary approach is called for. In other words, collaboration among physicians, family members, school professionals, and other relevant community service providers to individuals with ADHD is often necessary if not imperative (HaileMariam *et al.*, 2002).

Current best practices in the medical community for diagnosing adolescent and adult ADHD include a careful examination of current symptoms as well as a careful exploration of past history (Ritter & Setter, 2011). Currently utilized assessment tools and methods include comprehensive clinical interview, standardized questionnaires, such as the *Conner's' Rating Scale Revised for Children* and the *Conner's' Adult ADHD Diagnostic Interview*, direct observation, and rating and severity scales (Ritter & Setter, 2011; Woodard, 2006), which a sample is presented in Appendix C. The comprehensive clinical interview should aim to integrate assessment of current symptoms, medical history, family history, and comorbid disorders related to ADHD, such as Oppositional Defiance Disorder or Conduct Disorder (Willoughby, 2003) that may predict adult ADHD (refer to Appendix B for Predictors of ADHD into Adulthood). The most Common Comorbid Disorders with ADHD are also listed in Appendix B.

Overall, studies examining the unique manifestations of ADHD symptoms among adolescents have endorsed utilization of multi-source assessment methods including: (a) parent report of symptoms and impairment (but not self-reports) combined with similar report from a core academic teacher; (b) a lower symptom threshold (five symptoms) and greater emphasis on functional impairment; and (c) parent retrospective report combined with objective records from childhood (i.e., report cards, teacher progress reports, and school records) to establish retrospective evidence for symptoms presence prior to age 12 (Sibley *et al.*, 2012). ADHD diagnosis for adults should at the minimum include a comprehensive clinical interview, rating scales for past and present symptoms, supplemental information from multiple informants, as well as appropriate assessments of a broader spectrum of psychiatric disorders (Haavik *et al.*, 2010).

Diagnostic Issues. The medical literature shows a number of complications related to available diagnostic tools for adolescents with ADHD (Bruchmuller *et al.*, 2012; Hines *et al.*, 2012; Langberg *et al.*, 2008; Ritter & Setter, 2011). Potential barriers reported include (a) limited knowledge and experience by family physicians, (b) lack of understanding of developmental manifestations of ADHD symptoms, (c) failure of family members and patients to accurately recall childhood symptoms, and (d) high rate of overlapping symptoms with comorbid psychiatric disorders (Ritter & Setter, 2011). It is also imperative to recognize that symptoms evolve over time and manifest differently in adolescents when compared to children. For example, hyperactivity in late adolescence (also known as young adulthood) may be characterized by difficulty sitting through long meetings or lectures, and impulsivity may impair patients' abilities to sustain long-term personal relationships. In addition, symptoms may be masked by coping mechanisms developed by patients to mitigate impairment (Ritter & Setter, 2011).

As children mature and enter adolescence, they experience major biological changes in brain development as well as increasingly complex environmental factors (Langberg *et al.*, 2008). For example, in addition to biological changes, such as puberty, the transition to the middle and high school is accompanied with numerous environmental changes, including moving between multiple classrooms and teachers, increased academic demands, and the magnified importance of peer relationships (Langberg *et al.*, 2008). Due in part to these increased demands for independent functioning, higher levels of organization, and management of deadlines and time, ADHD symptoms in some individuals may present significant problems and become evident during the adolescent years (Bruchmuller *et al.*, 2012).

According to Hines *et al.* (2012), the diagnostic criteria for ADHD were originally designed for children and do not necessarily account for adolescent manifestations of the disorder. Furthermore, the DSM-IV-TR criteria were criticized for not accounting for the vast developmental changes that occur throughout an individual's maturation. More specifically, the diagnostic criteria originally designed for children may be too restrictive for the adolescent population and overlook critical symptoms, such as procrastination, poor motivation, and problems with time management (Hines *et al.*, 2012). In addition, while ADHD is widely regarded as a chronic disorder, there is evidence to show that inattention symptoms appear to remain constant across age groups whereas hyperactivity symptoms seem to decline (Harrison *et al.*, 2011). However, some researchers argue that hyperactive and impulsive symptoms remain constant across development, but they are less readily apparent as children age (Harrison *et al.*, 2011). For example, the common ADHD symptoms of restlessness and increased activity during childhood are more likely to be felt internally rather than manifested in overt behavior during adolescence (Haavik *et al.*, 2010). Further, as children mature into adolescence, parents and teachers focus more on inattentive behaviors that have a negative impact on academic performance, such as poor study, organization, and time management skills (Harrison *et al.*, 2011). Thus, it is likely that the core symptoms of ADHD, inattention, hyperactivity and impulsivity, remain constant throughout development.

Furthermore, although adolescents may not reach the six symptoms criterion established by the *DSM-V* standards (five if over 17 years of age) for diagnosing ADHD, their symptoms may remain highly pervasive and likely cause high level of impairment (Malmberg *et al.*, 2011). Adolescents may also demonstrate other maladaptive behaviors

not covered by the three core symptom clusters, such as temperament instability, overreacting to frustrations, irritability, and poor motivation (Haavik *et al.*, 2010). These symptoms may continue to cause significant impairments sometimes constituting an even larger barrier to adaptive functioning than the core symptoms of ADHD alone (Haavik *et al.*, 2010). As noted above, although the *DSM-V* revision has reduced the required symptom count to six for adolescents and to five for adults over 17 years of age and the age of onset to 12 (APA, 2013), its impact on diagnosis remains to be seen.

In general, the common misconception that ADHD symptoms tend to decrease or even remit entirely during adolescence can significantly compromise treatment developments for this population. For example, undiagnosed ADHD in adolescents can have such serious negative consequences as failure to receive needed educational accommodations, medication, and behavioral intervention. To address potential under-identification of ADHD in adolescents, researchers have suggested that it may be more beneficial for adolescents if greater weight is placed on level of impairment rather than the number of symptoms observed (Sibley *et al.*, 2012).

Family Physicians. An additional factor that contributes to diagnostic issues is the fact that family physicians (including internal medicine, pediatrics, and obstetrics/gynecology) have emerged as the first responders for mental illness (Faghri, Boisvert & Faghri, 2010). According to a study by Ovama, Burg, Fraser, and Kosch (2012), mental health disorders are among the most frequent diagnoses in the primary care setting; 50%-90% of those with mental health needs depend entirely on their family physicians for services. These authors assert that family physicians have been trained to assess mental health symptoms and provide some mental health interventions, but at the

same time, they acknowledge that there has been no standard of practice for the assessment and treatment of emotional disorders by family physicians.

To further illustrate, if pediatricians who are trained to work with children report that pediatric training and residency did not adequately prepare them to work with patients with learning disabilities, attention deficit disorders, mental retardation, substance abuse issues, or psychosocial and behavioral problems (Ovama *et al.*, 2012), it is unlikely that primary care physicians would have received better training. Hines *et al.* (2012) offer some explanation for the misdiagnosis of adolescent ADHD in the primary care settings, mainly, the lack of adequate training for physicians and physicians' discomfort in administering ADHD tests. Other contributing factors suggested by researchers include reliance on unsuitable screening tools or reluctance to utilize time-consuming and intrusive assessment methods (Sibley *et al.*, 2012; Hines *et al.*, 2012). Despite these issues, there is a call for integration of primary and mental health care (Xierali, Tong, Petterson, Puffer, Bazemore, 2013). This mode calls for family physicians to diagnose and treat mental health issues, including ADHD. However, the need for more training for diagnosing and treating mental health issues in medical school, residency, or continuing education has not been addressed.

In addition, a number of factors pose problems for physicians who diagnose ADHD regardless of the patient's age. First, physicians do not seem to be versed in psychometrics to gain useful information from rating scales. Sackett, Richardson, Rosenberg and Haynes (1998) and Wallach (2000), as cited in Cook and Beckman (2006) reported, "...the skills required to assess the validity of results from psychometric assessments are different than the skills used in appraising the medical literature or

interpreting the results of laboratory tests. In a recent review of clinical teaching assessment, we found that validity and reliability were frequently misunderstood and misapplied.” (p. 166.e7). Secondly, the diagnosis of ADHD requires not only ruling out other disorders that mimic ADHD, but it also requires accurate identification of comorbidities, such as generalized anxiety or depression. Finally, it is not cost effective for physicians to gather information from multiple sources, such as school or direct observation. Physicians are often criticized for prescribing medication based on parent information or self-report, because there is no medical test, such as blood analysis or imaging to corroborate the information. As a result, there is a great potential for misdiagnosis, false positive or false negative (Cook & Beckman, 2006).

Regardless of the issues discussed above, family physicians prescribe 41% of antidepressants, but they fall short on follow-up visits. In fact, a median number of visits for general medical providers are 1.7 versus 7.4 for mental health specialty providers for those patients receiving treatment during the 12 month survey period. Further, family physicians’ office visits last an average of 13 minutes and include an average of six patient problems. On one hand, family physicians lack training and experience in dealing with mental health issues, including ADHD, but they also reach the American population more than any other medical specialty. Approximately one in four of all office visits is made to family physicians (240 million office visits each year, nearly 87 million more than the next largest medical specialty), particularly in rural and underserved areas. They also treat all age groups, newborns to seniors (AAFP, 2013).

As discussed in the foregoing, several diagnostic issues about ADHD in adolescents exist. For instance, issues related to the lack of knowledge about diagnostic

tools, developmental changes, coping skills that mask symptoms, and biological and environmental contributing factors, and the need for training for family physicians, and so on. This study, which is concerned with diagnostic issues, may provide a better picture of current practices.

Theoretical Framework. In addition to the issues discussed above, what explains the suggestion made in the current study that physicians are not well qualified to diagnose or treat ADHD, and that their practice needs to be understood? The concept of knowledge encapsulation may explain this concern. In the medical field, *knowledge encapsulation* is understood as the process of acquiring knowledge and experience that enable physicians to encode information and disease script in their area of expertise (Rikers, Schmidt, & Boshuizen, 2000). These authors asserted that, based on the notion of knowledge encapsulation, physicians process cases within and outside their domain of expertise essentially the same way. To test this assertion, physicians with specialty, such as neurology, were asked to diagnose a case outside of their area of specialty; their performance had a mean accuracy of about 50% of the maximum score. This clearly indicated that they did not address all critical components of the correct diagnoses (Rikers, Schmidt, & Boshuizen, 2000). In a more recent study that investigated stages in the development of medical expertise, Schmidt and Rikers (2007) concluded that to facilitate the development of expertise in medical school, first basic sciences in a clinical context should be taught, followed by the introduction of patient problems early in the curriculum in order to support the processes of encapsulation and illness script formation. Finally, it is suggested that ample time should be devoted to enabling reflection on patient problems with peers and expert doctors during residency.

Based on the American Academy of Family Physicians website (AAFP, 2013), family medicine residency training includes clinical psychiatric rotations of one month, but the course work for psychiatric disorders was not provided. To put this in perspective, specialist level school psychologists are required to complete 1,200 hours of clinical experience including assessment, treatment, progress monitoring, and case management before providing services (NASP, 2013). Thus, it appears that family physicians' training or practical experience has not prepared them to benefit from knowledge encapsulation or disease script about mental health disorders in general and ADHD in particular. This conclusion supports the purpose of the current study, which sought to assess the practice of family physicians for diagnosing and treating ADHD in adolescents. As discussed elsewhere, diagnosing ADHD for the first time during adolescence (retrospective diagnosis) is complex and may result in less desirable outcomes for adolescents.

Outcomes for Misdiagnosis and Treatment Issues

Outcomes for Misdiagnosis. Individuals who fail to obtain a formal diagnosis for ADHD during the adolescent years that are in need of additional support, behavioral interventions, or pharmaceutical interventions are at a greater risk for severe problems including teen pregnancy, substance abuse, car accidents, and school dropout (Langberg *et al.*, 2008). On the contrary, adolescents who are misdiagnosed with ADHD and wrongfully placed on a medical treatment regimen may also be at-risk for serious side effects and behavioral problems that can lead to significant social and emotional dysfunction (Salmeron, 2009).

Despite the coping skills undiagnosed adolescents with ADHD utilize, such as adjusting their environment in order to best suit their needs, developing co-dependence on others, and selecting careers that serve to accommodate their symptoms, they seem to struggle on the job. For example, the majority have been reported by employers to demonstrate lower levels of work performance, a lack of independent skills, impaired task completion, and poorer relationships with supervisors (Hines *et al.*, 2012). Naturally, low quality work performance can lead to higher rates of unemployment, frequent job changes, and lower socioeconomic status. In addition to occupational impairments, according to Sibley and colleagues (2012), adolescent ADHD symptomology can be characterized by driving problems, difficulties with romantic and interpersonal relationships, higher rates of criminal behavior, and risk for substance-use disorders. Finally, adolescents with ADHD may struggle with emotional over-reactivity and, therefore, may be easily provoked and frustrated. Researchers, such as Haavik *et al.* (2010), have suggested that such emotional over-reactivity and anger outbursts may be reflective of a deficit in behavioral inhibition. Furthermore, consequences of behavioral inhibition may strongly interfere with social functioning and result in feelings of depression, confusion, anxiety, or anger.

