

12-7-2012

# The Feasibility of an Advanced Practice Registered Nurse-Managed ADHD Resource Center in Missouri

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The Feasibility of an Advanced Practice Registered Nurse-Managed ADHD Center in  
Missouri

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A DNP Clinical Scholarship Project submitted to the Graduate School at the University  
of Missouri – St. Louis in partial fulfillment of the requirements for the degree  
Doctorate of Nursing Practice

October 2012

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## ACKNOWLEDGEMENTS

I would like to take this opportunity to thank my committee for assisting me in the completion of this project. Without your time, guidance and input, the success of this project could not have been achieved. I would especially like to thank my committee chair person, Dawn Garzon, whose patience with me knew no bounds, even when I drug my feet; even when I panicked.

To my parents, I would like to extend my gratitude for instilling in me the confidence and perseverance to achieve my goals. I depend so much on your support. To my best friend, Rita Ruble, whose excellent listening skills and advice makes me forget she is not a nurse. Without her encouragement, help and motivation, I am not sure I would have gotten through this project.

To my son Ryan, I love you and am so proud of the young man you are becoming. I know we have struggled a lot for Mom to get through this project, but I hope you know I appreciate all of your help through it all and hope you see the importance of education and how hard work pays off.

To my husband Chad, my partner, teammate, and love of my life, who has supported me faithfully throughout each degree program. We have sacrificed so much as a family for me to get through school, yet you never once complained. I love you.

And finally, to my beautiful daughter, *Jillian Rose*. This project was really a personal quest for Mom to understand ADHD and help you and others become even more successful. I have learned so much. You were the inspiration for this project and the biggest help of all. You stuffed and stamped envelopes like no other. It would have been hard to do without you. I love you, Babe.

**ABSTRACT**

The Feasibility of an Advanced Practice Registered Nurse-Managed ADHD Resource  
Center in Missouri

Attention Deficit/Hyperactivity Disorder is a common neurobehavioral condition affecting 8-10% of the school age population. ADHD affects every aspect of a child's life. A nationwide shortage of mental health specialists has caused an influx of patients seeking treatment from primary care providers for mental health conditions such as ADHD. A literature review documented research that shows primary care providers are not always comfortable diagnosing and managing ADHD as well as inconsistency in the use of clinical practice guidelines for the diagnosis and management of ADHD which increases the risk of over diagnosis, under diagnosis, and misdiagnosis.

The primary objective of this project was to develop a survey to determine provider receptiveness to referring patients to an APRN-managed center for the diagnosis and management of Attention Deficit/Hyperactivity Disorder. A secondary aim of this project was to develop a business plan for the center, provided feedback from the surveys was determined to be supportive.

The majority of both physicians and APRNs answered they were aware that CPGs for the diagnosis and management of ADHD existed (physician group 82.6% vs. NP group 87.5%) and that they used them to evaluate and treat their patients (physician group 65.2% vs. NP group 50%). However, a substantial portion answered they did not use CPGs (physician group 26% vs. NP group 37.5%). In this study, 50% of the APRN group answered that they were uncomfortable with diagnosing ADHD, as compared with the physician group who were "Very Comfortable" to "Comfortable" (47.8% and 47.8%).

Almost 70% of physician subjects expressed a willingness to refer to an ADHD specialty center in contrast to 100% of APRNs reporting they would refer to such a center. However, when asked if they would refer to a specialty center for the diagnosis and management of ADHD by an APRN, less than half of those willing in the physician group would refer (33.3%) as compared to 87.5% of APRNs. Since there was insufficient community support for this type of center, a business plan was not developed.

This project yielded several implications for further research. More work is needed to establish why clinical practice guidelines are not being used consistently to diagnose and manage ADHD. More research is needed to determine the reasons APRNs are not as comfortable diagnosing and managing ADHD compared to the physician group. Finally, further work is needed to explore and explain the finding that physicians in this sample expressed a willingness to refer to an ADHD specialty center for diagnosis and management of ADHD, but not to a center managed by an APRN.

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The Feasibility of an Advance Practice Registered Nurse-Managed ADHD Center in  
Missouri

**PROJECT PURPOSE**

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurobehavioral conditions in childhood (Center for Disease Control, 2011). This chronic condition is characterized by inattention, distractibility, impulsivity and restlessness. These characteristics are pervasive, impairing how a child functions at home, in school, and in the community. Left untreated, ADHD increases a child's risk of school failure, altered self-esteem, criminality, substance abuse, and other psychiatric disorders, as well as causes discord in families (McDonnell & Moffett, 2010).

A nationwide shortage of mental health specialists has caused an influx of patients seeking treatment from primary care providers for mental health conditions such as ADHD (Thomas, Ellis, Konrad, Holzer, & Morrissey, 2009). Unfortunately, many primary care providers are not comfortable diagnosing and treating mental health conditions (Fremont, Nastasi, Newman, & Roizen, 2008), or simply do not have the time and resources needed to deal with diagnosis and management of mental health conditions in the office setting (Vlam, 2006).

The purpose of this project was to determine the feasibility of developing and implementing an advanced practice registered nurse (APRN)-managed center specializing in the diagnosis and treatment of children and adolescents with ADHD in Jefferson County, Missouri. A secondary aim of this project was to develop a business plan for the center, provided feedback was determined to be supportive.



As providers who can deliver cost-effective and quality care, APRNs are uniquely suited for this type of enterprise. Stringent collaborative practice laws, prescriptive authority and resistance to APRNs in Missouri may be a hindrance to advanced practice nurses who may otherwise be interested in this level of autonomy, but practicing at a certain level of independence is still very possible by observing the laws set forth for collaborative practice.

## **LITERATURE REVIEW**

### **Epidemiologic Relevance of ADHD**

ADHD affects 4.5 million 4 to 17 year-olds, with males outnumbering females 3:1 across the diagnostic subtypes (CDC, 2010). Sixty to eighty percent of children who are diagnosed with ADHD as children meet the criteria as adolescents. Up to 60% of those adolescents meet criteria as adults (McDonnell & Moffett, 2010; Elia, Acros-Burgos, & Bolton, 2009; Bloom & Cohen, 2007; Kessler, Chiu, Demler, & Walters, 2005). In the general population, 9.2% of males and 2.9% of females are found to have behaviors consistent with ADHD. The prevalence rate of ADHD is estimated to be approximately 8-10% of the school-age community (American Academy of Pediatrics, 2009).

### **Etiology of ADHD**

The etiology of ADHD is unknown, but there are a number of theoretical explanations associated with the disorder and there are clear genetic influences. A twin study performed by Wilcutt, Olsen, and DeFries (2007), involved a comparison of the rate of concordance for ADHD in of monozygotic twins (twins who share all genes) versus dizygotic twins (twins who share half of their genes). ADHD concordance rates

were significantly higher among monozygotic pairs (58-82%) versus same-sex dizygotic pairs (31-38%), providing evidence that ADHD has a genetic component. Although there is no single marker identified yet, the genes that have been implicated in the development of ADHD include 5, 10, 12, 16, and 17 (Wilcutt et al., 2007). More recently, both the DRD4 and DAT genes that regulate dopamine have been discovered to be deficient in children with ADHD (Kaplan & Adelman, 2011).

The prefrontal cortex (PFC) of the brain is responsible for aggression, impulse control and inhibition. Some propose that children with ADHD have an imbalance of noradrenaline, norepinephrine, and decreased dopaminergic regulation of neural circuits to the PFC (Da Silva, Szobot, Anselmi, Jackowski, & Chi, 2011). Characteristics of inattention and distraction appear to be caused by low levels of norepinephrine. Impulsivity and behavior problems appear to be caused by low levels of dopamine (Salmeron, 2009; Wilcutt et al., 2007).

Researchers feel these changes in the circuitry are directly related to genetics. Serotonin, a neurotransmitter in the brain, has many functions in the body including regulating appetite, sleep, memory, learning, temperature regulation, mood, behavior, cardiovascular function, muscle contraction, and endocrine regulation (Porth, 2005). Tryptophan dyhydroxylase is responsible for serotonin production in maternal reproductive tissues (TPH1) and the brain (TPH2). When these genes are mutated, serotonin production is impaired. Impairments in TPH1 and TPH2 have been detected in mental health conditions such as depression, anxiety, autism, schizophrenia and ADHD (Halmøy, Johansson, Winge, McKinney, & Knappskog, 2010). A recent study from Norway indicated a new link might exist between decreased maternal levels of serotonin

and children with ADHD (Halmøy et al., 2010). Using a population of adults with a clinical diagnosis of ADHD who met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) criteria and randomly selected people from the general population as a control group, Halmøy et al. identified that children of mothers with TPH1 variants were 1.5-2.5 times more likely to have ADHD than did children of fathers ( $P < .001$ ) with TPH1 variants or the control group ( $P < 10^{-6}$ ).

