MedStar Health

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) GUIDELINE

"These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider-in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations".

COMPONENT	CONTENT
Introduction and Overview	Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder that is thought to be caused by a combination of genetic, neurobiological, and environmental factors. It is a chronic condition that affects over seven million children and often continues into adulthood. ADHD includes a combination of persistent problems, such as difficulty sustaining attention, hyperactivity and impulsive behavior. ADHD can impact a person's daily life, including school or work performance, social relationships, and mental health. It's important to diagnose and treat ADHD at a young age so that symptoms have a better chance of not persisting into adulthood. While treatment won't cure ADHD, it can help a great deal with symptoms. Treatment typically involves medications and behavioral interventions.
Epidemiology	**Children** In 2020–2022, 11.3% of children ages 5–17 had been diagnosed with ADHD. Boys were more likely to be diagnosed than girls (14.5% vs. 8.0%). White non-Hispanic children were more likely to be diagnosed than Black and Hispanic children. ADHD has historically been diagnosed in boys at a higher rate than in girls. This may be because of a gender bias leading to an underdiagnosis of "female typical" inattentive ADHD presentations. and females with ADHD are more likely to have inattention as the primary symptom. **Adults** The prevalence of current ADHD in adults aged 18–44 is 4.4%, with a higher prevalence for males (5.4%) than females (3.2%). The lifetime prevalence of ADHD in adults aged 18–44 is 8.1%.

	Race and ethnicity Black and White children are more likely to be diagnosed with ADHD than Asian children. American Indian/Alaska Native children are also more likely to be diagnosed than Asian children.
Causes	The exact cause of attention deficit hyperactivity disorder (ADHD) is not fully understood, although a combination of factors is thought to be responsible. • Genetics – ADHD tends to run in families and, in most cases, it's thought the genes Inherited from parents are a significant factor in developing the condition. A child with ADHD has a 1 in 4 chance of having a parent with the condition. • Brain function and structure – Research has identified a number of possible differences in the brains of people with ADHD from those without the condition, although the exact significance of these is not clear. Other studies have suggested that people with ADHD may have an imbalance in the level of neurotransmitters in the brain, or that these chemicals may not work properly. Research has identified differences in the brains of people with ADHD, including lower levels of dopamine and lower brain metabolism in the parts of the brain that control attention, social judgment, and movement • Environmental factors Possible environmental factors include: o Exposure to environmental risks, such as lead, during pregnancy or at a young age o Alcohol and tobacco use during pregnancy o Other pregnancy-related factors, such as premature birth or low birth weight o Child health conditions, including head injuries o Parental mental health o Family environment • Research does not support the idea that ADHD is caused by eating too much sugar or watching too much television. However, stressful life events can make symptoms worse in some people.
Risk Factors	• Genetics: Having a close relative with ADHD or another mental health disorder • Environmental factors: Exposure to environmental toxins, such as lead, during pregnancy or at a young age • Pregnancy-related factors: Maternal drug use, alcohol use, or smoking during pregnancy • Child health conditions: Premature birth, low birth weight, or brain injuries • Family environment: Parental mental health, poverty, or poor parenting • Childhood trauma: Early life stress can shape how certain areas of the brain form, which can lead to ADHD symptoms Environmental • Prenatal exposure to smoking.

	• Visual and hearing impairments, • Neurotoxin exposure (e.g., lead), infections (e.g., encephalitis), and alcohol and drug exposure in utero.
Diagnostic features	Attention deficit hyperactivity disorder (ADHD) is diagnosed based on a pattern of symptoms that include: • Inattention: Difficulty paying attention to details, following instructions, or finishing tasks • Hyperactivity: Showing too much energy, talking too much, or having trouble sitting still • Impulsivity: Acting without thinking, interrupting others, or having difficulty waiting their turn Other symptoms that are a manifestation of ADHD can include carelessness, poor organizational skills, restlessness, mood swings, irritability, impatience, and taking risks. All these interfere with functioning or development. ADHD begins in childhood. The requirement that several symptoms be present before age 12 years conveys the importance of a substantial clinical presentation during childhood. Manifestations of the disorder must be present in more than one setting (e.g., home and school, or home and work). Typically, symptoms vary depending on context within a given setting. Females who are highly conscientious may not show obvious impairments in school or at work, but can experience a sense of overwhelm, exhaustion, and emotional depletion associated with their compensatory effort (also known as "masking" or "camouflaging." Some males and nonbinary folks present this way as well. ADHD is a risk factor for suicidal ideation and behavior in children and adults. **Associated Features** Delays in language, motor, or social development are not specific to ADHD but often co-occur. Emotional dysregulation or emotional impulsivity commonly occurs in children and adults with ADHD. Studies show that roughly 50% of people with ADHD have substantial challenges with emotional impulses that can be thought to parallel their challenges with behavioral impulsivity. Individuals with ADHD self-report and are described by others as being quick to anger, easily frustrated, and overreactive emotionally. Even in the absence of a specific learning disorder, academic or work performance is often impaired. Individuals with ADHD may exhibit neurocognitive deficits in a variety of areas, including working memory, set shifting, reaction time variability, response inhibition, vigilance, and planning/organization, although these tests are not sufficiently sensitive or specific to serve as diagnostic indices.

	Although ADHD is not associated with specific physical features, rates of minor physical anomalies (e.g., hypertelorism, highly arched palate, low-set ears) may be elevated. Subtle motor delays and other neurological soft signs may occur. (Note that marked co-occurring clumsiness and motor delays should be coded separately [e.g., developmental coordination disorder]. Children with neurodevelopmental disorders with a known cause (e.g., fragile X syndrome, deletion syndrome) may often also have symptoms of inattention and impulsivity/hyperactivity; they should receive an ADHD diagnosis if their symptoms meet the full criteria for the disorder. **Functional Consequences of Attention-Deficit/Hyperactivity Disorder** ADHD is associated with reduced school performance and academic attainment. Academic deficits, school-related problems, and peer neglect tend to be most associated with elevated symptoms of inattention, whereas peer rejection and, to a lesser extent, accidental injury are most salient with marked symptoms of hyperactivity or impulsivity. Inadequate or variable self-application to tasks that require sustained effort is often interpreted by others as laziness, irresponsibility, or failure to cooperate. Young adults with ADHD have poor job stability. Adults with ADHD show poorer occupational performance, attainment, attendance, and higher probability of unemployment, as well as elevated interpersonal conflict. On average, individuals with ADHD obtain less schooling, have poorer vocational achievement, and have reduced intellectual scores than their peers, although there is great variability. In its severe form, the disorder is markedly impairing, affecting social, familial, and scholastic/occupational adjustment. Family relationships may be characterized by discord and negative interactions. Individuals with ADHD have lower self-esteem relative to peers without ADHD. Peer relationships are often disrupted by peer rejection, neglect, or teasing of the individual with ADHD. Children with ADHD are significantly more likely than their peers without ADHD to develop conduct disorder in adolescence and antisocial personality disorder in adulthood, consequently increasing the likelihood for substance use disorders and incarceration. The risk of subsequent substance use disorders is elevated, especially when conduct disorder or antisocial personality disorder develops. Individuals with ADHD are more likely than peers to be injured. Children and adults with ADHD are at higher risk for suffering trauma and developing subsequent posttraumatic stress syndrome. Traffic accidents and violations are more frequent among drivers with ADHD. Individuals with ADHD have a higher overall mortality rate, largely because of accidents and injuries. There

	may also be an elevated likelihood of obesity and hypertension among individuals with ADHD.
Diagnostic Criteria – from APA DSM-5 – TR	**Diagnostic Criteria** A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years. C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities). D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning. E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal). Presentations are considered Combined if both inattention and hyperactivity-impulsivity appear. For predominantly inattention or predominantly hyperactive/impulsive presentation to be considered, symptoms must be present for the past 6 months. Severity may be in remission, mild, moderate or severe. Other Specified Attention-Deficit/Hyperactivity Disorder - symptoms characteristic of attention-deficit/hyperactivity disorder are present but do not meet the full criteria for ADHD Unspecified Attention-Deficit/ Hyperactivity Disorder – the clinician chooses not to specify the reason that the criteria are not met for attention.
Diagnostic Markers	No biological marker is diagnostic for ADHD. Neuroimaging studies of ADHD consistently show differences in brain structure and function between individuals with ADHD and those considered normal controls, particularly in regions like the frontal cortex, with findings including reduced gray matter volume and altered activity patterns in specific brain areas associated with attention and executive function.
Cultural Considerations	Cultural factors can have a significant impact on how ADHD is perceived, diagnosed and treated in different cultures. Some cultures may stigmatize mental health issues which can lead to delays in diagnosis and treatment. cultural