Treatment Issues. It is obvious that every medical and psychological treatment begins with assessment and diagnosis; in other words, linking assessment to treatment is evidence-based practice. Therefore, how do family physicians treat ADHD?

The clinical use of psychostimulants to treat ADHD is widespread and supported by a wealth of empirical evidence for alleviating the core symptoms of the disorder in both children and adolescents (Kollins, 2008; Kollins, 2007; Breggin, 1999). However,

stimulant treatment for ADHD is highly controversial due to potential implications for substance abuse and adverse side effects, especially among adolescents. According to Sussman (2008), the neural mechanisms responsible for cognition-enhancing, behavior, or calming have never been adequately explained. In addition to a general misunderstanding about the exact acting mechanism of these medications, a major reason for concern about the use of drugs like amphetamines and methylphenidate is that they have a high potential for recreational use (Sussman, 2008).

There are a number of stimulant medications commonly prescribed for the treatment of ADHD as immediate-release, such as Adderall, Dexedrine, Ritalin, Methylin, and Focalin, and extended-release, such as Concerta, Ritalin SR, Adderall XR, and Vyvance (Salmeron, 2009). The most common side effects of stimulant medications are stomach ache, decreased appetite, insomnia, and headache while more severe side effects include abdominal pain, skin rash, growth retardation, abnormal liver function tests, and tics (Salmeron, 2009). The most common non-stimulant treatment is Atomoxetine (Strattera) that works to block the norepinephrine transporter; however, potential side effects include sleep disturbances, nausea, headache, gastrointestinal distress, and increased blood pressure (Ritter & Setter, 2011). Therefore, it is absolutely critical that physicians carefully weigh the risks and benefits with the patient and monitor the patient to minimize harmful side effects.

It has been well established within the literature that pharmaceutical interventions are not, and should not, be intended to teach replacement behavior. For this reason, a wide variety of behavioral and socio-emotional interventions are available for the treatment of ADHD that are seemingly under-utilized by family physicians. For example,

parent training in behavioral therapy and teacher training in classroom behavior interventions are crucial components of treatment (Salmeron, 2008). In addition, incorporating simple modifications, such as increasing structure and limiting distractions often help to alleviate symptoms (Salmeron, 2008). Other behavioral interventions more appropriate to adolescents include family therapy, organizational skills training, social skills training, and individual psychotherapy (Ritter & Setter, 2011).

Adolescents suffering from ADHD symptoms who fail to be appropriately diagnosed and treated are likely to experience a wide array of complications in multiple domains of life. Conversely, there may also be adverse effects of misdiagnosis and wrongful treatment of individuals who do not truly demonstrate sufficient levels of ADHD symptoms for formal diagnosis. In order to serve adolescents well, family physicians need to provide accurate and careful diagnosis, followed by a closely monitored pharmacotherapy regimen combined with behavioral therapy or psychotherapy, and educational efforts aimed at helping patients cope with ADHD symptoms (Kollins, 2008).

Significance of the Current Study

The purpose of the present study was to identify current retrospective diagnostic practices used by family physicians in the diagnosis of ADHD in adolescents. Given the chronic and pervasive nature of the disorder, it would be important to assess the current diagnostic practices of family physicians in order to improve treatment outcome for patients.

The diagnosis of ADHD is complex, requiring knowledge of child development norms, age appropriate behaviors, comorbid disorders, diagnostic issues, medication, and psychosocial treatments (Hines *et al.*, 2012 & Harrison *et al.*, 2011). Family physicians

have limited to no training, with the exception of drug treatment, in any of these areas (Cook & Beckman, 2006); however, they diagnose and treat ADHD often. Because the outcomes of misdiagnosis can be dangerous to the patient (Langberg *et al.*, 2008 & Salmeron, 2009), it is critical that family physicians' practices are scrutinized. In fact, rapidly accumulating research has revealed that ADHD symptoms persist into adolescence and adulthood producing significant academic, social and occupational impairments (Walther *et al.*, 2012). The disorder has been associated with outcomes such as juvenile delinquency, school dropout, early initiations of sexual behavior, and substance abuse during adolescence (Sibley *et al.*, 2012). While accurate diagnosis is the first step to treating ADHD, the information family physicians use for doing so is not well known.

The current study was an adaptation of HaileMariam, Bradley-Johnson, and Johnson's (2002) study, which assessed the practices of pediatricians for diagnosing and treating ADHD in children. At the time, the authors found that only 12% of participants reported having training in addressing ADHD in medical school; which led them to conclude that if the vast majority of pediatricians, who are trained to work with children, are not educated about ADHD in medical school, family physicians would be even less knowledgeable about ADHD. Although family physicians report that they are the primary managers of psychiatric disorders for their patients (Faghri, Boisvert, & Faghri, 2010), regarding ADHD, it is not known if their practice is consistent with evidence-based practices. The current study replicated HaileMariam, Bradley-Johnson, and Johnson's work with adolescents, with some modification.

Research Questions and Predictions

- (1) What type and amount of information would family physicians use for diagnosing ADHD in adolescents and young adults?
- (2) Would family physicians retrospectively examine whether or not symptoms were evident prior to age 12?
- (3) Would relationships exist between best practice diagnostic procedures (e.g., direct observation, informal observation, parent/teacher rating scales, comprehensive clinical interview, and school records) and best practice treatment recommendations (e.g., combination of individual/family/medical intervention) by participants?
- (4) Would family physicians who report providing behavioral and stimulant medication treatment also report requesting treatment outcomes and side effect monitoring data?
- (5) Would there be relationships between professional attitudes regarding adolescent ADHD diagnosis and best practice diagnostic procedures (i.e., retrospective diagnosis, direct observation, informal observation, parent/teacher rating scales, comprehensive clinical interview, and school records)?

The following five predictions were made:

- (1) The information family physicians use for diagnosing ADHD in adolescents would be less likely consistent with best practice, e.g., seeking input from multiple informants or direct observation. Although multi-level and multi-informant approach to diagnosis is recommended (Haavik et al., 2010), family

physicians may not have the time (Cook & Beckmann, 2006) or expertise to seek (Bruchmuller *et al.*, 2012; Hines *et al.*, 2012; Langberg *et al.*, 2008; Ritter & Setter, 2011) such information. Thus, participants would be less likely to adhere to best practice when conducting retrospective diagnosis with adolescents.

- (2) The majority of family physicians would be less likely to gather information to determine if ADHD symptoms were evident before the age of 12. The American Psychiatric Association (2013) dictates that ADHD symptoms should be evident before the age of 12 for diagnosing ADHD in adolescents for the first time. However, because family physicians are pressed for time to conduct an in depth clinical interview with parents and the patient or seek school records, they are less likely to establish symptom onset before the age of 12. The American Academy of Family Physicians (2013) website shows that the average office visit lasts 13 minutes, which does not allow for careful examination of current symptoms as well as a careful exploration of past history (Ritter & Setter, 2011).
- (3) There would be a positive significant relationship between best diagnostic practices (e.g., direct observation, informal observation, parent/teacher rating scales, comprehensive clinical interview, and school records) and best practice treatment (“Combination Therapy”). This prediction is based on the understanding that assessment is linked to treatment. Only an exhaustive and multiple diagnostic practices can inform best treatment. Combination therapy,

medication combined with behavior/psychological therapy and educational accommodation, is deemed best practice (Kollins, 2008).

- (4) The majority of family physicians who report that they provide treatment for adolescents with ADHD would be less likely to also report that they monitor side effects of medication or behavioral outcome. In other words, they would be less likely to seek regular feedback from the patient or other informants to assess treatment outcomes or medical side effects. As indicated elsewhere, family physicians spend about 13 minutes on the average with clients (AAFP, 2013), rendering it difficult for them to require and evaluate side effect checklist and outcome data from their patients.
- (5) There would be significant positive relationships between professional attitudes regarding retrospective diagnosis and best practice diagnostics (e.g., retrospective evidence, direct observation, parent/teacher rating scales, comprehensive clinical interview, school records, and so on). In other words, physicians who agree on the necessity of retrospective diagnosis and establishing functional impairment would more likely utilize best practice diagnostics in general. In addition, there would be significant positive relationships between physicians' attitudes regarding functional impairment and best diagnostic practices. Participants who demonstrate attitudes in line with the DSM-V criteria for diagnosing ADHD (e.g., the presence of symptoms of ADHD prior to the age of 12), and those who understand the functional impairment that results from ADHD are more likely to engage in best diagnostic practices (APA 2013).

Method

Participants

Participants were 227 physicians, 63% ($N = 143$) randomly selected family physicians from the American Academy of Family Physicians (AAFP) and 37 % ($N = 84$) from a convenience sample. The names and addresses of participants were purchased from AAFP, and additional family and primary care physicians were randomly selected from a list compiled using online yellow pages. These physicians (37 %, $N = 84$) were randomly selected from metropolitan and rural regions of the United States (Northeast e.g., New York and Maine; Midwest, e.g., Illinois and Missouri; South, e.g., Texas and Mississippi; and West e.g., California and Arizona), and also included a convenience sample from the Chicago and St. Louis metropolitan areas.

Both male (52%, $N = 118$) and female (48%, $N=109$) physicians were almost equally represented within this sample. Participants primarily practiced in a group setting, 50% ($N = 110$), while 26% ($N = 56$) were in individual family practice. Other settings (24%, $N = 53$) included ADHD clinics, hospitals, urgent care, residential facilities and various clinics. Participants were experienced family physicians, 54% ($N = 116$) had been in practice for more than 15 years, and they practiced in rural (18%, $N = 19$), suburban (42%, $N = 45$), and urban (40%, $N = 43$) areas around the United States. Some participants did not respond to all items or they did not have the opportunity to do so. Participants' detailed information is found in Table 1, Demographic Information: Type of Practice, Years of Experience, and Location.

Instrument

Physicians Questionnaire. This questionnaire was partially based on a previous study designed to determine the type and format of information pediatricians received

from schools regarding the diagnosis and treatment of children with ADHD (HaileMariam, Bradley-Johnson, & Johnson, 2002). Although the original questionnaire was not standardized, it was based on the literature and established practices at the time. The results that were based on this questionnaire were published in a peer reviewed journal; and a quick Google Scholar search shows that the article continues to be relevant, cited in ADHD related research articles as many as 30 times to date. Because the original study targeted children, the questionnaire needed to be modified for the current study that focuses on adolescents (11-24 years old).

The Physician Questionnaire contains 27 items, with multiple sub-items under each. Most of the items were on a 5-point Likert Scale (*Never, Rarely, Sometimes, Usually, and Always*); except for a few items where participants had to check off or actually write a response. The questionnaire was designed in a hierarchical fashion prompting respondents to refer to (or proceed to) various sections based on initial response. For example, participants were first prompted to provide demographic information and details regarding their practice. Following these 5 questions, respondents were asked to indicate whether or not they diagnosed or treated ADHD in adolescents. The remaining survey progression varied according to responses to “Yes” or “No” questions regarding diagnostic and treatment procedures. All respondents were prompted to answer the “True” or “False” questions regarding attitudes toward ADHD diagnosis and treatment at the end of the survey. Based on the original questionnaire discussed above, the current literature, and the purpose of the current study, the questionnaire covered the following.

1. *The information physicians gather for diagnosing ADHD in adolescents.* The sub-items prompted physicians to indicate the likelihood of utilizing each information source, e.g., “Educational Background”, “Results from parent/teacher interview”, and “Results of rating scales completed by parents/teachers/patient.” This section was based on the general consensus for best practice within the medical community to utilize a collaborative, multi-source, multi-method approach for ADHD diagnosis among adolescents (Haavik *et al.*, 2010; HaileMariam *et al.*, 2002; Willoughby, 2003).

2. *The type of treatment physicians recommended.* In this section, treatment methods recommended or utilized as best practice for the management of ADHD symptoms were listed (e.g., “stimulant medication”, “behavior management”, and “self-monitoring tools.”) (Ritter & Setter, 2011; Sibley *et al.*, 2012).

3. *The type of information physicians required to assess treatment outcome for adolescents with ADHD.* This section tapped the practices utilized for monitoring side effects of prescribed medications, e.g., office visit or phone call interviews. The literature emphasizes the importance of closely monitoring treatment, particularly pharmacotherapy because of side effects (Kollins, 2008).

