Diagnostic Controversies in Adult Attention Deficit Hyperactivity Disorder

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Objective: While it is increasingly recognized that attention deficit hyperactivity disorder (ADHD) persists into adulthood, there is no consensus on diagnostic criteria for adult ADHD. In this article the authors describe and contrast competing approaches for diagnosis of adult ADHD used in clinical and research practice.

Method: The authors review the Wender Utah criteria, DSM criteria, and laboratory assessment strategies for adult ADHD. Advantages and disadvantages of each approach are described, and recommendations are made as a basis for clinical assessment and future research.

Results: Both the Wender Utah criteria and DSM-based approaches identify significantly impaired ADHD adults with neurocognitive, biological, and treatment response patterns similar to pediatric ADHD patients. The Wender Utah criteria established the need for retrospective childhood diagnosis and recognize developmental differences in adult symptom expression. The Wender Utah criteria fail to identify patients with predominately inattentive symptoms, exclude some patients with significant comorbid psychopathology, and diverge significantly from the DSM conception of ADHD. The DSM criteria have never been validated in adults, do not include developmentally appropriate symptoms and thresholds for adults, and fail to identify some significantly impaired adults who are likely to benefit from treatment. There are insufficient scientific data to justify use of laboratory assessment measures, including neuropsychological tests and brain imaging, in diagnosing adult ADHD.

Conclusions: Adult ADHD remains a clinical diagnosis. Clinicians should be flexible in application of the current ADHD criteria to adults. Additional research is required to validate adult diagnostic criteria.

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In the last decade attention deficit hyperactivity disorder (ADHD) has been largely reconceptualized as a lifespan disorder and not merely a condition of childhood. Increased awareness of adult ADHD was initially spurred by lay publications (1, 2). Academic skepticism about adult ADHD focused on reported reductions in ADHD symptoms over time (3) and perceived difficulties in assessment, including the need for retrospective childhood diagnosis, high rates of psychiatric comorbidity, overlap with other psychiatric disorders, and concerns regarding self-diagnosis (4).

Subsequent reviews demonstrated that adult ADHD is a valid disorder, can be reliably diagnosed, and predicts future outcome (5, 6). Investigators have shown that neurocognitive and biological findings in adults, including patterns of genetic transmission and abnormalities in brain imaging, are similar to those in children with ADHD (6, 7). Rates of remission in ADHD have proved to be a function of definition rather than course of the disorder (8). Longitudinal evidence suggests that childhood ADHD persists into young adulthood in 60%–70% of the cases when defined relative to same-age peers and in 58% of the cases when DSM-IV criteria and parental reports are used (9).

While a substantial literature addresses the validity of ADHD as an adult disorder, there has been relatively little discussion about the validity of diagnostic criteria for ADHD in adults. Seminal longitudinal follow-up studies of hyperactive children demonstrated the persistence of hyperactive symptoms into adulthood (10, 11), and they provide some basis for conceptualizing adult diagnosis. However, these early studies of childhood hyperactivity excluded many children that would currently meet the DSM criteria for ADHD, particularly the inattentive subtype. While some inferences about diagnosing adult ADHD can be based on these follow-up studies, the generalizability of the subjects' outcomes to currently diagnosed ADHD patients is limited. Development of DSM-IV was noteworthy in that the diagnostic criteria were empirically validated, but the DSM field trials for ADHD included only school-age children. To our knowledge, there have been no large-scale validation studies of ADHD criteria in adults.

Significant differences in both conceptualization and diagnostic approach underlie the existing studies of adult ADHD, and practicing clinicians must choose between competing diagnostic models as they evaluate patients. Two dominant diagnostic systems, one espoused by Wen-

der and colleagues and the other based on adaptation of the DSM criteria, are in actuality quite disparate and identify differing sets of patients. There has also been much recent interest in laboratory methods of diagnosis, including neuropsychological testing, EEG, computerized tests of attention, and brain imaging, that have no foundation in clinical diagnostic criteria. In this article we describe and compare competing diagnostic approaches to adult ADHD and make recommendations to resolve existing controversies surrounding the diagnostic criteria.

