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# Approach to Evaluating and Managing Adult Attention-Deficit/Hyperactivity Disorder in Primary Care

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**Abstract:** Requests for the evaluation of potential adult attention-deficit/hyperactivity disorder (ADHD) is on the rise across primary care clinics. Many health care providers, however, may feel ill equipped to diagnose and manage adults presenting with inattention and impulsivity. The diagnosis of ADHD is often complicated by medical and psychiatric conditions that can contribute to inattention symptoms. In this article, the authors provide a pragmatic clinical approach for evaluating and managing adult ADHD in the primary care setting.

**Keywords:** attention-deficit/hyperactivity disorder (ADHD), attention-deficit disorder (ADD), primary care

Adult attention-deficit/hyperactivity disorder (ADHD), with a prevalence of about 2.8%,<sup>1</sup> is currently conceptualized as the persistence of childhood ADHD symptoms into adulthood that is associated with impairments in social and occupational functioning.<sup>2</sup> Clinical presentation of adults with inattention requesting evaluations for ADHD has been growing recently. In the past ten years, the prevalence of adult ADHD has increased, and stimulant prescriptions in young adults has exceeded that of children.<sup>3</sup> Many health care professionals may feel ill prepared to diagnose and treat adult ADHD. This clinical review will provide a pragmatic approach to the diagnosis and treatment of adult ADHD in primary care settings.

## PRESENTATION

Adults typically present in primary care describing struggles with attending to work, school, or home duties. They report symptoms of poor concentration, general disorganization,

tendency to leave projects incomplete, inattention, impulsivity, poor school performance, difficulty functioning at work, problems with time management, difficulty controlling their temper, and anxiety.<sup>4</sup> The majority come in on their own, and a small percentage (5%) are referred by family, therapists, or others.<sup>4</sup> These individuals will sometimes have a childhood diagnosis of ADHD or past treatment with stimulants.

## ADULT ADHD DIAGNOSIS IN CONTEXT

The diagnostic validity of any disease is based on four criteria: symptoms, course, genetics, and biological markers.<sup>5</sup> In adult ADHD, the course of illness should be given careful consideration. Does ADHD in adults reflect the continuation of symptoms from childhood, independent of other diagnoses? It is one matter to see adults with inattention and executive dysfunction, consistent with the ADHD clinical picture. It is another matter to ascribe these symptoms to adult ADHD as opposed to other diagnoses.

In prospective studies, adults often meet *Diagnostic and Statistical Manual of Mental Disorders* [DSM]–5 criteria for current ADHD with no history of childhood ADHD. Two such studies showed that approximately 90% of adults who meet criteria for ADHD did not have ADHD in childhood.<sup>6,7</sup> Since those studies were prospective, some lasting three decades, researchers knew definitely whether or not those patients had childhood ADHD. In clinical practice, the matter is different, since clinicians must rely on recall on the part of patient. These prospective studies suggest that such recall is mostly false. The same two studies also found that most children with ADHD did not experience symptoms into adulthood. For instance, one study found that only 17% of children with ADHD continue to meet criteria for ADHD as young adults.<sup>6</sup>