4. *Perceptions about ADHD.* This section attempted to identify participants’ thoughts (beliefs) about ADHD. Example items were, “ADHD can be prevented “, or “ADHD cannot be effectively treated without medication.”

In general, higher scores were indicative of practice that was consistent with evidence-based practice. It is also important to note that although the questionnaire items were based on the research literature and what is accepted as sound practice, the psychometric properties of the instrument were unknown, which limits generalization.

Procedure

Before collecting data, approval from Eastern Illinois University's Institutional Review Board (IRB) was obtained to ensure that participants' rights and privacy were protected. Data collection occurred via U.S. postal mail and on-site delivery for the convenience sample. To ensure confidentiality, identifying information was not collected. Furthermore, questionnaire responses were physically stored in locked filing cabinet. Data were entered into electronic files and stored in highly secured server with password protection known only to the primary investigator and thesis chair. After three years, the questionnaires will be shredded, and the electronic data files will be permanently purged.

The AAFP was contacted to obtain names and addresses of participants. In addition, physicians' names and addresses were also obtained via public internet sources (i.e., yellow pages). Participation was limited to those practicing (i.e., not those who were teaching, for example). First, the Research Introduction Letter was sent, introducing the researcher and the research project, and inviting physicians to participate (Appendix D). This was followed with the Consent to Participate in Research form explaining the confidential and voluntary nature of the study (Appendix E), the Cover Letter explaining how to complete the survey (Appendix F), and the Physician Questionnaire (Appendix G) placed in a manila envelope. A stamped and addressed return envelope and a 3 by 5 card were also provided. Participants were given the option to indicate if they want to receive a summary of the results of the study. If they chose to do so, they were instructed to write their return address on the card provided and to include it along with the completed survey. Upon receipt, the survey was numbered

and the address card, if included, was immediately separated in order to assure confidentiality. At the conclusion of the study, a summary of the results would be sent to those who asked for it.

Results

The study was designed to assess family physicians' practices for diagnosing and treating ADHD in adolescents, as well as the type of information they used for monitoring medication side effects and treatment outcome. The study was both quantitative and descriptive in nature.

Current Practices. It should be noted that, because of the hierarchical design of the survey, the number of participants who responded to each item decreased as the survey progressed. Out of the 227 participants, and those who responded to each respective item, the majority reported engaging in the diagnosis (81.3%, $N = 178$) and treatment (86.0%, $N = 153$) of ADHD in adolescents and young adults. In addition, a large majority (89.9%, $N = 160$) of participants reported recommending stimulant medication to adolescents and young adults in the past 6 months. However, only about 53% ($N = 44$) of family physicians reported following the patient throughout the entire process by requesting information to evaluate treatment outcomes. Table 2, Physicians' Current Practices for Diagnosing and Treating ADHD in Adolescents provides more details on participants' current practices.

Hypothesis 1. The information family physicians used for diagnosing ADHD in adolescents were less likely to be consistent with best practice, (e.g., seeking input from multiple informants or direct observation. Of those who reported providing diagnostic services ($N = 178$), the sources of diagnostic information they "Usually" or "Always" sought included family history (46%, $N = 82$), medical history (46.6%, $N = 82$), self-rating scales (66.3%, $N = 53$), parent interview (39.0%, $N = 69$), teacher rating scales (41.1%, $N = 72$), parent rating scales (39.2%, $N = 69$), and clinical interview (55.6%, $N =$

44). On the other hand, data from teacher interview, educational background, school records, informal observation, direct/systematic observation, and intellectual and academic assessments were “Never or Rarely” sought. Regarding self-rating scales ($N = 80$) and clinical interviews ($N = 79$), only participants from the convenient sample responded to these items. These items were omitted from the questionnaire completed by members of the AAAP. For more details, refer to Table 3, Physicians’ Preferences: Diagnostic Information for ADHD in Adolescents.

Hypothesis 2. The majority of family physicians would be less likely to gather information to determine if ADHD symptoms were evident before the age of 12. Results of this study showed that the majority of physicians (61.0%, $N = 108$) who provided diagnostic services did seek out evidence of inattentive and hyperactive symptoms prior to age 12 in order to diagnose (refer to Table 2, Physicians’ Current Practices for Diagnosing and Treating ADHD in Adolescents).

Hypothesis 3. There would be a positive significant relationship between best diagnostic practices (e.g., direct observation, informal observation, parent/teacher rating scales, comprehensive clinical interview, and school records) and best practice treatment (“Combination Therapy”).

Regarding pharmaceutical treatment, nearly 90% ($N = 160$) of practitioners reported recommending stimulant medication to adolescents and young adults diagnosed with ADHD, which is considered a part of best practice (refer to Table 2, Physicians’ Current Practices for Diagnosing and Treating ADHD in Adolescents). Preferences for non-medical treatment methods varied between individual and family intervention methods. School behavior management was the most popular, followed by counseling

for the adolescent at school, and family counseling. Although combination treatment (medication and patient and family therapy) is considered best practice, only 39.5% ($N = 64$) of participants reported “Usually” or “Always” practicing it; while less than 10% ($N = 13$) of respondents reported “Usually” or “Always” prescribing medication alone. As expected, physicians showed preference for pharmaceutical treatment. However, 25-35% reported “Usually” or “Always” combining medication with some form of behavioral/psychotherapeutic intervention for the patient ($N = 58$) and family ($N = 42$) in addition to the 48% ($N = 78$) who reported at least “Sometimes” recommending the combination treatment. For more detailed information, refer to Table 4, Physicians’ Preferences: Treatment Recommendations for ADHD in Adolescents.

A Spearman’s rank-order correlation was conducted to determine the relationship between physicians’ preferences for diagnostic information (e.g., parent/teacher interviews, parent/teacher rating scales, clinical interview, school records, and informal and direct observation) and physicians’ recommendation of “Combination Therapy” (i.e., medication, individual therapy, and family therapy). There was a strong, positive correlation between Combination Therapy and school record ($r_s = .16, p = .048$), informal observations ($r_s = .23, p = .000$), direct observations, ($r_s = .29, p = .000$) and academic assessments ($r_s = .24, p = .003$) which were all statistically significant at a 0.01 level, with the exception of school record, which was significant at a 0.05 level (refer to Table 8, Spearman’s Correlation between Diagnostic Practices and Best Treatment Practice). No statistically significant positive relationship was found between “Combination Therapy” and clinical interview. Overall, there was a strong relationship found between four of the thirteen assessment tools utilized, that is, school record, informal observation,

direct observation, which are considered best practice, and academic assessment and recommending best practice treatment.

Hypothesis 4. The majority of family physicians who report that they provide treatment for adolescents with ADHD would be less likely to also report that they monitor side effects of medication or behavioral outcome. Many family physicians who responded to the question that addressed evaluation of treatment outcome indeed indicated that they sought information to evaluate treatment outcomes. Specifically, of the 83 participants who responded to this item (i.e., “Based on your practice within the last 6 months, do you typically request information to evaluate treatment outcomes for adolescents with ADD?”), 53% ($N = 44$) reported requesting information to evaluate treatment outcomes. The methods “Usually” or “Always” utilized included academic progress reports (60.5%, $N = 26$), self-rating scales (60.4%, $N = 26$), while fewer physicians reported utilizing informal observation, direction observation, or side effects checklist (refer to Table 5, Physicians’ Preferences: Information for Evaluating Treatment Outcomes).

In terms of monitoring side effects of medication specifically, only a small number of participants, ($N = 42$) responded. Of these, the vast majority (80.9%, $N = 34$) of physicians indicated monthly office visits as the standard method, while a small minority “Usually” or “Always” requested weekly office visits (9.5%, $N = 4$) or written feedback from school (28.6%, $N = 12$).

Hypothesis 5. Significant positive relationships between professional attitudes regarding retrospective diagnosis and functional impairment and best practice diagnostics (e.g., the use of retrospective evidence, comprehensive clinical interview, school records,

and so on) were predicted. In other words, physicians who agreed on the necessity of retrospective diagnosis and establishing evidence of functional impairment would more likely utilize best practice diagnostics in general. Regarding professional attitude, over 50% to 93% of physicians, depending on the item, agreed with best practice on 80% of the items. For example, 93.6% ($N = 110$) disagreed with the statement, “If not diagnosed in childhood, adolescents should not be referred for ADHD evaluation”, while 53% ($N = 107$) agreed that even if an adolescent shows ADHD symptoms, no treatment is needed unless functional impairment is indicated, although 20.6% were unsure of this fact. It is interesting that 27.6% ($N = 105$) and 23.1% ($N = 108$) were unsure that ADHD is a mental health issue and should be treated as such and family physicians are responsible for addressing ADHD, respectively (refer to Table 7, Physicians’ Understanding of ADHD Symptoms, Diagnosis, and Treatment).

A Spearman’s rank-order correlation was run to determine the relationships between physicians’ attitude toward retrospective diagnosis and functional impairment and preferences for diagnostics. There was no significant relationship between professional attitudes regarding retrospective diagnosis and best practice diagnostics. However, a significant negative correlation was found between physicians’ attitude toward retrospective diagnosis and self-rating scales ($r_s = -.29, p = .013$). Physicians who established evidence of ADHD symptoms prior to age 12 were less likely to utilize information from self-rating scales for diagnostic purposes. In addition, there was a strong negative correlation between attitudes toward functional impairment and diagnostic preferences for comprehensive clinical interview ($r_s = -.29, p = .140$); and school records ($r_s = .33, p = .005$). Therefore, physicians who agreed with the statement

that treatment for ADHD is unnecessary unless there is some form of functional impairment were more likely to request school records, but less likely to utilize comprehensive clinical interviews. These findings are summarized in Table 9, Spearman's Correlation between Physicians' Attitudes and Diagnostic Practices.

Discussion

The purposes of this study were to identify current retrospective practices used by family physicians in the diagnosis of Attention-Deficit-Hyperactivity Disorder (ADHD) in adolescents and young adults. In addition, this study aimed to examine the information physicians requested for ADHD diagnosis, types of treatments they recommended, and the type of information they used to assess treatment outcomes. Participants were also asked to answer questions designed to identify professional attitudes regarding the nature of ADHD.

Hypothesis 1. The hypothesis that current diagnostic practices would not be consistent with best practices was supported. Results indicated that only two diagnostic sources were “Usually” or “Always” requested by the majority family physicians (self-rating scales and clinical interview), while the remaining eleven assessment methods, listed in Table 3, were utilized by no more than half. In addition, nearly half of the respondents indicated “Never” requesting educational background or school records, they tended to interview parents more often than teachers, and they requested self-rating scales with the most regularity. This suggests that physicians prefer the time- and cost-efficient rating scales over the more elaborate assessment sources including informal/direct observations, educational background and school records. It is then understandable that physicians have been criticized for prescribing medication based solely on parent information or self-report (Cook & Beckman, 2006). Standardized questionnaires and rating scales from multiple sources are considered reliable sources of information, only if they are corroborated with additional information (Willoughby, 2003). Overall, results suggested a preference for parent and teacher rating scales; however, dependence on self-

rating scales was evident. Relying on self-rating scales alone for diagnosing ADHD can be dangerous as adolescents can easily fake ADHD symptoms for various reasons including to gain access to additional accommodations or even stimulant medication (Harrison *et al.*, 2007).

The *DSM-V* diagnostic criteria necessitates multi-source assessment methods, across two or more settings in order to provide clear evidence that symptoms interfere with, or reduce the quality of social, academic or occupational functioning (APA, 2013). Results of this study were consistent with previous studies illustrating discrepancies between current ADHD diagnostic practices and best practices, specifically within the medical settings (Ritter & Setter, 2011; Harrison *et al.* 2007). A number of explanations have been offered for the challenges associated with establishing a standard for assessment practices of family physicians. While some researchers attribute these challenges to a lack of adequate training in mental health for family physicians and reliance on unsuitable screening tools, others highlight a general reluctance to utilize time-consuming, cost-ineffective assessment methods (Cook & Ceckman, 2006; Sackett *et al.*, 1998). It appears that the quickest and least expensive assessment method is currently utilized, not necessarily best practice.

Hypothesis 2. This study was also designed to examine retrospective diagnostic practices of family physicians for diagnosing ADHD in adolescents. The prediction that the majority of family physicians would fail to establish evidence of symptom onset before the age of 12 was partially supported as nearly 40% of participants did not report collecting retrospective diagnostic information. However, 61% reported adhering to the retrospective diagnostic practice. As mentioned previously, ADHD diagnosis becomes

complicated in adolescence due to increasingly complex biological, environmental, and social factors (Sibley *et al.*, 2012). For example, it is possible for children to exhibit ADHD symptoms early on in life that do not significantly interfere with their overall functioning. However, as children get older, they experience biological changes in brain development as well as environmental changes (Langberg *et al.*, 2008). Certain environmental factors such as increased demands for independence, organization, and management of deadlines can exacerbate existing underlying ADHD symptoms and potentially lead to significant interference with social, academic or occupational functioning.

