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Mental Disorders and Learning Disabilities in Children and Adolescents

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Foreword

When I was in medical school, I remember one of our professors cutting through the fog of too much information by telling us we should primarily study the diseases that fit any of four questions: Is it common? Is it bad? Could I or my family members get it? Is it likely to show up on the test? In the intervening years, the amount of information that family physicians need to know has continued to grow.

This edition of *FP Essentials*™ covers four topics under the broad umbrella of pediatric and adolescent health. Our editorial board asked the authors to focus on these four issues, not only because most of the diseases are common and some are bad, but also because they occur both in our practices and in our families. And, of course, it is possible that questions about these topics may show up on your next board certification examination.

Section One of this edition discusses attention-deficit/hyperactivity disorder (ADHD), the most common neurobehavioral condition in children and adolescents.[1] Per the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition), ADHD has three presentations: predominantly inattentive, predominantly hyperactive/impulsive, and combined.[2] I found it helpful to be reminded that to diagnose ADHD, symptoms must have been present before age 12 years.

Section Two covers learning disabilities, which affect 5% to 9% of children in the United States.[3] Family physicians often are the first to be approached by parents with concerns about possible delays in their child's ability to learn and function in school. Being aware of the laws that support special education allows us to advocate for children with learning disabilities and help them and their parents navigate the assessment process and obtain needed services.

Section Three addresses eating disorders, which typically are seen in mid- to late adolescence and are among the most common chronic illnesses in adolescents. I was surprised to learn that anorexia nervosa has a higher standardized mortality ratio than schizophrenia, bipolar disorder, or unipolar depression, with approximately 20% of anorexia nervosa-related mortalities due to suicide.[4]

Section Four focuses on depression in adolescents and includes useful information on suicide risk and prevention strategies. Because depression in adolescents is underdiagnosed and undertreated, the US Preventive Services Task Force recommends that clinicians screen all adolescents ages 12 to 18 years for major depressive disorder.[5] For patients with moderate to severe depression, a combination of cognitive behavioral therapy and a selective serotonin reuptake inhibitor should be prescribed.

When you have finished studying this edition of *FP Essentials* and are ready to submit your posttest answers, please take a moment to give us feedback. Tell us what you found to be the most useful and what we can do to improve. We are always eager to hear your ideas for topics you would like covered in future editions. If you are interested in writing for us, visit our website, where calls for authors are posted 3 times per year: http://www.aafp.org/cme/subscriptions/fp-essentials/authors.html.

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*** websites accessed November 2018**

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Learning Objectives

1. Identify and apply criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) when diagnosing patients with attention-deficit/hyperactivity disorder (ADHD).
2. Recommend appropriate age-based therapies for patients with ADHD.
3. Describe the common types of learning disabilities.
4. Explain the process of psychoeducational evaluation as performed by schools and the development of an Individualized Education Program.
5. Describe the warning signs associated with eating disorders.
6. Recommend family-based treatment of adolescent patients with anorexia nervosa.
7. Establish a safety plan with all adolescent patients with suicidal thoughts.
8. Manage adolescent patients with moderate to severe depression with a combination of cognitive behavioral therapy and a selective serotonin reuptake inhibitor.

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FP Essentials is an editorially independent, peer-reviewed publication of the American Academy of Family Physicians (AAFP). It, and its derivative product *FP Comprehensive™,* are produced to assist family physicians and other learners in meeting their continuing medical education (CME), practice, and board certification goals.

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The mission of *FP Essentials* is to provide practicing family physicians, family medicine residents, and other clinicians and trainees with high-quality, cost-effective educational content that emphasizes new advances in clinical practice.

Objectives

1. To provide learners with information on advances in clinical practice to aid them in providing up-to-date care for their patients.
2. To assist learners in preparing for the American Board of Family Medicine (ABFM) certification and recertification examinations. Each monthly edition of *FP Essentials* is part of a 9-year curriculum that presents topics with areas of emphasis similar to those on the ABFM examinations.
3. To provide learners with content that meets their CME needs and requirements.
4. To present the content of *FP Essentials* in both print and online formats, thus enabling learners to have access to information anywhere, anytime.