Wender Utah Criteria

In the mid-1970s Wender and colleagues at the University of Utah published initial findings on minimal brain dysfunction in adults (12). Follow-up studies of adults diagnosed as hyperactive in childhood and clinical descriptions of childhood hyperactivity persisting in adults with other psychiatric disorders led Wender to consider the possible persistence of ADHD into adulthood (13). At the time, this position was at odds with the prevailing opinion that children outgrew the disorder (14). Also during the 1970s efforts had begun on the diagnostic framework that would eventually form the basis of DSM-III. Wender recognized that diagnostic criteria proposed for the syndrome of childhood hyperactivity, i.e., DSM-III attention deficit disorder, were not developmentally appropriate for adult patients. On the basis of empirical work, Wender developed an approach for diagnosis of ADHD in adults (15). The patient and an additional informant, preferably a parent, are interviewed to assess retrospectively the childhood diagnosis of ADHD. Evidence is also obtained for ongoing, continued impairment from hyperactive and inattentive symptoms. Seven symptom clusters were proposed to characterize the phenomenology of adult ADHD, namely, 1) inattentiveness, 2) hyperactivity, 3) mood lability, 4) irritability and hot temper, 5) impaired stress tolerance, 6) disorganization, and 7) impulsivity (15). The Utah criteria proposed by Wender for use in diagnosis of adult ADHD require a retrospective childhood diagnosis, ongoing difficulties with inattentiveness *and* hyperactivity, and at least two of the remaining five symptoms.

The Wender Utah Rating Scale was developed to aid in the retrospective diagnosis of childhood ADHD (16). The scale is a self-completed measure of retrospective childhood behavioral symptoms. A subset of 25 items from the 61-item Wender Utah Rating Scale were shown to correlate highly with parental report of childhood behavior as measured on the 10-item Conners Rating Scale. Other investigators have assessed the instrument's sensitivity, specificity, and internal factor structure (17–19). The Wender Utah Rating Scale has been translated into and validated in several languages, including Spanish (20, 21), German (22), and Italian (23).

The Utah criteria have been used to describe ADHD in clinical populations of adults (24, 25) and to assess the relationship between adult ADHD and other coexisting conditions (24, 26, 27). Clinical trials in adults with ADHD have used the Utah criteria for investigations of methylphenidate (13, 28), L-dopa and carbidopa (29), pargyline (30), DL-phenylalanine (31), L-tyrosine (32), nomifensine (33), bupropion (34), venlafaxine (35), and others. The Utah criteria have provided the basis for phenotype assessment in genetic (36) and imaging (37) studies of adult ADHD.

The Wender Utah Rating Scale was designed to aid in the retrospective assessment of ADHD but was not intended by its authors to diagnose childhood ADHD in the absence of other clinical information. Nonetheless, several studies have used high scores on the Wender Utah Rating Scale to classify older subjects as having or not having childhood ADHD. These include investigations of handedness (38), vulnerability to alcoholism (39), comorbidity and psychopathology in adolescents (40), anxiety and childhood ADHD in adults (41), and ADHD in mothers with ADHD children (42). None of the authors of these reports discussed the limitations of the Wender Utah Rating Scale as the sole means of diagnosis.

To its credit, the Utah approach to adult ADHD established the need for retrospective childhood diagnosis and careful elucidation of current symptoms. Moreover, the routine use of third-party informants for childhood and adult behavior has become a standard approach used by many clinicians and investigators. When originally reported, Wender's findings were critical to the scientific and clinical acknowledgment of adult ADHD.