Due to developmental differences between children and adolescents, it may be more difficult to accurately diagnose an adolescent whose behavioral manifestation of ADHD symptoms do not closely mimic the three core symptoms, inattention, hyperactivity, and impulsivity, as children do. Therefore, retrospective diagnosis can help to remediate the many problems associated with the over- and under-diagnosis of ADHD in adolescents and young adults. However, because most physicians in this study depended on rating scales, which are open to memory problems and social desirability, retrospective diagnosis, establishing symptoms before the age of 12, may be challenging. Krosnick and Presser (2009) suggested that “frailties of memory” is usually of greater concern for retrospective survey and rating scales. On the other hand, archival data from school, such as report cards, teacher comments, and referral records for behavioral problems are documented sources of information that may lead to a more accurate diagnosis. In fact, Krosnick and Presser (2009) suggested that archival data, even a diary, should be used to corroborate information from rating scales. Unfortunately, school

records were least sought by participating physicians.

Hypothesis 3. The prediction that significant relationships would be found between best practice diagnostics and best practice treatment recommendations was partially supported by the results of this study. While strong, positive correlations were found between what is referred to in this study as “combination therapy” and a number of evidence-based diagnostic practices, significant relationships were not found across all “best practice” sources of diagnostic information. Therefore, it could not be assumed that family physicians utilizing best practice diagnostic information were also more likely to recommend best practice treatments. However, upon examination of descriptive data regarding therapeutic practices, results were promising.

Overall, results of this study indicated that most participants recommended a wide array of behavioral and therapeutic interventions. Most importantly, a treatment regimen combining patient, family and pharmaceutical interventions was reported more frequently ($M=3.32$) than medication alone ($M=2.08$) (refer to Table 4, Physicians’ Preferences: Treatment Recommendations for ADHD in Adolescents). These results are encouraging as research supports a closely monitored medication regimen, combined with behavior therapy or psychotherapy, and educational efforts aimed at helping patients cope with ADHD (Kollins, 2008). Results of this study also indicated that as many as 90% of participants treated adolescents and young adults with stimulant medications within the past six months, which has been effective and well supported by empirical evidence for alleviating core symptoms of ADHD in both children and adolescents (Kollins, 2008; Kollins 2007; Breggin 1999). Regardless, stimulant medication continues to be highly controversial due to the high potential for substance abuse, especially among adolescents

(Salmeron, 2009).

It is important to note that 88% of participating physicians expressed concerns about stimulant medication abuse, and more than half (61%) reported awareness of high achieving adolescents using stimulant medication to succeed in school. Participants' attitude (or belief) about ADHD is presented in Table 7, Physicians' Understanding of ADHD Symptoms, Diagnosis, and Treatment. It would be interesting to learn how these physicians deal with the concerns they have about stimulant medication abuse, which future studies can explore. Their concern is, however, warranted as stimulant medication abuse has multiple negative consequences. Because stimulant medication rapidly increases dopamine levels in the brain, it can increase blood pressure, heart rate, body temperature, and feelings of hostility and paranoia. It can also decrease sleep and appetite as well as cause cardiovascular complications (National Institute on Drug Abuse, 2014). Nonetheless, according to Benson, Flory, Humphreys, and Lee (2015), 17% of college students (considered the last phase of adolescence in this study) abuse stimulant medication hoping to improve learning, promote wakefulness, suppress appetite to lose weight, increase focus and attention, enhance performance, or for recreational purposes. It appears education, particularly for patients, is indicated. Physicians may want to consider having an open and informative discussion with their patients and parents about appropriate use of stimulant medication, including not sharing prescription medication and signs of abuse. Both parents and physicians can closely monitor adolescents' adherence to prescription. Further, schools can do a better job of educating young people about the dangers of abusing stimulant medication. For instance, in 2014, in the U.S., Adderall was prescribed to 1.30% of 8th graders, 4.60% of 10th graders, and 6.80% of 12th

graders (National Institute on Drug Abuse, 2014), suggesting school is an ideal place for drug abuse education. The Council on School Health and Committee on Substance Abuse (2007) viewed schools a natural agency (students are captured audience) to assume a primary role in substance abuse education, prevention, and early identification.

Hypothesis 4. Another purpose of this study was to examine treatment outcome evaluation practices among family physicians who reported providing treatment for adolescent ADHD. It was predicted that the majority of family physicians would not report monitoring side effects of medication or behavioral outcomes. This hypothesis could not be tested because of low response ($N = 42$). However, the few who reported prescribing medication, monthly office visits was the preferred practice for monitoring side effects.

Although the clinical use of stimulants to treat ADHD in both children and adolescents is widespread and supported by a wealth of empirical evidence (Kollins, 2008; Breggin, 1999), they can also induce harmful side effects if not prescribed and monitored appropriately (Ritter & Setter, 2011). Therefore, it is absolutely critical that physicians regularly monitor patients in order to minimize harmful side effects. Due to low response, current practices for monitoring side effects and measuring treatment outcomes could not be examined in the current study; thus it is important for future studies to assess the practice.

Hypothesis 5. For the last hypothesis, it was predicted that significant relationships would be found between professional attitudes and diagnostic practices that are supported by current best practice. For example, it was assumed that physicians who agreed on the necessity of retrospective diagnosis would be more likely to use diagnostic

tools that were consistent with best practice, such as school records. In addition, physicians who agreed with the statement that treatment is only necessary if the symptoms cause some form of functional impairment would be more likely to use diagnostic tools that were consistent with best practice, such as school records. Results partially supported this hypothesis. Strong negative correlation was found between attitudes toward retrospective diagnosis and self-rating scales, but no relationship was found across all other best practice diagnostic procedures. In other words, physicians who agreed with the importance of establishing evidence of symptoms prior to age 12 were less likely to utilize information from self-rating scales. In addition, attitudes toward functional impairment had strong negative correlation with clinical interview, and a strong positive correlation with school records. Family physicians who agreed with the statement that functional impairment was necessary to justify treatment were less likely to utilize clinical interviews, but more likely to examine school records. These findings were not fully supportive of the hypothesis as significant relationships were not found across at least the majority of best practice diagnostic procedures.

It is interesting to note that on the attitude questions, some physicians indicated that they do not consider information from self-rating scales to establish the presence of ADHD symptoms prior to age 12. However, as discussed under hypothesis 1, the majority of family physicians “Usually” or “Always” requested self-rating scales for diagnosing ADHD. This raises some questions, does this point to (1) a discrepancy between actual practice and attitude, or (2) the selective use of information from self-rating, i.e., using some information for overall diagnosis, but not necessarily for establishing symptom onset? Similarly, again in the attitude section, some physicians

agreed that school records are useful for determining functional impairment, which again contradicts their actual practice, because they reported requesting school records the least. In the future, researchers may want to explore if the discrepancy between the actual practice of family physicians diagnosing and treating ADHD and their attitude about the disorder has any impact on patients.

Further, almost all participants agreed that children should continue to be referred for ADHD evaluation, even after reaching adolescence without ever receiving a formal diagnosis, which is consistent with best practice. On the other hand, only about half agreed that treatment is indicated only if functional impairment is present regardless of symptoms. It would be interesting to learn more about the practices of physicians who disagree with best practice or are unsure about it. For example, some physicians tended to disagree on the importance of establishing age onset of ADHD symptomology and that lifestyle, information-overload, and technology exacerbate ADHD. And, some were not sure that ADHD is a mental health issue and should be treated as such and family physicians are responsible for addressing ADHD. These findings suggest a knowledge gap for family physicians regarding ADHD; and one has to question the impact on their patients.

Likewise, only about half of respondents disagreed with the statement that “ADHD cannot be effectively treated without medication.” Although not surprising given that the vast majority of participants in this sample reported prescribing stimulant medication, it may indicate that a fair number of practitioners view medication as the first line of defense. However, the American Academy of Pediatricians’ clinical practice guidelines for the treatment of ADHD in adolescents (2011) states, “The primary care

clinician should prescribe Food and Drug Administration-approved medications for ADHD...and may prescribe behavior therapy as treatment...preferably both.” Stimulant medication is described as being supported by “quality of evidence A/strong recommendation,” while behavior therapy is considered “quality of evidence C/recommendation” (AAP, 2011). Similarly, the National Association of School Psychologists’ position statement acknowledges the potential efficacy of stimulant medication as supported by empirical research (NASP, 2011). However, it is explicitly stated that medication should be considered as a *part of* a “comprehensive treatment program that may also include academic, social, behavioral, and/or parent and family focused intervention” (NASP, 2011). Results of this study suggested that while many family physicians recommended a combination treatment for adolescents, behavioral interventions fell well short of medical treatment (refer to Table 4, Physicians’ Preferences: Treatment Recommendations for ADHD in Adolescents). These types of attitudes toward ADHD treatment may underestimate the complex interactions between biological and environmental factors that could negatively impact treatment efficacy. Overall, it would be interesting to further investigate the far-reaching implications of professional attitudes for therapeutic practice as well as patient outcome.

Limitations of the Study

Although the results of this study are generally considered representative of family physicians from throughout the United States, limitations to the true generalizability exist. First, due to initial low response from members of the American Academy of Family Physicians, additional participants were recruited from a randomly selected list compiled using online yellow pages and a convenience sample. Therefore,

even though participants practiced throughout the United States, the majority were from the Midwest region due to the convenience sample. In addition, for the sample to accurately represent the target population (family physicians in the United States), a 95% confidence level is generally accepted in scientific research. According to the Agency for Healthcare Research and Quality (AHRQ), in 2010, there were approximately 209,000 practicing primary care physicians in the United States (U.S. Department of Health & Human Services). Therefore, over 300 participants would be needed to achieve a 95% confidence level, while over 250 would constitute a 90% confidence. Unfortunately, the results of this survey are reflective of 227 respondents which somewhat compromises the generalizability of the study.

Finally, not all participants responded to each and every item due to the design of the survey. In order to maximize time efficiency and thus increase the likelihood of receiving responses, the survey was designed hierarchically. Therefore, some participants only responded to as few as a quarter of the items. For example, if physicians indicated that they did not provide treatment for adolescents and young adults (11-24 years of age); they were subsequently not required to respond to items measuring treatment recommendations, treatment outcomes, and so on. Therefore, some of the survey data are based on small sample responses. Furthermore, self-report is inherently problematic because of social desirability, i.e., participants may respond in a socially desirable manner (Krosnick & Presser, 2009).

Implications and Future Direction

The primary implication of the current study is that it highlights the need for (1) more training for family physicians and (2) collaboration between medical and educational professionals to close the gap between family physicians' current practices

and best practice in order to accurately diagnose and effectively treat adolescents with ADHD. Although results of the current study indicated a general trend toward a multi-method approach, a combination of stimulant medication and psychosocial intervention, for the treatment of ADHD in adolescents, diagnostic practices were not fully consistent with evidence-based best practices. For example, family physicians tended to rely on the more time- and cost-efficient assessment tools (e.g., parent, teacher and self-rating scales), they were less likely to request information from school (e.g., informal observations, direct/systematic observations, or educational background), and nearly half did not seek evidence of ADHD symptoms prior to age 12, which is a *DSM-V* diagnostic criterion. These findings suggest the need for more training for family physicians and collaboration.

Regarding training, future researchers may want to investigate family physicians' actual training and practical experiences to better understand their practice for addressing the needs of adolescents with ADHD. For instance, those who study mental health, like psychologists, commit 10 or more years to the discipline. It is unlikely that family physicians have this level of training given the already intense medical training they undergo, which suggests that they have not benefited from knowledge encapsulation regarding the complex nature of mental disorders, diagnosis, and treatment like ADHD. Knowledge encapsulation is the process of acquiring knowledge and experience that enable physicians to encode information and disease script in their area of expertise (Rikers, Schmidt, & Boshuizen, 2000). Is it fair then to expect them to provide mental health care based on a brief introduction to the field? Researchers may want to examine if the current trend, the emergence of family physicians as health care providers, is

realistic, or fair to the physicians themselves and their patients, or a collaborative effort is more appropriate. In other words, psychologists and family physicians remain experts in their discipline with basic understanding of each other's field, but collaborate for the benefit of patients.