Other theories concerning the risk factors inherent to the development of ADHD include environmental influences such as maternal health, maternal tobacco and/or alcohol use, fetal distress, low birth weight, and traumatic brain injury (CDC, 2010).

### **ADHD Screening and Diagnosis**

There is no objective test to diagnose ADHD, and the diagnosis can be confounded by the presence of other psychiatric co-morbidities. The American Academy of Pediatrics (AAP) and the American Academy of Child and Adolescent Psychiatry (AACAP) published guidelines to diagnose and manage ADHD based on criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR). The guidelines are comprised of six recommendations with a high level of evidence-based support which states that a child age 4-18 who presents with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems should have an evaluation for ADHD (Table 1). Screening tools can be used to assist in the diagnosis. Data should be obtained from parents, caregivers, and teachers, and should include age of onset, duration of symptoms and the degree of functional impairment (AAP, 2011).

The Vanderbilt rating scale is one screening tool that is available in the public domain. It screens for ADHD, and three other comorbidities: oppositional defiant disorder, conduct disorder, anxiety and depression. The Vanderbilt scale includes parent and teacher versions and addresses inattentive, hyperactive and impulsive symptoms. Scoring is then completed by the primary care provider using the scoring guide. Two other instruments that require per use fees are the Conner Assessment Scale, used for ADHD symptoms, and the Achenbach Child Behavior Checklist, which screens for multiple psychiatric conditions including depression, anxiety, conduct disorder, and oppositional defiant disorder.

The National Initiative for Children's Healthcare Quality (NICHQ) published the ADHD Toolkit based on to the AAP guidelines (NICHQ, 2011). The toolkit includes several tools for the diagnosis and treatment of children with ADHD including a Vanderbilt scale and a number of treatment resources. These include guidelines for therapy selection, teacher report forms, and strategies to assist the clinician in monitoring the child. English and Spanish versions of the toolkit are available.

Table 1.

#### Diagnostic Criteria for ADHD

1. Clinicians should initiate an evaluation in children ages 4-18 who present with inattention, hyperactivity, impulsivity, academic underachievement and behavior problems.
2. The child must meet DSM-IV criteria before a diagnosis is made.
3. Assessment requires data from parents, teachers and caregivers regarding the core

symptoms of ADHD in different settings. The age of onset, degree of functional impairment and duration of symptoms must be recorded.

3A. Assessment rating scales may be used when evaluating a child with ADHD.

3B. Clinicians may use ADHD-specific rating scales when evaluating children with ADHD, but global questionnaires are not recommended.

4. Evidence must be obtained from teachers regarding core symptoms of ADHD, the degree of functional impairment, duration of symptoms, and coexisting conditions must be recorded.

4A. Teachers may use the ADHD-specific rating scales.

4B. Use of teacher global questionnaires and nonspecific behavior scales is not recommended in the diagnosis of children with ADHD, although they may be used for other purposes.

5. The primary care provider should evaluate the child with ADHD for other coexisting disorders such as depression, anxiety, mood disorder, and conduct disorder.

6. There is no scientific evidence that validates the use of any diagnostic test to establish the diagnosis of ADHD.

*Note.* Adapted from “ADHD Clinical Practice Guideline for the Diagnosis, Evaluation and Treatment of Attention Deficit/Hyperactivity Disorder in Children and Adolescents,” by the Subcommittee on Attention Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management, 2011, *Pediatrics*, 128, p. 1007-1008.

ADHD has three subtypes: predominantly hyperactive-impulsive, predominantly inattentive, and combined hyperactive-inattentive. In order to meet diagnostic criteria, the child must have six or more inattentive or impulsive symptoms, although

characteristics from the other categories may be present to a lesser degree (National Institute of Mental Health, 2009).

Table 2 and Table 3 illustrate the categories and symptoms from the DSM-IV-TR for diagnosis of ADHD, as well as its subtypes. Symptoms of hyperactivity and impulsivity include fidgeting, squirming, talking incessantly, touching everything in sight, and difficulty completing quiet tasks or activities. The child with hyperactivity is in constant motion. He or she is very impatient and has difficulty waiting their turn. They often blurt out answers or inappropriate comments. They show no emotional restraint and act without regard for consequences. They often interrupt conversations and others' activities (NIMH, 2009).

Table 2.

Characteristics by Subtype of ADHD

IA. Inattention	IB. Hyperactivity/Impulsivity
<ul style="list-style-type: none"> <li>• Careless mistakes in schoolwork or other activities</li> <li>• Fails to give close attention to details</li> <li>• Cannot sustain attention in tasks</li> <li>• Does not seem to listen when spoken to</li> <li>• Does not follow through on instructions</li> <li>• Fails to finish work or chores</li> </ul>	<ul style="list-style-type: none"> <li>• Fidgets with hands/feet</li> <li>• Squirms in seat</li> <li>• Cannot stay seated</li> <li>• Has difficulty playing quietly or engaging in quiet activity</li> <li>• "On the go"</li> <li>• Seems "driven by motor"</li> <li>• Blurts out answers before questions are completed</li> <li>• Difficulty awaiting turn</li> <li>• Interrupts others</li> </ul>

*Note.* Adapted from "Diagnostic and Statistical Manual of Mental Disorders: Attention Deficit and Disruptive Behavior Disorders," by *American Psychiatric Association*, 2000, Fourth Edition, Text Revision.

Table 3.

## ADHD Subtypes

IA. Combined Type ADHD	IB. Predominantly Inattentive Type ADHD	IC. Predominantly Hyperactive/Impulsive ADHD
If both criteria for IA. and IB. are met for past 6 months	If criterion IA. is met, but IB. is not met for past 6 months	If criterion IB. is met, but criterion IA. is not met for past 6 months

*Note.* Adapted from “Diagnostic and Statistical Manual of Mental Disorders: Attention Deficit and Disruptive Behavior Disorders,” by American Psychiatric Association, 2000, Fourth Edition, Text Revision.

The child with inattention is easily distracted and misses details. They are forgetful, and have difficulty with organization, completing a task, or learning something new. They frequently switch from one activity to another. They have difficulty focusing on one thing and become bored with a task after a few minutes unless it is enjoyable to them. The inattentive child moves slowly, has trouble completing or turning in homework assignments, and loses things needed to complete them. They daydream and do not seem to listen when spoken to. They can become easily confused as they have difficulty processing information as quickly or as accurately as others. The child with combined-type has six or more symptoms in both categories, and may have symptoms that fit with one category at one time or others at another.

Clinical practice guidelines state that the evaluation of a child or adolescent with ADHD should include assessment for other psychiatric conditions that may coexist with ADHD in the form of emotional (e.g. depression, anxiety), behavioral (e.g. oppositional, conduct), developmental (e.g. learning, language or other neurodevelopmental disorders),

disabilities and/or physical conditions (e.g. tics, sleep apnea) (AAP, 2011). Clinicians should titrate medications to provide maximum benefit with minimum side effects. This includes careful monitoring and consistent follow-up. Longitudinal studies show that treatment is frequently not sustained despite the fact that children with ADHD are at risk for significant problems if left untreated. Consistent behavioral treatment and careful monitoring are necessary for treatment adherence (AAP, 2011).

According to a 2008 study performed by Epstein, Langberg, Lichtenstein, Mainwaring, and Luzader (2008), 52% of community physicians report they are aware of the clinical practice guidelines put forth by the AAP and AACAP; however, only 35% report using all components. A 2009 study done in Utah showed that advanced practice nurses follow the AAP diagnostic guidelines more closely than their physician counterparts (63.4% vs. 38.3%) (Vlam, 2006). Consistently following AAP guidelines for ADHD diagnosis decreases the risk of over-diagnosis, misdiagnosis and under-diagnosis (AAP, 2011). Using the AAP guidelines as standard of care for the diagnosis of ADHD aids in properly identifying and treating the condition as early as possible, which improves the long-term outcomes and ensures a child has a chance at reaching their full potential (AAP, 2011).