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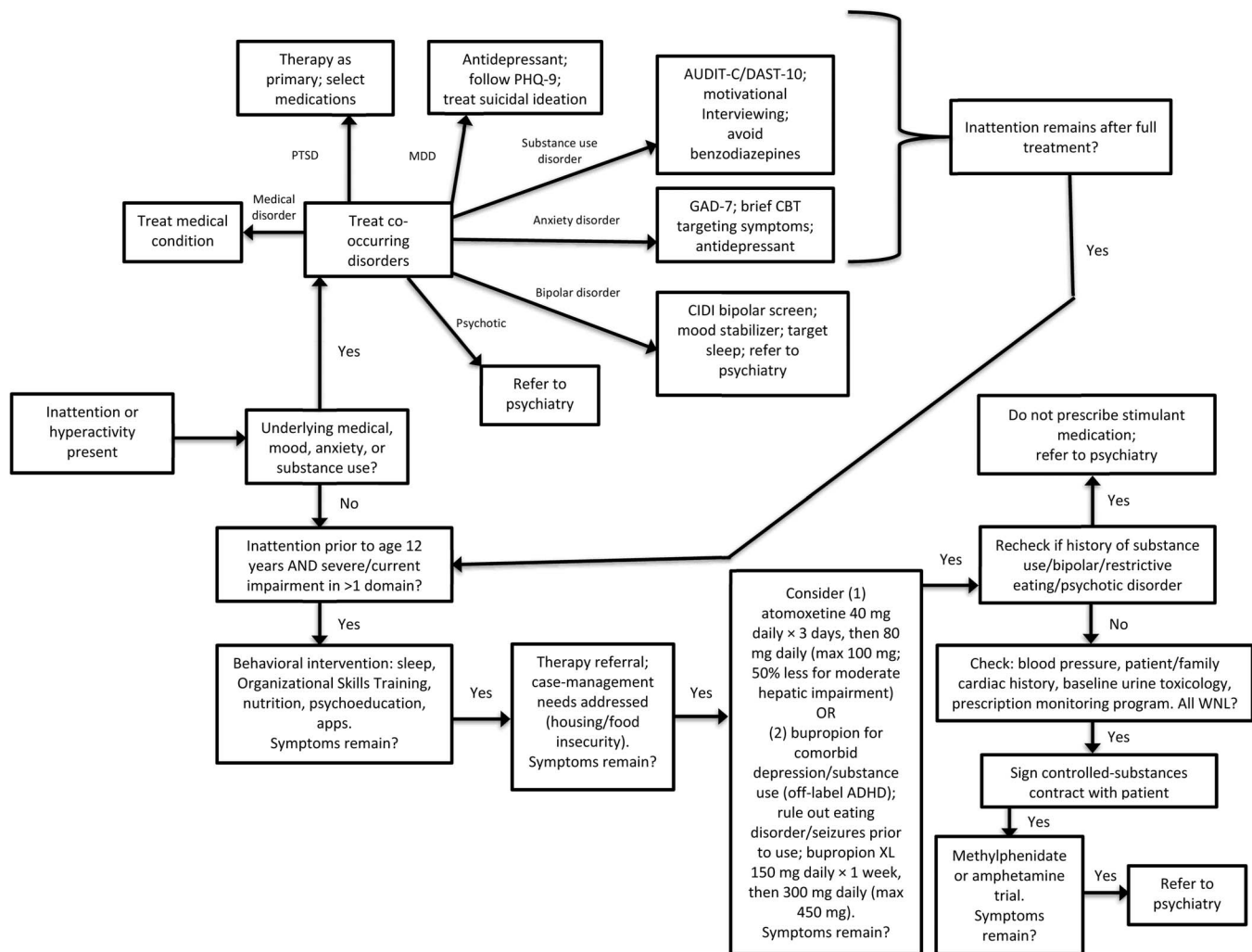
Furthermore, these studies found that about one-half of patients with adult ADHD also had other psychiatric or substance use diagnoses that cause similar inattention/executive dysfunction. Among those with late-onset ADHD symptoms, most experienced these symptoms in the context of psychiatric conditions and substance use.<sup>8</sup> Thus, the apparent prevalence would need to be halved when other psychiatric causes of cognitive ADHD-like symptoms were taken into account. In short, adult ADHD symptoms in themselves usually do not mean that someone has ADHD.

**DIAGNOSIS**

The diagnosis of adult ADHD is a clinical one, arrived at based on a carefully collected history of symptoms (ruling out other causes), without placing too much weight on neuropsychological testing or screening instruments. Clinical assessment should focus on (1) evaluating current inattention or hyperactivity/impulsivity symptoms, (2) establishing that

these symptoms cause impairment, affecting function across multiple domains, and (3) excluding medical, psychiatric, or other causes of inattention or hyperactivity/impulsivity. For a flow chart regarding diagnosis and treatment, see Figure 1.

According to DSM-5, ADHD occurs when one has inattention or hyperactivity/impulsivity across multiple settings that interferes with one’s life.<sup>9</sup> Impairments in adults with ADHD tend to manifest in various domains of life—for example, work, academic settings, and relationships. Adults with ADHD tend to have low job stability and behavioral problems and poor performance at work, and they are more likely to be fired than those without ADHD.<sup>10</sup> In evaluating occupational impairment, we like to ask, “Do you have problems getting along with bosses or co-workers? How are your performance reviews? Have you changed jobs a lot?” Adults with ADHD are more likely to have higher rates of divorce and separation, problems in relationships, and difficulty fulfilling parental responsibilities.<sup>2,11</sup>



**Figure 1.** AUDIT-C, Alcohol Use Disorders Identification Test–C; CBT, cognitive-behavioral therapy; CIDI, Composite International Diagnostic Interview; DAST-10, Drug Abuse Screening Test–7; GAD-7, Generalized Anxiety Disorder–7; MDD, major depressive disorder; PHQ-9, Patient Health Questionnaire–9.