Collaboration between family physicians and school psychologists, for example, can be mutually beneficial and thereby enhance overall service delivery. For example, because physicians may lack adequate training in psychometrics to gain useful information from rating scales (Sackett *et al.*, 1998), school psychologists could help inform physicians about the advantages and disadvantages of rating scales. On the other hand, family physicians can provide a wealth of useful information regarding pharmaceutical treatment. In addition to resolving discrepancies in training, collaboration and close communication may also improve time- and cost-efficiency. It is not efficient for both school and medical professionals to collect overlapping evaluation data. For example, while it is impractical for family physicians to observe children directly within the school setting, school professionals can easily provide such data. On the other hand, physicians may be more familiar with the family history to draw on. Both professionals are in a unique position to provide invaluable information for optimal decision-making. Indeed, continuous communication between school and medical personnel can only improve diagnostic practices and treatment outcomes for children and adolescents.

In conclusion, research has consistently illustrated limitations in current diagnostic practices for childhood, adolescent, and adult ADHD by medical practitioners. And, the reasons family physicians do not use best practice diagnostic procedures are not

clear, although limited knowledge and time may contribute to the current practice.

Perhaps the focus needs to shift away from a critical examination of physicians' diagnostic responsibilities, and more towards an investigation of the system at large. It appears both impractical and irresponsible to expect medical practitioners to be fully competent in addressing the physical, emotional, and mental well-being of patients across all age groups, especially given significant time restraints. Therefore, it would be beneficial for future researchers to target collaboration between medical and educational disciplines in an effort to examine and improve diagnostic and treatment practices. For example, does a collaborative approach lead to more efficient and accurate diagnosis and positive treatment outcome for patients? How can collaboration and communication be improved among medical, school, and home settings? What are the barriers to collaboration? Answers to such question may lead to a cost-effective practice for family physicians and accurate diagnosis and effective treatment for children and adolescents.

References

- Ambalavanan, G. & Holten, K. B. (2005). How should we evaluate and treat ADHD in children and adolescents? *The Journal of Family Practice*, 54 (12), 1058-1059.
- American Academy of Family Physicians (2011). History and Facts about Family Physicians and Mental Health Care Services by Family Physicians (Position Paper). Retrieved on July 28, 2013 from <http://www.aafp.org/about/the-aafp/history.html> and <http://www.aafp.org/about/policies/all/mental-services.html>
- American Academy of Pediatrics (2011). ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. *Pediatrics* 2011; 128; 1007; originally published online October 16, 2011; DOI: 10.1542/peds.2011-2654
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders, 4th edition-text revision (DSM-IV-TR)*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, 5th edition (DSM-V)*. Washington, DC: American Psychiatric Association.
- Ashton, H., Gallagher, P., & Moore, B. (2006). The adult psychiatrist's dilemma: psychostimulant use in attention deficit/hyperactivity disorder. *Journal of Psychopharmacology*, 20, 602-610.
- Barbarese, W. J., Colligan, R. C., Weaver, A. L., Voigt, R. G., Killian, J. M., & Katusic, S. K. (2013). Mortality, ADHD, and Psychosocial Adversity in Adults with

- Childhood ADHD: A Prospective Study. *Pediatrics*, 4, 637-44. (doi: 10.1542/peds.2012-2354).
- Barkley, R. A. (2013). *ADHD: Nature, Course, Outcomes, and Comorbidity*. Retrieved from <http://www.continuingcourses.net/active/courses>
- Barkley, R. (Ed.). (2006). *Attention-deficit hyperactivity disorder: A hand-book for diagnosis and treatment* (3rd ed.). New York, NY: Guilford Press.
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological Bulletin*, 121 (1), 65.
- Benson, K, Flory, K., Humphreys, K. L., & Lee, S. S. (2015). Misuse of stimulant medication among college students: A comprehensive review and meta-analysis. *Clinical Child and Family Psychology Review*, 18, 1, 50-76. DOI 10.1007/s10567-014-0177-z
- Booksh, R.L., Pella, R. D., Singh, A.N., & Gouvier, W. D. (2010). Ability of college students to imulate ADHD on objective measures of attention. *Journal Attention Disorders*, 13 (4), 325-338.
- Breggin, P. R. (1999). Psychostimulants in the treatment of children diagnosed with ADHD: risks and mechanism of action. *International Journal of Risk & Safety in Medicine*, 12, 3-35.
- Bruchmuller, K., Margraf, J., & Schneider, S. (2012). Is ADHD diagnosed in accord with diagnostic criteria? Overdiagnosis and influence of client gender on diagnosis. *Journal of Consulting and Clinical Psychology*, 80 (1), 128-138.

- Cook, D. A. & Beckman, T. J. (2006). Current concepts in validity and reliability for psychometric instruments: theory and application. *The American Journal of Medicine*, 119, 166.e7-166.e16.
- Council on School Health and Committee on Substance Abuse (2007). The Role of Schools in Combating Illicit Substance Abuse. *Pediatrics*, 120, 6, 1379 -1384.
DOI: 10.1542/peds.2007-2905
- Dillman, D. A. (1978). *Mail and telephone surveys: The total design method*. New York: John Wiley & Sons.
- Dopfner, M., Breuer, D., Wille, N., Erhart, M., Ravens-Sieberer, U., & the BELLA Study Group. (2008). How often do children meet ICD-10/DSM-IV criteria of attention deficit-/hyperactivity disorder and hyperkinetic disorder? Parent-based prevalence rates in a national sample—results of the BELLA study. *European Child & Adolescent Psychiatry*, 17, 59-70.
- Faghri, A., Boisvert, C. M., & Faghri, S. (2010). Understanding the expanding role of primary care physicians (PCPs) to primary psychiatric care physicians (PPCPs): enhancing the assessment and treatment of psychiatric conditions. *Mental Health Family Medicine*, 7, 17-25.
- First, M., Spitzer R., Gibbon, M., Williams, J. (1996). *Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV)*, American Psychiatric Press, Inc., DC, USA.
- Fischer, M., Barkley, R., Fletcher, K., & Smallish, L. (1993). The stability of dimensions of behavior in ADHD and normal children over an 8-year follow-up. *Journal of Abnormal Child Psychology*, 21, 315-337.

- Haavik, J., Halmoy, A., Lundervold, A. J., Fasmer, O. B. (2010). Clinical assessment and diagnosis of adults with attention-deficit/hyperactivity disorder. *Expert Review of Neurotherapy*, 10 (10), 1569-1580.
- HaileMariam, A., Bradley-Johnson, S., & Johnson, C.M. (2002). Pediatricians' preferences for ADHD information from schools. *School Psychology Review*, 31 (1), 94-105.
- Hines, J. L., MD, King, T. S., Cury, W. J. (2012). The adult ADHD self-report scale for screening for adult attention deficit-hyperactivity disorder (ADHD). *Journal of American Board of Family Medicine*, 25 (6), 847-853.
- Hoekstra, P. J. (2011). Is there potential for treatment of children with ADHD beyond psychostimulants? *European Child & Adolescent Psychiatry*, 20, 431-432.
- Harrison, J. R., Vannest, K. J., & Reynolds, C. R. (2011). Behaviors that discriminate ADHD in children and adolescents: primary symptoms, symptoms of comorbid conditions, or indicators of functional impairment? *Journal of Attention Disorders*, 15 (2), 147-160.
- Kim, N. S., & Ahn, W. (2002). Clinical psychologists' theory-based representations of mental disorders predict their diagnostic reasoning and memory. *Journal of Experimental Psychology: General*, 131, 451-476.
- Kollins, S. H. (2008). ADHD, substance use disorders, and psychostimulant treatment: current literature and treatment guidelines. *Journal of Attention Disorders*, 12, 115-125.

- Kollins, S. H. (2007). Abuse liability of medications used to treat Attention-Deficit/Hyperactivity Disorder (ADHD). *The American Journal on Addictions*, 16, 35-44.
- Konrad, K., Neufang, S., Hanisch, C., Fink, G. R., & Herpertz-Dahlmann, B. (2006). Dysfunctional attentional networks in children with attention deficit/hyperactivity disorder: evidence from an event-related functional magnetic resonance imaging study. *Biological Psychiatry*, 59 (7), 643-651.
- Kratochvil, C. J., Greenhill, L. L., March, J. S., Burke, W. J., & Vaughan, B. S. (2004). The role of stimulants in the treatment of preschool children with attention-deficit hyperactivity disorder. *CNS Drugs* 2004, 18 (14), 957-966.
- Kratochvil, C. J. (2007). AACAP releases new evidence-based guidelines for screening, evaluation and treatment of ADHD. *The Brown University Child & Adolescent Psychopharmacology Update*, 9 (5), 1-5.
- Krosnick, J. A., & Presser, S. (2009). Question and Questionnaire Design in James D. Wright and Peter V. Marsden (eds.) *Handbook of Survey Research* (2nd Edition). Elsevier: San Diego.
- Langberg, J. M., Epstein, J. N., Altaye, M., Molina, B. S. G., Arnold, L. E., & Vitiello, B. (2008). The transition to middle school is associated with changes in the developmental trajectory of ADHD symptomatology in young adolescents with ADHD. *Journal of Clinical Child & Adolescent Psychology*, 37 (3), 651-663.
- Livingston, R. L., Dykman, R. A., & Ackerman, P. T. (1990). The frequency and significance of additional self-reported psychiatric diagnoses in children with attention deficit disorder. *Journal of Abnormal Child Psychology*, 18, 465-478.

- Malmberg, K., Edbom, T., Wargelius, H.L., & Larsson, J.O. (2011). Psychiatric problems associated with subthreshold ADHD and disruptive behavior diagnoses in teenagers. *Acta Paediatrica*, 100, 1468-1475.
- Meyers, J., Classi, P., Wietecha, L., & Candrilli, S. (2010). Economic burden and comorbidities of attention-deficit/hyperactivity disorder among pediatric patients hospitalized in the United States. *Child & Adolescent Psychiatry & Mental Health* 4:31, doi:10.1186/1753-2000-4-31.
- Miller, C., Newcorn, J., & Halperin, J. (2010). Fading memories: Retrospective recall inaccuracies in ADHD. *Journal of Attention Disorders*, 14, 7-14.
- Molina, B., Hinshaw, S., Swanson, J., Arnold, L., Vitiello, B., Jensen, P., & the MTA Cooperative Group. (2009). The MTA at 8 years: Prospective follow-up of children treated for combined-type ADHD in a multisite study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48, 484-500.
- National Association of School Psychologists (NASP, 2010). Standards for Graduate Preparation of School Psychologists. Retrieved on July 28, 2013 from http://www.nasponline.org/standards/2010standards/1_Graduate_Preparation.pdf
- National Association of School Psychologists. (2011). *Students With Attention Deficit Hyperactivity Disorder* (Position Statement). Bethesda, MD: Author.
- National Institute on Drug Abuse (NIDA, 2014). Stimulant ADHD Medications: Methylphenidate and Amphetamines. Retrieved on August 7, 2015 from <http://www.drugabuse.gov/publications/drugfacts/stimulant-adhd-medications-methylphenidate-amphetamines>.> Bethesda, MD: Author.

Ovama, O., Burg, M. A., Fraser, K., & Kosch, S. G. (2012). Mental health treatment by family physicians: current practices and preferences. *Family Medicine*, 44 (10), 704-711.

Ritter, T. & Setter, S. M. (2011). Primary Care Clinicians' Guide to Diagnosis and Management of Adult Attention-Deficit/Hyperactivity Disorder. *The Nurse Practitioner Healthcare Foundation/Clinical Adviser Fact Pack*. NPHF/Haymarket Media, Inc.

Rikers, Remy M. J. P. ,Schmidt, H. G. & Boshuizen, Henny P. A. (2000). Knowledge Encapsulation and the Intermediate Effect. *Contemporary Educational Psychology* 25, 150–166, doi:10.1006/ceps.1998.1000.

Schmidt, H. G., Rikers, R.. M. (2007). How expertise develops in medicine: knowledge encapsulation and illness script formation. *Medical Education*, 41, 12, 1133-1139.

Shaffer, D. (2013). The big impact of small changes for DSM-5 ADHD diagnosis.

MedpageToday'sKevinMD. Retrieved on July 20, 2013 from . <**Error! Hyperlink reference not valid.**<http://www.kevinmd.com/blog/2013/05/big-impact-small-dsm5-adhd-diagnosis.html>>

Sibley, M. H., Pehlham Jr., W. E., Gnagy, E. M., Waschbusch, D. A., Kuriyan, A. B., Babinski, D. E., Molina, B. S. G., Garefino, A. C., & Karch, K. M. (2012). Diagnosing ADHD in adolescence. *Journal of Consulting and Clinical Psychology*, 80 (1), 139-150.