### **Treatment**

The management of ADHD should involve behavioral/psychological therapy, medication, or educational interventions alone or in combination (AAP, 2011). A decision regarding the choice of how to treat each child should be individualized and must be done in collaboration with parents. Both the provider and the parents must weigh the risks and benefits of the treatment strategy. Goals must be set for realistic,



achievable and measurable outcomes. Examples of outcomes could be improved relationships with peers (e.g., playing without fighting at recess), improved academic performance (e.g., hands in homework on time), or improved rule following (e.g., raises hand to answer questions). Behavioral interventions include modifications in the environment that are designed to change behavior. Although considered an important strategy in ADHD treatment, they may fail to decrease the core ADHD symptoms of inattention, hyperactivity, and impulsivity. However, these interventions can improve other behavior problems often seen in the child with ADHD, such as depression, anxiety, aggression and self-worth. Behavioral therapy is included in the treatment recommendations of the AAP and AACAP (Wolraich, Brown, Brown, DuPaul, & Earls, 2011), and is considered first-line treatment for pre-school children ages 3-5 (Kaplan & Adelman, 2011).

Behavioral modifications must include parent training and require consistency and patience and include activities such as time-out, response cost (taking away something when a negative behavior is identified), over-learning (practice procedures from beginning to end repeatedly), restitution (restoring what was lost during the misbehavior), positive reinforcement, simple charts to track desired behaviors, skill building, relaxation techniques, memory exercises and self-monitoring (Reiff, 2011).

Psychostimulant medications are considered effective for children, adolescents and adults. They are the most commonly used drugs and the most studied. At this time, only short-acting amphetamines are FDA-approved for use in children ages 3-5. Side effects of psychostimulants include insomnia, anorexia, and weight loss, headache, tachycardia, increased blood pressure, and irritability. They can also worsen tics, so they

are only used when symptoms are profoundly impairing a child's home or school life or when behavioral therapy has been ineffective (Kaplan & Adesman., 2011).

In 2000, the Texas Children's Medication Algorithm Project published an evidence-based algorithm for the pharmacotherapy of childhood ADHD (Pliszka, 2000). Pliszka et al. revised the algorithm in 2006, as the Texas Consensus Conference Panel on Pharmacotherapy of Childhood Attention Deficit-Hyperactivity Disorder. The recommended order of treatment is psychostimulants, alternative psychostimulant (Cylert; with liver function tests every two weeks), antidepressant/nonstimulant (Strattera), alternative antidepressant (selective norepinephrine reuptake inhibitors, tricyclic acid antidepressants, monoamine oxidase inhibitors), and noradrenergic modulators such as clonidine for insomnia, or guanfacine for children who are predominantly hyperactive or impulsive, or who do not tolerate psychostimulants or Strattera (Strange, 2008). There is a slight increase risk of suicide as well as liver disease with the use of Strattera. Table 4 lists the medications prescribed in the treatment of ADHD.

Table 4.

Medications for ADHD

<b>Class</b>	<b>Brand Name</b>	<b>Daily Dose Mg/kg/day</b>	<b>Daily Dosing Schedule</b>	<b>Duration of Action</b>
<b>Stimulants</b>				
Dextroamphetamine	Dexedrine	0.3-1.0	Twice daily, three times daily	3-5 hours
Mixed salts of L- and D-amphetamine	Adderall	0.5-1.5	Once daily, twice daily	4-6 hours

Methylphenidate	Ritalin	1.0-2.0	Twice daily, three times daily	3-4 hours
	Methylin	1.0-2.0	Twice daily, three times daily	3-4 hours
	Focalin	0.5-1.0	Twice daily, three times daily	3-4 hours
<b>Extended-Release Formulations</b>				
Dextroamphetamine	Dexedrine Spansules	0.3-1.0	Once to twice daily	8-12 hours
Methylphenidate	Concerta	1.0-2.0	Once to twice daily	10-12 hours
	Ritalin LA	1.0-2.0	Once to twice daily	8-9 hours
	Metadate CD	1.0-2.0	Once to twice daily	8-9 hours
	Focalin XR	1.0-2.0	Once to twice daily	10-12 hours
	Daytrana	1.0-2.0	Once daily	One patch once daily x 9 hours, then off for 15 hours
	Methylin ER	1.0-2.0	Once to twice daily	4-8 hours
Mixed salts of L- and D-amphetamine	Adderall XR	0.5-1.5	Once to three times daily	10-12 hours
Lisdexamfetamine dimesylate	Vyvanse	30-70mg/day	Once daily	
Pemoline	Cylert	56-75mg/day	Once daily	
<b>Non-stimulant Medications</b>				
<b>Noradrenergic-Specific Reuptake Inhibitors</b>				
Atomoxetine	Strattera	0.5-1.4	Once to twice daily	

<b>Tricyclic Antidepressants</b>				
Imipramine	Tofranil	2.0-5.0	Once to twice daily	
Amitriptyline	Elavil	2.0-5.0	Once to twice daily	
Clomipramine	Anafranil	2.0-5.0	Once to twice daily	
<b>Secondary Amines</b>				
Desipramine	Norpramin	1.0-2.0	Once to twice daily	
Nortriptyline	Pamelor	1.0-3.0	Once to twice daily	
<b>Other antidepressants</b>				
Bupropion	Wellbutrin	3.0-6.0	Once to twice daily	
	Wellbutrin SR	3.0-6.0	Once to twice daily	
	Wellbutrin XL	3.0-6.0	Once daily	
<b>Noradrenergic Modulators</b>				
Clonidine	Catapres	0.003-0.010	Twice to three times daily	
Guanfacine	Tenex	0.015-0.05	Once to twice daily	
<b>Wakefulness-Promoting Agents</b>				
Modafinil		100-400mg	Once daily	

*Note.* Adapted from “Coming into Focus: Pharmacologic treatment for ADHD,” by M. McDonnell and C. Moffett, 2010, *Advance for NPs and PAs 1(14)*, p. 16-22.

A careful history and physical is recommended before prescribing stimulants.

Vital signs, weight, appetite, abnormal movements (tics), sleep disturbance and growth should be monitored whenever psychostimulants are used (McDonnell & Moffett, 2010).

In 2008, the American Heart Association released a statement that it was reasonable, though not mandatory, to consider ordering electrocardiogram (ECG) in children with

ADHD before beginning a psychostimulant, because of the increased cardiac risk due to increased blood pressure and heart rate. They recommend ECG monitoring in children with cardiac history or in the case of family history of heart disease due to sudden cardiac death (Jensen, 2009). The American Academy of Pediatrics countered this statement stating that sudden cardiac death is rare, happening in 1-2 out of one million children taking ADHD medications (AAP, 2008).

Psychostimulants have also been implicated in growth impairment. Altered growth is believed to be associated with anorexia secondary to stimulant use. The AAP recommends clinicians use the best judgment for their patients (Harvard Medical School, 2008).

Unfortunately, the psychostimulant drug class has high abuse potential, which is a legitimate concern. There are many reports of children selling their medication, and even other people or family members stealing, selling or taking the medication. Some research indicates that stimulant medication seems to be protective against future substance abuse disorder in children and adolescents with a significant risk reduction (Wilens, Faraone, Biederman, & Gunawdene, 2003) in individuals with ADHD. In this study, researchers examined 56 male adolescents with ADHD, 19 non-medicated male adolescents with ADHD, and 137 non-ADHD male adolescent control subjects for four years. Pharmacotherapy was associated with an 85% reduction ( $P < 0.01$ ) in risk of substance abuse disorder for any substance at follow-up; however, the results of the larger MTA study indicated that the actual risk for substance use neither increased or decreased in children and adolescents who were prescribed stimulants (Jensen, 2009; Molina et al., 2009).

New medication preparations tend to discourage abuse potential, particularly the delivery system of the extended release formulations as well as the patch. When the drug is released slowly and at low doses throughout the day, the rise of dopamine is slower and side effects such as euphoria are lessened. Even extended release formulations have abuse potential because when taken inappropriately because dopamine levels can rise faster. To lessen abuse potential, stimulants are controlled substances, and require an original prescription limiting the number of pills dispensed at one time.

Literature suggests that medication in combination with cognitive behavioral therapy produces the best treatment outcomes (AAP, 2011; Wolraich et al., 2011; Jensen et al., 2009; Scottish Intercollegiate Guidelines, 2011; Pliszka, S., 2007). To assess the effectiveness of each treatment, the MTA Study was performed.