In evaluating relational problems, we may ask patients about past relationships/marriages and whether they struggle as parents.

Given the current conceptualization of adult ADHD as persistence of childhood symptoms into adulthood, diagnosing ADHD in adults requires establishing the presence of ADHD symptoms in childhood (prior to the age 12 in DSM-5). Unfortunately, access to childhood medical records documenting inattention symptoms is often not possible. Accuracy of self-report of such early symptoms has not been found to be valid, making reliance on this criterion for adults questionable.<sup>12</sup> It would thus be worthwhile to use collateral sources such as family members to describe the patient's childhood symptoms that would be suggestive of ADHD.

One may also indirectly assess childhood symptoms through inquiry of childhood academic impairment. Children with ADHD do not perform as well in school (lower grade point average and class ranking), and are more likely to have had any of the following in their histories: grade retention, required tutoring, an individualized education program (IEP), reading disability, disciplinary actions (being suspended or expelled), and dropping out.<sup>13,14</sup> In evaluating for childhood academic impairment, clinicians may ask what grades were obtained in elementary, middle, and high school; whether the patient was ever diagnosed with a learning disability or had an IEP; and whether he or she was ever held back or had disciplinary problems involving suspension or expulsion.

### **RATING SCALES AND NEUROPSYCHOLOGICAL TESTING FOR ADULT ADHD**

A variety of instruments are cited as being useful for detecting positive cases of adult ADHD—including the Wender Utah Rating Scale, Conner's Adult ADHD Rating Scale, and Adult ADHD Self-Report Scale (ASRS).<sup>15</sup> These instruments are screening tools and not diagnostic. They tend to have limited utility in clinical practice since most adults who present with inattention will likely screen positive due to the nature of the questions. However, the ASRS can be helpful in ruling out ADHD, as its negative predictive value is 98%. Although neuropsychological testing is a way to objectively identify the presence of executive dysfunction, current evidence does not support a role for neuropsychological testing in the diagnosis and evaluation of ADHD.<sup>16</sup>

### **ASSESSING FOR PSYCHIATRIC COMORBIDITIES**

It should be noted that DSM-5 ADHD functional criteria specify that symptoms of inattention or hyperactivity/impulsivity cannot be better explained by another psychiatric disorder. Given the high rates of psychiatric comorbidity associated with ADHD, ruling out other psychiatric causes of inattention in order to diagnose ADHD can be challenging. In a nationally representative sample, among those with adult ADHD, 38% had mood disorders, 47% had anxiety disorders, and 15% had

substance use disorders (SUDs; especially alcohol use disorder).<sup>17</sup> This high degree of correlation between adult inattention and other psychiatric conditions would suggest that the symptoms of inattention may reflect an underlying psychiatric disorder. Although it has been postulated that symptoms of inattention cause mood disorders, no diagnostic studies actually support this causal claim.<sup>2</sup> By contrast, studies have shown that mood states and anxiety conditions are associated with poor concentration and impaired attention.<sup>18</sup> In fact, the DSM-5 includes the symptom of poor concentration as one of its diagnostic criteria for mood and anxiety disorders.<sup>9</sup>

Since mood disorders contribute to symptoms of inattention in adults seeking ADHD evaluations, these conditions should be screened with validated instruments that are feasible for use in primary care settings. Positive results on the screens can then be followed by an evaluation by the health care provider that would include a history of illness, family history, mental status exam, neurologic/physical exam, and laboratory tests when indicated. The Patient Health Questionnaire (PHQ)-9 can be used both for screening for clinically relevant depressive symptoms and for serial measurement to follow depression treatment response.<sup>19</sup> The Composite International Diagnostic Interview scale can be used by primary care providers (PCPs) to screen for bipolar spectrum disorder.<sup>20</sup> A negative result can be helpful in guiding their depression or ADHD management decisions, while positive results may benefit from a psychiatric consultation for further diagnostic clarification or treatment recommendations for bipolar disorder.