	attitudes can also impact the use of stimulant medications. For example, some people may have negative attitudes towards ADHD medications. Some communities may have historic mistrust of healthcare providers, which can impact how likely they are to seek help. These and other cultural factors can lead to an over- or under-diagnosis and over- and under-treatment of ADHD.
Differential Diagnosis	• Other neurodevelopmental or neurocognitive disorders • disorders • Specific learning disorder • Intellectual developmental disorder (intellectual disability) • Autism spectrum disorder • Reactive attachment disorder • Oppositional defiant disorder • Intermittent explosive disorder • Anxiety disorders • Posttraumatic stress disorder • Depressive disorders • Bipolar disorder • Disruptive mood dysregulation disorder • Substance use disorders • Personality disorders • Psychotic disorders • Medication-induced symptoms of ADHD
Co-morbidity	• Oppositional defiant disorder • Autism spectrum disorder • Personality disorders • Substance use disorders • Conduct disorder • Disruptive Mood Dysregulation Disorder • Anxiety disorders • Major depressive disorder • Obsessive-compulsive disorder • Sleep disorders • Neurodevelopmental disorders, including specific learning disorder, intellectual developmental disorder, language disorders, developmental coordination disorder, and tic disorders. • Elevated rates of a number of medical conditions, particularly allergy and autoimmune disorders, epilepsy, neurological problems, digestive problems, immune dysregulation, obesity, and migraines.
Course	Up to 90% of children with ADHD continue to experience symptoms into adulthood. Symptoms of adult ADHD are similar to childhood ADHD, but the intensity of symptoms, especially hyperactivity, may decrease over time. ADHD is most often identified during elementary school years when inattention

	becomes more prominent and impairing. ADHD in males is often identified in the elementary school years when hyperactivity and impulsivity can disrupt the classroom environment. Inattentive males and females who are very bright, highly conscientious, or in school systems that struggle to identify quiet children with problems may not have their symptoms identified in elementary school. Their symptoms may become more prominent when their schooling requires greater academic organization, planning, and overall productivity. The disorder is relatively stable through early adolescence, but some individuals have a worsened course with development of antisocial behaviors. In most individuals with ADHD, symptoms of motoric hyperactivity become less obvious in adolescence and adulthood, but difficulties with restlessness, inattention, poor planning, and impulsivity persist. A substantial proportion of children with ADHD remain relatively impaired into adulthood.
Treatment – overview	Treatment for attention deficit hyperactivity disorder (ADHD) isn't a one-size-fits-all. One may find that different levels and types of treatment work best for specific symptoms. A holistic approach (an approach that considers the whole person) is strongly recommended to treating ADHD in adults and children and includes: • medication • psychotherapy and counseling • nutrition • coaching including life skills and relationships • lifestyle changes • educational and vocational counseling ADHD medication can help with impulsivity, inattention, and hyperactivity, and often make it easier to focus, work, and learn. But research has found that medication alone may not address every symptom of ADHD, especially when psychosocial factors play into the condition and require attention.
Treatment – medication treatment	First, a diagnosis of ADHD should be established after a comprehensive assessment by someone with expertise in assessing behavioral health disorders in children and adults. This usually means a psychiatrist, a child psychiatrist, or a pediatrician or primary care physician with expertise in ADHD. The indication for drug treatment in ADHD is the presence of impairment resulting from ADHD. • In mild-moderate cases, the first treatments are usually behavior therapy and education. • As the intensity of symptoms increases, moderate cases may need and respond to medication as well as behavioral interventions. • In more severe cases, medication is considered as the first line of therapy.

	The FDA has approved two types of medications – stimulants and non-stimulants – to help reduce the symptoms of ADHD and improve functioning in children as young as age 6. **Stimulants** Stimulants are the most common type of prescription medication healthcare providers use to treat ADHD. Approximately 80% of children with ADHD have fewer symptoms after finding the correct stimulant medication and dosage. The two types of stimulants commonly used to treat ADHD are methylphenidate and amphetamine: • **Methylphenidate**: Brand names include Ritalin, Concerta, Focalin, and Daytrana. • **Amphetamine**: Brand names include Adderall, Dexedrine, Vyvanse, and others Despite their name, stimulants – which contain various forms of methylphenidate and amphetamine – have a calming effect on hyperactive children with ADHD. Stimulants are thought to increase brain levels of dopamine and norepinephrine, neurotransmitters associated with motivation, attention and movement. Stimulants increase dopamine levels by blocking transporters that reabsorb dopamine into neurons, or by increasing the amount of dopamine released into the synapse. They increase norepinephrine levels by increasing the amount of norepinephrine available at synapses. Dopamine helps with motivation. Increasing norepinephrine levels can help with symptoms like inattention, impulse control, and memory problems. Stimulants can be though to "stimulate" the frontal lobes and related circuits, increasing behavioral control. **Methylphenidate** prevents dopamine and norepinephrine from being reabsorbed into nerve cells after they're released. This results in higher levels of these chemicals in the brain, which can improve concentration and focus. The increased levels of dopamine activate the motor inhibitory system in the orbital-frontal-limbic axis, which can help inhibit impulsiveness. **Amphetamine** works by increasing the levels of dopamine, norepinephrine, and serotonin in the brain. It increases dopamine release from nerve terminals. It also inhibits the metabolism of dopamine by inhibiting monoamine oxidase (MAO). Amphetamine increases norepinephrine concentrations at the synapse and also increases serotonin levels, though to a lesser extent than dopamine and norepinephrine. There are two forms of stimulants: • **Immediate-release (short-acting):** One normally takes these stimulants as needed. They typically last 3-4 hours. When people with ADHD are coming down off a short-acting stimulant dose, they can experience what's often referred to as "the crash" or "the rebound effect." It typically involves a sharp decrease in energy level, and it commonly

causes severe hunger. Some people experience an intense drop in mood or depression.
- **Extended-release (intermediate-acting or long-acting):** One typically takes these stimulants once in the morning each day. Some last from six to eight hours, while others last for up to 16 hours. Longer-acting ADHD medications may result in fewer "ups and downs" during the day and may reduce the need for extra doses at school or during work.

Many people supplement an extended-release medication taken in the morning with an immediate-release dose taken in the mid to late afternoon. This extra dose may help cover the late afternoon to evening hours after the earlier dose starts to wear off.

Side Effects of Stimulants

For the most part, side effects related to methylphenidate and amphetamine overlap. Some (but not all) research shows that amphetamines may be slightly more likely than methylphenidate products to cause cardiovascular problems, psychosis, and irritability. But the absolute risk of each of these is low and the difference between methylphenidate and amphetamines is small.

For **methylphenidate**, the most common side effects, which are usually dose related, include:
- Headache
- Nausea, stomach pain
- Trouble sleeping
- Decreased appetite, weight loss or gain
- Anxiety, nervousness, irritability, overstimulation
- Exacerbation of tics, tremor
- Dry mouth
- Dizziness
- Increased sweating
- Increased blood pressure
- Heart palpitations

Dangerous side effects include:
- Psychosis or psychotic episodes
- Seizures
- Palpitations, tachycardia, hypertension
- Sudden death in preexisting cardiac structural abnormalities

Contraindications
- Marked anxiety, tension, and agitation since the drug may aggravate these symptoms.
- Hypersensitivity to the drug

- Glaucoma
- Motor tics or with a family history or diagnosis of Tourette's syndrome.
- During treatment with monoamine oxidase inhibitors and also within a minimum of 14 days following discontinuation of a monoamine oxidase inhibitor (hypertensive crises may result).