The Multimodal Treatment Study of Children with ADHD (MTA) is the largest and most comprehensive clinical trial conducted in ADHD. Five hundred seventy-nine, 7-10 year old children with ADHD were randomly assigned to routine community care, medication, behavioral interventions, or combination therapy. These children were then assessed at four different times in multiple outcomes. Results indicated that combination therapy and medication were substantially superior to behavioral interventions and community care for ADHD symptoms. Improvement in social skills, academics, parent/child relations, oppositional behaviors, anxiety, and depression had slight advantages in combination therapy over medication, behavioral interventions and community care (Jensen et al., 2001).

At both the 14- and 24-month marks, researchers confirmed previous research, that although all children who received any type of treatment improved, the best results

occurred in children who received medication alone or in combination with behavioral therapy. Surprisingly, that advantage began to diminish at 24 months and disappeared by 36 months, even in children who consistently took their medication. Researchers speculate that this occurred because children who participated in the study transitioned back to community care where they were not monitored as closely (Molina et al., 2009).

### **IMPLICATIONS TO SOCIETY, ECONOMY AND HEALTH CARE:**

#### **THE STAKEHOLDERS**

ADHD is associated with impairments in many areas of children's lives, including academic performance, social functioning, and overall quality of life. Children with ADHD are more likely to have other co-morbidities such as learning disabilities, obesity, anxiety, depression, and tic disorder (Taurines et al., 2010). Approximately 15% of children with ADHD (about 1% of the population) have co-morbidities of behavioral problems such as oppositional defiant disorder, conduct disorder, bipolar disorder, obsessive-compulsive disorder, and anti-social personality disorders (Bernfort, Norfelt, & Persson, 2007).

Impairments caused by ADHD have major impacts on society, the economy, and healthcare. Children with ADHD typically present with behavioral disturbances, restlessness, and poor social skills. They exhibit difficulties in social relations and school environments. Usually related to emotional factors and communication abilities, research indicates these children have low self-esteem and are frequently rejected by peers (Bernfort et al., 2007). The question of stigma related to the diagnosis is raised, and other children may not tolerate the ADHD student's behavioral issues as they are often disruptive. Children with ADHD have difficulty adapting to school rules and routines.

These symptoms negatively affect academic performance and social development. The adolescent with ADHD is more likely to become involved with deviant peer groups. They typically exhibit unsafe driving skills, have a higher rate of substance abuse, and have early initiation of smoking, marijuana, and inhalant use (Salmeron, 2009; Vierhile, Robb, & Ryan-Krause, 2009; Bernfort et al., 2007).

Adolescents with ADHD ages 12-18 are more likely than children without ADHD to be injured in a motor vehicle accident (Xiang, Stallones, Guanmin, Hostetler, & Kelleher, 2005). Drivers tend to have slower reaction times, impulsiveness, poor vehicle handling, inconsistent rule following, and decreased attention. In fact, drivers with ADHD are 1.88 times more likely to crash than those without ADHD (Jerome, Segal, & Habinski, 2006). Children and adolescents with ADHD are also more accident-prone, having more broken bones, lacerations, head injuries, bruises, lost teeth and accidental poisonings than children without ADHD (Matza, Paramore, & Prasad, 2005).

School-aged children and adolescents with ADHD have poorer grades, more failed courses, and lower educational attainment than their non-affected peers (Bernfort et al., 2007). Mannuzza, Klein, Bessler, Malloy, and Hynes (1997) found that young adults with a diagnosis of ADHD had on average two years less education than control groups. In a sample of 85 people with ADHD and 73 controls with a mean age of 24, 25% did not finish high school (compared to 1% of the controls), and 15% earned a Bachelor's degree (compared to 50% controls).

Approximately 60% of children with a diagnosis of ADHD grow into adults with ADHD. It is important to realize that adults with ADHD are also stakeholders (Vierhile et al., 2009). These people exhibit lower rates of occupational attainment, difficulty



holding a job, frequent job changes, relationship discord, multiple marriages, and problems with the law such as being more likely to be arrested, convicted or incarcerated (Vierhile et al., 2009).

The societal cost of ADHD in childhood and adolescence was \$42.5 billion in the United States, a total of \$14, 576 per individual in 2005 (Vierhile et al., 2009). Studies from 2005 consistently show that both children and adults with ADHD have an increased annual medical cost per individual than those without the diagnosis at \$1,500 per child and \$3,000 per adult. In addition, family members of children with ADHD had 1.6 times as many medical claims as an individual without a family member with the diagnosis (Matza et al., 2005).

An ADHD diagnosis can also place a burden on family finances due to medication costs, treatment, and decreased work productivity as parents may miss work in order to meet with teachers, health care providers, or mental health professionals. An estimated \$86-138 billion in lost work productivity and education costs is associated with ADHD (Hodgkins, Kahle, & Sikirica, 2012). Parents of children with ADHD report higher rates of self-blame, social isolation, depression, and marital discord (McDonnell & Moffett, 2010).

Finally, ADHD places a burden on providers. With an increased shortage of mental health specialists, it has required primary care providers to diagnose and treat ADHD. Community-based clinicians are now the primary providers of services for children with ADHD and are often the first people patients see when a problem is noticed, usually as a referral from school (Bukstein, 2010). Moreover, clinicians are

frequently asked about signs and symptoms of ADHD, so it is of utmost importance to understand not only the nature of the condition, but also the implications of the diagnosis.

### **PROJECT DESCRIPTION**

In an effort to provide appropriate care to children and adolescents who may exhibit symptoms of ADHD, a center designed exclusively for the diagnosis and treatment of ADHD would fill a void in an area where access to mental health services is disparate. Implementing a nurse-managed clinic for this purpose would add a resource for mental health care access, decrease rates of over-diagnosis, misdiagnosis and under-diagnosis of ADHD, and increase adherence to treatment. Moreover, a nurse-managed clinic would establish advanced practice nurses as quality providers of care in the community. The proposed resource center, called *The ADHD Resource Center of Jefferson County*, would be located in Jefferson County, a suburb of St. Louis, Missouri. Evidence demonstrates that the best outcomes are obtained using psychostimulants, behavioral modification and counseling (Scottish Intercollegiate Guidelines, 2011; Wolraich et al., 2011; Jensen, 2009; Molina et al., 2009; Pliszka, 2007). The center would diagnose and manage children and adolescents ages 4-18 with ADHD, offer behavioral therapy, individual and family counseling, and test for learning disabilities as approximately 40% of children with ADHD have a co-existing learning problem (Harvard Medical School, 2008; Wilcutt et al., 2007), using a multidisciplinary approach. The center would operate by accepting referrals from primary care practices throughout Jefferson County and would accept payment from insurance companies. In addition to cash payment system, the center would offer a

sliding scale fee-for-service for the underinsured. To establish a referral base to support such a center, a need assessment survey needed to be performed.

### **RATIONALE AND SUPPORT FOR THE PROJECT**

A 2009 survey done by Thomas et al. illustrated that nearly all counties in the United States had some mental health prescriber shortage and three-fourths of all counties actually demonstrate severe shortage, limiting the number of resources available to patients. Waiting lists to see a mental health care specialist can be up to a year long, and many providers limit the number of Medicare, Medicaid and self-pay patients they accept. Many patients have an established rapport with a primary care office and they often visit there first (Bukstein, 2010; Minkoff, 2009; Pliszka, 2007).

Unfortunately, there is documented discomfort among primary care physicians in the diagnosis and treatment of conditions such as depression, anxiety, bipolar disorder and ADHD. In 2008, Fremont et al. conducted a survey demonstrating that pediatricians and family practice physicians had some level of discomfort in diagnosing and treating children with psychiatric disorders. Pediatricians reported being more comfortable diagnosing and treating ADHD, while family practice physicians felt more comfortable with depression and anxiety.