There are, however, several limitations to the Utah criteria. With subsequent editions of DSM, the Utah criteria have diverged further and further from current conceptualizations of ADHD. It is difficult to apply knowledge derived from study of DSM-based child ADHD to adults identified with alternative diagnostic schemes, such as the Utah criteria. By design, the Utah criteria include only individuals with lifelong inattention and hyperactivity, and therefore they exclude patients with the predominately inattentive ADHD subtype. Conversely, although symptoms of irritability and hot temper were included in early conceptions of childhood ADHD (14), substantial research shows this dimension of behavior to be semi-independent of ADHD symptoms, to have different associated impairments, to be more closely associated with problems in the social environment, and to predict developmental outcomes that differ from those for the symptoms of ADHD (43, 44). Permitting symptoms of irritability and hot temper to qualify one for the disorder creates an automatic confound of ADHD with oppositional defiant disorder, conduct disorder, and possibly the dysphoric form of bipolar disorder. Likewise, the inclusion of symptoms of mood lability without further clarification may further confound the delineation of this disorder from other mood disorders in adulthood. The Utah criteria exclude diagnosis of ADHD with coexisting major depression, psy-

chosis, or severe personality disorder. While these restrictions can be useful in research studies of medication response, they will fail to diagnose significant numbers of patients who are clearly impaired and would benefit from treatment. Longitudinal studies indicate that a significant minority of ADHD children are likely to have major depression (20%–27%) and personality disorders (11%–24%) by adulthood (45). Likewise, adults who self-refer to clinics specializing in adult ADHD may have even higher rates of anxiety disorders and depression than do ADHD children followed to adulthood (24, 46).

DSM Criteria

DSM-III defined ADHD as a disorder of childhood but created the category "attention deficit disorder, residual type" for adults diagnosed in childhood who continue to exhibit a clinically significant level of symptoms and impairment. There is some recognition of adult ADHD within the text of DSM-III-R, with a suggestion that ADHD might continue in up to 30% of affected children. DSM-IV also presumes that only a minority of children with ADHD continue to have the full disorder in adulthood, but it extends the potential areas of impairment at home and school to difficulties in the workplace.

Biederman and colleagues described a systematic DSM-based approach to diagnosis and demonstrated that adults identified with ADHD have patterns of impairment, comorbidity, and neurocognitive functioning similar to those of children with ADHD (47, 48). In this approach, structured diagnostic interviews for adult psychopathology are supplemented with behavioral disorders modules from child diagnostic instruments. Patients are asked to report retrospectively on the occurrence and associated impairment of each of the DSM ADHD symptoms during childhood. If positive responses are obtained, further inquiries are made as to current DSM symptoms and related impairment. As with the Utah criteria, diagnosis of adult ADHD is contingent on the retrospective diagnosis of ADHD in childhood. Other investigators have similarly adapted structured or semistructured interviews of childhood ADHD symptoms to assess childhood and current functioning (49, 50).

The DSM criteria have been used in numerous studies of adult ADHD, comorbid conditions, and associated impairments (9, 24, 48, 49, 51–58). The DSM criteria for ADHD have been used in multiple clinical pharmaceutical studies, including published trials of nomifensine (33), methylphenidate (58), nicotine (59), desipramine (60), venlafaxine (61), atomoxetine (62), dextroamphetamine (63), pemoline (64), mixed amphetamine salts (65), bupropion (66), and the nicotinic agonist ABT-418 (67). A 57% prevalence of ADHD has been demonstrated among the children of adults with DSM-defined ADHD (68). Families ascertained through adult probands diagnosed with DSM ADHD have demonstrated an association with a variant of the dopamine receptor gene (DRD4) also shown to be associated with childhood ADHD (69). The DSM criteria have identified groups of adults with cognitive impairments typically seen in children (51, 52, 70, 71), as well as the substantial driving problems frequently associated with adolescent ADHD (72). Adults diagnosed with DSM ADHD have demonstrated increased striatal dopamine transporter density in imaging studies using single photon emission computed tomography (SPECT) (73).