- Salmeron, Patricia A. (2009). Childhood and adolescent attention-deficit hyperactivity disorder: Diagnosis, clinical practice guidelines, and social implications. *Journal of the American Academy of Nurse Practitioners*, 21, 488-497.
- Seitler, B. N. (2006). On the implications and consequences of neurobiochemical etiology of attention deficit hyperactive disorder (ADHD). *Ethical Human Psychology and Psychiatry*, 8 (3), 229-240.
- Sheehan, D.V., Lecrubier Y., & Sheehan, K. H (1998). Reliability and validity of the Mini International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, 59 (20), 22-33.
- Simon, V., Czobor, P., Balint, S., Meszaros, A., & Bitter, I. (2009). Prevalence and correlates of adult attention-deficit hyperactivity disorder: meta-analysis. *British Journal of Psychiatry*, 194 (3), 204-211.
- Smalley, S. L., Loo, S. K., Hale, T. S., Shrestha, A. & McGough, J. (2009). Mindfulness and attention deficit hyperactivity disorder. *Journal of Clinical Psychology*, 65 (10), 1087-1098.
- Sussman, Norman (2008). Explaining the cognitive enhancing effects of drugs that treat ADHD. *Primary Psychiatry*, 15 (8), 19-20.
- Swanson J. M., Sergeant, J. A., Taylor, E., Sonuga-Barke, E. J., Jensen, P. S., & Cantwell, D. P. (1998). Attention-deficit hyperactivity disorder and hyperkinetic disorder. *Lancet*, 351, 429-433.
- U.S. Department of Health and Human Services (2013). What is adolescence? Retrieved on July 20, 2013 from

http://www.hhs.gov/opa/familylife/tech_assistance/etraining/adolescent_brain/Overview/what_is_adolescence/index.html.

- Vaughan, B. S., Roberts, H. J., Needleman, H. (2009). Current medications for the treatment of attention-deficit/hyperactivity disorder. *Psychology in the Schools*, 46 (9), 846-855.
- Walther, C. A. P., Cheong, J., Molina, B. S. G., Wymbs, B. T., Pelham, W. E., Belendiuk, K. A., & Pedersen, S. L. (2012). Substance use and delinquency among adolescents with childhood ADHD: the protective role of parenting. *Psychology of Addictive Behaviors*, 26 (3), 585-598.
- Weyandt, L. L. & Dupaul, G. J. (2008). ADHD in college students: Developmental findings. *Developmental Disabilities Research Reviews*, 14 (4), 311-319.
- Weyandt, L. L., Swentosky, A., & Gudmundsdottir, B. G. (2013). Neuroimaging and ADHD: fMRI, PET, DTI findings, and methodological limitations. *Developmental Neuropsychology*, 38 (4), 211-225.
- Willcutt, E. G. (2005). The etiology of ADHD: behavioral and molecular genetic approaches. In D. Barch (Ed.), *Cognitive and Affective Neuroscience of Psychopathology*: Oxford University Press.
- Williamson, P., Koro-Ljungberg, M.E., & Bussing, R. (2009). Analysis of critical incidents and shifting perspectives: transitions in illness careers among adolescents with ADHD. *Qualitative Health Research*, 19 (3), 352-365.
- Wolraich, M. L., Brown, L., Brown, R. T., Dupaul, G. J., Earls, M., Feldman, H. M., & Visser, S. (2011). ADHD: clinical practice guideline for diagnosis, evaluation, and

treatment of attention-deficit/hyperactivity disorder in children and adolescents.

Pediatrics, 128 (5), 1007-1022.

Woodard, R. (2006). The diagnosis and medical treatment of ADHD in children and adolescents in primary care: a practical guide. *Pediatric Nursing*, 32 (4), 363-370.

Xierali, I. M, Tong, S. T., Petterson, S. M., Puffer, J. C., Phillips, R. L., & Bazemore, A.

W. (2013). Family physicians are essential for mental health care delivery.

Journal of American Board Family Medicine, 26, 114-115.

Table 1

Demographic Information: Type of Practice, Years of Experience, and Location

Practice	N	%
Type (N = 219)		
Family Group Practice	114	50.2
Family Practice Alone	59	26.0
ADHD Clinic	13	5.7
Hospital	17	7.5
Urgent Care	5	2.2
Residential	6	2.6
Other	5	2.0
No Response	8	3.5
Years of Experience (N = 214)		
Less than 5 Years	25	11.0
6-10 Years	45	19.8
11-15 Years	46	20.3
16-20 Years	43	18.9
Over 20 Years	55	24.2
No Response	13	5.7
Location (N = 107)		
Rural	19	18.4
Suburban	45	42.0
Urban	43	40.2
No Response/or opportunity to respond*	120	

*Participants from the American Academy of Family Physicians were not asked this question.

Table 2

Physicians' Current Practices for Diagnosing and Treating ADHD in Adolescents (N = 227)

Item	Yes % (N)	No % (N)	No Response (N)*
In the last 6 months			
Provided diagnostic services (Item 6)**	81.3 (178)	18.7 (41)	(8)
Provided treatment services (Item 8)	86.0 (153)	14.0 (25)	(49)
Sought evidence of ADHD symptoms prior to age 12 before diagnosing (Section A, Item 1)	61.0 (108)***	39.0 (69)	(50)
Recommended stimulant medication (Section A, Item 9)	89.9 (160)	10.1 (18)	(49)
Sought information to evaluate treatment outcome (Section A, Item 13)	53.0 (44)	47.0 (39)	(144)****

*Participants chose not to respond to the item.

**Items in parenthesis are Questionnaire items responses are based on.

*****Bold** numbers indicate Best Practice.

****Participants from the American Academy of Family Physicians were not asked this question.

Table 3

Physician's Preferences: Diagnostic Information for ADHD in Adolescents (N = 178)

Items	N	Never/Rarely %	Sometimes %	Usually/Always %	Mean %
ADHD in the family	176	39.2	14.8	46.0	3.16
Other family mental health disorders	176	38.6	14.8	46.6	3.15
Parent Interview	177	42.4	18.6	39.0	2.88
Teacher Interview	176	42.6	28.4	29.0	2.77
Parent Rating Scales	176	34.7	26.1	39.2	3.03
Teacher Rating Scales	176	33.5	25.6	41.1	3.06
Self-Rating Scales*	80	11.3	22.5	66.3	3.75
Educational Background/Records	174	47.2	19.5	33.3	2.74
Informal Observations	174	40.2	28.7	31.0	2.83
Direct/Systematic Observations	174	58.0	21.3	20.6	2.42
Intellectual Assessment (IQ)	175	63.5	24.6	12.0	2.24
Academic Assessment	175	48.0	30.9	21.1	2.57
Clinical Interviews*	79	25.3	19.0	55.6	3.52

*AAPF were not asked to respond to these items.

Table 4

Physician's Preferences: Treatment Recommendations for ADHD in Adolescents (N = 178)

Items	N	Never/Rarely %	Sometimes %	Usually/Always %	Mean %
Behavior Management at School	147	10.9	36.1	53.1	3.56
Counseling at School	147	19.0	44.9	36.1	3.23
Social Skills Training	147	33.3	45.6	21.1	3.05
Family Counseling/Therapy	147	11.6	55.8	32.6	3.30
Stimulant Medication/Patient Therapy	164	42.1	22.6	35.4	2.82
Stimulant Medication/Family Therapy	164	39.0	35.4	25.6	2.73
Stimulant Medication Alone	164	73.2	18.9	7.9	2.08
Combination of Medication, Therapy for the Patient, and Therapy for the Family	162	12.3	48.1	39.5	3.32

Table 5

Physician's Preferences: Information for Measuring Treatment Outcomes (N = 83)

Items	N	Never/Rarely %	Sometimes %	Usually/Always %	Mean %
Results from Informal Observation	44	31.9	25.0	43.2	3.07
Graphs or Tables of Systematic Direct Observation (pre-treatment and post- treatment)	45	55.6	37.8	6.6	2.18
Results from Parent Rating Scales	45	11.1	44.4	44.5	3.44
Results from Teacher Rating Scales	45	11.1	51.1	37.8	3.29
Results from Self-Rating Scales	43	11.7	27.9	60.4	3.53
Results from Side Effects Checklist	44	25.0	40.9	34.1	3.11
Academic Progress (e.g., grades, progress monitoring data)	44	14.0	25.6	60.5	3.56

AAFP were not asked to respond to these items.

Table 6

Physician's Preferences: Monitoring Side Effects of Medication (N = 83)

Items	N	Never/Rarely %	Sometimes %	Usually/Always %	Mean %
Weekly Office Visits	42	54.7	35.7	9.5	2.33
Monthly Office Visits	42	19.1	57.1	80.9	4.00
Written Feedback from Schools	42	38.1	33.3	28.6	2.69
Self-Reports (e.g., journal, side effects checklist)	42	26.2	40.5	33.3	3.05
Parent Reports	42	4.8	35.7	59.5	3.76
Academic Progress (e.g., grades, progress monitoring data)	41	14.7	29.3	56.1	3.44

AAFP were not asked to respond to these items.

Table 7

Physician's Understanding of ADHD Symptoms, Diagnosis, and Treatment (N = 110)

Items	N	True %	False %	Unsure %	Mean %
If not diagnosed in childhood, adolescents should not be referred for ADHD evaluation.	110	4.5	93.6*	1.8	1.97
ADHD diagnosis in late adolescence is on the rise.	110	72.7	7.3	20.0	1.47
If an adolescent shows ADHD symptom, it does not matter if the symptoms were present as a child.	105	46.7	36.2	17.1	1.70
Concerned about stimulant medication abuse.	107	87.9	7.5	4.7	1.17
ADHD is a mental health issue and should be treated as such.	105	64.8	7.6	27.6	1.63
ADHD cannot be effectively treated without medication.	107	29.9	52.3	17.8	1.88
ADHD can be prevented.	107	14.0	66.4	19.6	2.06
Stimulant medication is expected to address behavioral problems.	106	7.5	73.6	18.9	2.11
Lifestyle/technology overload is exacerbating ADHD.	107	42.1	19.6	38.3	1.96
Family Physicians are responsible for addressing ADHD.	108	34.3	42.6	23.1	1.89
Most families do not have the time for therapy.	106	23.6	50.0	26.4	2.03
Medication is the only treatment a patient with ADHD needs.	105	8.6	81.9	9.5	2.01
Monitoring side effects of medication is family/patient responsibility.	107	84.1	12.1	3.7	1.20
Stimulant medication use for school success.	107	60.7	11.2	28.0	1.67
No treatment unless functional impairment is indicated.	107	53.3	26.2	20.6	1.67

* Responses in **bold** indicate Best Practice.

AAFP were not asked to respond to these items.

Table 8

Pearson's Correlation between Diagnostic Practices and Best Treatment Practice (N = 178)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Evidence	1.00												
2. Parent	-.43	1.00											
Interview													
3. Teacher	-.36	.64	1.00										
Interview													
4. Rating	-.38	.64	.49	1.00									
Parents													
5. Rating	-.37	.45	.58	.74	1.00								
Teachers													
6. Self-Rating	-.07	.25	.25	.22	.04	1.00							
7. Clinical	.28	.18	.02	-.00	-.06	.15	1.00						
Interview													
8. School	-.53	.42	.42	.42	.40	.13	-.04	1.00					
Records													
9. Informal	-.40	.42	.56	.37	.40	.25	.05	.44	1.00				
.Observation													
10. Direct	-.39	.34	.40	.26	.29	.05	.21	.51	.56	1.00			
Observations													
11. IQ Assess	-.37	.40	.32	.37	.26	.02	-.08	.43	.28	.43	1.00		
12. Academic	-.47	.49	.42	.34	.28	.03	.08	.46	.40	.47	.66	1.00	
Assessment													
13. Combination	-.03	.10	.14	.00	-.05	.11	.17	.16*	.23**	.29**	.12	.236**	1.00
Therapy													

**Significant at the 0.01 level

*Significant at the 0.05 level

Table 9

Spearman's Correlation between Diagnostic Practice and Physicians' Attitudes (N = 110)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Evidence for ADHD	1.00													
2. Parent Interview	-.43	1.00												
3. Teacher Interview	-.36	.64	1.00											
4. Rating Parents	-.38	.64	.49	1.00										
5. Rating Teachers	-.37	.45	.58	.74	1.00									
6. Self-Rating	-.08	.25	.25	.22	.04	1.00								
7. Clinical Interview	.28	.18	.02	-.00	-.06	.15	1.00							
8. School Records	-.53	.42	.42	.42	.40	.13	-.04	1.00						
9. Informal	-.40	.42	.56	.37	.40	.25	.05	.44	1.00					
10. Direct	-.39	.34	.40	.26	.29	.05	.21	.51	.56	1.00				
11. IQ	-.37	.40	.32	.37	.26	.02	-.08	.43	.28	.43	1.00			
12. Academic	-.47	.49	.42	.34	.28	.03	.08	.46	.40	.47	.66	1.00		
13. Attitude Retrospect	.17	-.19	-.38**	-.20	.06	-.29*	.10	-.09	-.15	.01	-.08	-.022	1.00	
14. Attitude Functional Impairment	-.07	-.03	.15	.10	.04	-.19	-.28*	.33**	-.01	-.02	.14	.03	-.13	1.00

**Significant at the 0.01 level

*Significant at the 0.05 level

APPENDIX A

DSM-V Diagnostic Criteria for ADHD*

Inattention. Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions.