The shortage of mental health professionals has been a problem for many years, so much so that government involvement has led to the creation of legislation to make mental health care disparity a focus and a cause for reform. In 1996, legislators forbade insurance companies to set annual or lifetime limits on mental health care. In 2002, President George W. Bush endorsed the principle of mental health parity, meaning mental illnesses should be treated the same as physical

illnesses. He established the New Freedom Commission on Mental Health. This commission was to conduct a comprehensive study to identify policies that could be implemented by federal, state and local governments to improve mental health care in the United States by focusing on recovery and delivering excellent care without disparity (Konrad , Ellis, Thomas, Holzer, & Morrissey, 2009). The commission reported that mental disorders often go undiagnosed and recommended screening for consumers of all ages, including preschoolers because “each year, children are expelled from preschools and child care facilities for disruptive behavior and emotional disturbances” (Department of Health and Human Services, 2003). Ultimately, the commission recommended improving the public’s knowledge regarding mental health, greater involvement of patients and families in decision-making, creating individualized care plans, early screening and treatment, and more use of evidence-based practice (DHHS, 2003).

In 2008, the U.S. House of Representatives passed a bill requiring group health plans to provide more generous coverage for treatment of mental health, making it more comparable to physical illness coverage, and applying this coverage to any mental illness described in the current DSM. This also includes treatment for drug and alcohol abuse (Pear, 2008).

Support for mental health parity stems from several factors. First, researchers have identified biological causes for mental illness, reinforcing that it is a medical condition. Second, there are many companies that specialize in managing mental health benefits, thereby making mental health treatment more affordable. Finally, some feel that the stigma of mental illness is fading as more people in authority,

government and military admit to their own experience with mental illness (Pear, 2008).

Despite this apparent increase in awareness and support, it is estimated that 54% of people with serious mental illness still do not receive timely care (Konrad et al., 2009). In 2009, there were 353,398 clinically active providers in six mental health groups in the United States workforce: advanced practice psychiatric nursing, licensed professional counselors, marriage and family counselors, psychologists, psychiatrists, and social workers. The advanced practice psychiatric nurse and psychiatrists made up the smallest percentage of the workforce. Rural, low-income counties had the fewest mental health care providers per capita, where highly populated, high-income counties housed the most (Ellis, Konrad, Thomas, & Morrissey, 2009).

The disparity of mental health care providers in the rural counties has led to primary care providers being asked by parents and teachers to evaluate children and adolescents for ADHD. (Bukstein, 2010; Power, Mautone, Manz, Frye, & Blum, 2009). As professionals who have taken on more roles as primary care providers, APRNs play a crucial role in the diagnosis and management of ADHD and are well-suited to do so. A 2008 systematic review of the literature published between 1990 and 2008 by Newhouse et al. clearly establishes that APRNs provide similar, if not better care than physicians, had higher patient satisfaction rates, and could easily augment the physician in efforts aimed at expanding access to care. Nurses are patient advocates, a quality necessary to assist patients and families to achieve goals at home and school (Vierhile et al., 2009). As previously established, APRNs are

more likely to use clinical practice guidelines which aids in prompt diagnosis and effective treatment of ADHD, thereby lessening the impact of the condition (Vlam, 2006).

## **CHALLENGES FOR THE APRN**

### **Missouri Practice Act Restrictions**

Despite a seemingly complex web of rules and regulations regarding advanced nursing practice in the state of Missouri, it is quite possible for the APRN to practice with a certain level of autonomy. In order to practice as an advance practice registered nurse, APRNs must be board-certified by the state, and have a collaborative practice agreement with a physician with a similar specialty. APRNs that practice outside of their specialty must function at the level of the registered nurse.

Once a collaborative practice agreement is agreed upon and signed, the physician must work directly with the APRN for one calendar month before going off-site. The physician is limited to three full-time equivalent collaborative practice agreements at one time. He or she must be within 30 miles of the APRN by road in a non-health professional shortage area, or 50 miles of the APRN by road in a designated health professional shortage area in order for the collaborative practice agreement to remain valid. The collaborating physician must review 10% of the APRNs patients' charts every two weeks, 20% where controlled substances have been prescribed. In addition, this review and process must be documented and kept on file. APRNs may write prescriptions, but prescriptions must conform to laws and contain the name address and telephone number of the APRN and collaborating

physician. In addition, when sampling medications, APRNs are limited to 72 hour dispensing boundaries. Drugs must be labeled, packaged and stored according to regulations. Logs must be kept for dispensing them. Methods of treatment and authority to administer, dispense or prescribe drugs delegated to the APRN cannot be further delegated. Other regulations include that the diagnosis and initiation of treatment for acutely or chronically ill or injured conditions other than acute self-limited or well-defined parameters be seen by the physician no more than two weeks later (Missouri Department of Professional Registration, 2012).

Recently, new legislation has been passed regarding prescriptive authority for APRNs in Missouri. Provided the collaborating physician agrees for the APRN to prescribe controlled drugs and it is delegated in the collaborative practice agreement, Schedules III-V may now be prescribed by the APRN, but Schedule III is limited to 120 hour supply without refill. To obtain this authority, the APRN must submit a document of recognition, application and appropriate fee to the state board of nursing, current proof of certification, provide evidence of having a three credit hour pharmacology class within the past 5 years which must include 300 hours of preceptored experience or a letter from the university attended describing how this was accomplished within the curriculum. If not applicable, 45 continuing education hours in pharmacology may be submitted. The APRN must also provide evidence of a minimum of 800 clinical practice hours as an APRN with the last 2 years. Official transcripts must be sent. Once the APRN receives controlled substance prescriptive authority, he or she may apply for a Board of Narcotics and Dangerous Drugs (BNDD) registration number and a federal Drug Enforcement Agency (DEA)

number. Any restrictions on the collaborating physician's BNDD number will apply to the APRN as well (Missouri Department of Professional Registration, 2012).

Every two years, the APRN must provide evidence of a minimum of 800 clinical practice hours and 60 contact hours in their field of specialty offered by a university or accredited college. They must adhere to all the requirements of the BNDD and DEA.

If an APRN practices in a nurse-managed clinic, the above rules still apply and the physician must be present at the site at least once every 2 weeks (Missouri Department of Professional Registration, 2012). However, in some specialties, such as mental health, and in rural areas, it can be difficult to find a collaborating physician, not to mention pay substantial fees for collaboration if he or she is practicing without a physician on site.

Another barrier is reimbursement for APRNs. In Missouri, APRNs are considered capable of being licensed independent providers by the Board of Nursing, Joint Commission on Accreditation of Healthcare Organizations, and all of the APRN certification organizations, however, numerous insurance companies will not reimburse Missouri APRNs for their services. Like physicians, APRNs must apply for credentialing with each commercial managed care organization, health maintenance organization, commercial indemnity insurer, Medicare, and Medicaid. The application process and approval takes time. However, APRNs are considered "midlevel providers" or "physician extenders" and are not reimbursed the same fee-per-service as a physician despite carrying out the same task. A Medicare patient seen for an existing condition by an APRN will only receive 85% of what a physician receives.



Some physicians are concerned that they are liable for care that they did not provide. Reeducating physicians, multidisciplinary team members, legislators, and the public as the role of the APRN continues to be an ongoing endeavor. Due to the restrictions in Missouri, the role of the APRN can be confusing because there is a lack of understanding about what the role entails. Local and national organizations such as Missouri Nurses Association, The American Academy of Nurse Practitioners and The American Nurses Association continually publish literature clarifying the role, yet there is still a lack of respect for APRNs in the medical community. Since 1974, numerous studies demonstrate that APRNs have increased patient satisfaction, increased patient compliance and outcomes equivalent to or better than physicians, but the American Medical Association continues to publish unsubstantiated reports questioning the safety of APRN practice (Missouri Nurses Association, 2012).

Seventeen out of fifty states today do not require a collaborative practice agreement, and twenty-three only require one for prescribing (MONA, 2012). APRNs still contribute to good health outcomes for their health care consumers. Yet the war between medicine and nursing continues to deny the APRN recognition as a primary care provider in Missouri.

### **IMPORTANCE TO HEALTH CARE AND NURSING PRACTICE**

Cost-effective, quality medical treatment and access to care are national concerns. The statutory regulations that govern APRN scope of practice is determined by each state, causing regulations to vary greatly among the United States, thereby creating barriers to care. These barriers directly affect access to healthcare and the cost and time

associated with healthcare delivery. Missouri ranks 50 out of 51 areas in access to care (MONA, 2012).