For **amphetamine**, the most common side effects are:

- Anxiety, agitation, nervousness
- Depression, crying, quick to react or overreact emotionally, rapidly changing moods
- Delusions of persecution, mistrust, suspiciousness, or combativeness, feeling of unreality, sense of detachment from self or body
- False or unusual sense of well-being
- Anorexia, nausea, dry mouth, diarrhea, constipation, weight loss
- Temporary slow normal growth
- Bladder pain, difficult, burning, or painful urination, frequent urge to urinate
- Lower back or side pain

Dangerous side effects include:

- Psychosis or psychotic episodes
- Seizures
- Palpitations, tachycardia, hypertension
- Sudden death in preexisting cardiac structural abnormalities

Contraindications include:

- Advanced arteriosclerosis, symptomatic cardiovascular disease
- Moderate to severe hypertension though patients with well-managed hypertension should be offered stimulants through an informed consent process
- Hyperthyroidism
- Hypersensitivity or idiosyncrasy to the sympathomimetic amines
- Glaucoma
- Agitated states
- Patients with a history of drug abuse
- Monoamine oxidase inhibitors (MAOIs), or within 14 days of stopping MAOIs

Non-stimulants

The FDA has also approved four non-stimulants to treat the symptoms of ADHD for adults and kids ages 6 years and older: atomoxetine (Strattera), guanfacine (Intuniv), clonidine (Kapvay) and viloxazine (Qelbree). Some antidepressants, though not SSRIs, are also used. Non-stimulants are prescription medications, but they're not controlled substances like stimulants. They work by increasing the levels of norepinephrine in your brain.

	Atomoxetine is generally considered the most effective non-stimulant ADHD medication. Guanfacine and clonidine may be taken alone or in combination with stimulants for ADHD treatment in children and teens. Non-stimulant medications aren't always as effective as stimulant medications. Nonstimulants have an effect size that is roughly 2/3 that of stimulants. Non-stimulant medications for ADHD take longer to start working than stimulants. One may not feel the full effects of these medications until they've been taking them regularly for three to four weeks at an optimized dose. These medications may be considered if the patient isn't responding to stimulants or are experiencing bothersome side effects from them. They can also help improve attention, focus and impulsivity. They can work for up to 24 hours. A healthcare provider may prescribe a non-stimulant for various reasons, including: • Stimulants aren't effective. • Intolerable side effects from stimulants. • Pairing it with a stimulant to increase effectiveness. • A current or past history of substance use. **Antidepressants** The FDA hasn't specifically approved antidepressants for the treatment of ADHD. However, healthcare providers sometimes prescribe them alone or in combination with a stimulant for the treatment of ADHD. The antidepressants providers typically prescribe for ADHD work on the dopamine and norepinephrine levels in the brain. The most common drug classes are norepinephrine-dopamine reuptake inhibitors, and some prescribe tricyclics though this is more controversial. Off-label medications, such as bupropion and desipramine, can play an important role in adult ADHD treatment.
Treatment – psychological and psychosocial interventions	There are several types of psychological treatments for ADHD many of which are included in the list below. Most therapies for ADHD tend to be structured, goal-oriented, skills-based, and collaborative: • Cognitive behavioral therapy (CBT) – a structured type of counseling that helps people identify and change negative thought patterns. CBT can help people deal with challenges in school, work, and relationships. • Behavioral parent training (BPT) • Executive Functions Coaching – helps build skills and habits related to planning, organization and time management. • Classroom interventions – helps children with ADHD improve their behavior and academic performance in the classroom. • Behavioral therapy – a type of therapy that helps people change negative behaviors into positive ones. Behavioral therapy can help people manage impulsivity, improve focus, and enhance relationships.

	• Family therapy – a type of therapy that helps family members and partners learn how to cope with the stress of living with someone who has ADHD. Family therapy can help improve communication and problem-solving skills. • Social skills groups – a type of therapy that helps people learn and practice important skills for interacting with others. • Mindfulness – a practice that encourages awareness and calmness through techniques such as breathing exercises. • Art therapy – a non-medication treatment that involves using creative expression to improve emotional regulation and reduce stress. • Acceptance and commitment therapy (ACT) – a type of therapy that focuses on being present with what life brings and moving toward valued behavior. • Dialectical behavior therapy (DBT) – a type of therapy that focuses on helping people learn to understand and accept intense emotions, regulate them, and change unhelpful behaviors. • Psychoeducation • Coaching and skills training – helps people with ADHD identify their strengths, work on goals, and negotiate problems. • Cognitive training (CT) – helps strengthen the brain networks involved in ADHD by exposing people to information processing tasks. • Neurofeedback (NFB) – a type of EEG biofeedback that helps people regulate specific brain activity patterns. • Physical exercise Therapy can help the patient and family understand, accept, and manage the effects of ADHD. It can also help with other mental health conditions, like depression and anxiety, that often come with ADHD.
Prognosis	The prognosis for ADHD depends on whether the condition is treated: With treatment most children with ADHD can live healthy lives with the help of medication and/or behavior therapy. About 60% of adults with ADHD who receive treatment experience fewer symptoms and a better quality of life. Without treatment people with ADHD who don't receive treatment may face lifelong complications, including trouble with daily activities, other mental health conditions, substance use disorders. academic or job-related issues, and increased risk of suicide. ADHD is a lifelong condition that can't be cured, but symptoms can be managed with medication. Some findings from the research: • Children with ADHD usually don't outgrow inattentiveness, but they may become less impulsive and hyperactive with age. • Adults with ADHD may have fewer hyperactive symptoms, but they may still have trouble focusing and be impulsive. • ADHD symptoms may worsen during life changes, such as the birth of a child, menopause, or a new job.

	• Some research suggests that ADHD symptoms improve after age 60.
ADHD IN ADULTS – ASSESSMENT, TREATMENT AND MANAGMENT **This section uses the previous information above about ADHD and builds on it as a base for adults.**	
OVERVIEW	The ADHD guidelines vary in their application depending on the age of the patient. For youth younger than 18 years old, the guidelines can be followed more rigorously as the diagnosis of ADHD tends to be clearer in youth and is not complicated by other conditions and diagnoses that arise with age. As one ages beyond 18 years old, other factors enter that complicate the clinical picture and make the assessment and diagnosis of ADHD more difficult and less clear. These factors include other mental health diagnoses that may appear during these ages, eg bipolar disorder which is typically diagnosed in the mid 20 year old and schizophrenia which typically is diagnosed in the late teens or early. An important related issue is whether ADHD or ADHD like symptoms are a precursor to other behavioral health conditions. These factors also include substance use disorders which may can make it difficult to determine whether a patient presenting with ADHD symptoms actually has ADHD. These considerations impact treatment choices which can also lead to a more trial and error approach in older patients with mixed pictures.
ASSESMENT	Although there is no single medical, physical, or genetic test for ADHD, a diagnostic evaluation can be provided by a qualified mental health care professional or physician who gathers information from multiple sources. These sources include ADHD symptom checklists, standardized behavior rating scales, a detailed history of past and current functioning, and information obtained from family members or significant others who know the person well. Some practitioners will also conduct tests of cognitive ability and academic achievement in order to rule out a possible learning disability. ADHD and learning disabilities co-occur frequently. ADHD cannot be diagnosed accurately just from brief office observations or simply by talking to the person. A diagnosis of ADHD must include consideration of the possible presence of co-occurring conditions. During an evaluation, the clinician will try to determine the extent to which ADHD symptoms currently apply to the adult and if they have been present in childhood. In making the diagnosis, adults should have at least five of the symptoms present. These symptoms can change over time, so adults may fit different presentations from when they were children. The *DSM-5 TR* lists three presentations of ADHD—Predominantly Inattentive, Hyperactive-Impulsive and Combined. The symptoms for each are adapted and summarized below. **ADHD predominantly inattentive presentation** • Fails to give close attention to details or makes careless mistakes • Has difficulty sustaining attention • Does not appear to listen

