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EXPERT ROUNDTABLE SUPPLEMENT

BEST PRACTICES IN ADULT ADHD: EPIDEMIOLOGY, IMPAIRMENTS, AND DIFFERENTIAL DIAGNOSIS

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ABSTRACT

Attention-deficit/hyperactivity disorder (ADHD) is commonly thought to be a pediatric disorder whose symptoms attenuate or disappear in adulthood. In fact, ~4% of adults in the United States have ADHD, and many of these adults are unaware that they have the disorder. Because symptoms of ADHD manifest differently in adults and children, physicians who are familiar with childhood ADHD have difficulty identifying the disorder in adults. Adults with ADHD themselves may be poor informants about their symptoms and impairments. A high prevalence of mood and other co-morbid disorders in adults with ADHD can also complicate diagnosis and treatment. Adults with ADHD experience high rates of anxiety disorders, mood disorders, substance use disorders, and impulse disorders. Adult ADHD is related to impairments in executive functioning and adaptive functioning; these patients have unique deficits related to their roles as parents, caregivers, and employees. Physicians should use impairments to guide treatment design. Early identification and treatment of ADHD can alter the developmental course of co-morbid disorders. Unfortunately, metrics for impairment in adult ADHD are still in their infancy.

This Expert Roundtable Supplement represents part 1 of a 3-part supplement series on adult ADHD led by Lenard A. Adler, MD. In this activity, Thomas J. Spencer, MD, reviews the epidemiology of adult ADHD in the US and around the world; Mark A. Stein, PhD, reviews data on the impairments resulting from adult ADHD; and Jeffrey H. Newcorn, MD, discusses the differential diagnosis of adult ADHD and common co-morbidities.



This activity is jointly sponsored by the Mount Sinai School of Medicine and MBL Communications, Inc.



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This activity has been peer reviewed and approved by Eric Hollander, MD, Chair and Professor of Psychiatry at the Mount Sinai School of Medicine. Review Date: July 22, 2008.

Statement of Need and Purpose

Although attention-deficit/hyperactivity disorder (ADHD) has traditionally been considered a pediatric disorder, up to 65% of children diagnosed with this disorder continue to display behavioral problems and symptoms of the disorder into their adult lives. ADHD has a deleterious impact upon the daily functioning of these adults, who often demonstrate functional impairments in multiple domains, including educational performance, occupation, and relationships. Accurate diagnosis of ADHD in adults is challenging and requires careful consideration of other psychiatric and medical disorders. The majority of adults with ADHD exhibit at least one co-morbid psychiatric disorder, which may confound a proper ADHD diagnosis. Although adult ADHD is a substantial source of morbidity in both psychiatric and primary care settings, only 25% of adults with this disorder had been diagnosed in childhood or adolescence. Among patients who had not received a prior diagnosis, more than half had complained about ADHD symptoms to other healthcare professionals, without being diagnosed. Recognition and treatment of adult ADHD is often based on upwardly extended models of child and adolescent care. However, differing patterns of co-morbidity and symptom heterogeneity in adults pose new conceptual, diagnostic, and treatment challenges. Although several organizations have issued practice guidelines for the assessment of adults with ADHD, there remains confusion and a continued need to determine best practices with regard to these patients. The expert opinions of clinical and research thought leaders in the field provide insight relevant to clinicians faced with the task of recognizing impairment and diagnosing adult ADHD.

Target Audience

This activity is designed to meet the educational needs of primary care physicians and psychiatrists.

Learning Objectives

- Review the epidemiology of attention-deficit/hyperactivity disorder (ADHD), including prevalence, persistence, and co-morbid tendencies.
- Explain the common impairments associated with adult ADHD and how to incorporate assessment of impairment levels into the diagnostic process.
- Discuss the differential diagnosis and psychiatric co-morbidities that require consideration in the assessment of adult ADHD.

Faculty Disclosures

Lenard A. Adler, MD, is a consultant to and on the advisory boards of Abbott, Cephalon, Cortex, Eli Lilly, Novartis, Ortho-McNeil, Janssen, Johnson and Johnson, Merck, New River, Organon, Pfizer, Psychogenics, sanofi-aventis, and Shire; is on the speaker's bureaus of Eli Lilly and Shire; and receives grant/research support from Abbott, Bristol-Myers Squibb, Cephalon, Cortex, Eli Lilly, Janssen, Johnson and Johnson, Merck, National Institute of Drug Abuse, New River, Novartis, Ortho-McNeil, Pfizer, and Shire.

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EPIDEMIOLOGY, IMPAIRMENTS, AND DIFFERENTIAL DIAGNOSIS IN ADULT ADHD: INTRODUCTION

By Lenard A. Adler, MD

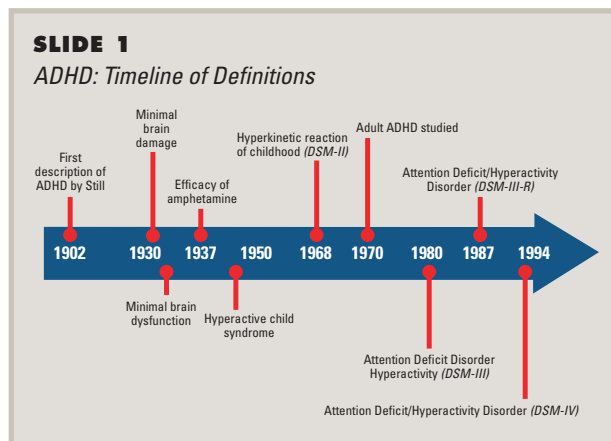
Introduction

In the mid-1970s, attention-deficit/hyperactivity disorder (ADHD) was still believed to be a childhood disorder that disappeared with the onset of adolescence. At this time, Wender¹ studied a cohort of adults presenting with ADHD-like symptoms, all of whom had been diagnosed with ADHD in childhood. Wender prescribed psychostimulants, which successfully produced a response in the adults, thus fostering research into adult ADHD. Of his experience, Wender said:

ADHD is probably the most common chronic undiagnosed psychiatric disorder in adults. It is characterized by inattention and distractibility, restlessness, labile mood, quick temper, overactivity, disorganization, and impulsivity. It is always preceded by a childhood diagnosis, a disorder that is rarely inquired about and usually overlooked.¹

Wender's predictions were later corroborated (although labile mood and quick temper are not defined as core features in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision [DSM-IV-TR]*).² The National Co-morbidity Survey Replication has demonstrated that the prevalence of ADHD in adults in the United States is ~4.4%, but that only 11% of these patients receive treatment.³ Self-report data from Barkley and colleagues⁴ showed a 4.7% ADHD prevalence rate among adults applying for driver's licenses. Four percent of adult college students met *DSM-IV*⁵ criteria for ADHD.⁶ Though Wender had specified that adult ADHD is always preceded by a childhood diagnosis, for many individuals the condition is overlooked during childhood and the diagnosis is never made. However, it is true that all cases of full adult *DSM-IV* ADHD are preceded by childhood onset of significant symptoms.

ADHD has been described over time in such terms as "minimal brain dysfunction" and "minimal brain damage" (Slide 1). ADHD was originally described in 1902 by Still,⁷ whose clinical descriptions of children closely resemble today's diagnostic criteria for ADHD. The first treatment for this disorder was a racemic mixture of amphetamine in 1937. A full adult diagnosis of active ADHD would not be included in the *DSM-III-R*⁸ until 1987.



Diagnostic and Statistical Manual of Mental Disorders Criteria

There are five major criteria for adult ADHD in the *DSM-IV* (Slide 2).⁵ The first criterion is significant presence of six out of nine inattentive symptoms and/or hyperactive/impulsive symptoms over the past 6 months. Patients with six of nine inattentive symptoms have the inattentive subtype of ADHD. Patients with six of nine of the hyperactive/impulsive symptoms have the hyperactive/impulsive subtype of ADHD. Patients with six of nine of both symptom types have the combined subtype.