According to the Missouri Nurses Association (2012), the Patient Protection and Affordable Care Act (PPACA) will introduce 374,000 patients by 2013 and 600,000 patients by 2019. Currently, Missouri has 6,000 APRNs practicing in rural and urban settings, and many of them are the only providers of care in healthcare shortage areas. Moreover, an aging physician population and fewer medical students entering primary care, access to care will continue to be profoundly affected. These shortages contribute to poor health care outcomes, as the United States ranks 37<sup>th</sup> in overall healthcare outcomes (MONA, 2012) despite spending that is double that of other industrial nations. With well-established research studies to support the role, the APRN is in a position to provide the type of care consumers need and at an affordable price.

## **PROJECT ACTIVITIES AND METHODS**

### **Project Plan**

The primary objective of this project was to develop a survey to determine provider receptiveness to referring patients to an APRN-managed center for the diagnosis and management of Attention Deficit/Hyperactivity Disorder. A secondary aim of this project was to develop a business plan for the center, provided feedback from the surveys was determined to be supportive. This business plan would have included a description of a potential clinic location, a budget describing the financial needs inherent in starting a clinic, the location and amount of money needed to start the practice, prospective staffing needs, as well as a list of services to be provided, evidence of the need for those services, projections for the practice's income compared with expenses, a description of the

principal business owner, an organization plan, a plan for managing daily operations, potential problems and critical risks, as well as a plan for addressing or minimizing the risk. In addition, marketing strategies and a timeline for opening the center would have been designed. This would have been accomplished by working closely with a mentoring APRN who is already established as an independent provider and business owner in the community. If the study proved that the center was infeasible, a business plan would not have been developed.

### **Project Design**

Dillman's Tailored Design Method (TDM) provided the framework for survey creation and implementation. This method increases survey return rates by 70%.

(Dillman, 2000).

During this project, four contacts were made with subjects. First, a pre-notice letter (Appendix A) was mailed to each subject describing the purpose of the survey. Five days later, an anonymous survey (Appendix B) was mailed to the subjects with a self-addressed, stamped return envelope. Subjects were asked to complete the survey and return it to the principal investigator by a given deadline. One week later, a post card (Appendix C) was sent to all participants reminding them to complete the survey. Two weeks after the postcard was sent, a thank you note and replacement survey (Appendix D) was mailed to all subjects along with a self-addressed, stamped envelope.

### **Project Questions**

The primary project questions derived from the project objectives were:

1. Do providers use clinical practice guidelines to diagnose and manage ADHD in children and adolescents ages 4-18?

2. What is the perceived comfort level of providers concerning diagnosis and management of ADHD in children and adolescents?
3. Will providers refer their ADHD patients to a specialty center for diagnosis and management?
4. Will providers refer their ADHD patients to a specialty center managed by an APRN?

### **Project Setting**

The project was conducted via United States Postal Service mail correspondence with participating physicians, APRNs and physician assistants practicing in pediatrics, family practice and internal medicine in Jefferson County, Missouri, a suburban area in the Midwestern United States.

### **Project Participants**

Eighty-four study participants were identified using a public directory of health care providers in Jefferson County, Missouri. Of the 84 providers in the area, 75 providers had a current address listed. Eight subjects were listed by the post office as unable to forward, and one subject was deceased. The subjects were not compensated for their participation in the project. The following inclusion criteria were developed for participation:

1. The subject must be a health care provider with the credentials of Medical Doctor (MD), Doctor of Osteopathy (DO), Nurse Practitioner (NP), or Physician Assistant (PA).
2. The subject must currently work in internal medicine, family practice, or pediatrics in Jefferson County, Missouri.

3. The subject must treat children and adolescents ages 4-18.
4. The subject must return the answered survey.

### **Project Plan Awareness/Approval**

This project was granted exempt status from University of Missouri, St. Louis Institutional Review Board. University of Missouri, St. Louis Graduate School Approval was obtained August 7, 2012.

### **Human Subject Protection**

There were no human subject violations during the implementation of this project. The surveys contained no identifying markers or information. All surveys and responses were voluntary and anonymous.

## **PROJECT METHODS**

### **Data Collection Timeline**

Based on the TDM, it was decided that at least a 30% response rate was needed to determine feasibility of the proposed center. Data collection commenced on August 8, 2012 with the mailing of the pre-notice letter, the day after IRB Exempt Status and Graduate School approval was obtained. The first survey was then mailed on August 13, 2012. Reminder postcards were sent a week later on August 20, 2012. A thank you note and replacement survey was sent on September 4, 2012. The last completed survey was received on September 16, 2012, marking the close of the project implementation process.

## **DATA SUMMARY**

The primary purpose of this project was to determine if providers would refer their ADHD patients to a specialty clinic managed by an advanced practice nurse. A

secondary aim of this project was to develop a business plan for the center, provided feedback was determined to be supportive. To evaluate this, a total of 84 surveys were distributed to the providers identified in Jefferson County, Missouri. Eight were unable to contact due to the inability to locate a current address, and one provider was deceased. A total of 34 surveys were returned, two were returned incomplete, resulting in a response rate of 42.7%. This resulted in a final sample of 32 participants. Table 5 illustrates respondent's credentials, and whether they treat children and adolescents or ADHD, information describing their practice, and insurance demographics. The two incomplete surveys were discarded from consideration.

Table 5.  
Provider Demographics (n=32)

Variable	Number	Percent of Sample
Profession description		
MD	18	56.2%
DO	6	18.8%
NP	8	25.0%
Multi-provider practice		
Yes	27	84.4%
No	5	15.6%
Ability to refer independently		
Yes	30	93.8%
No	2	6.3%
Willingness to refer independently		
Yes	23	71.9%
No	6	18.8%
No answer	3	9.4%
Treatment of children and adolescents		
Yes	29	90.6%
No	3	9.4%
Treatment of ADHD		
Yes	28	87.5%

No	3	9.4%
No answer	1	3.1%
Description of Insurance Payer Mix		
Medicare	0	0
Medicaid	0	0
Managed Care	1	3.1%
Third party/commercial	0	0
Self-pay	0	0
All of the above	14	43.8%
Some combination of the above	17	53.1%

The largest group of responders was the MD group (56.2%), followed by the NP group (25%), then the DO group (18.8%). Nearly 91% of subjects reported treating children and adolescents, and 87.5% treated ADHD in their practice. Most subjects reported practicing in a multi-provider group (84.4%), and would refer outside of their practice regardless of what their partners did (71.9%). Just over half of the subjects answered they accepted a combination of insurance providers such as Medicare, Medicaid, managed care plans, third party/commercial, and self-pay patients (53.1%). Nearly 44% answered they accepted all the listed payers.

One subject was removed from analysis because he/she did not meet the inclusion criteria of treating ADHD and/or children and adolescents. As a result, only 31 subject responses were included in the analyses related to clinical practice guidelines use and willingness to refer to an ADHD center. As both MDs and DOs have similar scopes and practices, and given the size of the survey, the MD and DO group were collapsed into one group for final analysis.

Table 6.

## Provider Responses Regarding ADHD Clinical Practice Guidelines (CPG) (n = 31)

<u>Variable</u>	<u>Number</u>	<u>Percent of Sample</u>
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Physician comfort level in diagnosing and managing ADHD (n=23)		
Very comfortable	11	47.8%
Comfortable	11	47.8%
Uncomfortable	1	4.3%
APRN comfort level in diagnosing and managing ADHD (n=8)		
Very comfortable	1	1.2%
Comfortable	2	2.5%
Uncomfortable	4	50.0%
No answer	1	1.2%
Physician Awareness of CPG (n=23)		
Yes	19	82.6%
No	4	17.3%
APRN Awareness of CPG (n=23)		
Yes	7	87.5%
No	1	1.2%
Physician Use of CPG (n=23)		
Yes	15	65.2%
No	6	26.0%
Sometimes	1	4.3%
No Answer	1	4.3%
APRN Use of CPG (n=8)		
Yes	4	50%
No	3	37.5%
No Answer	1	1.2%
Type of CPG Used (n=31)		
AAP	14	45.2%
AACAP	1	3.2%
Both	5	16.1%
Neither	3	9.4%
Other	0	0
No answer	8	25.8%
Portion of CPG Used (n=31)		
Diagnosis	2	6.5%
Management	0	0
Follow-up	2	6.5%
All Parts	11	35.5%
Diagnosis, Management	3	9.7%
Diagnosis, Management, Follow-up	1	3.2%
Management, Follow-up	1	3.2%



No Answer	11	35.4%
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Note: \*AAP= American Academy of Pediatrics, AACAP= American Academy of Child and Adolescent Psychiatry

Nearly the entire physician group responded they were either “Very Comfortable” (47.8%) or “Comfortable” (47.8%) with diagnosing and managing ADHD. The majority of the NP group (50%) answered they were “Uncomfortable” with diagnosing and managing ADHD. This is not reflected in the literature which states most physicians are uncomfortable diagnosing ADHD (Fremont et al., 2008).