	• Struggles to follow through with instructions • Has difficulty with organization • Avoids or dislikes tasks requiring sustained mental effort • Loses things • Is easily distracted • Is forgetful in daily activities **ADHD predominantly hyperactive-impulsive presentation** • Fidgets with hands or feet or squirms in chair • Has difficulty remaining seated • Runs about or climbs excessively in children; extreme restlessness in adults • Difficulty engaging in activities quietly • Acts as if driven by a motor; adults will often feel inside as if they are driven by a motor • Talks excessively • Blurts out answers before questions have been completed • Difficulty waiting or taking turns • Interrupts or intrudes upon others **ADHD combined presentation** • The individual meets the criteria for both inattention and hyperactive-impulsive ADHD presentations. These symptoms can change over time, so adults may fit different presentations from when they were children. They are classified as mild, moderate, or severe. A diagnosis of ADHD is determined by the clinician based on the number and severity of symptoms, the duration of symptoms and the degree to which these symptoms cause impairment in various areas of life, such as home, school or work; with friends or relatives; or in other activities. The clinician must further determine if these symptoms are caused by other conditions, or are influenced by co-existing conditions. Several of the symptoms must have been present prior to age 12. This generally requires corroboration by a parent or some other informant, however a strict adherence to a requirement for collateral information will selectively disadvantage females—since females are more likely to have a "subtle" inattentive presentation that is less visible to others. It is important to note that the presence of significant impairment in at least two major settings of the person's life is central to the diagnosis of ADHD. Impairment refers to how ADHD interferes with an individual's life. Examples of impairment include losing a job because of ADHD symptoms, experiencing excessive conflict and distress in a marriage, getting into financial trouble because of impulsive spending, failure to pay bills in a timely manner or being put on academic probation in college due to failing grades. If the individual exhibits a number of

	ADHD symptoms but they do not cause significant impairment, they may not meet the criteria to be diagnosed with ADHD. **Internet self-rating scales** There are many Internet sites about ADHD that offer various types of questionnaires and lists of symptoms. Most of these questionnaires are not standardized or scientifically validated and should not be used to diagnose ADHD. A valid diagnosis can only be provided by a qualified, licensed professional. **Who is qualified to diagnose ADHD?** For adults, an ADHD diagnostic evaluation should be conducted by a professional with experience and expertise in assessing and diagnosing ADHD. These typically include psychiatrists, psychologists and licensed mental health professionals or a physician with experience and expertise in making the diagnosis. **Features indicating a need for an evaluation for ADHD** Most adults who seek an evaluation for ADHD experience significant problems in one or more areas of living. The following are some of the most common problems: • Inconsistent performance in jobs or careers; losing or quitting jobs frequently • History of academic and/or career underachievement • Poor ability to manage day-to-day responsibilities, such as completing household chores, maintenance tasks, paying bills or organizing things • Relationship problems due to not completing tasks • Forgetting important things or getting upset easily over minor things • Chronic stress and worry due to failure to accomplish goals and meet responsibilities • Chronic and intense feelings of frustration, guilt or blame A qualified professional can determine if these problems are due to ADHD, some other cause or a combination of causes. Although some ADHD symptoms are evident since early childhood, some individuals may not experience significant problems until later in life. Some very bright and talented individuals, for example, are able to compensate for their ADHD symptoms and do not experience significant problems until high school, college or in pursuit of their career. In other cases, parents may have provided a highly protective, structured and supportive environment, minimizing the impact of ADHD symptoms until the individual has begun to live independently as a young adult. **How to prepare for the evaluation** It may help to review old school records, previous medical records, psychological testing, or job evaluations should be brought for review if available.

	Many professionals will ask the individual to complete and return questionnaires before the evaluation and to identify a spouse or other family member who can also participate in parts of the evaluation. **What is a comprehensive evaluation?** This includes a thorough history and diagnostic interview, information from independent sources such as the spouse or other family members, DSM-5 symptom checklists, standardized behavior rating scales for ADHD and other types of psychometric testing. A mental status exam and physical exam should also be conducted if not recently performed. **The diagnostic interview – history and interview** The single most important part of a comprehensive ADHD evaluation is a structured or semi-structured interview history and interview, which provide a detailed history of the individual. It is important to ask questions about the person's history of development going back to early childhood, academic and work experience, driving history, drug and alcohol abuse, family and/or marital life and social history. The clinician will review the diagnostic criteria for ADHD and determine how many of them apply to the individual, both at the present time and since childhood. The interviewer will further determine the extent to which these ADHD symptoms are interfering with the individual's life. **The diagnostic interview: screening for other psychiatric disorders** The examiner conducts a detailed review to see if other psychiatric disorders that may resemble ADHD or commonly co-exist with ADHD are present. ADHD rarely occurs alone, and research has shown that more than two-thirds of people with ADHD have one or more co-existing conditions. The most common include depression, anxiety disorders, learning disabilities and substance use disorders. Many of these conditions have symptoms that can mimic ADHD symptoms, and may, in fact, be mistaken for ADHD. When one or more co-existing conditions are present along with ADHD, it is essential that all are diagnosed and treated. Failure to treat co-existing conditions often leads to failure in treating ADHD. And, crucially, when the ADHD symptoms are a secondary consequence of depression, anxiety or some other psychiatric disorder, failure to detect this can result in incorrect treatment of the individual for ADHD. Other times, treating ADHD will eliminate the other disorder and the need to treat it independently of ADHD. It is important to ask questions about the person's history of development going back to early childhood, academic and work experience, driving history, drug and alcohol abuse, family and/or marital life and social history. **Participation of loved ones** It is also essential to interview one or more independent sources, usually a significant other (spouse, family member, parent or partner) who knows the person well. This procedure is not to question the person's honesty, but rather to gather additional information. Many adults with ADHD have a spotty or poor memory of their past, particularly from childhood. They may recall specific details but forget diagnoses they were given or problems they encountered. Thus,

	the clinician may request that the individual being evaluated have his or her parents fill out a retrospective ADHD profile describing childhood behavior. Many adults with ADHD may also have a limited awareness of how ADHD-related behaviors cause problems for them and have impact on others. In the case of married or cohabitating couples, it is to the couple's advantage for the clinician to interview them together when reviewing the ADHD symptoms. This procedure helps the non-ADHD spouse or partner develop an accurate understanding and an empathetic attitude concerning the impact of ADHD symptoms on the relationship, setting the stage for improving the relationship after the diagnostic process has been completed. If it is not possible to interview the loved ones, having them fill out checklists of symptoms is a good alternative. Many adults with ADHD may feel deeply frustrated and embarrassed by the ongoing problems caused by the disorder. It is very important that the person being evaluated discuss these problems openly and honestly and not hold back information due to feelings of shame or fear of criticism. The quality of the evaluation and the accuracy of the diagnosis and treatment recommendations will be largely determined by the accuracy of the information provided to the examiner. **Standardized behavior rating scales** A comprehensive evaluation can include one or more standardized behavior rating scales. These questionnaires use research comparing behaviors of people with ADHD to those of people without ADHD. Scores on the rating scales are not considered diagnostic by themselves but serve as an important source of objective information in the evaluation process. Most clinicians ask the individual undergoing the evaluation and the individual's significant other to complete these rating scales. Rating scales are useful for the initial diagnosis of a child with ADHD, the assessment for co-occurring conditions, and monitoring the treatment strategy that has been put in place. ADHD-specific scales are designed to focus on ADHD symptoms (inattentive, hyperactive-impulsive) and can determine the presence of core symptoms of ADHD. Examples of ADHD-specific rating scales for children include Vanderbilt scales, Conners scales, ADHD Rating Scales (ADHD-RS-V), Swanson, Nolan and Pelham (SNAP) scale Scales for adults include Adult ADHD Self-Report Scale Symptom Checklist Version 1.1 (Adult ASRS), Conners Adult ADHD Rating Scales (CAARS), and the Wender Utah Rating Scale. More broadband rating scales assess a variety of behavioral conditions in addition to the core symptoms of ADHD, such as functional impairments in peer relationships and academics, executive function deficits in organization and time management, and co-occurring conditions such as anxiety, depression or oppositional/conduct problems. Examples of broadband scales are Child

Behavior Checklist (CBCL), Behavior Assessment Scale for Children (BASC), and the Brown Attention Deficit Disorder Scales (BADDS)

Additional testing
Depending on the individual and the problems being addressed, additional psychological, neuropsychological or learning disabilities testing may be used as needed. These do not diagnose ADHD directly but can provide important information about ways in which ADHD affects the individual. The testing can also help determine the presence and effects of co-existing conditions. For example, in order to determine whether the individual has a learning disability, the clinician will usually give a test of intellectual ability as well as a test of academic achievement.