- a. Often fails to give close attention to detail or makes careless mistakes in schoolwork, work, or other activities (overlooks or misses details, work is inaccurate).
- b. Often has difficulty sustaining attention in tasks or play activities (e.g., has a difficulty remaining focused during lectures, conversations, or lengthy reading).
- c. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere)
- d. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- e. Often has difficulty organizing tasks and activities (difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- f. Often avoids, dislikes or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; **for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers**).
- g. Often loses things necessary for tasks or activities (e.g., toys, school assignment, pencils, books, or tools, **wallets, keys, paperwork, eyeglasses, mobile telephones**).
- h. Is often distracted by extraneous stimuli (e.g., **for older adolescents and adults may include unrelated thoughts**).
- i. Is often forgetful in daily activities (e.g., doing chores, running errands; **for older adolescents and adults, returning calls, paying bills, keeping appointments**).

Hyperactivity-Impulsivity. Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

- a. Often fidgets with hands or feet or squirms in a seat.
 - b. Often leaves seat in classroom or in other situations in which remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
 - c. Often runs about or climbs excessively in situations in which it is inappropriate (Note: **In adolescents may be limited to subjective feelings of restlessness**).
 - d. Often has difficulty playing or engaging in leisure activities quietly.
 - e. Is often “on the go” or often acts as if “driven by a motor” (e.g., is unable to be or uncomfortable
-

- being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficulty to keep up with).
- f. Often talks excessively.
 - g. Often blurts out answers before questions have been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
 - h. Often has difficulty awaiting turn (e.g., while waiting in line).
 - i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; **for adolescents and adults, may intrude or take over what others are doing**).
- A. Several inattentive or hyperactive-impulsive symptoms were present **prior to age 12 years**.
 - B. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).
 - C. **There is clear evidence that that symptoms interfere with, or reduce the quality of, social, academic or occupational functioning.**
 - D. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

Subtypes

- a. **Attention-Deficit/Hyperactivity Disorder Combined Presentation:** Both criteria for inattention and hyperactivity-impulsivity are met for the past 6 months
- b. **Attention-Deficit/Hyperactivity Disorder Predominately Inattentive Presentation:** Criterion for inattention is met but criterion for hyperactivity-impulsivity is not met for the past 6 months.
- c. **Attention-Deficit/Hyperactivity Disorder Predominately Hyperactive-Presentation:** Criterion for inattention is not met but criterion for hyperactivity-impulsivity is met for the past 6 months.
- d. **Other Specified and Unspecified Attention-Deficit/Hyperactivity Disorder:** Criterion for inattention and hyperactivity-impulsivity are not fully met but prominent symptoms are present for the past 6 months.

Specify current severity

- **Mild:** Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.
- **Moderate:** Symptoms or functional impairment between "mild" and "severe" present.
- **Severe:** Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.

*American Psychiatric Association (2013)

Items in **bold represent updates from the *DSM-IV-TR*

APPENDIX B

Predictors of ADHD into Adulthood and Common Comorbid Disorders with ADHD

Predictors of ADHD Persistence into Adulthood

(Adapted from Ritter & Setter, 2011)

- Severity of childhood symptoms
- Childhood ADHD of combined inattentive/hyperactive-impulsive
- Comorbid major depressive disorder
- High number of comorbid psychiatric disorders
- Paternal (not maternal) anxiety mood-disorder
- Parental antisocial personality disorder

Common Comorbid Disorders with ADHD

(Adapted from Barreto & Costea, 2008)

Psychiatric Disorders:

- Bipolar Disorder (Bipolar II)
- Unipolar Depressive Disorder
- Anxiety Disorders
- Obsessive-Compulsive Disorder
- Impulse Control Disorders
- Personality Disorders
- Alcohol and Substance Abuse

Medical Disorders:

- Endocrine and metabolic disorders (thyroid disorders)
 - Neurological disorders (including traumatic brain injury)
 - Sleep disorders (obstructive sleep apnea)
 - Side effects of drug treatment
-

APPENDIX C

Clinical Interviews and ADHD Rating Scales

Sample Clinical Interviews

(Adapted from Haavik *et al.*, 2010)

Commonly used Clinical Interviews:

- Structured Clinical Interview for DSM Disorders (SCID)
- Mini-International Neuropsychiatric Interview (MINI)
- Mini-International Neuropsychiatric Interview-Plus (MINI-Plus)
- Dutch Diagnostic Interview for ADHD in Adults (DIVA)
- Conners' Adult ADHD Diagnostic Interview (CAADID)

Critical Elements of the Comprehensive Clinical Interview:

(Adapted from Ritter & Setter, 2011)

- Assessment of current symptoms
- Medical history (including childhood symptoms)
- Family history (including family members diagnosed with ADHD)
- Social functioning
- Current problems related to ADHD and associated symptoms
- Previous Diagnoses: ADHD-related problems before age 7
- Marital status: frequency of changing partners
- Use of tobacco, alcohol or illegal substances
- Physical illness or other psychiatric disorders

Commonly used ADHD Rating Scales

(Adapted from Haavik *et al.*, 2010)

- Conners' Rating Scale Revised (CRS-R)
 - Brown Attention-Deficit Disorder Scale (BADDSS)
 - Vanderbilt ADHD Rating Scale
 - Adult ADHD Self-Report Scale (ASRS)
-

APPENDIX D

Research Introduction Letter

The Retrospective Diagnosis of ADHD in Adolescents

Dear Doctor,

My name is Adam Pechmann and I am a graduate student in the School Psychology Specialist Program at Eastern Illinois University. I am writing to invite you to participate in a thesis study that is designed to identify information physicians currently use to diagnose and treat Attention-Deficit/Hyperactivity Disorder (ADHD) in adolescents and adults. The research project has been approved by the Eastern Illinois University's Institutional Review Board (IRB) that ensures that participants' rights and privacy are protected, and the thesis is supervised by Dr. Assegedetch HaileMariam, professor of psychology.

Rapidly accumulating research has revealed that ADHD symptoms from childhood persist into adolescence and adulthood producing significant academic, social, and occupational impairments. Although we know that accurate diagnosis is the first step to treating ADHD, the information physicians currently use for doing so is not well known in the literature. In addition, research has shown that as children enter adolescence and young adulthood, the detection of ADHD can become complicated due to increasingly complex biological, environmental and social factors. Therefore, the diagnosis becomes even more challenging to physicians. The proposed study attempts to assess the sources of information currently utilized by physicians for conducting a retrospective diagnosis of ADHD in adolescents. It is important to analyze the type and amount of diagnostic information currently used by physicians in order to improve diagnosis as well as outcomes for patients. As you know, diagnosis informs treatment.

This letter serve as an invitation to participate in this study; because you are frontline health care provider, your input is invaluable. Attached, you will find the full survey and informed consent form, along with a stamped, addressed return envelope. Please rest assured that to ensure confidentiality, identifying information will not be collected. Please direct any questions or concerns to Adam Pechmann, School Psychology Intern at 217-402-5098 or at ampechmann@eiu.edu or Dr. Assege HaileMariam at ahailemariam@eiu.edu or 217-581-2127. We thank you in advance for your participation!

Sincerely,

Adam Pechmann
School Psychology Intern

Dr. Assege HaileMariam, Ph.D
Professor of Psychology

Eastern Illinois University
Psychology Department
600 Lincoln Avenue
Charleston, Illinois 61920-3099

APPENDIX E

Consent to Participate in Research

CONSENT TO PARTICIPATE IN RESEARCH

The Retrospective Diagnosis of ADHD in Adolescents

You are invited to participate in a research study conducted by Adam Pechmann and faculty sponsor Dr. Assege Hailemariam from the Department of Psychology at Eastern Illinois University.

Your participation in this study is entirely voluntary. Please ask questions about anything you do not understand, before deciding whether or not to participate.

You have been asked to participate in this study because as a physician you have had experiences with the diagnosis and treatment of Attention Deficit Hyperactivity Disorder (ADHD) in adolescents and adults.

- **PURPOSE OF THE STUDY**

The purpose of this research project is to assess the type of information physicians find helpful in the diagnosis and treatment of ADHD in adolescents (ages 11-24), and for monitoring and evaluating treatment outcomes. Given the chronic and pervasive nature of the disorder, it is imperative to study current diagnostic practices in order to improve outcomes for patients with ADHD.

- **PROCEDURES**

If you volunteer to participate in this study, you will be asked to:

Read the Informed Consent Form

Determine if you would like to participate

Complete the paper and pencil survey and mail it in the self-addressed and stamped envelope provided.

- **POTENTIAL RISKS AND DISCOMFORTS**

There is no risk involved. We are asking you to share your experience regarding the diagnosis and treatment of ADHD. No personally identifiable information (such as your name or address) will be on the survey. And, only aggregate data will be reported. Please also note that there is no compensation of any kind for participating in the research.

- **POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

As a physician, we are sure you appreciate the complex nature of ADHD and its association to diagnostic and treatment difficulties. By sharing your experience, you will be contributing to knowledge and also to better treatment of your patients with ADHD. The disorder is associated with academic, psychological, and behavioral problems. Thus, your participation will benefit society as well.

- **CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of coding procedures and security measures. To ensure confidentiality,

identifying information, such as name or address, will not be collected. Participants' data will be collected and analyzed using assigned individual identification code. Data will be entered into SPSS using the assigned identification code and the file will be password protected, and the hardcopy will be kept in a locked filing cabinet that only the researchers can access. After three years, the electronic file will be permanently purged/deleted and the hardcopy will be shredded.

- **PARTICIPATION AND WITHDRAWAL**

Participation in this research study is voluntary and not a requirement or a condition for being the recipient of benefits or services from Eastern Illinois University or any other organization sponsoring the research project. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits or services to which you are otherwise entitled.

There is no penalty if you withdraw from the study and you will not lose any benefits to which you are otherwise entitled.

- **IDENTIFICATION OF INVESTIGATORS**

If you have any questions or concerns about this research, please contact:

Adam Pechman, B.S.
Principal Investigator
Department of Psychology
Eastern Illinois University
ampechmann@eiu.edu
217-402-5098

Assegedetch HaileMariam, Ph.D.
Supervisor
Department of Psychology
Eastern Illinois University
ahailemariam@eiu.edu
217-581-2127

- **RIGHTS OF RESEARCH SUBJECTS**

If you have any questions or concerns about the treatment of human participants in this study, you may call or write:

Institutional Review Board
Eastern Illinois University
600 Lincoln Ave.
Charleston, IL 61920
Telephone: (217) 581-8576
E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

By completing the questionnaire, I voluntarily agree to participate in this study. I understand that I am free to withdraw my consent and discontinue my participation at any time. I have been given a copy of this form.

APPENDIX F

Cover Letter

The Retrospective Diagnosis of ADHD in Adolescents

Dear Doctor,

As you know, the diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) becomes complicated when the condition is diagnosed for the first time during the adolescent years and early adulthood. The primary purpose of this study is to identify the information physicians use and need to diagnose and treat ADHD in adolescents. You are invited to give input because you are frontline health care provider. The information gleaned from this study will contribute to accurate diagnosis and treatment of ADHD.

All responses that you provide will be kept confidential, i.e., no personally identifiable information will be reported. Only aggregate data will be reported. Your participation in this study is entirely voluntary.

The survey should take about 20 minutes of your time to complete. Please complete the survey as soon as you receive it and return it in the self-addressed and stamped envelope provided. We cannot emphasize enough the critical importance of your participation, your invaluable feedback will contribute to knowledge and to better service for patients with ADHD.

Any questions or concern regarding this study can be directed to the principal investigator, Adam Pechmann (217-402-5098, ampechmann@eiu.edu) or Assege HaileMariam, Ph.D., supervisor, (217-581-2127, ahailemariam@eiu.edu).

Thank you for your participation!