The second criterion is age of onset. Patients must have onset of at least some symptoms before 7 years of age.

SLIDE 2

ADHD: *DSM-IV* Criteria⁵

- Symptoms must be present for the past 6 months
 - Inattention and/or hyperactivity/impulsivity
- Some symptoms must be present before 7 years of age
- Some impairment from symptoms must be present in two or more settings (eg, school and home)
- Significant impairment: social, academic, or occupational
- Symptoms cannot be accounted for by another mental disorder

DSM-IV=*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.*

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This is best obtained by taking a longitudinal history and obtaining collaterals (information from surviving parents or older siblings or old report cards, when available). Third, some impairment from the symptoms must be present in two or more settings, ie, school, work, or in social settings. It is important to note that the impairment can be relative (ie, underperformance relative to the expected capabilities of the individual). Fourth, the impairment must be significant and fall in the realm of social, academic, or occupational deficit. Finally, symptoms should not be better accounted for by another mental health disorder. If the symptoms of ADHD only appear during the active phase of another mental health disorder, they should be coded for that disorder and not ADHD.

Longitudinal history is critical for making the diagnosis of ADHD. Although the disorder is highly co-morbid (ie, 50% to 75% in adults),³ the onset of ADHD symptoms and those of other disorders will often distinguish themselves over an extended period of time—with the ADHD symptoms generally preceding those of other disorders.

Symptoms Manifestation in Adulthood

Symptoms change over the course of a patient's lifetime. The symptoms noted in the *DSM-IV* are specific to childhood. Clinicians are therefore left to interpret how those symptoms will manifest in adults. Childhood inattention symptoms, such as difficulty sustaining attention, not listening, not following through, not organizing, losing things, and easy distraction, more often present as poor time management, trouble initiating and completing tasks, trouble with multitasking, procrastination, and avoiding activities that demand attention in adults (Slide 3).⁹ Many adults do not recognize that inattention can significantly impact their lives. Adults cope with their symptoms and tend to adapt to them by self-selecting active lifestyles and using support staff. It is important

to observe how adults deal with their symptoms. Adults have a higher cognitive load than children, so it is not surprising that the inattentive symptoms become more problematic as one reaches adulthood.

Hyperactivity symptoms also change over a patient's lifetime. The childhood symptoms are squirming and fidgeting, not staying seated, running about, climbing, not playing/working quietly, being "on the go" or "motor-driven," or talking excessively. This aimless restlessness in childhood migrates to purposeful restlessness in adulthood. Adults often cope with this sense of restlessness by working two jobs, working long hours, or selecting active jobs. Family tension is often a consequence of this constant activity. There may be consequences to the individual's excess activity; for example, long hours at work may compromise time spent with family. These are common complaints. Adults with ADHD tend to avoid low-activity situations, such as circumstances in which they would have to sit still, or they might plan breaks for such circumstances. The frank hyperactivity is often felt rather than manifested because obvious manifestations, such as constantly moving about in the workplace, can be stigmatizing.

Impairments in Adult ADHD

The consequences of ADHD symptoms are significant, and the impairments are notable. Barkley and colleagues¹⁰ compared the adult adaptive outcomes of nearly 140 patients with and without ADHD, following subjects for 13 years. They found that adults with untreated ADHD are four times as likely to contract a sexually transmitted disease and three times as likely to be unemployed. In a population survey of 500 ADHD adults and 501 gender- and age-matched adults without ADHD, Biederman and colleagues¹¹ found that adults with ADHD were twice as likely to be divorced, and twice as likely to have been arrested. Adults with untreated ADHD are 78% more likely to be addicted to tobacco and are less likely to quit a tobacco habit.

SLIDE 3
Inattention Symptoms and their Manifestation in Adults

Many adults do not recognize that inattention severely impairs their lives

DSM-IV Symptom Domain	Common Adult Manifestation
Difficulty sustaining attention	<ul style="list-style-type: none"> • Poor Management • Difficulty • Initiating/completing tasks • Changing to another task when required • Multi-tasking
Does not listen	
No follow-through	
Cannot organize	
Loses important items	<ul style="list-style-type: none"> • Procrastination • Avoids tasks that demand attention
Easily distractible, forgetful	<ul style="list-style-type: none"> • Adaptive behavior • Self select lifestyle • Support staff

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THE EPIDEMIOLOGY OF ADULT ADHD

By Thomas J. Spencer, MD

Introduction

Until recently, little was known about the epidemiology of attention-deficit/hyperactivity disorder (ADHD) in adults. Bottom-up studies following children with ADHD into adolescence had shown variable rates of persistence, some of which depended on the definitions used.¹ The traditional diagnosis was complicated by the introduction of the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition,² which stated that ADHD could be diagnosed with inattentive symptoms alone. This resulted in diagnostic inconsistency as earlier investigations demanded the presence of hyperactivity while others did not. Diagnosis also depended on the site, the cohort, whether interviews versus rating scales were employed, and whether the subject or their parent were the source of information.

According to a meta-analysis by Faraone and colleagues,¹ ~50% of children with ADHD continue to experience symptoms into adolescence and adulthood. The epidemiology of childhood ADHD is ~5% to 8%, which extrapolates to a prevalence of ~4% for adult ADHD.

Epidemiologic Studies: The National Co-morbidity Survey Replication

Two quasi-epidemiologic studies provided much of the data regarding adult ADHD, but these samples were relatively limited. Barkley and colleagues³ surveyed adults applying for driver's licenses, yielding a ~4.7% prevalence of adult ADHD. Heiligenstein and colleagues⁴ surveyed college students, producing an estimated prevalence of 4%. However, there had been no truly systematic studies of the epidemiology of ADHD until Kessler and colleagues⁵ conducted the National Co-morbidity Survey Replication (NCS-R).

The NCS-R is a definitive epidemiologic study of numerous psychiatric disorders, including ADHD. It surveyed a probability sample of 9,282 individuals with initial questionnaires, conducted follow-ups depending on subjects' answers, and calculated back rates of different disorders. Subjects were 18–44 years of age (since confounders were thought to be present in individuals >44 years of age). The survey contained questions about childhood ADHD and a question about

persistence into adulthood. Remarkably, 70% of subjects who endorsed childhood ADHD responded that they continued to have ADHD. In a careful follow-up and re-interview, 100 individuals who met the ADHD criteria and 50 who did not were directly interviewed to confirm the validity of the findings. Several rating scales were used, including the Adult ADHD Self-Report Scale, which was expanded and validated for this survey. (Some of these tools are available free online.⁶) The subjects determined by this survey to have adult ADHD had experienced full childhood ADHD—meeting six out of nine criteria in childhood—and showed current persistent symptoms and impairment. There is concern that these criteria were developed for childhood and may be too restrictive for adults. They may exclude individuals who would benefit from interventions targeting the disorder.

The various correlates and impairments found in the NCS-R mirrored those found in survey studies and in clinical studies of adults with ADHD presenting for treatment: There were more men than women with ADHD, but a much lower ratio overall among adults than that observed in childhood. Adults with ADHD had lower education levels, were less likely to be employed, and were more likely to be separated or divorced. There were also interesting correlates between subpopulations regarding endorsement, where African-American patients had less endorsement of symptoms (Slide 1).⁵

Psychiatric Co-morbidities of Adult ADHD

In epidemiologic samples, the subject pool is not ascertained by people seeking treatment. Thus, there is no referral bias. These surveys are less affected by Berkson's bias, in which patients are more likely to see a doctor if they have two disorders. In the case of the NCS-R, because subjects were assessed independently, one would expect to find less severe illness and less co-morbidity. Surprisingly, there appeared to be very high rates of co-morbidity, mirroring those reported in clinical samples.