Medical examination
If the individual being evaluated has not had a recent physical exam (within 6–12 months), a medical examination is recommended to rule out medical causes for symptoms. Some medical conditions, such as thyroid problems and seizure disorders, can cause symptoms that resemble ADHD symptoms. A medical examination does not confirm ADHD but is extremely important in helping to rule out other conditions or problems. Medical co-morbid conditions associated with ADHD include sleep disorders, neurodevelopmental disorders, including specific learning disorder, intellectual developmental disorder, language disorders, developmental coordination disorder, and tic disorders. Autoimmune disorders, epilepsy, digestive problems, obesity, and migraines.

Below are recommendations about cardiac evaluation prior to stimulant initiation. Unless the answers to the questions are as noted 1) YES, 2) NO, 3) NO, then some measure of cardiac risk stratification is warranted.

Cardiac Screening Prior to Stimulant Prescription:
-1. Have you had a general physical examination within the past: 1 year (age 3-18) / 3 years (age 18 - 50) / 1 year, including ECG (age >50)? YES
2. Personal History of a known heart condition; palpitations, passing out, or seizures; shortness of breath with exercise greater than age/fitness-matched peers? NO
3. Family History (in first or second degree relative) of sudden death in infants, children, or young adults; Wolff-Parkinson-White syndrome, hypertrophic cardiomyopathy, familial arrhythmia such as long QT syndrome, heart transplant, pulmonary hypertension, unexplained motor vehicle collisions or drowning, or an implantable defibrillator? NO

Concluding the evaluation
Towards the end of the evaluation the clinician will integrate the information that has been collected and provide the individual and family with diagnostic opinions concerning ADHD as well as any other psychiatric disorders or learning disabilities that may have been identified during the course of the assessment. The clinician will then review treatment options and assist the

	individual in planning a course of appropriate medical and psychosocial intervention.
TREATMENT AND MANAGEMENT	The primary goal of treatment is to minimize the impact ADHD symptoms on patient function while maximizing the patient's ability to compensate or cope with any remaining difficulties. Not all symptoms can be resolved with treatment; it is important to manage expectations of treatment and to promote a sense of responsibility and personal agency in patients. **Treatment of ADHD in adults includes:** • Stratification by ADHD based on severity and with and without co-existing mental health or medical conditions • Medication management • Target symptom monitoring in response to treatment • Ongoing monitoring for adverse effects • Drug contracts for patients at high risk of substance abuse. • Non-pharmacological treatment options including psychotherapy and psychosocial interventions • Psychoeducation and effective coping strategies for the patient and family • Vocational and/or educational accommodations • Individual and family therapy for adults with ADHD who are parents or have difficulties in relationships **Pharmacological Treatments** Currently, two classes of FDA-approved medications are used for ADHD treatment: stimulant and non-stimulant. (See Appendix A) **Stimulants** Methylphenidate and amphetamine are the two most commonly used stimulant medications for treatment of ADHD in adults. They both affect dopamine and norepinephrine reuptake in certain parts of the brain and, as a result, increase the amount of these neuro - transmitters to facilitate brain functioning. While methylphenidate and amphetamine have different mechanisms of action in the brain, they generally have a similar effect in terms of improvement of ADHD symptoms. **How medication works** Medication does not cure ADHD; when effective, it eases ADHD symptoms during the time it is active. Practitioners cannot know in advance what drug will work best for a particular patient without trying them. Doctors will use a medication trial to figure out which medicine works best for each individual and at what dosage. The trial usually begins with a low dose that is gradually increased at 3–7-day intervals until clinical benefits are achieved.

Choosing a medication
The process of choosing a medication should involve recognizing the negative side effects of a medication so that the risks and benefits can be adequately weighed in the decision. It is often useful to construct a daily timeline of the needs (both attentional and behavioral) of the adult.

Psychostimulants
Psychostimulant compounds are the most widely used medications for the management of ADHD symptoms in adults as well as children and adolescents. Several long-acting psychostimulants are approved by the Food and Drug Administration (FDA) for the treatment of ADHD in adults and are routinely prescribed. The two stimulants most commonly used, methylphenidate (MPH) and amphetamines (AMP), are regulated as Schedule II drugs by the Drug Enforcement Administration (DEA) because they have a potential for abuse when not used as prescribed by a medical professional.

ADHD medications approved for adults include methylphenidate; Focalin, Focalin XR; Concerta; Daytrana; Metadate CD; and the amphetamines, Adderall XR and Vyvanse.

Short-acting preparations generally last approximately 4 hours; long-acting preparations are more variable in duration—with some preparations lasting 6–8 hours and newer preparations lasting 10–12 hours. Of course, there can be wide individual variation that cannot be predicted and will only become evident once the medication is tried.

Since effective longer-acting formulations of stimulants became available, many children, adolescents and adults have found these preferable. Longer-acting medications may cause fewer "ups and downs" over the day and may eliminate the need for taking additional doses at school or during work. Although there is little research on utilizing short-acting and long-acting medications together, many individuals, especially teenagers and adults, find that they may need to supplement a longer-acting medication taken in the morning with a shorter-acting dose taken in the mid to late afternoon. The "booster" dose may provide better coverage for doing homework or other late afternoon or evening activities and may also reduce problems of "rebound" when the earlier dose wears off.

Hundreds of controlled studies involving more than 6,000 children, adolescents and adults have been conducted to determine the effects of psychostimulant medications—far more research evidence than is available for virtually any other medication. There are no studies on the use of psychostimulant medications for more than a few years, but many individuals have been taking these medications for many years without adverse effects. Longer term-controlled studies cannot be done because withholding treatment over many years from some patients suffering significant impairments, which is required in a controlled study, would be unethical.

	Stimulants and Substance Use This is a controversial issue with many aspects and considerations. First, there is a significant abuse of stimulants especially among young adults, some who have ADHD but many do not. The 2020 National Survey on Drug Use and Health show that stimulant use is on the rise across the United States with more than 10.2 million people aged 12 and older who misused stimulants in 2022. Second, ADHD is associated with increased risk of developing a substance use disorder (SUD). People with ADHD tend to be more impulsive and likely to have behavior problems, both of which can contribute to drug and alcohol abuse Children and adolescents with ADHD are significantly more likely to try alcohol, tobacco, and a range of substances during their lifetime compared with their non-ADHD counterparts. Approximately 15 percent of adolescents and young adults with ADHD have a concurrent substance use disorder. A large meta-analysis revealed that almost one in every four patients seeking treatment for a substance use disorder also have ADHD. In the vast majority of these cases, ADHD remained undiagnosed and consequently untreated. Third, the picture is quite different for those diagnosed with ADHD and then treated with a stimulant. Several studies have shown there is no indication of increased risk of substance abuse among individuals diagnosed with ADHD and prescribed stimulant ADHD medication for ADHD. There is no evidence to substantiate the fear that stimulant use leads to substance abuse or dependence among these patients. If anything, the data suggested a long-term protective effect on substance abuse. Successful treatment of ADHD with stimulants lowers the chances of substance use disorders, compared to adults with untreated ADHD. Generally, the stimulants are well tolerated in therapeutic doses without any abuse. Although stimulant ADHD medication does not seem to increase the risk for substance abuse, clinicians should remain alert to the potential problem of stimulant misuse and diversion in ADHD patients. Adults with ADHD who have a co-existing substance use disorder and who are actively using sometimes abuse psychostimulants. Generally, the active substance use disorder needs to be treated before the co-existing ADHD can be treated. In this case, it may be advisable not to use a psychostimulant for the treatment of ADHD. For people with a recent history of substance use but no current use, deciding to use stimulant medication needs to be addressed on a case-by-case basis. Certain extended-release preparations, such as Concerta (an extended-release form of MPH with a delivery system that cannot be crushed and used other than as prescribed orally), are less likely to be abused. It should be noted in 2019, rates of methamphetamine-involved overdoses were highest in American Indian/Alaska Native populations. Other groups with higher rates of stimulant use than the general population include people experiencing homelessness, transgender individuals, and men who have sex with men. In addition, people with mental health issues are also more likely to develop