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Manuscripts are solicited from family physicians and subspecialists. For information about writing or peer reviewing, contact Medical Editor Barry D. Weiss, MD, FAAFP, at bdweiss@u.arizona.edu.

Pretest Questions

1. According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria, which one of the following is a core sign or symptom that is consistent with a diagnosis of attention-deficit/hyperactivity disorder with a predominantly inattentive presentation?

- ❑ A. Acting impulsively.
- ❑ B. Distractibility.
- ❑ C. Fidgetiness.
- ❑ D. Talking excessively.

2. Which one of the following is true of attention-deficit/hyperactivity disorder?

- ❑ A. It affects 6% to 8% of adults.
- ❑ B. It affects 12% to 14% of children age 4 to 17 years.
- ❑ C. It has four presentations, according to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition).
- ❑ D. It is more common among adolescent males than adolescent females.

3. Which one of the following statements about learning disabilities is true?

- ❑ A. Coexisting mental disorders are rare.
- ❑ B. Learning disabilities are not heritable.
- ❑ C. Learning disabilities can lead to social exclusion and bullying.
- ❑ D. Socioeconomic status does not appear to be a factor.

4. Which one of the following is the minimum length of time a deficiency must persist to meet the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria for a specific learning disability?

- ❑ A. More than 6 months.
- ❑ B. More than 1 year.
- ❑ C. More than 2 years.
- ❑ D. More than 3 years.

5. Which one of the following physical examination findings is associated with binge eating?

- ❑ A. Bruising or abrasions over the spine.
- ❑ B. Facial muscle wasting.
- ❑ C. Palatal abrasions and petechiae.
- ❑ D. Salivary gland hypertrophy.

6. Which one of the following mental health disorders is associated with the highest mortality rate?

- ❑ A. Anorexia nervosa.
- ❑ B. Bipolar disorder.
- ❑ C. Bulimia nervosa.
- ❑ D. Unipolar depression.

7. Which one of the following statements about suicide in adolescents is true?

- ❑ A. Hanging is the most common method of suicide in the United States.
- ❑ B. Less than 5% of adolescents who committed suicide left a note.
- ❑ C. Rates of death by suicide are higher in males than in females.
- ❑ D. Rates of suicide attempts are higher in males than in females.

8. In addition to fluoxetine, which one of the following drugs is approved by the Food and Drug Administration for management of depression in adolescents?

- ❑ A. Citalopram.
- ❑ B. Escitalopram.
- ❑ C. Paroxetine.
- ❑ D. Sertraline.

Pretest Answers

Question 1: The correct answer is B.
According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition), attention-deficit/hyperactivity disorder has three presentations: a predominantly inattentive presentation (difficulties with sustaining attention, listening, distractibility, forgetfulness, organizing, and completing tasks), a predominantly hyperactive/impulsive presentation (difficulties with talking excessively, restlessness, fidgetiness, acting impulsively), and a combined presentation (six or more of nine symptoms in each category). *See page 11 and Table 2.*

Question 2: The correct answer is D.
Among children and adolescents, boys are more likely to meet diagnostic criteria for attention-deficit/hyperactivity disorder. *See page 11.*

Question 3: The correct answer is C.
Individuals with learning disabilities can experience social exclusion and bullying, poor self-image, or underachievement. *See pages 18-19.*

Question 4: The correct answer is A.
For diagnosis of a learning disability, the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) requires at least one noted deficiency in reading skills and comprehension, spelling, written expression, or mathematical skills and reasoning that is not responsive to intervention and lasts for more than 6 months. *See page 21.*

Question 5: The correct answer is D.
Physical examination results associated with binge eating include abrupt weight increases, signs of metabolic syndrome (eg, elevated blood pressure, acanthosis nigricans) and salivary gland hypertrophy. *See page 25.*