The NCS-R sample was meant to independently assess all co-morbid disorders, using state-of-the-art technology and highly trained interviewers. The rates of other disorders in the population were determined

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by the sample. Individuals with ADHD were more likely to have a co-morbid disorder than not. Lifetime prevalence rates were 45% for mood disorder, 59% for anxiety, 36% for substance abuse, 70% for impulse disorders (antisocial personality, oppositional defiant conduct, and intermittent explosive disorder); and 89% for any psychiatric disorder. In addition, 67% had current psychiatric disorder (present within the previous 12 months) (Slide 2).⁵

SLIDE 1

Demographic Correlates of Adult ADHD⁵

	<u>%</u>	<u>OR</u>
<i>Sex</i>		
Female	35.9	1.0
Male	64.1	1.8*
<i>Age</i>		
18–29	43.5	1.0
30–44	56.5	1.1
<i>Education (years)</i>		
<12	18.1	1.7*
12	26.7	1.1
13–15	37.3	1.6
≥16	17.9	1.0
<i>Employment</i>		
Working	71.1	1.0
Student	4.9	0.9
Homemaker	4.8	1.2
Retired	0.7	4.8
Other	18.6	2.4*
<i>Race</i>		
Caucasian	73.5	1.0
African-American	6.2	0.3*
Hispanic	15.0	0.7
Other	5.3	0.7
<i>Marital</i>		
Married/cohabitates	52.5	1.0
Separated/divorced	12.1	1.7*
Never married	35.5	1.2

*P=.05. OR=odds ratio.

SLIDE 2

Psychiatric Comorbidities of Adult ADHD⁵

	<u>12-Month</u>		<u>Lifetime</u>	
	<u>%</u>	<u>OR</u>	<u>%</u>	<u>OR</u>
Any mood	29.9	3.5*	45.4	3.0*
Any anxiety	47.0	3.4*	59.0	3.2*
Any substance	14.7	2.8*	35.8	2.8*
Any impulse†	35.0	5.6*	69.8	5.9*
Any psychiatric	66.9	4.2*	88.6	6.3*

*P=.05. OR=odds ratio.

† Includes antisocial personality disorder, oppositional defiant disorder, conduct disorder, intermittent explosive disorder, bulimia, and gambling.

Epidemiologic studies tend to discover individuals who suffer silently. Subjects are often unaware they have a disorder but may be aware of impairments. In the NCS-R sample, those with ADHD symptoms experienced impairment in virtually every domain. There were high rates of occupational failure, low social functioning, and low cognitive functioning (Slide 3).⁵ Approximately 40% of individuals with ADHD were being treated for mental or substance problems, but only ~10% were receiving treatment for ADHD.⁵ This is a much lower treatment rate than for anxiety, mood, or substance disorders. It is likely that some patients were being treated inappropriately for medical disorders that mirrored or masked the ADHD. The high impairment rates among ADHD subjects may be a reflection of the chronicity of the disorder (many other psychiatric disorders are fluctuant) in addition to the low treatment rates.

SLIDE 3

Impairments in 30-Day Functioning Associated With Adult ADHD⁵

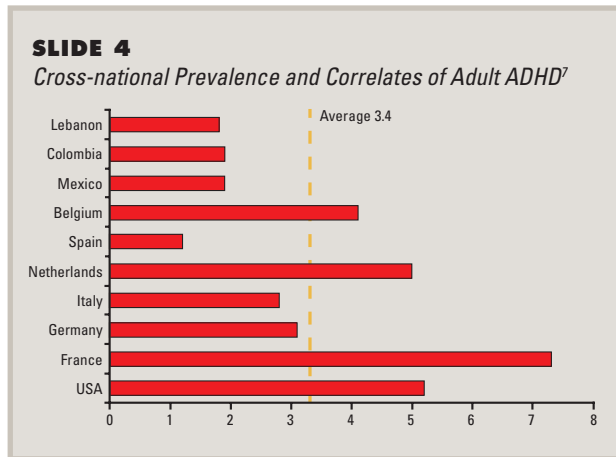
	<u>% ADHD</u>	<u>% No ADHD</u>	<u>OR</u>
High time out of role	15.8	6.0	2.9*
Low role functioning	15.0	6.1	2.7*
Low social functioning	18.7	5.9	3.7*
Low cognition	23.3	5.5	5.2*
Low mobility	8.3	4.7	1.8
Low self-care	6.1	4.0	1.6

*P=.05. OR=odds ratio.

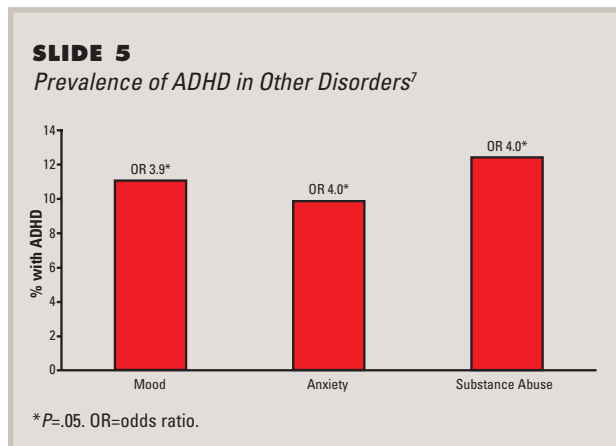
Cross-National Prevalence and Correlates of Adult ADHD

An epidemiologic study by Fayyad and colleagues⁷ investigated populations in 10 countries, including the United States, using a methodology modeled on the NCS-R. The researchers retrospectively assessed childhood-onset, persistent ADHD in 11,432 respondents 18–44 years of age (Slide 4).⁷ Rates of adult ADHD varied from country to country. The average prevalence rate was 3.4%. While there was general agreement between most countries, there were some outliers. For example, the rate reported in France was >7%, statistically greater than the average, and in lower-income countries—Lebanon, Colombia, and Mexico—the rates were statistically lower. Spain was the only country with a higher income that also had a lower rate of ADHD prevalence. In general, however, the same findings reported in the NCS-R were reported in this study. The demographics were similar: ADHD was more common among males and those with less education. It appears that ADHD may have prevented successful matriculation into later grades and resulted in a lesser occupation. The study also found higher rates of separa-

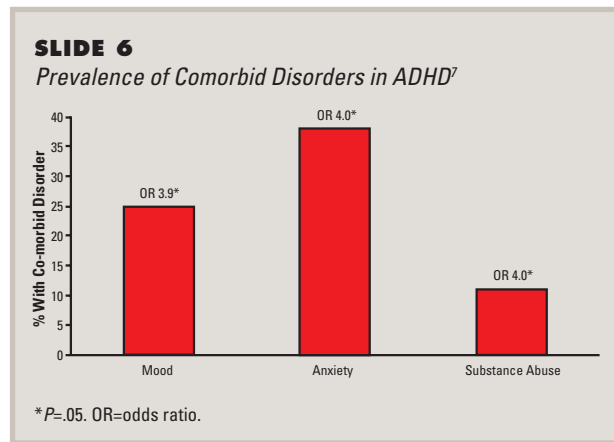
tion and divorce among international adults with ADHD similar to those in the US.



Fayyad and colleagues⁷ also examined rates of ADHD among people with other disorders. These rates were substantial, but lower than rates of other disorders in populations with ADHD. Approximately 10% of individuals with a significant mood disorder had ADHD, an odds ratio of almost four. The prevalence of ADHD was also higher in populations with anxiety disorder and substance abuse than in the general population, which implies that there is some interaction between the disorders, perhaps genetic, environmental, or a combination (Slides 5 and 6).⁷ These data are similar to those described in the US sample.



Higher rates of these co-morbid disorders were found in the ADHD sample; 25% had a significant mood disorder, >38% had an anxiety disorder, and 12% had a substance abuse disorder. Impairments in functioning associated with adult ADHD included low occupational function (time out of role), low cognitive function, low social function, low physical mobility, and low self-care.