Another common condition that can present with symptoms of inattention in the primary care setting is post-traumatic stress disorder (PTSD), mainly due to difficulties with memory, avoidance, and changes in arousal and reactivity.<sup>21</sup> The 4-question primary care PTSD screen (PC-PTSD)<sup>22</sup> or 20-item PTSD Checklist for DSM-5 (PCL-5)<sup>23</sup> can be used to screen for this disorder.<sup>24</sup>

Sleep disturbance is highly associated with individuals presenting with inattention/hyperactivity.<sup>25</sup> A careful sleep history should therefore be performed during the evaluation for ADHD to discover possible sleep or other disorders. Such a sleep history could include a description of bedtime routines (e.g., which may include exposure to blue light from the use of phones, tablets, laptops, or television in the evening), caffeine use (quantity and time of use), presence of restless leg symptoms when falling asleep, sleep latency, the number of times the patient awakens overnight, whether the patient awakens overnight gasping for breath, presence of snoring, presence of nightmares, time of awakening, and whether the patient feels refreshed in the morning. The presence of frequent nightmares may be indicative of trauma-related reexperiencing. If a sleep history reveals the patient has symptoms suggestive of obstructive sleep apnea, the STOP-Bang sleep apnea questionnaire can be administered to determine if a sleep study would be indicated.<sup>26</sup>

## ASSESSING FOR UNDERLYING MEDICAL AND NEUROPSYCHIATRIC CONDITIONS

In evaluating adults with ADHD, it is important to consider a broad differential diagnosis. While there are no standard recommendations for the medical evaluation of ADHD, in our practice the medical workup is guided by relevant clinical history. We routinely consider common conditions such as thyroid disease, obesity, and sleep disorders (as described above). In women, we consider hormonal changes experienced during menopause or pregnancy. Neuropsychiatric causes of inattention/executive dysfunction can include brain injury, stroke, vascular disease, and dementia. We take substance use into consideration, especially cannabis since there is a known association between cannabis use and difficulties with attention.<sup>27</sup> Certain medications can also contribute to attentional difficulties—such as antihistamines, anticholinergics, benzodiazepines, sleeping aids, narcotics, anticonvulsants, and muscle relaxants.

## TREATMENT AND MANAGEMENT

Evidence-based treatments available for adult ADHD include pharmacologic agents (which can be categorized as stimulants and nonstimulants) and psychotherapy. Stimulants, which are FDA approved for adult ADHD, are often touted as the first-line treatment for adult ADHD. A recent Cochrane Review of 19 amphetamine studies, however, reveals that these studies are either of low or very low quality and that none of them had low risk of bias.<sup>28</sup> In addition, the mean length of the studies was just over five weeks, which means we do not have long-term data on the efficacy of this class of medications for adult ADHD.

It is easy to underappreciate the risks associated with stimulant exposure—including neurotoxicity (in animals),<sup>29</sup> worsening of anxiety states (which can, in turn, worsen focus and further impair concentration),<sup>30</sup> amphetamine-induced mania,<sup>31</sup> and possible cardiovascular events in adults.<sup>32</sup> The relevance of neurotoxicity in animals should not be underestimated. Amphetamines and methylphenidate have been shown repeatedly to cause neuronal cell death, both in tissue cultures and in living brain—and especially hippocampal atrophy, which itself would worsen cognition. These findings have been replicated over decades in dogs, mice, rats, and other mammals. Human data are limited, but patients should be informed of this neurotoxic harm in animals and of the lack of definitive counteracting data in humans.

The worsening of anxiety as a prominent side effect of all amphetamines and methylphenidate should be emphasized since anxiety itself is a major cause of inattention and executive dysfunction. Hence, a vicious cycle can occur, with amphetamines given for inattention/executive dysfunction for purported ADHD (which often is due to anxiety or mood illnesses), causing further anxiety that then worsens inattention/executive dysfunction, leading to more amphetamine treatment. It is common (and relevant to the following comments on abuse) for amphetamine treatment to lead to benzodiazepine treatment for concomitant or

worsened anxiety. Many clinicians do not appear to appreciate such anxiety as iatrogenic.