Question 6: The correct answer is A.
Anorexia nervosa is associated with the highest mortality rate among mental disorders, with approximately 20% of those mortalities from suicide. The standardized mortality ratio is 5.86 for anorexia nervosa, compared with 1.93 for bulimia nervosa, 2.65 for schizophrenia, 2.0 for bipolar disorder, and 1.55 for unipolar depression. *See page 29.*

Question 7: The correct answer is C.
Males have significantly higher rates of death by suicide because they tend to choose more lethal means. *See page 30.*

Question 8: The correct answer is B.
Besides fluoxetine, the only other selective serotonin reuptake inhibitor approved by the Food and Drug Administration for management of depression in adolescents is escitalopram. *See page 33.*

Key Practice Recommendations

1. In evaluating children and adolescents for attention-deficit/hyperactivity disorder (ADHD), ensure that the diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) are met, symptoms cause functional impairment, and symptoms are not better explained by another condition or mental disorder.

2. For management of ADHD in preschool-aged children (age 4 to 5 years), prescribe behavioral therapy as the first-line treatment.

3. For management of anorexia nervosa in adolescents, recommend family-based behavioral treatment as the treatment of choice.

4. Screen all adolescents ages 12 to 18 years for major depressive disorder at least annually when resources are available for additional evaluation and care.

5. For adolescents with positive screening results for depression, perform a suicide risk assessment (ie, assessment of the potential for harm to the self and others). Create a safety plan for all adolescents with suicidal thoughts.

6. Treat adolescents with moderate to severe depression with a combination of cognitive behavioral therapy and a selective serotonin reuptake inhibitor (SSRI), with fluoxetine as the first choice. (This is an off-label use of some SSRIs.)

Evidence Ratings and Sources

1. **Evidence rating: SORT B**
   Sources: *Pediatrics, Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition), references 14 and 3.
   Website: http://pediatrics.aappublications.org/content/128/5/1007

2. **Evidence rating: SORT A**
   Source: *Pediatrics*, reference 14.
   Website: http://pediatrics.aappublications.org/content/128/5/1007

3. **Evidence rating: SORT A**
   Sources: *Child Adolesc Psychiatr Clin N Am*, *J Clin Child Adolesc Psychol*, references 90 and 89.
   Websites: https://www.childpsych.theclinics.com/article/S1056-4993(15)00024-3/fulltext;
   https://www.tandfonline.com/doi/full/10.1080/15374416.2014.971458

4. **Evidence rating: SORT B**
   Source: US Preventive Services Task Force.
   Website: https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/depression-in-children-and-adolescents-screening1?ds=1&s=depression

5. **Evidence rating: SORT B**
   Sources: *Pediatrics*, *Pediatrics*, references 115 and 104.
   Websites: http://pediatrics.aappublications.org/content/132/4/e996;
   http://pediatrics.aappublications.org/content/141/3/e20174081

6. **Evidence rating: SORT A**
   Sources: *Pediatrics*, *Pediatrics*, *JAMA*, references 115, 104, and 116.
   Websites: http://pediatrics.aappublications.org/content/132/4/e996;
   http://pediatrics.aappublications.org/content/141/3/e20174082;
   https://jamanetwork.com/journals/jama/fullarticle/199274

Strength of Recommendation Taxonomy (SORT)

Strength of Recommendation	Definition
A	• Recommendation based on consistent and good-quality patient-oriented evidence.[a]
B	• Recommendation based on inconsistent or limited-quality patient-oriented evidence.[a]
C	• Recommendation based on consensus, usual practice, opinion, disease-oriented evidence,[a] or case series for studies of diagnosis, treatment, prevention, or screening.

[a]Patient-oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life. Disease-oriented evidence measures intermediate, physiologic, or surrogate end points that may or may not reflect improvement in patient outcomes (eg, blood pressure, blood chemistry, physiologic function, pathologic findings).