Although the DSM criteria have been successfully adapted for identification of adult patients with ADHD, significant limitations remain. We will describe the current DSM-IV criteria along with specific difficulties that arise as they are applied to adults.

Criterion A

Criterion A is "Either (1) or (2): (1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level...; (2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level...."

The DSM-IV Child Disorders Work Group selected ADHD symptoms on the basis of a field trial of items derived from DSM-III, DSM-III-R, ICD-10, and other sources (74). Selected symptoms significantly correlated with parent and teacher ratings of impairment and differentiated clinically diagnosed ADHD in a group of 380 clinically referred children ranging from 4 to 17 years of age. The field trial results further suggested that a threshold of six of nine hyperactive-impulsive or inattentive symptoms optimally predicted significant impairment and a clinically validated diagnosis of ADHD. The current DSM-IV criteria for ADHD are based on these findings.

The shortcomings of the DSM-IV symptoms for adult ADHD are readily apparent. The symptoms were identified by a work group concerned with childhood disorders. Unlike the Wender Utah criteria, the DSM criteria are not based on testing of symptoms more developmentally representative of adults. No adults were included in the DSM field trial. Several DSM-IV symptoms, such as "runs and climbs excessively" and "has difficulty playing…quietly" are clearly inappropriate and without face validity for adults. There is little evidence to suggest that the current DSM symptoms best characterize adults with ADHD. Current groups that conduct research on adult ADHD use various adaptations of diagnostic interviews to assess current symptoms. Two diagnostic interviews designed to assess developmentally appropriate adult correlates of DSM ADHD symptoms have been published (75, 76) but have not gained wide usage in clinical practice or other research.

Similarly, there is no scientific basis for establishing six symptoms as the appropriate threshold for adult diagnosis. We studied the prevalence of DSM-IV symptoms in a

group of adults in Massachusetts and found that a threshold of six symptoms for the diagnosis of ADHD was 2 to 4 standard deviations above the normal adult mean (49). Similarly, this threshold was 3.5 standard deviations above the mean for a comparison group followed from childhood to adulthood in a prospective study of ADHD children (9). We concluded that significant numbers of individuals with meaningful impairment failed to meet the threshold for clinical diagnosis. Others have reported that a threshold of four current symptoms of hyperactivity or inattention identifies college students with difficulties sufficient to warrant treatment (77). This suggests that the DSM-IV criteria are overly restrictive and fail to identify significant numbers of adults who suffer meaningful levels of dysfunction.

Criterion B

Criterion B states, "Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years." ADHD has always been characterized as a disorder of early childhood, with the implication that ADHD-like symptoms arising later in life represent another condition. Use of a precise criterion for age at onset, however, was not introduced until publication of DSM-III in 1980. Even then, it was not based on any sound scientific rationale or empirical basis. Furthermore, results from the DSM-IV field trials revealed that a significant percentage of children who were felt to have ADHD failed to demonstrate impairment before age 7, particularly children with the inattentive type (78).

The age-at-onset criterion for symptoms and associated impairment poses particular difficulties for the diagnosis of adult patients. Assessment of adults is highly dependent on patient self-report. Adults may have limited recall of the exact time course and nature of symptoms as well as impairments related to those symptoms. Many adults who seek clinical care are unable to provide independent evidence of the disorder, either through retrospective parental report or records of academic functioning. Given the lack of empirical evidence supporting the age-at-onset criterion, as well as practical difficulties in demonstrating impairment before age 7 in older adolescents and adults, some have argued that the criterion should be abandoned or redefined to include the broader period of childhood, specifically to age 12 (79). The DSM-IV field trial also demonstrated that all individuals with ADHD in that study developed their disorder by this more generous age at onset.

Criterion C

Criterion C is, "Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home)." Adults are involved in far more numerous and important social settings than this criterion would imply. General functioning within the larger organized community (e.g., participating in government, cooperating with others, abiding by laws, driving), financial management (e.g., banking, establishing and using credit, forming contracts), child rearing (providing protection, sustenance, financial and social support, appropriate education, etc.), marital functioning, and routine health maintenance activities may qualify as additional major life settings in which symptoms may produce impairment yet would not be evident in children. The current criteria fail to reflect these potential areas of impairment.