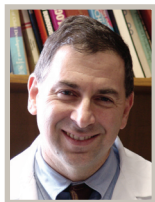
Treatment by a professional varied widely by country. Among respondents with adult ADHD, treatment rates over the previous 12 months for disorders other than ADHD were: 50% in the US; 20% to 24% in Spain, Belgium, and the Netherlands; 9% to 13% in other countries; and 1.1% in Lebanon. While there appeared to be significant amounts of professional treatment in this population, there was seldom treatment specifically for ADHD. Rates of 12-month professional treatment for ADHD among respondents with adult ADHD were: 13.2% in the US; 3.2% in Spain; and 1.9% in Mexico and Lebanon.

Conclusion

Epidemiologic studies of ADHD reveal that while it is a common disorder, it is largely unrecognized in spite of its considerable associated impairments. ADHD is not a benign condition. Rather, it affects all areas of life, and has a substantial correlation with educational, occupational, and social impairment. A broader appreciation of ADHD will be necessary to reduce the frequency and severity of these damaging impairments.

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IMPAIRMENT ASSOCIATED WITH ADULT ADHD

By Mark A. Stein, PhD

Introduction

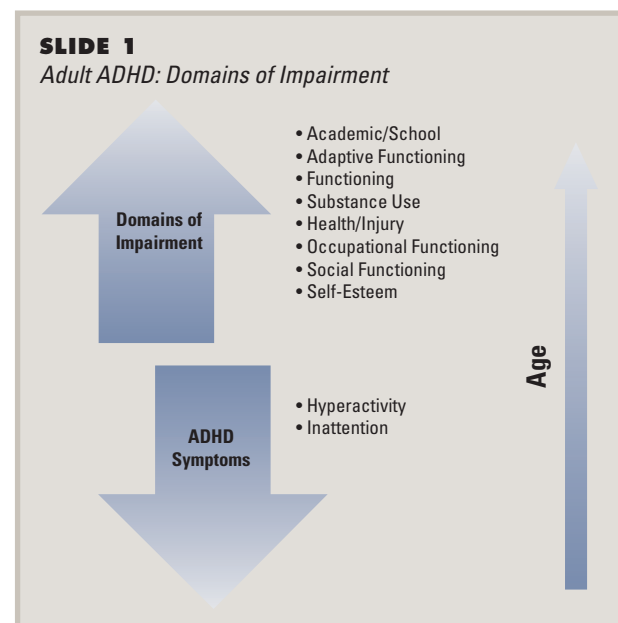
Attention-deficit/hyperactivity disorder (ADHD) is present in 4% to 6% of adults in the United States. In the National Co-morbidity Survey Replication,¹ a diagnosis of ADHD was associated with greater marital problems, unemployment, difficulties in the workplace, and frequent workplace absence. Despite these findings, the body of knowledge regarding impairment in adult ADHD is far from complete. Building upon our knowledge of impairment in adults with ADHD will result in a broader range of treatment outcomes which may be measured and targeted.

Symptoms and Impairment

When considering ADHD, most lay people picture the most prominent symptoms of childhood ADHD—hyperactivity. However, diagnosis of the disorder requires ADHD symptoms and impairment. Experience with childhood ADHD clarifies that there is only a modest correlation between symptoms and impairment.² Less is known about the relationship between ADHD symptoms and impairment in adults. Although hyperactivity and impulsivity symptoms often decline with age, impairment may actually increase as less structure is provided outside of school. Moreover, the cumulative effect of untreated or undertreated ADHD in adults contributes to increased academic, occupational, and social difficulties. In addition to symptoms declining with age, symptoms may also change in form and become more subtle. However, a contrary trend arises with impairments: they tend to accumulate, and therefore may be more obvious than ADHD symptoms once a patient reaches adulthood.

Impairment occupies a wider range of domains in adults than in children or adolescents (Slide 1). Impairment in children typically begins with problems in school and often extends to circumstances beyond school and academics as children get older. Adults with ADHD tend to perform poorly at work, resulting in severe consequences. Difficulty at work can cause financial stress and may be compounded if the individual has several jobs or experiences problems in multiple areas of work, such as poor relationships with supervisors, trouble with deadlines, and absenteeism. Adults with ADHD, like children with ADHD, may be more accident-prone. Moreover, adults tend to overutilize medical resources and may have more health difficulties. Adults with ADHD, like children, have higher rates of substance

abuse disorder. They also tend to have unique deficits relating to their specific roles, whether those roles are student, parent, caregiver, or employee. In addition, much impairment seems to be related to the co-morbid characteristics of the disorder in adults. For example, an adult with ADHD and co-morbid antisocial personality may experience legal difficulties.



Follow-Up and Cross Sectional Studies of ADHD-Related Impairments

Deficiencies in adaptive functioning relative to ability occur in individuals with ADHD at all age levels. In a 1993 longitudinal study by Weiss and Hechtman,³ ~20% of adults with ADHD reported that they experienced difficulties with sexual adjustment. Barkley and colleagues⁴ delineated some of the sexual difficulties in a longitudinal study of hyperactive children, mostly boys, who were followed into young adulthood. These hyperactive children were compared to socioeconomic status-matched controls. Children with ADHD, in their adolescence and adulthood, tended to have sex 1 year earlier, and tended to be more promiscuous, than controls.⁵ Sixteen percent of the adolescents and young adults with ADHD were treated for a sexually transmitted disease, versus 4% of the controls. The ADHD group was also less likely to use contraception; 38% of those with ADHD had an unplanned pregnancy, versus

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Disclosures: Dr. Stein is a consultant/advisor to Abbott, Novartis, and Pfizer; is a speaker for Novartis and Ortho-McNeil; and receives research support from Eli Lilly, National Institute of Mental Health, Organon, Ortho-McNeil, and Pfizer.

4% of controls.^{4,5} Among those with children, 54% did not have custody.

Longitudinal studies indicate that young adults and adults with ADHD seem to have more academic and vocational underachievement (Slide 2). For example, college completion for an individual with ADHD often requires 5–6 years rather than 4 years, if college is completed at all. This, along with the aforementioned risk of substance abuse, early and risky sexual behavior, and impairments in adaptive functioning, creates a pattern of instability. Often, adults with ADHD become demoralized and convinced that failure is externally determined.

SLIDE 2

What Do We Know About Impairment?

Longitudinal studies of children with ADHD, combined type

- Academic and vocational underachievement
- Substance use and abuse
- Early and risky sexual behavior
- Poor adaptive skill performance
- Poor executive functioning
- Less stability in life
- Demoralization and low self esteem
- Caveat: may be less severe for inattentive type

Similarly, a cross-sectional study by Murphy and Barkley⁶ examined the presenting complaints of a group of adult patients seeking treatment for difficulty at work, school, or with relationships (Slide 3). Many had emotional problems such as low self-esteem, antisocial behaviors, substance abuse, and criminality. The majority had deficits in adaptive functioning.

SLIDE 3

Chart Review of Presenting Symptoms of ADHD Adults⁶

Poor school/work performance

Poor interpersonal skills (few friends, marital dissatisfaction)

Emotional problems (low self-esteem)

Antisocial behavior (substance abuse, crime)

Adaptive deficits

- Less educated than others of cognitive ability
- Poor financial management
- Chaotic personal and family life (divorces, moves)

There are some limitations to ADHD studies as the majority of the longitudinal studies were conducted prior to development of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*⁷ criteria and consisted primarily of individuals with the combined subtype (inattention plus hyperactivity). In addition,

most of the subjects in these studies were male. Consequently, much less is known about the impairments experienced by females and by those with the inattentive subtype.

Case Examples

Three cases illustrate common impairments associated with adults who present for ADHD evaluation and how clinicians might address them.