	stimulant use disorder (SUD) than people without pre-existing mental health concerns. **Screening for stimulant misuse** Stimulant use often goes undetected in health care settings, such as emergency departments and primary care offices. It is uncommon for routine primary care settings to screen for stimulant misuse. The American Society of Addiction Medicine (ASAM) recommends that routine screening for substance use in primary care settings include an assessment for stimulants. **Charting Target Signs and Symptoms** Matching the characteristics of the various extended-release stimulants with the needs of the adult requires both knowledge of these medications as well as an understanding of the specific needs of the adult with ADHD and how these needs change over time. It is often useful for the prescribing professional and adult to chart the adult's needs and individual response to the medication. Adjustments may require changing the amount and/or timing of the dosing, changing the extended-release stimulant to one with different characteristics, or adding an immediate release preparation at the beginning, middle or end of the extended-release preparation's action. For example, if an adult has a business meeting later in the day or after dinner, he or she could take the extended-release medication later than usual or add an immediate release dose or two late in the day. **Non-stimulants** Atomoxetine (Strattera) and viloxazine (Qelbree) are FDA-approved, non-stimulant ADHD options for adults and kids ages 6 years and older. Strattera is generally considered the most effective non-stimulant ADHD medication. Guanfacine and Clonidine may be taken alone or in combination with stimulants for ADHD treatment in children and teens. Non-stimulant medications aren't always as effective as stimulant medications. But they may be considered if the patient isn't responding to stimulants or are experiencing bothersome side effects from them. Atomoxetine (Strattera) is currently the only non-stimulant approved by the FDA for the treatment of ADHD in adults. It is a potent selective norepinephrine reuptake inhibitor. It lacks the abuse potential of stimulants and is not a controlled Schedule II drug. The effects of atomoxetine take longer to achieve. Some people report small changes in hyperactivity and impulse control within two weeks, but it may take 4 to 8 weeks for the drug to achieve maximum effectiveness. With the exception of atomoxetine, non-stimulant medications have generally been considered second-line medications. They have been used in people who

have an incomplete response or no response to stimulants, cannot tolerate stimulants or have certain co-existing psychiatric conditions.

Atomoxetine (Strattera)
Atomoxetine (Strattera) is approved by the FDA for the treatment of ADHD in children, adolescents and adults. It is a potent selective norepinephrine reuptake inhibitor. It is the first nonstimulant medication to be approved by the FDA for the treatment of ADHD and the first medication of any kind specifically approved for the treatment of ADHD in adults. It lacks the abuse potential of stimulants, and since it is not a controlled Schedule II drug, atomoxetine can be prescribed by telephone and with refills.

While the effects of stimulants are almost immediate, atomoxetine takes longer to produce a response. In controlled studies of adults, atomoxetine was associated with cardiovascular side effects including increased heart rate of five beats per minute and an increase in blood pressure of 3 mm Hg for systolic and 1 mm Hg for diastolic blood pressure. No controlled studies comparing the cardiovascular effects of atomoxetine and of stimulants have yet been published. Other side effects can include dry mouth, insomnia, nausea, constipation, decreased appetite, dizziness, decreased libido, erectile disturbance, and urinary retention, hesitation or difficulty. Atomoxetine may lead, in rare cases, to severe liver injury resulting in liver failure if not stopped immediately on finding any liver effects (itching, dark urine, right upper quadrant tenderness or unexplained "flu-like" symptoms).

In a long-term, open label study of atomoxetine, two-thirds of adults with ADHD continued to have a positive therapeutic response through an average of 34 weeks.

Atomoxetine is metabolized (broken down) in the liver by the CYP2D6 enzyme. Drugs that inhibit this enzyme, such as fluoxetine, paroxetine and quinidine, can inhibit this enzyme and slow the metabolism of atomoxetine. Decreasing the dosage of atomoxetine may be necessary when the person is taking these medications. Atomoxetine (as with the stimulants and TCAs) should not be taken with a mono-amine oxidase inhibitor (MAOI) or within two weeks of discontinuing a MAOI. Likewise, treatment with a MAOI should not be initiated within two weeks of discontinuing atomoxetine.

Antidepressants
Antidepressants that have a direct effect of increasing the neurotransmitter norepinephrine (but not serotonin as in the selective serotonin reuptake inhibitors [SSRIs] like fluoxetine) appear to have a positive effect on the core symptoms of ADHD. None of the antidepressants has been approved by the FDA for the treatment of ADHD in children, adolescents or adults; such treatment is considered off-label. Off-label medications, such as bupropion and Norpramin (desipramine), can play a role in adult ADHD treatment.

	Antihypertensive agents Clonidine (Catapres; Kapvay) and guanfacine (Tenex; Intuniv) are alpha-2 and alpha-2a noradrenergic agents, respectively, that may indirectly affect dopamine by first affecting norepinephrine. Although they have been used to help children who have ADHD with hyperactive and aggressive symptoms, their use in adults has been generally minimal. A few small, controlled studies have shown some efficacy of guanfacine in adults with ADHD. However, sedation and blood pressure lowering effects as well as potential hypertensive rebound are issues of concern. Long-acting preparations of clonidine Kapvay and guanfacine have been approved for ADHD in children and may also be helpful in adults. These agents are most helpful for 1) facilitating a reduction of "ADHD busy-mind", the presents of lots of thoughts which makes it hard to transition to sleep. This should be distinguished from an anxiety-mediated "worried thoughts" which of course also make it hard to fall asleep. 2) Irritability and emotional impulsivity in some subpopulations, typically as an add-on to a stimulant, rather as alpha agonist monotherapy **Wake-promoting agent** Modafinil (Provigil) is approved by the FDA for the treatment of narcolepsy. Its main effect appears to be indirect activation of the frontal cortex rather than direct involvement in central dopamine and norepinephrine pathways. In a two-week, controlled study of modafinil, 48% of adults with ADHD responded favorably to the medication. Longer, controlled studies in adults are clearly needed. At this time, modafinil's utility may be limited to adults with ADHD who do not respond to first line medications. A variation of modafinil, armodafinil (Nuvigil) has become available in the United States; its effects on ADHD in adults have not yet been studied. **Medication therapy in adults with ADHD and co-existing psychiatric disorders** Approximately two-thirds to three-quarters of adults with ADHD will have at least one other psychiatric disorder during their lifetime. These other disorders include antisocial personality disorder, anxiety disorders, depressive disorders, bipolar disorder, and substance use disorders (SUD). After diagnoses have been made, the clinician and adult should decide which diagnoses need to be treated and in what order. There is some research on medication therapy in adults with ADHD and co-existing conditions. The treatment decisions of the medical professional and the individual will be guided by their previous therapeutic and clinical experience, extrapolations from others' clinical experiences, and a rational, empirical approach to the individual's clinical response. One strategy is to pick the best medication for the other psychiatric disorder, e.g., depression and then the best medication for ADHD than to try to get "two for one" and the other sentences are not needed or are not clear to me.