Another prominent concern related to stimulant prescribing is the risk for abuse, misuse, and diversion. In 2015 and 2016, 6.6% of U.S. adults used prescription stimulants, with one in three users (31.2%) reporting misuse at least once and 2.7% meeting criteria for prescription stimulant use disorders.<sup>33</sup> Among those misusing stimulants, the most common sources of prescription stimulants were friends or family (56.9%), and the most common reason for misuse was to improve performance (78%). Interestingly, evidence suggests that nonmedical use of prescription stimulants is not associated with performance improvement.<sup>34,35</sup>

Before deciding to initiate a prescription for a stimulant medication, we suggest carefully weighing the benefits of improved focus against the risks elaborated above. An evaluation of cardiac risk is warranted; it would include checking and monitoring vitals, collecting a personal and family history of cardiac disease, and in some cases obtaining an electrocardiogram. When stimulant pharmacotherapy is started, it would be reasonable to have a controlled substance contract in place, to order a baseline urine toxicology screen (to detect current substance use), and to check random urine screens after stimulant treatment has started to detect subsequent substance use and possible diversion. We recommend renewing the controlled substance contract every 2–3 years and checking random urine screens at least once yearly. Since we have limited long-term safety data on stimulant exposure in humans,<sup>36</sup> it may make sense to consider time-limited treatment with this class of medications. Atomoxetine, the only nonstimulant approved by the Food and Drug Administration (FDA), is a medication option for treating adult ADHD, especially for individuals with SUDs. The starting atomoxetine dose is 40 mg daily for three days, with an increase to 80 mg daily (the maximum daily dose is 100 mg). It should be noted that a dose reduction of 50% is needed for those with moderate hepatic impairment. Some evidence suggests that bupropion (which is not FDA approved for treating ADHD) can help improve symptoms of inattention in those with adult ADHD.<sup>37</sup> This option could be considered for those presenting with clinical depression that is marked by impaired concentration/focus. Before starting bupropion treatment, patients should be asked about a history for eating disorders and seizures, which are contraindications for bupropion. The extended-release (XL) formulation of bupropion may improve medication adherence as it is dosed once daily. Bupropion XL can be started at 150 mg daily for one week and then increased to 300 mg daily (the maximum daily dose is 450 mg).

The available evidence suggests that for patients taking medications for adult ADHD, cognitive-behavioral therapy improves outcomes for at least 12 months.<sup>38,39</sup> This therapy can be offered in either group or individual settings, with the evidence indicating that groups are more cost-effective.<sup>40,41</sup> Empirically supported protocols can be used to help the clinician walk the patient through modules such as

(1) psychoeducation and organizational planning, (2) problem solving, (3) distractibility, (4) environmental strategies, (5) adaptive thinking, (6) procrastination, and (7) therapy with a spouse/partner.<sup>42</sup> Health care providers can also share with patients helpful strategies aimed at improving focus and concentration for adults with inattention. These strategies include breaking down large tasks into smaller ones, minimizing distractions in the environment, and taking time (instead of rushing) when performing tasks. The employment of these strategies may be aided by the use of alarm functions and productivity apps on smartphones. In addition to using psychopharmacologic and nonpharmacologic treatments, patients can benefit from support groups for ADHD.<sup>43</sup>

## TREATMENT OF UNDERLYING MEDICAL AND PSYCHIATRIC DISORDERS

### Major Depressive Disorder

Both antidepressants and psychotherapy are effective for treating major depressive disorder.<sup>44</sup> The decision to initiate an antidepressant should take into account the severity of depressive symptoms and the history of depressive episodes. When an antidepressant is prescribed, one could also consider a time-limited course; this class of medication may offer only limited protection against relapse in depressive illness.<sup>45</sup>

### Anxiety Disorder

Evidence-based treatments for anxiety disorders (including generalized anxiety disorder, panic disorder, and obsessive-compulsive disorder) are similar to those for depressive disorders. Treatments include psychotherapy and medications from the antidepressant class.