Sincerely,

Adam Pechman, B.S.
Principal Investigator

Assegedetch HaileMariam, Ph.D.
Supervisor

APPENDIX G

Physician Questionnaire

The Retrospective Diagnosis of ADHD in Adolescents

Physician Questionnaire

Please tell us about your practice:

1. Your sex is (please check one):
 - a) Female
 - b) Male

2. In what type(s) of setting(s) do you work? (Check ONE)
 - a) ADHD clinic
 - b) Family practice (alone)
 - c) Family group practice
 - d) Hospital
 - e) Urgent care
 - f) Residential
 - g) Other (please write) _____

3. Which of the following professionals are part of your practice and work with you when treating children with ADHD? (Check all that apply)
 - a) Psychologists
 - b) Social workers
 - c) Psychiatrists
 - d) OTHER: (Please write): _____
 - e) None

4. How long have you been in practice? (Check one)
 - a) Fewer than 5 years
 - b) 6 to 10 years
 - c) 11 to 15 years
 - d) 16 TO 20 years
 - e) Over 20 years

5. In what area is your practice located? (Check one)
 - a) Rural
 - b) Suburban
 - c) Urban

6. In the past 6 months, have you diagnosed and/or treated ADOLESCENTS (11-24 years old) for Attention-Deficit Hyperactivity Disorder (ADHD)?
Yes _____
No _____

If YES, please continue to Question 7
 If NO, please continue to Section B

7. About how many REFERRALS of ADOLESCENTS (11-24 years old) did you receive for the DIAGNOSIS of ADHD over the past 6 months?

Number of referrals: _____

8. In the past 6 months, did you provide TREATMENT/INTERVENTION for ADOLESCENTS (11-24 years old) following a diagnosis of ADHD?

Yes ___
 No ___

If YES, please continue to Question 9
 If NO, please continue to Section A

9. In the past 6 months, for about how many ADOLESCENTS (11-24 years old) did you provide TREATMENT/INTERVENTION following a diagnosis of ADHD?

Number of patients: _____

10. How many ADOLESCENTS (11-24 years old) are you currently TREATING for ADHD?

Number of patients: _____

PLEASE CONTINUE TO SECTION A

Section A

1. Before diagnosing ADOLESCENTS (11-24 years old), I seek to obtain EVIDENCE of ADHD symptoms PRIOR TO AGE 12 (i.e., at what age symptoms were first observed).

Yes ___
 No ___

2. Please indicate the likelihood that you would request the following FAMILY BACKGROUND information to assist in diagnosing ADHD in ADOLESCENTS (11 to 24 years old).

	1	2	3	4	5
Family Background (FB)					
FB 1: ADHD in the family	Never	Rarely	Sometimes	Usually	Always
FB 2: Other mental health disorders	Never	Rarely	Sometimes	Usually	Always
FB 3: Family routine and structure	Never	Rarely	Sometimes	Usually	Always
FB 4: Parenting style	Never	Rarely	Sometimes	Usually	Always
FB 5: Discipline Practices	Never	Rarely	Sometimes	Usually	Always

3. Please indicate the likelihood that you would request the following ASSESSMENT information to assist in diagnosing ADHD in ADOLESCENTS (11-24 years old).

	1	2	3	4	5
Results from Parent Interview	Never	Rarely	Sometimes	Usually	Always
Results from Teacher Interview	Never	Rarely	Sometimes	Usually	Always
Results from Rating Scales completed by Parents	Never	Rarely	Sometimes	Usually	Always
Results from Rating Scales completed by Teachers	Never	Rarely	Sometimes	Usually	Always
Results from Self Rating Scales completed by Patient	Never	Rarely	Sometimes	Usually	Always
Results from a Comprehensive Clinical Interview (semi-structured or structured).	Never	Rarely	Sometimes	Usually	Always

4. Please indicate the likelihood you would request the following EDUCATIONAL information to assist in the diagnosing of ADHD in ADOLESCENTS (11-24 years old).

	1	2	3	4	5
School Student Records (e.g., report cards, progress reports, and attendance record)	Never	Rarely	Sometimes	Usually	Always
Results from Informal Observations (e.g., classroom, lunch, and recess)	Never	Rarely	Sometimes	Usually	Always
Results from Systematic Direct Observation of Behavior (e.g., on-task vs. off-task data)	Never	Rarely	Sometimes	Usually	Always
Individual Education Plan (IEP)	Never	Rarely	Sometimes	Usually	Always
Behavior Intervention Plan (BIP)	Never	Rarely	Sometimes	Usually	Always

Comments:

5. Please indicate the likelihood you would request the following STANDARDIZED ASSESSMENT information to assist in the diagnosing of ADHD in ADOLESCENTS (11-24 years old).

	1	2	3	4	5
Intellectual Functioning (IQ) assessment results	Never	Rarely	Sometimes	Usually	Always
Academic Achievement assessment results (e.g., in reading or math)	Never	Rarely	Sometimes	Usually	Always

Conners' Rating Scale Revised (CRS-R)	Never	Rarely	Sometimes	Usually	Always
Brown Attention Deficit Disorder Scale (BADDS)	Never	Rarely	Sometimes	Usually	Always
Vanderbilt ADHD Rating Scale	Never	Rarely	Sometimes	Usually	Always
Adult ADHD Self-Report Scale	Never	Rarely	Sometimes	Usually	Always

Comments:

6. Please indicate the likelihood you would request the following PERSONAL HISTORY information to assist in the diagnosing of ADHD in **ADOLESCENTS** (11-24 years old).

	1	2	3	4	5
History of Substance Misuse/Abuse (e.g., alcohol, marijuana, and prescription medication)	Never	Rarely	Sometimes	Usually	Always
History of Psychiatric Disorders (e.g., anxiety, mood, and personality disorders)	Never	Rarely	Sometimes	Usually	Always
Medical History (e.g., neurological disorders, endocrine, and metabolic disorders)	Never	Rarely	Sometimes	Usually	Always

Comments:

7. Based on your practice within the past 6 months, do you recommend and/or provide THERAPY/INTERVENTION treatments to ADOLESCENTS (11-24 years old) diagnosed with ADHD?

Yes ___

No ___

If YES, please continue to Question 8

If NO, please continue to Question 9

8. Based on your practice within the past 6 months, please indicate the likelihood you would RECOMMEND the following THERAPY/INTERVENTION treatments to ADOLESCENTS (11-24 years old) diagnosed with ADHD.

	1	2	3	4	5
Behavior management at school	Never	Rarely	Sometimes	Usually	Always
Counseling at school	Never	Rarely	Sometimes	Usually	Always
Social skills training	Never	Rarely	Sometimes	Usually	Always
Organization skills training	Never	Rarely	Sometimes	Usually	Always
Individual psychotherapy	Never	Rarely	Sometimes	Usually	Always
Individual cognitive therapy	Never	Rarely	Sometimes	Usually	Always

Individual cognitive-behavior therapy (CBT)	Never	Rarely	Sometimes	Usually	Always
Behavior management at home	Never	Rarely	Sometimes	Usually	Always
Family counseling/therapy to address family problems	Never	Rarely	Sometimes	Usually	Always
Psychoeducation (e.g., teach patients about the nature of the disorder, coping skills, etc.)	Never	Rarely	Sometimes	Usually	Always
Family education/therapy (e.g., parent ed. about ADHD)	Never	Rarely	Sometimes	Usually	Always

Comments:

9. Based on your practice within the past 6 months, do you recommend STIMULANT MEDICATION (e.g., *Concerta, Ritalin, Adderall*) to ADOLESCENTS (11 TO 24 years old) diagnosed with ADHD?

Yes ___

No ___

If YES, please continue to Question 10

If NO, please continue to Question 11

10. Based on your practice within the past 6 months, please indicate the likelihood that you would RECOMMEND the following TREATMENTS to ADOLESCENTS (11-24 years old) diagnosed with ADHD.

	1	2	3	4	5
Stimulant Medication and Therapy/Intervention for the Patient	Never	Rarely	Sometimes	Usually	Always
Stimulant Medication and Family Counseling/Education	Never	Rarely	Sometimes	Usually	Always
Stimulant Medication alone	Never	Rarely	Sometimes	Usually	Always
Combination of Medication, Therapy for the Patient, and Therapy for the Family	Never	Rarely	Sometimes	Usually	Always

Comments:

11. Please indicate, in rank order, the top 3 treatments you REGULARLY recommend to ADOLESCENTS (11 to 24 years old) diagnosed with ADHD.

1.

2.

3.

12. If you typically make a referral for THERAPY/INTERVENTION (e.g., behavioral-cognitive therapy for the patient, family therapy, etc.) which professionals do you refer them to?

	1	2	3	4	5
Psychologists	Never	Rarely	Sometimes	Usually	Always
Psychiatrists	Never	Rarely	Sometimes	Usually	Always
Counselors	Never	Rarely	Sometimes	Usually	Always
Social Workers	Never	Rarely	Sometimes	Usually	Always

Comments:

13. Based on your practice within the last 6 months, do you typically request information to evaluate TREATMENT OUTCOMES for ADOLESCENTS (11 to 24 years old)?

Yes ___

No ___

If YES, please continue to Question 14

If NO, please continue to Section B

14. Based on your practice within the last 6 months, what information do you typically request to evaluate TREATMENT OUTCOMES for ADOLESCENTS (11-24 years old)?

	1	2	3	4	5
Results from informal observation	Never	Rarely	Sometimes	Usually	Always
Graphs or tables of systematic direct observation (pre-treatment and post-treatment)	Never	Rarely	Sometimes	Usually	Always
Results from parent rating scales	Never	Rarely	Sometimes	Usually	Always
Results from teacher rating scales	Never	Rarely	Sometimes	Usually	Always
Results from self-rating scales	Never	Rarely	Sometimes	Usually	Always
Results from side effects checklist	Never	Rarely	Sometimes	Usually	Always
Academic progress (e.g., grades and progress monitoring data)	Never	Rarely	Sometimes	Usually	Always
Job performance/satisfaction	Never	Rarely	Sometimes	Usually	Always
Self-monitoring report (e.g., daily report card, journaling, etc.)	Never	Rarely	Sometimes	Usually	Always
Weight/appetite monitoring	Never	Rarely	Sometimes	Usually	Always
Heart rate/blood pressure monitoring, depending on medication	Never	Rarely	Sometimes	Usually	Always

Comments:

15. Please indicate how often you use the following information for MONITORING SIDE EFFECTS

of medications prescribed for the treatment of ADHD in ADOLESCENTS (11-24 years old).

	1	2	3	4	5
Once a week office visit until medication is titrated	Never	Rarely	Sometimes	Usually	Always
Monthly office visit to monitor side effects	Never	Rarely	Sometimes	Usually	Always
Written feedback from school professional who knows the patient	Never	Rarely	Sometimes	Usually	Always
Self-reports (e.g., journal and side effects checklist)	Never	Rarely	Sometimes	Usually	Always
Parent reports (e.g., side effects checklist and behavioral rating scale)	Never	Rarely	Sometimes	Usually	Always
Academic progress (e.g., grades and progress monitoring data)	Never	Rarely	Sometimes	Usually	Always
Job performance/satisfaction	Never	Rarely	Sometimes	Usually	Always
Blood test results	Never	Rarely	Sometimes	Usually	Always

Comments:

PLEASE CONTINUE TO SECTION B

Section B

16. Please select either TRUE or FALSE for the following items. These items are intended to provide useful information regarding your professional opinions about the nature of ADHD as well as appropriate treatment practices.

	1	2	3
1. If children reach adolescence without being diagnosed with ADHD, they should not be referred for ADHD evaluation.	True	False	Unsure
2. ADHD diagnosis in late adolescence (18-24 olds) is on the rise.	True	False	Unsure
3. If an adolescent definitely shows ADHD symptoms, it does not matter whether or not the symptoms were present as a child.	True	False	Unsure
4. I am concerned about stimulant medication abuse.	True	False	Unsure
5. ADDH is a mental health issue and should be treated as such.	True	False	Unsure
6. ADHD cannot be effectively treated without medication.	True	False	Unsure
7. ADHD can be prevented.	True	False	Unsure
8. Stimulant medication is expected to fix behavior problems that parents and teachers should address.	True	False	Unsure
9. Life style, information-overload, and technology is exacerbating ADHD.	True	False	Unsure

10. Family Physicians are responsible for addressing the psychological needs of ADHD patients	True	False	Unsure
11. Most families do not have the time for therapy	True	False	Unsure
12. Medication is the only treatment a patient with ADHD needs	True	False	Unsure
13. It is the family's or patient's responsibility to monitor side effects of stimulant medication	True	False	Unsure
14. I am aware the high achieving adolescents are using stimulant medication is to succeed (similar to speed).	True	False	Unsure
15. Even if an adolescent shows ADHD symptoms, no treatment is needed unless the symptoms impact her or his academic, social, or occupational life.	True	False	Unsure

Comments:

17. Finally, despite our best efforts, we may not have given you the opportunity to share your concerns about the diagnosis and treatment of ADHD. In the following space, please write your **TOP 3 CONCERNS** regarding diagnosis, treatment, and treatment outcome monitoring of ADHD in order of importance (1=most important).

Rank	Diagnosis	Treatment	Outcome Monitoring
1			
2			
3			

Thank you for taking the time to complete this survey. Your participation is greatly appreciated!