(From Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy [SORT]: a patient-centered approach to grading evidence in the medical literature. Am Fam Physician. *2004;69:548-556.)*

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SECTION ONE

Attention-Deficit/Hyperactivity Disorder

Attention-deficit/hyperactivity disorder (ADHD) is a neurobehavioral condition that affects more than 9% of US children and adolescents and often is seen in family medicine settings. A comprehensive evaluation for ADHD gathers information across time and settings; considers common comorbid or alternative conditions, such as learning disabilities and disorders of mood or anxiety, vision, hearing, and sleep; and includes a thorough physical examination. The need for additional evaluation is determined by the history and physical examination results. Diagnosis requires a sufficient number and duration of symptoms of inattention, or hyperactive/impulsive symptoms, or symptoms in each domain, beginning before age 12 years. Evidence-based management varies depending on patient age and may include psychosocial-behavioral approaches and pharmacotherapy. Behavioral treatment is the first-line recommended therapy for preschool-aged children and has been shown to benefit school-aged children. Stimulant drugs address core ADHD symptoms for a majority of patients but the incidence of adverse effects is greater for preschool-aged children. Alternative second-line drugs are available. Monthly monitoring is advised until the dosage is optimized, then patients should be monitored quarterly for the first year, followed by at least two annual visits. Individuals with ADHD may experience symptoms in adulthood.

Case 1. Sam, a 9-year-old boy, presents to your office with his parents regarding concerns about school performance. He often is fidgety, off-task, and distracted, though he performs well academically and there are no other behavioral issues. This began in preschool. He now is in the fourth grade, and his teachers have raised concerns about his behavior. He has difficulty with organization, finding homework, and completing assignments. It is difficult to get his attention in class. His grades have been As and Bs except for in language arts. Outside of school, he enjoys participating in a youth group and playing soccer.

Results of vision and hearing tests and health maintenance examinations are normal. There have been no changes in Sam's appetite, sleep, or mood, and no changes in the family's social situation. There is a family history of attention-deficit/hyperactivity disorder (ADHD) in his father and depression in his mother.

Presentations, Prevalence, and Biology

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral condition in children and adolescents.[1] According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) (*DSM-5*), ADHD has three presentations: a predominantly inattentive presentation (difficulties with sustaining attention, listening, distractibility, forgetfulness, organizing, and completing tasks), a predominantly hyperactive/impulsive presentation (difficulties with talking excessively, restlessness, fidgetiness, acting impulsively), and a combined presentation (six or more of nine symptoms in each category).[1,2,3] ADHD affects approximately 7% to 11% of children 4 to 17 years.[4,5] ADHD and its functional consequences also affect adults, with an estimated prevalence of 2.5% to 5%.[6,7]

Among children and adolescents, boys are more likely to meet diagnostic criteria for ADHD. The estimated male to female prevalence ratio for combined type ADHD is 3.2:1.[6] The 2016 National Survey of Children's Health (NSCH) found that 9.4% of US children 2 to 17 years (approximately 6.1 million) had ever been diagnosed with ADHD, and 8.4% had a current ADHD diagnosis.[8]

Although measurement methods changed between 2003 to 2011, the prevalence of a parent reporting that ADHD was ever diagnosed for their child by a clinician increased by 42%, or approximately 4% per year.[5] The increase in ADHD diagnoses is thought to be related to changes in diagnostic criteria and improved detection due to education of physicians and the public.[5,8]

The biology of ADHD involves genetic and neurotransmitter factors.[9] Parents and siblings of individu-

als with ADHD have a two- to eightfold increased risk of ADHD.[10] Symptoms are related to several brain regions and neurotransmitter systems. The prefrontal cortex is particularly affected, as are other regions, including the dorsal anterior cingulate cortex and the nucleus accumbens. Regulation of neurotransmitters is altered in the dopamine, norepinephrine, and serotonin systems.[11]

Evaluation

The first step in evaluation of patients with suspected ADHD is identification of symptoms that affect functioning or performance, result in significant academic or social impairment, and are present in two or more settings, such as at home and school.[12] Because it is common, it is reasonable to screen patients for ADHD at health maintenance visits (*Table 1*).