Tom was a 24-year-old student in his 6th year of college. He had attended community college and two 4-year schools, and had changed his major ~7 times. His grade-point average was 1.7. He drank heavily, often slept in, and missed many classes. His parents were very upset that his tuition costs were not yielding any concrete benefits. Tom was also unable to balance his budget, and constantly ran out of money as a result. However, these behaviors were not new: Tom has exhibited childhood symptoms of inattention and impulsivity. He had graduated high school at the bottom half of his class. Tom clearly exhibited both child and adult symptoms of ADHD and significant impairments.

Stephanie was a 25-year-old second-year medical student. She had been diagnosed with ADHD in college, during which stimulant treatment had resulted in a dramatic improvement in her grades. Stephanie had been very driven and had excelled in her undergraduate courses. Because of her diagnosis, she had received accommodations during the Medical College Admission Test and was subsequently admitted into medical school. In her second year, she seemed to struggle. During a surgery rotation, her supervisor rated her performance as unsatisfactory. Stephanie was forgetful and disorganized. She requested further accommodations on some of her testing.

William was a 31-year-old investment banker. He was a little disorganized, but was very successful financially. He was generally happy with his career and his social life. His parents requested that he be evaluated for ADHD out of concern about his high activity level and his single marital status.

These three examples exemplify the range and severity of impairment and symptom presentation. Tom showed clear signs of impairment early on, which has continued. In contrast, the diagnosis of ADHD was less certain in Stephanie's case. Stephanie did not show clear signs of impairment until challenged by medical school, and would likely require additional evaluation to determine if ADHD is the primary cause of her difficulties. Although William displayed some ADHD symptoms, there is no evidence of impairment as he seemed to successfully compensate for his high activity level. In this situation, treatment decisions are guided more by impairment than ADHD symptoms per se.

Measuring Impairment

After obtaining the patient's history, clinicians should consider acquiring their adult patient's medical and edu-

cational records. However, it should keep in mind that often patients may not recall their childhood symptoms or impairments. Consequently, it is also useful to talk to other informants, such as spouses or parents. In cases such as Stephanie's, in which a patient may require educational accommodations, psychological or neuropsychological testing can be helpful. In Stephanie's case, further investigation demonstrated that she had an above-average IQ with attentional skills consistent with her IQ. Her attention difficulties may have mattered less than the poor match between her expectations and capabilities.

Metrics for impairment in adult ADHD, and even childhood ADHD, are still in their infancy. Typically, clinicians use global measures such as the Clinical Global Impression-Severity scale. There are also quality of life measures that have been used successfully in children and adolescents with ADHD.^{8,9} A new measure, the Adult ADHD Quality of Life scale, has been validated in adults with ADHD.¹⁰ In addition, the Weiss Functional Impairment Rating Scale-Self Report (WFIRS-S) is another useful gauge.¹¹ The WFIRS-S is a brief questionnaire that offers a snapshot of patients' own views of their impairments in the following domains: family, work, school, life skills, self-concept, social, and risk.

Influence of Impairment on Diagnosis and Treatment

In recent years, the field has been accused of over-diagnosing ADHD. Although this may occur in some cases, there is even stronger evidence that ADHD is often underdiagnosed or misdiagnosed. The disorder is most certainly undertreated, especially in adults. However, physicians must be careful to distinguish between treating actual impairing psychiatric disorders and offering medications for the purposes of performance enhancement. Patients experiencing symptoms of ADHD but not impairment should not be diagnosed with ADHD. Defining the impairment, therefore, is the key clinical issue.

Impairment is vital to diagnosis and treatment. Often, impairment is not specific to the ADHD, but is related to the overlap of ADHD and the co-morbidity. Typically, adult ADHD is related to impairments in executive and adaptive functioning. Other areas of impairment are related to the overlap of ADHD and the co-morbid condition (Slide 4).

Impairment should be at the forefront of the clinician's mind during diagnosis, and should be the physician's central focus when designing a treatment strategy. We recommend writing out the chief complaint, operationalizing the impairment, and then confirming the targets of treatment with the patient. If a patient has problems financially, for example, the percentage of bills paid on time can become a useful measure for both the patient and the clinician. If communication or marital satisfaction are chief complaints, spouses can help gauge improvement. If the problem is work attendance or school attendance, attendance records can function

SLIDE 4

Issues Related to Impairment

Criteria for diagnosis

- Symptoms without impairment is not ADHD
- Performance enhancement versus treatment of a psychiatric disorder

Often the chief complaint (eg, cannot keep job, unstable relationships, low self esteem) should be the focus or goal of treatment

- Impairment guides treatment planning
- Patient may not be best informant ("lots of friends")

Few standardized impairment measures for adults

- Often related to ADHD symptoms plus impairments in executive and adaptive functioning

Overlap of co-morbidity with impairment

as helpful measures of improvement. Treatment must be adequate in focus, duration, and intensity, not just to reduce ADHD symptoms but with the ultimate aim of reducing impairment (Slide 5).

SLIDE 5

Influence of Impairment on Treatment

Consider the setting where impairments occur

Consider duration or time (at work, after work, socially)

Operationalize impairment and monitoring strategy (eg, percentage of bills paid, listening to spouse, improved marital satisfaction, attendance record)

Beyond symptom improvement, is treatment adequate in focus, duration, or intensity to reduce impairment?

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CO-MORBIDITY IN ADULTS WITH ADHD

By Jeffrey H. Newcorn, MD

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is highly co-morbid across the life span. However, co-morbidity is not uniform across time; individual co-morbid conditions tend to occur at different times developmentally, with rates often reflecting lifetime occurrence (Slide 1).^{1,2} In addition to changes in the rates of co-morbidity, the nature of co-morbidity may also differ in late adolescence/adulthood, when co-morbid conditions can be especially impairing (eg, antisocial disorder, substance use disorder [SUD], more severe mood disorders).

SLIDE 1
Developmental Trajectory of ADHD Symptoms: From Childhood to Adulthood

The nature and frequency of ADHD symptoms changes with age

Children	↓	Motoric hyperactivity Aggressiveness Low frustration tolerance Impulsiveness
Adolescents		Easily distracted Inattentiveness Shifts activities Easily bored
Adults		Impatient Restlessness

It is important to identify co-morbidity because the presence of co-morbid disorders can alter response to ADHD therapy or require treatment independent of, and distinct from, the treatment for ADHD. In the latter case, physicians must decide which condition to treat first. In some instances, treating ADHD may produce improvement or even alleviation of a co-morbid condition, suggesting that the particular condition developed as a result of untreated ADHD. The reverse is also possible—treatment of the co-morbid disorder may produce improvement in ADHD symptoms. Thus, treating co-morbidity or minimizing its developmental impact can be an important goal of ADHD treatment (Slide 2).

SLIDE 2

Why Focus on Co-morbidity in Adults with ADHD?

ADHD remains highly co-morbid across the lifespan

The nature of co-morbidity may differ in adolescents and adults with ADHD compared to children with ADHD

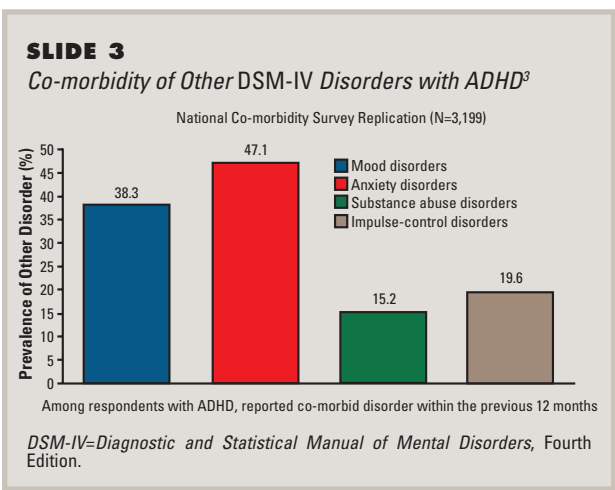
Impairment from co-morbidity increases with age

Co-morbidity should inform treatment decisions because:

- Co-morbidity may alter the response to ADHD therapy
- Co-morbid disorders often require treatment independent of, and distinct from, therapy for ADHD
- Co-morbidity may alter the sequence of interventions
- Prevention of co-morbidity should be a goal of treatment

Co-morbidity Rates in Adult ADHD

The National Co-morbidity Survey Replication (NCS-R) by Kessler and colleagues³ found that 38.3% of respondents with ADHD had a co-morbid mood disorder; 47.1% had a co-morbid anxiety disorder; 15.2% had a SUD; and 19.6% had other impulse-control disorders (Slide 3).