	Another strategy is to treat the more substantial condition first should generally be treated first. For example, a patient with severe ADHD and mild depression associated with work underperformance should receive ADHD treatment first. On the other hand, patients with active moderate to severe substance use disorders or bipolar disorder will benefit from those conditions being stabilized prior to the initiation of ADHD medication. It is important to consider how the ADHD may be affected by medication for a co-existing disorder. For example, treating depression with bupropion may also help ADHD. On the other hand, some medications for major depression and bipolar disorder may actually worsen ADHD symptoms. The SSRIs (selective serotonin reuptake inhibitors), which by themselves do not effectively treat ADHD symptoms directly, appear to be successful in the treatment of individuals who have co-existing depression and who are taking stimulants at the same time for ADHD. It is also important to note that medications for ADHD may affect co-existing disorders. For example, psychostimulants may worsen untreated anxiety or bipolar disorder. The risk of stimulant abuse is also greater in adults with substance use disorder and who are actively using. However, as previously mentioned, successful treatment of ADHD tends to decrease the chances of a person with ADHD eventually developing an SUD. Some nonstimulant treatments of ADHD may simultaneously and adequately treat the co-existing disorder along with ADHD. For example, an antidepressant (bupropion, venlafaxine) may effectively treat co-existing depression and ADHD, and similarly, a venlafaxine may successfully treat co-existing anxiety and ADHD. Tricyclic antidepressants have been prescribed by some and avoided by others, thus being a subject of controversy, **Treatment Monitoring** It is suggested that all adults with a new ADHD diagnosis, uncontrolled symptoms or any change in medication should be seen within 30 days and monthly there after until the symptoms and function improve. When symptoms and function improve, visits every 3-6 months are recommended. At the follow up visit, consider the following: • Review target symptoms and function • Review medication use and effects • Monitor for treatment adherence and side effects • Monitor vital signs • Review information from informants • Adjust therapy • Provide patient education and advice • Monitor for signs of substance abuse/dependence

Prognosis
About 60% of adults experience improvements in quality of life and symptom reduction in treatment. Comorbid conditions such as mood and anxiety disorders are also highly treatable.

Treatment Discontinuation
There is no evidence from controlled trials to indicate how long the patient with ADHD should be treated with medications. Most patients need to continue indefinitely to continue to obtain benefit. Trials of off medications and "medication holidays" can be used to assess the patient's functioning without pharmacotherapy. Improvement may be sustained when the drug is either temporarily or permanently discontinued. The evidence on effectiveness and safety of these methods is lacking in adults.

Withdrawal
There is a documented withdrawal syndrome for stimulant medications. The initial phase (crash) of withdrawal syndrome occurs as the stimulant effects wear off. Symptoms may include:

- Prolonged sleeping
- Depressed mood
- Irritability
- Overeating
- Some cravings (not usually severe in this initial phase).

The initial phase may last one to two days and then is followed by a longer period of several days to weeks of dysphoria (unpleasant or negative mood states). This can start within a few hours to several days of stopping use of the stimulant, in addition to at least two of the following symptoms:

- Difficulty sleeping (insomnia) or excessive sleeping (hypersomnia)
- Feelings of fatigue
- Unpleasant and very vivid dreams
- Psychomotor agitation (e.g., jitteriness, nervousness, moving quickly, edginess, etc.) or psychomotor retardation (e.g., slowed reflexes, moving as if one feels they are weighted down, moving like one is in slow motion, etc.)
- Cravings
- Lethargy

Psychotic symptoms may emerge during the first one to two weeks, particularly if they were present during times of use.

Amphetamine withdrawal is largely psychological, but may be difficult to manage, particularly for friends and family members, due to mood swings. An inpatient setting may be necessary if the patient has significant psychotic symptoms, in which case a referral to mental health services is appropriate.

Medication for Amphetamine Withdrawal
No medication has been demonstrated to be effective in alleviating amphetamine withdrawal, but some medications may be useful with some symptoms.

- Patients should drink at least 2-3 liters of water per day during stimulant withdrawal.
- Multivitamin supplements containing B group vitamins and vitamin C are recommended.
- Symptomatic medications should be offered as required for aches, anxiety and other symptoms
- If patients are significantly distressed or agitated, presenting a danger to themselves or others, short-term use of benzodiazepines and antipsychotics for control of irritability and agitation can be helpful, particularly in the inpatient setting. Care should be taken to limit access to large quantities of medications and to avoid development of benzodiazepine dependence. These medications should be prescribed for a maximum of 7 – 10 days.

The goal of treatment during withdrawal is supportive care and counselling.

Referrals
Referral is always at the physician's discretion with the patient's preferences considered. Consider referral to a psychiatrist or for

- Extreme or severe dysfunction
- Suicidal or homicidal ideations
- Substance use or dependence
- Psychosis
- Extreme psychosocial stressors or recent traumatic events
- Previous treatment failures
- Atypical presentation

During treatment and monitoring, consider referral to a psychiatrist in the following situations:

- Poor or no treatment effect after repeated medication adjustments
- Resistant mood or anxiety disorder
- Active substance use and dependence

EVIDENCE-BASED NON-PHAMACOLOGICAL TREATMENTS
Cognitive Behavioral Therapy (CBT)

- Cognitive Component: Focused on identifying and modifying "thinking errors" or "thought distortions" so that the patient's thoughts are more aligned with success and confidence.
- Behavioral Component: Involves engineering the environment to be more conducive to concentration and focus, and learning what reinforces and maintains problem behaviors, and constructive behaviors so that constructive changes can be implemented that support the patient's ability to function well. It includes training in skills to promote relaxation and quiet the mind; communication skills training and

	exposure therapy, which helps a patient overcome certain fears and avoidance. It also includes behavioral rehearsal, behavioral practice, and role-playing. **Meta-Cognitive Therapy** Metacognitive therapy is a type of therapy that involves changing how people think rather than what they are thinking about. Metacognitive therapy suggests stepping back from specific thoughts and instead understanding one's own thinking style. Changing one's own patterns or style of thinking could have a broad impact on how one manages their life. In this way, metacognitive therapy is distinct from cognitive behavioral therapy, which focuses more on the content of people's thoughts. In people with ADHD, problems with metacognition more often encompass difficulty in planning or executing tasks. The goal of metacognitive therapy in ADHD is to improve organization skills, planning, time management, and resolve thinking distortions that lead to negative moods and the perception of limited options. **ADHD and Exercise, Sleep and Diet** There is no research on exercise and adults with ADHD, but there is some research showing improvement of ADHD with exercise on children and adolescents. There is not enough research to conclude what type, intensity, or duration is best. Exercise is an important part of a healthy lifestyle, and should be recommended for both health and possible ADHD benefits. When patients fail to get regular exercise, it could be an indication that ADHD is affecting their organizational skills. Sleep disruption or inadequate sleep alone can produce an ADHD clinical picture. For many patients with ADHD, regular exercises has a substantial impact on cognitive function. And adequate nutrition / reduction in ultra processed foods is also an appropriate recommendation, though the data on nutrition to treat ADHD is somewhat limited. **Tips and Resources for Patients** Most adult patients with ADHD can benefit from education about ADHD, skill building trainings and adjuvant psychotherapy. A variety of self-help resources such as books, websites and apps exist for adults with ADHD.
SOURCES **While there are many good sources of information on ADHD including in adults, the first five are particularly good and have been significantly relied on for this document.**	
1. Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents. American Academy of Pediatrics| Clinical Practice Guideline, October 1, 2019.	

2. ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents, by the American Academy of Pediatrics and endorsed by the American Academy of Family Physicians.
3. American Academy of Child and Adolescent Psychiatry (AACAP) Practice Parameters for the Assessment and Treatment of Children and Adolescents with Attention-Deficit/Hyperactivity Disorder, 2007
4. Treatment and Management of ADHD in Adults, Am Academy Family Physician.
5. Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD) website.
6. Society for Developmental and Behavioral Pediatrics Clinical Practice Guideline for the Assessment and Treatment of Children and Adolescents with Complex Attention-Deficit/Hyperactivity Disorder, January 30, 2020.
7. CDC on ADHD website, Oct 2024.
8. Clinical practice guidelines for attention-deficit/hyperactivity disorder: recent updates, Clin Exp Pediatr. 2023 Jun.
9. Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents, Pediatrics. 2019 Oct.
10. ADHD in adults: good practice guidelines, Royal College of Psychiatrists in Scotland, 2017.
11. Clinical Guidelines: Pharmacologic Treatment of Attention Deficit and Hyperactivity Disorder (ADHD) in Children and Adolescents, Community Behavioral Health, updated February 12, 2024,
12. Annual Research Review: Perspectives on progress in ADHD science – from Characterization to Cause, The Journal of Child Psychology and Psychiatry, 2023.
13. The Canadian ADHD Practice Guidelines, 4th Edition, 2020.
14. Australian Evidence-Based Clinical Practice Guideline For Attention Deficit Hyperactivity Disorder (ADHD), 2022.
15. Practice Tool: ADHD Prescribing Guidelines, Nationwide Children's Hospital.
16. ADHD Guidelines from CareSource website.
17. Attention-Deficit/Hyperactivity Disorder (ADHD): Assessment and Treatment, Cigna, April 2024.
18. Guideline for ADHD in Primary Care for Children and Adolescents, Security Health Plan.
19. Adult ADHD, Mayo Clinic, 2023.
20. Attention deficit hyperactivity disorder in adults: Treatment overview, UpToDate, Oct 2024.
21. Treatment of adults with attention-deficit/hyperactivity disorder, Neuropsychiatry Dis Treat. 2008 Apr.
22. Treatment of ADHD in Adults, CHADD website.
23. Treatment of Adult ADHD: a clinical perspective, Ther Adv Psychopharmacol. 2017 Oct.
24. Univ Wisconsin Hospital and Clinical Authority, ADHD Algorithms, 2014.
25. Pharmacist Medication Management of Adults with ADHD: an Alternative Clinical Structure, the Permanente Journal, June 2020.
26. DSM V TR
27. Websites from training programs including Harvard, Yale, UCLA, Utah, Cleveland Clinic, Columbia.

Initial Approval Date and Reviews:	**Most Recent Revision and Approval Date**:	**Next Scheduled Review Date:**
December 2024 (new guideline)	December 2024	December 2026
		Ambulatory Best Practice

APPENDIX A: ADHD MEDICATIONS:

Methylphenidate Extended-Release Formulations				
Medication Name	**Dosing Information**	**Duration of Action**	**Price***	**Additional Information**
Methylphenidate hydrochloride Aptensio XR®	**Initial**: 10mg daily in the morning **Max**: 60mg/day	12 hours	$215	**For all extended-release capsules:** Capsules may be opened; contents sprinkled on applesauce; and consumed immediately without chewing
Methylphenidate hydrochloride Concerta ®	**Initial**: 18-36mg daily in the morning **Max**: 72mg/day	10-12 hours	$187	
Dexmethylphenidate hydrochloride Focalin XR®	**Initial:** 10mg daily in the morning **Max:** 40mg/day	12 hours	$273	
Methylphenidate hydrochloride Jornay PM®	**Initial**: 20mg daily in the evening **Max**: 100mg/day	12+ hours	$548 (brand only)	
Methylphenidate Hydrochloride Metadate CD®	**Initial**: 10mg daily in the morning **Max**: 60mg/day	8 hours	$168	
Methylphenidate hydrochloride Metadate ER®	**Initial**: 10mg twice daily **Max**: 60mg/day	8-12 hours	$450	Give Metadate ER® 30-45 min before a meal
Methylphenidate hydrochloride Methylin ER®	**Initial**: 10mg twice daily **Max**: 60mg/day	8 hours	$30	Give Methylin ER® 30-45 min before a meal
Methylphenidate hydrochloride chewable QuilliChew ER®	**Initial**: 10mg daily in the morning **Max**: 60mg/day	8-12 hours	$447 (brand only)	QuilliChew ER® tabs are scored and may be broken in half
Methylphenidate hydrochloride Relexxii®	**Initial:** 18mg daily in the morning **Max:** 72mg/day	8-12 hours	$264	
Methylphenidate Immediate-Release Formulations				
Dexmethylphenidate hydrochloride Focalin®	**Initial:** 2.5mg twice daily **Max:** 20mg/day	3-5 hours	$41	Administer at least 4 hours apart
Serdexmethylphenidate and dexmethylphenidate Azstarys®	**Initial:** 39.2mg/7.8mg daily in the morning **Max**: 52.3mg/10.4mg daily	10+ hours	$502 (brand only)	Capsules may be opened; contents sprinkled onto 50mL of water or 2 tbsp applesauce; and consumed within 10 minutes
Methylphenidate hydrochloride Ritalin®	**Initial:** 10-20mg daily in 2 divided doses before breakfast and lunch **Max:** 60mg/day in 2-3 divided doses	3-5 hours	$86	

Other Methylphenidate Formulations				
Methylphenidate patch Daytrana®	**Initial:** 10mg daily **Max:** 60mg/day	10-16 hours	$217	Apply to hip 2 hours before needed and remove 9 hours after applying
Methylphenidate hydrochloride oral solution Methylin®	**Initial:** 10-20mg daily in 2 divided doses before breakfast and lunch **Max:** 60mg/day in 2-3 divided doses	3-5 hours	$13	
Methylphenidate hydrochloride extended-release oral solution Quillivant XR®	**Initial:** 20mg daily in the morning **Max:** 60mg/day	8-12 hours	$407 (Brand only)	Shake bottle for at least 10 seconds prior to administration and use dispenser provided with solution
Amphetamine Extended-Release Formulations				
Amphetamine/ Dextroamphetamine Adderall XR®	**Initial:** 10-20mg daily in the morning **Max:** 60mg/day	8-12 hours	$257	Administer upon waking Capsule may be opened; sprinkled on applesauce; and swallowed immediately without chewing
Amphetamine orally disintegrating tablet Adzenys XR-ODT®	12.5mg daily	9-12 hours	$603 (brand only)	Peel backing off blister pack; do not push through foil
Amphetamine Dyanavel XR®	**Initial:** 2.5-5mg daily **Max:** 20mg/day	8-12 hours	$534 (brand only)	May be split along scored line on tablet
Mixed amphetamine salts Mydayis®	**Initial:** 12.5mg daily in the morning **Max:** 50mg/day	16 hours	$352	Administer consistently with or without food
Amphetamine Immediate-Release Formulations				
Amphetamine/ Dextroamphetamine Adderall®	**Initial:** 5mg once or twice daily **Max:** 60mg/day	4-8 hours	$62	If >1 dose/day, space doses by at least 4-6 hours
Methamphetamine hydrochloride Desoxyn®	**Initial:** 5mg once or twice daily **Max:** 25mg/day	4-8 hours	$606	
Lisdexamfetamine dimesylate chewable Vyvanse® chewable	**Initial:** 30mg daily in the morning **Max:** 70mg/day	8-12 hours	$198	

Lisdexamfetamine dimesylate Vyvanse®	**Initial:** 30mg daily in the morning **Max:** 70mg/day	10-12 hours	$416	Capsule may be opened and contents mixed with water, yogurt, or orange juice; stir and then consume immediately
Other Amphetamine Formulations				
Amphetamine extended-release oral suspension Dyanavel XR®	**Initial:** 2.5-5mg daily **Max:** 20mg/day	8-12 hours	$104	Administer directly into mouth using provided dispenser Shake well prior to administration
Dextroamphetamine transdermal patch Xelstrym®	**Initial:** 9mg/9 hours patch **Max:** 18mg/9 hours	9 hours	$584 (brand only)	Apply patch 2 hours before effect is needed Remove patch within 9 hours after applying Apply to dry, hairless skin on the upper arm, upper back, chest, flank, or hip Rotate application sites daily Avoid application of external heat sources If edges lift, press down; do not add external adhesives After handling, wash hands with soap and water
Norepinephrine Reupdate Inhibitors				
Atomoxetine hydrochloride Strattera®	**Initial:** 40mg once daily **Max:** 100mg/day	24 hours	$464	Do not crush, chew, or open capsule If capsule is opened, medication is an ocular irritant and eyes must be flushed immediately if contacted by capsule contents
Viloxazine extended-release Qelbree®	**Initial:** 200mg once daily **Max:** 600mg/day	24 hours	$427 (brand only)	Capsules may be opened; sprinkled on applesauce or pudding; and consumed within 15 min (pudding) or 2 hours (applesauce)

*30-day Average Wholesale Price for cheapest generic unless stated otherwise