When evaluating patients for ADHD, physicians should gather information about the evolution of the presenting concerns and review past and current risk factors.[1,12,13] They should review the diagnostic criteria in the *DSM-5* and obtain information about current symptoms across settings to ensure the criteria are met. If parental concern and patient symptoms coincide with psychosocial changes, physicians should explore this thoroughly. The presence of a family history of ADHD is supportive of the diagnosis.[9]

Physicians should screen for coexisting or primary conditions with symptoms that can mimic those of ADHD. These include vision disorders, hearing loss, sleep disorders (insufficient duration or poor quality due to sleep disordered breathing), learning disabilities, anxiety, depression, substance use disorders, and seizure disorders.[12,13] Physicians also should consider other factors and conditions, including fetal alcohol syndrome; autism spectrum disorders; prematurity or low birth weight; lead exposure; nutritional deficiencies, such as iron deficiency; developmental delay or intellectual disability; and genetic conditions, such as fragile X syndrome.[9,12,14,15]

When the physical examination is performed, a thorough cardiovascular evaluation and assessment for any conditions suggested by the history should be included. The need for additional laboratory tests is determined by the history and physical examination.[12,13,14,16]

Case 1, cont'd. Sam's parents tell you that his teachers have been concerned about his distractibility and poor work completion since preschool. His parents recall attributing Sam's behaviors to his being "just like his father." Sam has no history of hospitalization, surgery, or injury. He was born prematurely at 32 weeks with a low birth weight. Results of the physical examination are normal.

Evaluation for ADHD includes gathering information from parents and teachers using behavioral rating scales. These scales are not diagnostic but can confirm the degree and consistency of concern across settings and raters. Some behavioral ratings scales are free, such as the National Initiative for Children's Healthcare Quality (NICHQ) Vanderbilt Assessment Scales (VAS), and others are proprietary.[12,17,18,19]

The VAS includes the *DSM-5* criteria for ADHD and questions regarding functional impairment and symptoms of comorbid mental disorders (eg, oppositional defiant, conduct, mood, and anxiety disorders). It is validated for use in patients ages 6 to 12 years but does not provide normative comparisons for age or sex.[20] Other scales, such as the Conners rating scales, provide age- and sex-based normative comparisons from preschool age to 18 years.[17]

Table 1
Screening for ADHD

Questions to ask	How well is the child functioning at school?
	Has the child's teacher discussed any learning concerns?
	Does the child have problems completing work at school or home?
	Are there behavioral problems or concerns at school or home?
Behaviors to observe	Is the child distracted or engaged?
	Is the child overly active, fidgety, or restless?
	Is the child impulsive in conversation or action?

ADHD = attention-deficit/hyperactivity disorder.

Information from American Academy of Pediatrics. Implementing the key action statements: an algorithm and explanation for process of care for the evaluation, diagnosis, treatment, and monitoring of ADHD in children and adolescents. Pediatrics. *2011;(Suppl):SI1-SI21.*

Although the choice of tool may depend on the cost, the optimal evaluation includes age-appropriate behavioral rating scales across settings from adults who know the patient well. Obtaining behavioral rating scales across settings may be challenging for preschool-aged children who are not in school or for adolescents who are in middle school and rotate through multiple classes. In adolescents, other adults such as coaches may be helpful. Factors such as parent mental disorder or stress may affect rater reliability.[1,14]

Diagnosis

The *DSM-5* diagnostic criteria require the presence of six or more of nine symptoms in the inattentive and/or hyperactive/impulsive domains in two or more settings (eg, home, school, community) for at least 6 months, before age 12 years, along with evidence of functional impairment. They also require that no other condition or mental disorder better explain the symptoms (*Table 2*). The *DSM-5* includes different criteria for patients 17 years or older (ie, five of nine symptoms in one or both domains must be present).[3]

Experts suggest using caution when considering an ADHD diagnosis for preschool-aged children because of the challenges of determining whether behaviors are within the accepted range for a preschooler's developmental stage.[14,21] ADHD symptoms, such as inattention, may not be associated with functional impairments until school demands increase with age.