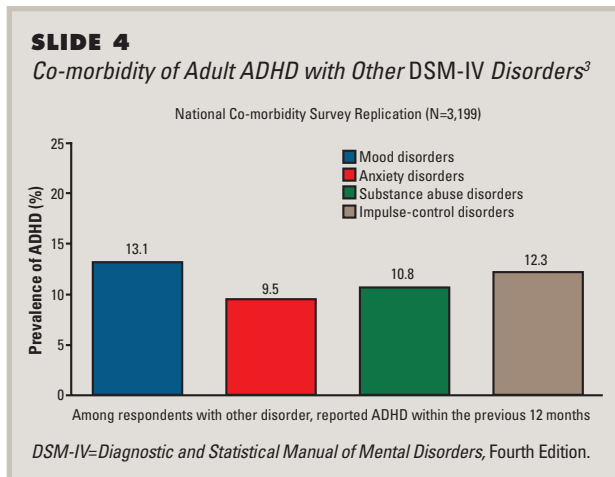


Similarly, the prevalence of ADHD is higher among individuals with other disorders: 13.1% of adults with mood disorders have ADHD, approximately three times the prevalence seen in the general adult population; 9.5% of adults with anxiety disorders have

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ADHD; 10.8% of adults with SUD have ADHD; and 12.3% of adults with impulse-control disorders have ADHD (Slide 4).



Data on co-morbidity of ADHD in adults come from two different lines of research—retrospective assessment of newly diagnosed adults (ie, cross-sectional approach) and longitudinal follow-up of children with ADHD. The estimates of lifetime co-morbidity determined from cross-sectional studies is generally high; those from follow-up studies of ADHD in childhood are generally lower. Differences in co-morbidity rates from these two approaches are likely accounted for by differences in the types of patients studied.

Results of several smaller studies parallel those from the NCS-R³⁻⁵: 30% to 35% of patients with ADHD have major depression, 40% to 50% have anxiety disorders, and 40% to 50% have SUD. This rate of SUD is higher than that found in epidemiologically derived samples. This is consistent with the idea that SUD co-morbidity among individuals with ADHD is highly impairing and often motivates people to present for treatment. Also, in patients with SUDs, the rate of ADHD is 25%, which is at least five times the rate in the general population.⁶ Similarly, in patients with generalized anxiety disorders, the rate of ADHD is 20%.⁷ Finally, ~20% of adults with major depression⁸ and 15% of adults with bipolar disorder⁹ have ADHD. It is clear from these data that assessment of ADHD in patients with other psychiatric diagnoses is essential.

Longitudinal Studies

The natural history of ADHD is complicated not only by the presence of other disorders, but also by the fact that not all subjects retain their ADHD diagnosis. Thus, it is not always the case that these other disorders represent co-morbidity (ie, they may be the primary disorder). Additionally, the prevalence rates of other disorders may be confounded by the assessment methods used. For example, although most of the longitudinal studies indicate increased risk for antisocial personality disorder, many of these studies lack systematic data on the full range of personality disorders. In addition, there

are important differences across studies. Fischer and colleagues¹⁰ found that personality disorders occurred in 40% of hyperactive children followed into young adulthood. However, a follow-up study into adulthood by Mannuzza and colleagues¹¹ found much lower rates. One problem with these studies is that the samples were recruited prior to release of the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition,¹² criteria, and co-morbidity data were collected in the follow-up study but not at baseline.¹³ Owing to these and other complexities in assessment and interpretation, it is not thoroughly understood whether adult co-morbidity is a consequence of early life co-morbidity, persistent ADHD, or other factors.

Understanding the Relationship Between ADHD and Co-morbidity

The relationship between ADHD and co-morbid disorders is interesting though complex (Slide 5). There is confusion as to whether ADHD and other disorders represent different aspects of the same overarching condition, or whether they are truly independent conditions. Some co-morbid disorders may be a direct reflection of ADHD symptoms and their impact. For example, oppositional defiant disorder may arise in children with severe hyperactive/impulsive symptoms. Similarly, some anxiety and mood disorders may follow directly from ADHD. For example, if a person with ADHD experiences repeated failure in performance situations, he or she could reasonably be expected to develop anxiety in these situations, or develop low self-esteem and other manifestations of mood disturbance.¹⁴ Further, ADHD may selectively increase the risk for certain co-morbid disorders, as illustrated by the high degree of co-occurrence of conduct disorder, other disorders of impulsivity, and SUDs.

SLIDE 5

Understanding the Relationship Between ADHD and Co-morbid Disorders

Some “co-morbid” disorders may be a direct reflection of ADHD symptoms and their impact (eg, ODD, some anxiety and mood disorders)

Risk for certain “co-morbid” disorders is increased by ADHD (eg, CD, other disorders of impulsivity)

Other “comorbid” disorders are likely genetic variants of ADHD (eg, TS; ADHD+CD; ADHD+BPD)

Several disorders share environmental risk factors with ADHD, so would expect “co-morbidity” (eg, depression, CD)

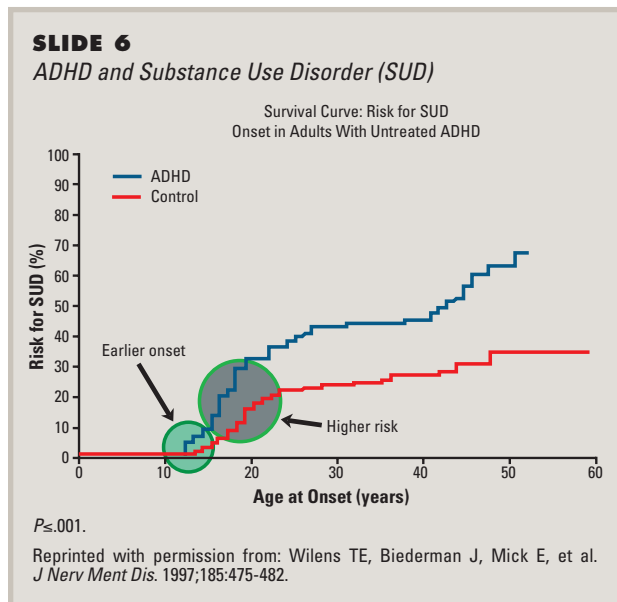
ODD=oppositional defiant disorder; CD=conduct disorder; TS= Tourette’s syndrome; BPD=borderline personality disorder.

Other co-morbid disorders may represent genetic variants within the spectrum of ADHD, such as Tourette’s disorder. Similarly, the frequent occurrence of affective dysregulation in children and adults with ADHD may help explicate the relationship between

ADHD and bipolar spectrum disorder. However, not all co-morbidity within ADHD reflects genetic variation; several disorders share common environmental risk factors. For example, a child of a depressed mother might have increased risk for disruptive behavior disorders (ie, environmental effect) but also depression (ie, due to both genetic and environmental factors). There are also important questions regarding the potential contribution of ADHD persistence to the development of co-morbidity. For example, children with early manifestations of disruptive behavior are at substantially increased risk for conduct and SUDs if they also have ADHD. Thus, it is not clear how much these other disorders should be seen as independent conditions or reflections of impairment from ADHD.