Criterion D

Criterion D states, "There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning." ADHD is conceptualized as a pervasive disorder of functioning and not as a reaction limited to a specific stress. In childhood it is expected that ADHD leads to some measurable impairment in multiple settings, most notably home, school, and with peers. DSM-IV briefly specifies substitution of "work" for "school" but fails to reference the full range of adult impairments. Adults with ADHD demonstrate lower self-esteem, less educational achievement, poorer occupational functioning, less successful marriages, poorer personal health choices, and greater driving risks than adults without ADHD (49). DSM-IV provides no guidance for differentiating among impairments in various domains of functioning necessary to meet diagnostic criteria and makes no mention of alternative domains of impairment that might be more relevant to adults. Conversely, many adults have adopted lifestyles that minimize self-reported dysfunction across multiple domains. For example, an adult with significant occupational impairment might live alone, no longer attend school, and be content with few or no friends or might have minimal insight into the full range of his or her dysfunction. Clinicians who strictly adhere to the requirement for multiple domains of impairment might fail to treat patients who would clearly benefit in a single domain.

Recent controversy over the definition of impairment has ensued because of an enormous increase in requests for special accommodations in employment and high-stakes academic testing under the Americans With Disabilities Act. Further specification of the meaning of impairment is necessary to avoid misunderstandings among clinicians and public agencies. Some clinicians assess impairment on the basis of comparison of deficits with a person's intellectual level. Others believe impairment is based on how well an individual functions relative to his or her specialized peer group, such as fellow medical or law school students. Still others have argued that impairment should mean serious dysfunction in the performance of major life activities (family, marital, social, and occupational functioning, etc.) that are required of society in general. More to the point, impairment should be further defined as relative to the norm or the average person, as required by the Americans With Disabilities Act, and not relative to some narrow, highly specialized, and accom-

plished subset of adults. Future DSM committees should make the criterion for impairment clearer as to the domains it encompasses and the comparison group to be used for its determination.

Criterion E

Criterion E is, "The symptoms...are not better accounted for by another mental disorder." The current DSM symptoms were selected in part for their ability to differentiate ADHD from other psychiatric disorders (74). However, without studies of ADHD in adults there is no evidence to suggest that childhood ADHD symptoms similarly differentiate ADHD in adults from other adult psychiatric conditions. Unlike the Utah criteria, which exclude significant comorbid conditions from the adult ADHD diagnosis, DSM allows co-occurring psychopathology, and DSM-based studies have shown high rates of comorbidity with adult ADHD. ADHD in adults is frequently described as coexisting with oppositional defiant disorder, conduct disorder, antisocial personality disorder, or psychoactive substance use disorders (24, 45, 49, 54). More controversial are reportedly higher rates of anxiety, depression, and bipolar disorder (24, 80, 81). Several ADHD symptoms, i.e., concentration difficulties, restlessness, increased speech, and acting "on the go," are also symptoms of other disorders, particularly anxiety, depression, and mania. It is unclear whether these DSM symptoms adequately differentiate ADHD from other adult disorders or how other disorders might be manifested when co-occurring with ADHD.