The majority of both physicians and APRNs answered they were aware that CPGs for the diagnosis and management of ADHD existed (physician group 82.6% vs. NP group 87.5%) and that they used them to evaluate and treat their patients (physician group 65.2% vs. NP group 50%). However, a substantial portion answered they did not use CPGs (physician group 26% vs. NP group 37.5%). This is not mirrored in the literature which states the APRN tends to use CPGs more often than physicians (Abrahamson, Fox, & Doebbeling, 2012; Pogorzelska & Larson, 2008; Sinuff, Eva, Meade, Dodek, & Heyland, 2007; Vlam, 2006). The most commonly cited CPG used is the American Academy of Pediatrics (45.2%). A little more than a third (35%) said they used all parts of the CPGs to treat their patients. It is important to note that 35.4% of subjects did not answer the question.

Table 7 illustrates the willingness of the provider to refer their ADHD patients not only to a specialty center, but a specialty center managed by an APRN.

Table 7.

Providers’ Willingness to Refer to Specialty Center

<u>Variable</u>	<u>Number</u>	<u>Percent of Sample</u>
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Willingness to refer to an ADHD specialty center (n=23)		
Yes	16	69.6%
No	7	30.4%
Willingness to refer to an ADHD specialty center managed by APRN (n=23)		
Yes	8	33.3%
No	15	62.5%
APRN referral to specialty center (n=8)		
Yes	8	100%
No	0	0
APRN referral to specialty center managed by APRN (n=8)		
Yes	7	87.5%
No	1	1.2%

Almost 70% of physician subjects expressed a willingness to refer to an ADHD specialty center in contrast to 100% of APRNs reporting they would refer to such a center. However, when asked if they would refer to a specialty center for the diagnosis and management of ADHD by an APRN, less than half of those willing in the physician group would refer (33.3%). The majority of the NP group reported willingness to refer to an APRN-managed specialty center (87.5%), with one stating he or she could only refer to psychiatry per the collaborating physician.

These results were shared with the mentoring APRN, Angela Ames-Powers. Mrs. Powers stated she has to examine 18-20 patients per day in her clinic in order to maintain her income, pay overhead and pay her staff. Sixteen (33%) of respondents stated they were willing to refer to an APRN-managed ADHD center. In order to meet the minimum of 18 patient visits a day, 360 patients would need to be referred to the center per month. These 16 providers would have to refer at least 22 patients per month in order for this center to remain open, an unlikely possibility. Dillman (2000), states that people feel uncomfortable when they do something inconsistent with their past behavior.

Since people tend to behave consistently, it can be argued that the 41 subjects who did not respond to the survey would be unlikely to refer their ADHD patients to the clinic. Therefore the number of potential referrals was determined to be insufficient for establishing this type of center in Jefferson County, Missouri. Because the feasibility of an advanced practice registered nurse-managed ADHD center was not established, a business plan was not developed.

## EVALUATION

### **Provider Comfort Level**

In this study, 50% of the APRN group answered that they were “Uncomfortable” with diagnosing ADHD as compared with the physician group who were “Comfortable” to “Very Comfortable” (47.8% and 47.8%). The comfort level of providers diagnosing and managing ADHD is relatively understudied. Only one article was found regarding this subject and this project did not mirror those results which reported that APRNs were comfortable and more likely to use CPGs to diagnose and ADHD (Vlam, 2006).

### **Provider Use of Clinical Practice Guidelines**

While both survey groups reported that they were aware of clinical practice guidelines, 45.2% reported they followed AAP recommendations and 35.4% did not use any CPGs in their management of children with ADHD. Further investigation is needed to determine how often these guidelines are used and why providers do not use the ADHD CPGs in practice. Primary care pediatricians have complained of lack of clarity on how to interpret discrepancies in assessment, limited knowledge on community resources and how to identify which child needs a psychiatric evaluation (Power et al.,

2008). More research is needed to determine the reasons APRNs are not as comfortable diagnosing and managing ADHD compared to the physician group.

### **Providers' Willingness to Refer to an APRN-Managed Center**

Subjects were asked to explain why they would or would not refer to an APRN-managed center. While nearly 71% of physicians reported willingness to refer to an ADHD specialty center, less than half of that group would not refer to a specialty center managed by an APRN. Some respondents made qualitative comments like "I can do it better," "the APRN has limited training and even less clinical experience," and "most patients want to start out with a physician." Other respondents stated they would not use an APRN-managed center out of concern about the APRN role. An example of this type of comment is "APRNs cannot prescribe controlled substances, so prescribing may be an issue." One response was concerning the subject's own practice. "Half of my patients are ADHD. If I referred them, I wouldn't see enough patients." While the latter is a legitimate concern, the majority of subjects did not answer why they would not refer to the APRN-managed center.

Research consistently shows APRNs are cost effective, provide quality care and have equal or improved health care outcomes as compared with physicians. Many studies show that APRNs reduce hospital stays thus resulting in decreased cost of care, have low readmission rates, decreased emergency room use, decreased drug utilization, decreased laboratory cost and more use of preventative medicine (MONA, 2012).

Further work needs to be done to study the issue of reluctance to refer to APRN-managed centers.

## **LIMITATIONS**

There were several limitations to this study. First, the sample size was relatively small, despite sending the survey to the 84 providers in Jefferson County and following the TDM framework. Second, the survey was anonymous, thus limiting the ability to follow-up and clarify responses. Asking providers' specialty would have lent greater understanding to the results, such as which specialties were more comfortable diagnosing and managing ADHD, as well as which specialties would consider referring to an APRN-managed specialty center. Third, the survey did not ask how many patients subjects would refer to the center, which could have given a better understanding of potential referral sources. Finally, asking what diagnostic methods subjects use, such as a parent interview, observations, various rating scales, school reports could have established a better understanding of how ADHD is being diagnosed and perhaps why guidelines are not consistently used.

## **BARRIERS AND CHALLENGES TO THE PROJECT**

A challenge encountered with the project was ensuring that all of the providers in Jefferson County were invited to participate in the survey. Using the most current issue of the local telephone directory was inaccurate as nearly 10% of the providers did not have a current address listed. The local hospital directory was consulted for the providers' surveys that had been returned as "Unable to Forward," and mailed again.

## **APPLICATIONS FOR PRACTICE**

### **Implications for Further Research**

This project yielded several implications for further research. More work is needed to establish why clinical practice guidelines are not being used consistently to

diagnose and manage ADHD. Important questions to study include: If primary care providers are aware of the guidelines, why are they not being utilized? Are they too cumbersome? For example, it is not certain if this discrepancy can be attributed to differences in the way APRNs and physicians are educated or if it is due to the roles that these clinicians assume after finishing their education. However, it would be necessary to pair with a PhD-prepared nurse to develop means to investigate this understudied area.

Further work is needed to explore and explain the finding that physicians in this sample expressed a willingness to refer to an ADHD specialty center for diagnosis and management of ADHD, but not to a center managed by an APRN. This finding has profound implications not only for research, but for policy change. Since 1974, research has established that the APRN provides safe, high quality, cost-effective care, equal to or better than physicians, but attitudes and beliefs regarding that care that APRNs give remains shrouded in mistrust. Further research in this area is needed to continue to support positive change for the APRN role.

### **DNP Education Influence on Personal APRN Practice**

DNP preparation can have a profound impact on professional nursing careers by enabling APRNs to translate research and apply evidence-based medicine in care provided to patients, thereby increasing the quality of that care. This researcher is now familiar with clinical practice guidelines and uses them to consistently diagnose and manage ADHD. DNP preparation was important during this project, because without it, an APRN could not have delved into the problem concerning the diagnosis and management of ADHD among primary care providers. Without DNP preparation, a new

APRN would have difficulty seeing beyond individual patient care and affect changes in healthcare for aggregate groups.

The DNP program also helps APRNs develop leadership skills and instills the confidence to foster change. It opens minds and forces APRNs to think in broader directions. While there is still a great deal of change to be wrought regarding the beliefs and attitudes of physician providers and the role of the APRN, only a leader can elicit input from all of the stakeholders and implement this change in order to move forward. This type of leader will be necessary to advocate for the APRN, educate physician providers regarding the role of the APRN, and assist in the continual evolution of the APRN role.