ADHD and Substance Abuse

The relationship between ADHD and substance abuse has been highlighted by several research groups,¹³ who generally have found earlier onset and elevated rates of SUD in late adolescence/young adulthood, which stabilizes with age (Slide 6).¹⁴ While many other factors also contribute to the development of substance abuse, the early occurrence in association with ADHD suggests that there could be a window of opportunity for treatment.

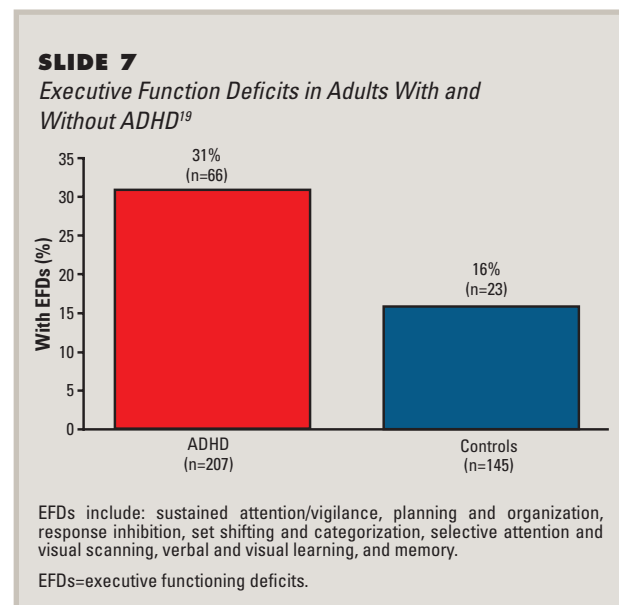


There appears to be a specific association between ADHD and nicotine abuse.^{14,15} Nicotine enhances attention by stimulating the release of acetylcholine, serotonin, and dopamine, and the prevalence of nicotine use in adults with ADHD is approximately twice that of the general population. The inability to quit smoking may be biologically driven in the ADHD population. The effects of nicotine may also serve to increase risk for other drug abuse, either by increasing exposure to peers who use drugs or by altering biological functioning in selective brain regions.

Learning Disability

Although the correlation between ADHD and learning disability is a major focus in children, it is not often discussed in adults. This is unfortunate since academic underachievement and learning disability can cause substantial impairments in adults with ADHD.¹⁶ ADHD and learning disability result in increased rates of school drop out, below-average grades, grade repetition (especially in males), and working below one's ability.^{5,17,18} One caveat regarding assessment of adults for the possible presence of learning disability is that it is often difficult to clearly distinguish between capacity and achievement.

A related area of investigation involves executive function deficits—which are often considered part and parcel of ADHD, but in fact look more like a co-morbid condition. Approximately one third of adults with ADHD have executive dysfunction, as defined by having abnormal performance on one of several tests of executive function (Slide 7).¹⁹ While this is twice the prevalence found in adults without ADHD, it suggests that executive dysfunction is not a prerequisite for the ADHD syndrome.



Personality Disorders

Individuals with disruptive behavior disorders are at increased risk for a diagnosis of Cluster B personality disorders,²⁰ including antisocial personality disorder²¹ and borderline personality disorder.²² The latter point is often not appreciated. Findings from a longitudinal study by Miller and colleagues²³ showed increased rates of a variety of personality disorders in adolescents with ADHD, particularly in those with persistent ADHD. This finding was more clearly derived from parent report rather than self-report—consistent with the observation that individuals with personality disorders often fail to recognize them. Intriguingly, there may be biological underpinnings to the development of personality disorders in adults with ADHD. Flory and

colleagues²⁴ showed that early serotonergic dysfunction in childhood contributes risk for developing antisocial disorder in late adolescence or young adulthood. It is intriguing to consider whether this pernicious course could potentially be ameliorated by treatment. However, there are not yet data to indicate whether this is the case.

Clinical Implications of Co-morbidity in Adults with ADHD

Among adults with ADHD, those with co-morbidity are likely to have higher levels of impairment. In addition, those with more severe and persistent ADHD are at risk for higher levels of co-morbidity. Understanding the high rate of co-morbidity of other disorders with ADHD is particularly important in the diagnosis and treatment of adults since the majority of adults with ADHD present to clinics for the treatment of other disorders and not ADHD. This is the reverse of what one sees in children. It has not yet been demonstrated that early identification and treatment of ADHD can alter the developmental course of other disorders, but there is reason to speculate that this may be the case.

Assessing ADHD and Co-morbidity: The "Psychiatric Review of Systems"

The "psychiatric review of systems," like its medical counterpart, constitutes a series of questions regarding psychiatric symptoms and disorders, which the patient is asked after the history of the present illness and relevant past history are elicited. These questions are not at all linked to the areas covered in the present or past history, but represent a systematic review of all domains of function. This technique is analogous to the structured clinical interview, which is used as the gold standard for diagnosis in clinical research. Incorporating a psychiatric review of systems into the more traditional clinical history can greatly facilitate the identification of both ADHD and co-morbid disorders in patients in whom these conditions might otherwise appear ambiguous or indistinct.

Conclusion

Co-morbidity is common in adults with ADHD and can complicate treatment. It is important for clinicians to look for other disorders in patients with ADHD, and to look for ADHD in patients with other psychiatric conditions. Shifts in co-morbidity parallel developmental changes in the nature and prevalence of ADHD and other disorders. The accurate diagnosis of ADHD and co-morbid conditions is not always easily achieved, because anxiety, learning disabilities, and less severe depression may be concealed by more obvious ADHD symptoms. In addition, ADHD symptoms may be concealed by more robust symptoms of conduct disorder, severe depression, borderline personality disorder, or SUD. Adopting a broad developmental perspective is the key to distinguishing ADHD from co-morbid dis-

orders, and to appreciating the complex relationships among multiple disorders which can co-occur in a single patient.

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QUESTION-AND-ANSWER SESSION

Q: Rates of treatment vary widely by country and are markedly different from the relatively consistent prevalence rates. How do you account for this disparity?

Dr. Spencer: Adult attention-deficit/hyperactivity disorder (ADHD) is an orphan diagnosis. It is viewed as a childhood diagnosis, and clinicians who treat children tend not to identify and treat it when it appears in late adolescence or adulthood. Those who treat adults are often not trained to recognize adult ADHD. Rather, the disorder is often trivialized or treated as an odd group of temperamental features without consequence.

Q: The high prevalence of ADHD found in the National Comorbidity Survey Replication (NCS-R)¹ is quite startling. For context, what are the prevalence rates of anxiety disorder and depression in adults?

Dr. Adler: This depends on how you define anxiety disorders and depressive disorders. The prevalence of ADHD, 4.4% of the United States adult population, is less than the prevalence of all depressive disorders put together, including dysthymia and bipolar depression. It is also lower than the prevalence of anxiety disorders when these are taken together. However, it is important to note that the 4.4% prevalence rate accounts only for ADHD, not multiple attention disorders.

Q: It was once thought that ADHD symptoms followed a linear developmental trend, decreasing with age. However, data from the NCS-R¹ indicate that 43% of ADHD patients 18–29 years of age experienced a co-morbidity, compared to 56% of those 30–44 years of age. Is the distribution of co-morbidities therefore different? Would adult ADHD symptoms worsen in even older people?

Dr. Adler: The evidence base for geriatric ADHD is fairly limited. However, there is a possibility that there may be overlapping issues of neuropsychological impairment for older individuals with ADHD who might be experiencing other potential cognitive impairments that can occur with aging (eg, mild cognitive impairment, dementia, cerebrovascular accidents). Furthermore, the possibility exists that with the increased time from childhood, older, as compared

to younger, adults might have greater difficulty retrospectively recalling ADHD symptoms in childhood, further complicating the diagnosis. In my clinical experience, in older patients, when the differential between ADHD and other potential causes of cognitive decline or when childhood cannot be adequately recalled, appropriate neuropsychological testing can be helpful in establishing the diagnosis.