### Bipolar Disorder

Maintenance treatments for bipolar disorder include lithium, anticonvulsants, and some atypical antipsychotics.<sup>46</sup> The role of antidepressants in treating bipolar disorder is controversial, with most randomized trials failing to find efficacy; as a result, these agents are generally not recommended. Importantly, stimulants, like standard depressants, can also cause mania, with a consequent negative impact on inattention.<sup>47</sup> Although guidelines exist for managing bipolar disorder in primary care, PCPs may have limited confidence in using some mood stabilizers, such as lithium. Since PCPs are often experienced with prescribing anticonvulsants such as lamotrigine, divalproex, and carbamazepine, it may be reasonable to start patients on one of these agents when bipolar illness is diagnosed, and then to refer to a psychiatrist if the first mood stabilizer trial is ineffective or not tolerated.

### Posttraumatic Stress Disorder

The mainstay of treatment for PTSD is trauma-informed therapy.<sup>48</sup> Evidence-based therapies include prolonged exposure therapy, cognitive processing therapy, and eye-movement desensitization and reprocessing (EMDR). Medications can be used alone in primary care if appropriate therapy is

unavailable or if the patient has a strong preference for pharmacotherapy.<sup>48</sup> Sertraline and paroxetine are FDA approved as antidepressant treatment for PTSD, although other medications in this class have also shown benefit.

### Insomnia

Appropriate treatments for obstructive sleep apnea should be offered when this condition is present. For patients presenting with chronic insomnia, cognitive-behavioral therapy for insomnia (CBT-I) should be offered; sleep agents should be used judiciously as they have limited efficacy in improving sleep.<sup>49</sup>

## SPECIAL CONSIDERATIONS IN THE TREATMENT OF ADULT ADHD

### Pregnancy and Breast Feeding

In evaluating risks and benefits of treatment of patients in the perinatal period, one must consider the impact of untreated ADHD to the mother/infant pair and of medication exposure to the infant. Limited data are available on the effects of stimulants, atomoxetine, and bupropion on human pregnancy, neurodevelopment, and breastfeeding. Data on methylphenidates and amphetamines indicate no increase in the rate of major congenital anomalies.<sup>50</sup> Data for atomoxetine are limited to a few case reports and a small cohort study (n = 34) indicating no congenital anomalies.<sup>51</sup> A recent systematic review found that first-trimester use of bupropion was linked with a small elevation in the risk of cardiovascular defects; the absolute risk was low, however, and confounding could not be excluded.<sup>52</sup> No data are available on long-term neurodevelopmental effects on children with prenatal exposure to these medications.

Stimulants are secreted in breast milk. When the relative infant dosing (RID) of a medication is <10%, breastfeeding is considered acceptable. Case reports of methylphenidate use during breastfeeding demonstrated RIDs ranging from 0.16% to 0.7%.<sup>50</sup> One study examining dextroamphetamine use in breastfeeding mothers showed that RIDs ranged from 5.7% to 14%.<sup>53</sup> There are no available data on atomoxetine and lactation. Exposure to infants is theoretically reduced by coordinating the medication-dosing and infant-feeding schedules.<sup>54</sup>

### Co-occurring Substance Use Disorder

Meta-analyses show a 23.1% prevalence of ADHD in adults with SUDs (excluding nicotine), higher than what is found in the general population.<sup>55</sup> Although an earlier review of the literature suggested that stimulant treatment for children with ADHD is protective against the development of SUDs in later life,<sup>56</sup> a more recent meta-analysis has shown that stimulant exposure for this population neither increases nor decreases the risk for SUDs in adulthood.<sup>57</sup>

No clear treatment guidelines are available for adults with comorbid SUDs and ADHD. Given the abuse potential for stimulants, a major concern arises when treating these individuals—substantial enough, we would argue, to warrant

a black box warning. Motivational interviewing and appropriate substance abuse treatments, such as screening, brief intervention, and referral to treatment (SBIRT), are indicated for patients with comorbid ADHD and SUD.

## CONCLUSION

Requests to evaluate potential adult ADHD are increasingly common in primary care. Diagnosis of ADHD in adults is made clinically, with a focus on establishing impairment across multiple domains and excluding other causes of inattention and hyperactivity/impulsivity. The DSM-5 ADHD diagnostic criteria are of limited use in adults, as is neuropsychological testing. Primary psychiatric and substance use disorders are common causes of adult inattention, which calls for the treatment of those conditions before diagnosing ADHD and initiating treatment (in which case the risks/benefits of stimulant use must be carefully considered). The risks of stimulant treatment for adult ADHD are generally underappreciated, as long-term efficacy and safety data on stimulant use in adults with ADHD are lacking.

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