Coexisting conditions can worsen the severity of ADHD symptoms.[12] A benefit of the VAS is that it provides additional screening for symptoms of common comorbid mental disorders.[20]

If the diagnosis of ADHD is uncertain, a history of risk factors (eg, prematurity, low birth weight, environmental exposure, family history) may be supportive.[9] If there is parent concern but symptom reporting reliability is uncertain, consider reassessment of the patient after instituting parent management training, particularly for younger children.

Case 1, cont'd. Sam's behavioral ratings support a predominantly inattentive ADHD presentation. He has more than six of nine inattentive symptoms, with three of nine hyperactive/impulsive symptoms, present across home and school settings. Parent and teacher ratings describe "somewhat of a problem" in overall school

Table 2
DSM-5 Diagnostic Criteria for ADHD

A. Six or more of the following symptoms in one or both domains that have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively affect activities:

Inattention	Fails to attend to details, makes careless mistakes
	Difficulty sustaining attention
	Does not seem to listen
	Does not follow through, fails to finish work
	Difficulty organizing tasks
	Difficulty starting tasks that require sustained effort
	Often loses necessary things
	Easily distracted
	Often forgetful
Hyperactivity/ impulsivity	Often fidgety
	Trouble remaining seated
	Runs about inappropriately
	Cannot play quietly
	Often "on the go"
	Talks excessively
	Blurts out answers
	Difficulty with waiting his or her turn
	Interrupts or intrudes

B. Symptoms present before age 12 years

C. Symptoms present in ≥2 settings

D. Symptoms interfere with functioning

E. Symptoms not better explained by other mental disorder

Presentations

Predominantly inattentive

Predominantly hyperactive/impulsive

Combined inattention and hyperactivity/impulsivity

ADHD = attention-deficit/hyperactivity disorder.

performance and relationships with others but they note that he is maintaining his grades. Teacher comments on his report cards and progress reports show that he has difficulty with work completion, organization, and daydreaming. You provide education and discuss initial management with his parents.

Management

Attention-deficit/hyperactivity disorder is a chronic condition that should be monitored in the context of a medical home.[1,14] If one or more coexisting medical condition, mental disorder, or learning disability is present, the management plan should include further evaluation and management of those conditions. After coexisting conditions have been managed, patients should be reevaluated for ADHD symptoms to determine whether and how much ADHD-specific management is required.[14]

Several guidelines provide evidence-based and expert opinion regarding evaluation and behavioral and drug management of ADHD.[14,15,16] Guideline recommendations differ depending on patient age, the available studies of pharmacotherapy and behavioral approaches considered separately and together,[22,23,24,25] and the incidence of adverse drug effects depending on age.[13,14,16,26]

The American Academy of Pediatrics (AAP) clinical practice guideline recommendations for management vary by age and include the following[14]:

- Preschool-aged children (age 4 to 5 years): Evidence-based parent- and/or teacher-administered behavioral therapy is the first-line treatment for this age. Drugs may be recommended if behavioral approaches do not sufficiently improve symptoms, which may remain moderate to severe.
- Elementary school-aged children (age 6 to 11 years): Drugs and evidence-based parent- and/or teacher-administered behavioral therapy are recommended.
- Adolescents (age 12 to 18 years): Drugs are recommended for this age group, preferably with behavioral therapy.