Subtypes

The DSM-IV ADHD subtypes, i.e., inattentive, hyperactive-impulsive, and combined, are based on the DSM field trial, which suggested that ADHD symptoms cluster around distinct inattentive or hyperactive-impulsive factors (74). There is ongoing controversy as to whether ADHD subtypes represent manifestations of the same or different conditions. Some researchers have found evidence that DSM subtypes breed true (82, 83), while other investigators report a lack of relationship in subtype among family members (50, 84, 85). The question of subtype is particularly vexing with adults. Evidence suggests that hyperactive-impulsive more than inattentive symptoms decrease within individuals over time (8), at least as they are currently described in the DSM symptom list. Yet this could easily be the result of using the symptom descriptions most applicable to early childhood, which fail to capture the expression of the same construct at later developmental stages. Results from the field trial reveal that most hyperactive-impulsive children develop the combined subtype during the early school years, while inattentive children tend to remain inattentive (74). In many cases, patients who might have been diagnosed with the combined subtype as youths will appear to have the inattentive subtype in adulthood. DSM provides no guidance as to whether assignment of the adult subtype should be based on the child or adult symptom presentation. This has relevance to investigators investigating potential biological differences between subtypes and to practitioners who clinically diagnose patients. The current DSM subtype classification has, to our knowledge, never been validated in adults with ADHD and has insufficient empirical evidence at present to justify its use after childhood.

Residual Categories

In earlier versions of DSM the category "attention deficit disorder, residual type" was reserved for adults who met the criteria for ADHD in childhood and continued to have significant symptoms and impairment that fell below the threshold for the full diagnosis. This category was replaced in DSM-IV with "attention deficit hyperactivity disorder, in partial remission." The DSM-IV category "attention deficit hyperactivity disorder, not otherwise specified" is used when patients have impairment from symptoms of inattention or hyperactivity/impulsivity but fail to meet the criteria for ADHD. These diagnoses are default categories that are useful when treating clinicians are required to provide a diagnosis. Neither of these categories has defined or validated criteria, and reliability is insufficient to support research efforts. Adult patients would be better served with developmentally appropriate and well-validated diagnostic criteria.

Laboratory-Based Diagnostic Methods

Specified batteries of neuropsychiatric tests have been proposed as a basis for the diagnosis of ADHD in adults, with particular emphasis on tests of executive functioning and working memory (86). Similarly, various laboratory tests of attention have been investigated to examine deficits in response inhibition in ADHD adults, with a suggestion that the Continuous Performance Test successfully differentiates the disorder (87). A study of quantitative electroencephalography showed 90% sensitivity and 94% specificity for differentiation of adults with ADHD from nonclinical comparison subjects (88). Neuroimaging methods using proton magnetic resonance spectroscopy reportedly identify differences among adult ADHD subtypes and healthy comparison subjects (89). SPECT has demonstrated greater dopamine transporter density in striatal regions of adults with ADHD than in healthy comparison subjects (73).

There is considerable interest in development of nonclinical, laboratory tests for adult ADHD, with an implication that these methods are more objective than clinical interviews and clinical diagnostic criteria. Alternative strategies for ADHD diagnosis, including use of extensive neuropsychological batteries, continuous performance tests, EEG, and SPECT imaging, are available in many communities and are popular with clinicians and patients. Although research increasingly reveals neurocognitive and biological differences between persons with and with-

out ADHD, the majority of studies are limited to single research groups and small numbers of subjects. Laboratory assessments involve significantly more expense than rating scales and clinical interviews, and they have no proven advantage over clinical diagnosis of ADHD. In some instances, such as SPECT imaging, patients are subjected to potential risks from radiation exposure.

Most problematic in assertions that one or another laboratory measure has clinical diagnostic utility is the frequent failure to provide the proper evidence to support such claims. Findings concerning sensitivity and specificity are not especially relevant clinically. These statistical terms refer to the likelihood that a person gets a normal or abnormal test finding if he or she is known to have or not have the disorder. The clinical circumstance is precisely the opposite—clinicians must determine whether or not the person has the disorder given the normal or abnormal score on the test. That requires computation of positive and negative predictive power. To date, studies examining neuropsychological tests of executive functioning have not been able to demonstrate positive predictive power and, especially, negative predictive power that is sufficiently high to recommend use of these tests in clinical settings with children or adults (90, 91). The situation is likely to be the same for most neuroimaging or neurological assessments. At the present time, there are insufficient data to support the use of laboratory-based measures in the diagnosis of ADHD. ADHD remains a clinical diagnosis that is best determined through careful history taking, adherence to well-described clinical criteria, and training in the differential diagnosis of adult disorders.