Dr. Newcorn: There is a lower rate of ADHD in adults than in children, but adulthood comprises a longer period of time than childhood. Therefore, there are more adults than children with ADHD.

Q: How does one decide whether to simply use a screener such as the Adult ADHD Self-Report Scale (ASRS) Version 1.1 or a full diagnostic evaluation?

Dr. Spencer: A screening tool is a brief instrument used to examine a general population to identify those at high risk for a disorder. A full diagnostic evaluation is always necessary to confirm the clinical significance of each symptom and to establish the presence of other diagnostic criteria including age of onset, related impairment, duration, pervasiveness, and rule out causation by another disorder.

Q: Faraone and colleagues² considered issues for ADHD not otherwise specified. ADHD adults who met all criteria but the childhood age of onset behaved exactly like the full-ADHD cohort in terms of their impairments and co-morbidities and functional outcomes. How should this affect diagnostic criteria?

Dr. Newcorn: One controversial issue is whether we should invoke a relative or an absolute standard for impairment. This gets to the issue of prevalence rates in the context of individual treatment versus public health. For example, a child with an IQ of 135 who gets B's in school might be considered impaired because he is not achieving grades in accordance with his intelligence, but the child might also be considered fully functional because B's are not bad grades. Of course, ADHD is not simply about grades in school, or any one domain of function. The clinical diagnosis is made when impair-

QUESTION-AND-ANSWER SESSION

ments are seen across multiple settings, all pointing to the same conclusion. But in making those determinations, I would definitely refer to the individual's capacities rather than any absolute standard.

Dr. Adler: It is important to realize that ignoring relative impairment will result in missing many cases of functional impairment.

Dr. Spencer: Functional impairment may be mitigated by compensatory mechanisms. Someone may attain good grades or good performance reviews by taking twice as long to complete tasks, for example. However, often families complain that these individuals always come home late or are obsessed with work. Here, the impairment is difficult to rate. The patient achieves a level of success, but at some cost.

Dr. Adler: It is also important to not take coping strategies at face value. Physicians must consider whether coping mechanisms are helpful or if they are themselves creating impairment. Coping strategies can be time-consuming or may be chosen ineffectively, impairing other domains of an individual's life.

Q: What are some of the differences between clinical populations and those in the epidemiologic samples?

Dr. Stein: Clinicians will see patients with a variety of problems and impairments, and they may or may not be aware of their ADHD, especially when there is other psychiatric co-morbidity present.

Dr. Spencer: They are sometimes described as "the survivors" for surviving an entire childhood of ADHD-associated difficulties without treatment.

Dr. Newcorn: In clinics, physicians rarely have to convince patients that they experience impairment. Most often, patients will try to convince physicians that they have the disorder. It is important to note, too, that the impairment the patient may describe as indicating ADHD may reflect a different disorder.

Dr. Stein: Not all people present are aware of impairments. Sometimes after evaluating a child with ADHD,

I am able to identify the disorder in the child's parent, even if the parent was unaware that the difficulties in his or her life were related to ADHD.

Q: Conduct disorder and antisocial personality disorder were both discussed as co-morbidities occurring with ADHD. What is the nature of the relationship between conduct disorder and antisocial personality disorder?

Dr. Spencer: Oppositional disorder and conduct disorder are often confused. Oppositional disorder is often marked by a reactive, thin-skinned, blaming others response but not habitual antisocial actions. Conduct disorder is a euphemism used for antisocial behavior in childhood, such as lying, cheating, stealing, and fighting. Fortunately, approximately half of conduct disorder cases remit by adulthood. Antisocial personality disorder does not arrive de novo in adulthood. Usually it is conduct disorder that progresses into adulthood.

Dr. Newcorn: Longitudinal studies of children with ADHD show that those with conduct disorder have the worst outcome, and are particularly vulnerable to substance abuse disorder.

Q: How will the interaction of co-morbidities affect the treatment of ADHD as a public health concern?

Dr. Stein: Co-morbidities may affect the willingness of primary care physicians and other healthcare professionals to treat ADHD, as they may not want to deal with the range of personality disorders and psychiatric co-morbidity found in this population. This is a huge problem, given the prevalence of ADHD in adults and current manpower limitation. As a result, adults with ADHD may have difficulty obtaining appropriate treatment services.

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BEST PRACTICES IN ADULT ADHD: EPIDEMIOLOGY, IMPAIRMENTS, AND DIFFERENTIAL DIAGNOSIS

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CME QUESTIONS

- According to the National Co-morbidity Survey-Replication (NCS-R), what percentage of adults in the United States have adult attention-deficit/hyperactivity disorder (ADHD)?**
 - 0.1%
 - 1%
 - 4.4%
 - 20%
- According to the NCS-R, what percentage of adults with ADHD in the US are being treated for ADHD?**
 - 1%
 - 11%
 - 50%
 - 100%
- Which statement is *not* true of adults with ADHD?**
 - They have lower educational attainment
 - They are less likely to be employed
 - They are more likely to be separated or divorced
 - More women than men have adult ADHD
- Relative to individuals with ADHD combined type, much less is known about the types and stability of impairments in individuals with the inattentive subtype of ADHD.**
 - True
 - False
- Measures of impairment used in ADHD studies include:**
 - Clinical Global Impressions-Severity scale
 - Weiss Functional Impairment Rating Scale
 - A measure of executive functioning (eg, BRIEF, Brown scales)
 - All of the above
- The goal of treatment in ADHD is to:**
 - Reduce symptoms
 - Reduce symptoms and impairment
 - Reduce symptoms and risk of stimulant abuse
 - None of the above
- Frequently occurring co-morbid conditions in adults with ADHD include all of the following except:**
 - Antisocial personality disorder
 - Mood and anxiety disorders
 - Schizophrenia
 - Learning disorders
- Which of the following statements regarding co-morbidity of ADHD in adults is most accurate?**
 - Co-morbidity is more or less continuously present from childhood to adulthood
 - Co-morbidity of mood and anxiety disorders is higher in adults than children
 - Rates of substance use disorders continue to increase over time in adults with ADHD
 - The rate of co-morbidity in longitudinal studies of children with ADHD followed into adulthood is more or less equal to that seen in cross-sectional studies of newly diagnosed adults with ADHD

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ANSWER FORM

Expert Roundtable Supplement – Best Practices in Adult ADHD: *Epidemiology, Impairments, and Differential Diagnosis*

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Please circle your answers

1. A B C D 2. A B C D 3. A B C D 4. A B 5. A B C D 6. A B C D 7. A B C D 8. A B C D

EVALUATION SECTION (please provide the information below and print clearly)

1. Was this activity relevant to your practice? Yes No
2. Were the following objectives met?
 - A. Review the epidemiology of attention-deficit/hyperactivity disorder (ADHD), including prevalence, persistence, and co-morbid tendencies. Yes No
 - B. Explain the common impairments associated with adult ADHD and how to incorporate assessment of impairment levels in the diagnostic process. Yes No
 - C. Discuss the differential diagnosis and psychiatric co-morbidities that require consideration in the assessment of adult ADHD. Yes No
3. Did this activity increase your knowledge and/or skills in delivering patient care? Yes No
4. Does the information you received from this CME activity confirm the way you presently manage your patients? Yes No
5. Will the information you received from this CME activity change the way you will manage your patients in the future? Yes No
- If you answered yes, what change(s) do you intend to make in your practice? _____
6. Did this CME activity provide a balanced, scientifically rigorous presentation of therapeutic options related to the topic without commercial bias and influence? Yes No
7. Do you feel these topics should be repeated/updated in future CME activities? Yes No
- If you answered yes, what suggestions would you make to improve this activity? _____
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