Through this project, the DNP program has assisted in a personal quest to validate that there is inconsistency in the diagnosis and management of ADHD. Most importantly, this researcher has come to understand her own child, and has made an effort to help other parents and children who have had similar experiences despite the infeasibility of this specialty center.

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## APPENDICES

### **Appendix A. *First Contact: Pre-Notice Letter***

August 8, 2012

Dear Sir or Madam:

In a few days, you will receive a request to complete a brief questionnaire for a DNP scholarship project being conducted to discover provider's beliefs about the diagnosis and management of Attention Deficit Hyperactivity Disorder in children and adolescents ages 4-18.

Your participation will involve receiving and/or completing:

- an anonymous survey that will be mailed to you with a self-addressed, stamped return envelope
- a reminder post card that will be mailed two weeks later
- a replacement survey with another reminder letter that will be mailed two weeks later for those who may not have filled it out

Approximately 90 subjects may be involved in this research.

The amount of time involved in your participation will be approximately 5 minutes, and you will receive nothing for your time. There are no anticipated risks associated with this research. There are no direct benefits for you participating in this study.

However, your participation will contribute to the knowledge about providers' beliefs regarding the diagnosis and management of Attention Deficit Hyperactivity Disorder in children and adolescents ages 4-18 Jefferson County Missouri, and may help society.

Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.



By agreeing to participate, you understand and agree that your data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.

If you have any questions or concerns regarding this study, or if any problems arise, you may call the Principle Investigator, Kara J. Stackley (636)448-3844 or the Faculty Advisor, Dawn Garzon, (314) 516-7094. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at (314) 516-5897.

Thank you for your time and consideration. Without your input, research for this area of need could not be completed.

Sincerely,

Kara J. Stackley, FNP-BC

University of Missouri, St. Louis

**Appendix B. *Second contact: The Questionnaire Mail-out***

August 13, 2012

Dear Sir or Madam,

I am seeking your assistance for completion of a DNP scholarship project regarding providers' beliefs about the diagnosis and management of Attention Deficit/Hyperactivity Disorder in children and adolescents ages 4-18.

To participate in this study, simply answer the survey questions, place the completed survey in the enclosed self-addressed, stamped envelope and drop it in the mail. It should take approximately 5 minutes to complete. Please be advised that the survey is completely anonymous and there is no way to know who has or has not completed it. No identifying information will be collected.

By returning the questionnaire, you are providing consent to participate in this study. The research team values your opinion. You can elect to not participate in this study, and you may choose to answer or not answer any question. Please call me with any questions or concerns at (636)448-3844. You can also call the Office of Research Administration at (314)516-5897 regarding your rights as a research participant.

Your response would be appreciated by August 23, 2012.

Sincerely,

Kara J. Stackley, FNP-BC

University of Missouri-St. Louis

**Need Assessment Survey**

1. Describe your profession:

MD                      DO                      NP                      PA

2. Do you treat children and adolescents in your office?

Yes    No

3. Do you treat ADHD in your office?

Yes    No

4. What is your comfort level regarding the diagnosis and management of ADHD in children and adolescents?

Very comfortable                      Comfortable                      Uncomfortable

5. Are you aware of clinical practice guidelines for the diagnosis and management of ADHD?

Yes    No    Unaware

6. If you are aware of clinical practice guidelines for the diagnosis and management of ADHD, do you use them in your practice?

Yes    No

7. If you do use clinical practice guidelines for ADHD in your practice, which ones do you use?

AAP              AACAP                      Both                      Neither

Other \_\_\_\_\_

8. If you use clinical practice guidelines for ADHD in your practice, which part of the guidelines do you use?

Diagnosis                      Management (behavior mod, medication, combination therapy)

Follow-up

All parts of the guidelines

9. Would you consider referring your ADHD patients to a specialty center for diagnosis and management?

Yes                      No      If no, why not?

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10. Would you consider referring your ADHD patients to a specialty center solely for the purpose of diagnosis and management of ADHD performed by a family nurse practitioner who is practicing within the rules and regulations of the state of Missouri?

Yes                      No      If no, why not?

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11. Are you in a multi-provider practice?

Yes                      No

12. Do you have the ability to refer patients independently?

Yes                      No

13. If yes, would you refer your patients to a specialty center solely for the purpose of diagnosis and management of ADHD regardless of what your collaborators do?

Yes                      No

14. Please describe your insurance demographics:

Medicare      Medicaid      Managed Care      Third party/commercial  
Self-pay

**Appendix C. *Third Contact: The Reminder Post Card***

August 20, 2012

Last week, a survey was sent to you seeking your responses regarding providers' beliefs about the diagnosis and management of Attention Deficit/Hyperactivity Disorder in children and adolescents ages 4-18.

If you have already completed your survey, please accept my sincere thanks. If not, please do so today. I am especially grateful for your help because it is through your input and thoughts that research in this area can expand. Because all surveys are anonymous, I have no way of knowing who has or has not already responded.

If you did not receive a questionnaire, if it was misplaced, or you have questions or concerns, please call (636)448-3844. You may also call the Office of Research Administration at (314)516-5867 regarding your rights as a research participant.

Kara Stackley, FNP-BC

University of Missouri-St. Louis

**Appendix D. *Fourth Contact: The Reminder Post Card with Replacement Survey***

September 4, 2012

Dear Sir or Madam:

About two weeks ago, I sent a survey to you that asked for your input regarding providers' beliefs about the diagnosis and management of Attention Deficit Hyperactivity Disorder in children and adolescents ages 4-18.

I am looking for your input regarding the diagnosis and management of Attention Deficit Disorder in children and adolescents ages 4-18 and how it applies to your practice. I want to stress the importance of how you practice provides information to further the research in this particular field. If you have already returned it, thank you in advance and please disregard this letter.

If you haven't yet completed the survey, a replacement has been enclosed. If you have not already responded, please complete the enclosed questionnaire, place it in the enclosed self-addressed, stamped envelope, and drop it in the mail. It should take about 5 minutes to complete. By returning the survey, you are providing consent to participate in this study. You can elect to not participate in this study, and you may choose to answer or not answer each question.

Please be advised that the survey is completely anonymous, and there is no way for me to know who has or has not completed it. No identifying information will be collected, and this is the final time you will be contacted. Please call me at (636)448-3844 with any questions or concerns. You may also call the Office of Research Administration at (314)516-5897 regarding your rights as a research participant. Your response would be appreciated by September 15, 2012,

ADHD Center

Stackley, 2012, UMSL 62

Sincerely,

Kara J. Stackley, FNP-BC

University of Missouri-St. Louis

**Need Assessment Survey**

1. Describe your profession:

MD                      DO                      NP                      PA

2. Do you treat children and adolescents in your office?

Yes    No

3. Do you treat ADHD in your office?

Yes    No

4. What is your comfort level regarding the diagnosis and management of ADHD in children and adolescents?

Very comfortable                      Comfortable                      Uncomfortable

5. Are you aware of clinical practice guidelines for the diagnosis and management of ADHD?

Yes    No    Unaware

6. If you are aware of clinical practice guidelines for the diagnosis and management of ADHD, do you use them in your practice?

Yes    No

7. If you do use clinical practice guidelines for ADHD in your practice, which ones do you use?

AAP              AACAP                      Both                      Neither  
Other \_\_\_\_\_

8. If you use clinical practice guidelines for ADHD in your practice, which part of the guidelines do you use?

Diagnosis                      Management (behavior mod, medication, combination therapy)

Follow-up    All parts of the guidelines

9. Would you consider referring your ADHD patients to a specialty center for diagnosis and management?



Yes                      No                      If no, why not?

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10. Would you consider referring your ADHD patients to a specialty center solely for the purpose of diagnosis and management of ADHD performed by a family nurse practitioner who is practicing within the rules and regulations of the state of Missouri?

Yes                      No                      If no, why not?

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11. Are you in a multi-provider practice?

Yes                      No

12. Do you have the ability to refer patients independently?

Yes                      No

13. If yes, would you refer your patients to a specialty center solely for the purpose of diagnosis and management of ADHD regardless of what your collaborators do?

Yes                      No

14. Please describe your insurance demographics:

Medicare      Medicaid      Managed Care      Third party/commercial  
Self-pay

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