Discussion

Both the Utah and DSM-IV criteria identify clinically impaired adults with ADHD who respond well to treatment and exhibit neuropsychiatric and biological features similar to those of children with ADHD. Inherent differences between these two diagnostic systems are underappreciated. The Utah criteria are the most restrictive. Adult ADHD diagnosed according to the Utah criteria most closely resembles the combined subtype of DSM-IV, but the diagnosis is precluded in the presence of certain severe coexisting psychopathologies. The DSM-IV criteria allow diagnosis of individuals with the primarily inattentive ADHD subtype but make no allowance for developmental variations in symptom expression. In the absence of well-validated and universally accepted diagnostic criteria, clinicians risk both overdiagnosis and underdiagnosis. This is of particular significance in a disorder for which controlled substances are first-line treatments. Additionally, competing diagnostic systems limit the comparability and generalizability of scientific research findings.

ADHD remains a clinical diagnosis. Neuropsychiatric tests have value in the assessment of learning disabilities and other cognitive impairments but, in spite of widespread use, have no demonstrated value in the diagnosis of ADHD. Other laboratory measures, such as computerized tests of attention, EEG, SPECT, and positron emission tomography, have potential as research tools, but there is no evidence to support their routine clinical use.

The Utah criteria established the need for retrospective determination of childhood ADHD, use of third-party informants, and recognition of developmental changes in adult presentation. Those criteria are not as empirically based as those in DSM-IV and grow increasingly disparate with official psychiatric nosology. But their focus on these three aspects of diagnosis (life history, corroboration through others, and developmentally referenced comparisons) are worth retaining, even if the specific symptom clusters are not. Our understanding of adult ADHD remains grounded in our conceptualization of the disorder as it occurs in children. Ongoing attempts to develop theories of ADHD based on executive functioning may offer some promise for understanding ADHD in adults, where full expression of this system can be better appreciated (92). Several studies have documented deficits in working memory in adults with ADHD (52). This is not to say that other disorders might not disrupt executive functioning; rather, ADHD might do so through its impairment in inhibition and working memory. Future revisions of DSM must incorporate growing knowledge of the broader domain of executive deficits likely to be evident in ADHD and developmental changes in symptom expression as manifested in adults.

Until research adequately defines developmentally appropriate symptoms and diagnostic thresholds for adult ADHD, practicing clinicians must exercise reasonable clinical judgment in application of the DSM criteria to adult patients. A major obstacle to retrospective diagnosis is that it is significantly biased by current functioning. Clinicians must insist on reasonable evidence of retrospectively determined ADHD symptoms with associated impairments at home and school. They are encouraged to use rating scales that have been well standardized in groups of adults to determine the degree of deviance of the individual from the normal population. Given the lack of empirical support for 7 years as the age-of-onset criterion, clinicians should establish some evidence of symptoms and impairment before age 12 or initiation of puberty. In assessing functional impairment, clinicians should consider all available information to confirm evidence of pervasive impairments over the lifespan, even if current complaints are limited to a single domain. Clinicians can be comfortable treating adults with childhood histories of ADHD, evidence of current ADHD-related impairment, and a minimum of four current hyperactive-impulsive or inattentive symptoms. Clinicians should make efforts to obtain third-party corroboration whenever available and should carefully document the evidence of the disorder as justification for treatment. Clinicians who prescribe medication should carefully monitor

treatment response and the possibility of stimulant abuse and illicit diversion. Clinicians must maintain a high suspicion for coexisting psychiatric conditions and should provide reasoned polytherapy when justified. Ongoing research and clinical input on the criteria for ADHD in adults, including long-term follow-up studies of DSM-diagnosed children and field trials of symptoms in adults, are essential for subsequent revisions of DSM-IV.

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