Behavioral Therapy

The Multimodal Treatment Study of Children With ADHD (MTA) included children ages 7 to 9.9 years with combined presentation of ADHD. The study assessed intensive behavioral therapy, drug treatment, behavioral therapy and drug treatment combined, and standard care by community physicians.[22]

Initial findings were published in 1999 and showed similar behavioral, academic, and social skills outcomes for patients treated with a drug and with or without behavioral therapy. The findings suggested that when drugs were initiated with monthly dosage adjustments and follow-up until core symptoms improved, children experienced short-term benefits.[22] Longer term follow-up from the MTA study showed additional benefits with behavioral therapy.[24]

Behavioral interventions for ADHD are listed in *Table 3* and include parent training, classroom management with reporting back to parents with a daily report card, organizational skills training, and peer interventions with social skills training.[14,25,27] Group or individual play-based therapy and cognitive behavioral therapy have not been shown to be effective for ADHD management, although cognitive behavioral therapy may be useful in addressing coexisting conditions, such as anxiety.[25] Lack of parental availability and time commitment may be barriers to treatment.

Table 3
Psychosocial/Behavioral Management of ADHD

Intervention	Description
Classroom management	Teachers implement rules, use token systems, and create a daily report card to communicate with parents
Organizational skills training	The child is trained in skills of organization, time management, task planning, and assignment tracking
Parent training	Parents are educated about ADHD and trained to use attention-praise, privileges-rewards, disengagement, and limit-setting
Peer interventions	The child is provided with systematic social skills training and supervised practice in appropriate peer interactions

ADHD = attention-deficit/hyperactivity disorder.

Information from Schoenfelder EN, Sasser T. Skills versus pills: psychosocial treatments for ADHD in childhood and adolescence. Pediatr Ann. *2016;45(10):e367-e372.*

Pharmacotherapy

Pharmacotherapy for ADHD includes first-line stimulants and second-line nonstimulants.[16] The mechanisms of action of stimulant and nonstimulant drugs for ADHD involve changes to neurotransmitter levels in affected brain regions. Stimulant drugs block norepinephrine and dopamine transporter reuptake and facilitate the release of these neurotransmitters in cortical and subcortical areas.[11] Alpha$_2$-receptor agonists stimulate postsynaptic alpha$_{2A}$-receptors and improve synaptic transmission in the prefrontal cortex.[28] Atomoxetine, a selective norepinephrine reuptake inhibitor, increases the norepinephrine level in the presynaptic space.[11]

If a patient has an insufficient response to standard drugs and behavioral therapy, referral to a psychiatry subspecialist may be indicated to consider other approaches to management.[15] The drugs covered by or that require authorization from health insurance plans may vary by state and by insurance plan.

Stimulants. These first-line drugs (ie, methylphenidate and amphetamine salts) manage ADHD symptoms for most patients.[16] Methylphenidate is approved by the Food and Drug Administration (FDA) for use in children 6 years and older and adolescents, and some amphetamine salts (eg, amphetamine, dextroamphetamine) are approved for use in children 3 years and older. While amphetamine, dextroamphetamine, and the combination are approved by the FDA for use in children, the AAP does not recommend their use in children ages 3 to 5 years due to a lack of safety and efficacy data.[29]

The physician may choose to prescribe a short- or long-acting formulation of a stimulant. The choice may be influenced by patient age, such as use of short-acting formulations for preschool-aged children and longer-acting formulations for older children and adolescents.[12,15] Experts typically suggest starting with a low dose and increasing the dose at 3- to 7-day intervals to achieve improvement in ADHD symptoms.[1,12,14,16] Stimulants are controlled substances, so prescriptions need to be renewed monthly.

In studies of methylphenidate and amphetamine salts, approximately 70% of patients with ADHD showed a reduction in symptoms with the first drug taken.[1,11,14,16] If the drug is not effective at appropriate doses or there are significant adverse effects, then it is reasonable to try another drug in the same or another stimulant group. Because stimulants have short half-lives, dose adjustments can be made quickly.[30,31]

To evaluate response to a drug, patients should be asked to provide feedback after an initial trial.[12] This may include questions about the level and duration of benefit, as well as the timing of any adverse effects. If symptoms worsen instead of improve, the physician should consider trying an alternative stimulant. If symptoms worsen later in the day, the addition of a small dose of a short-acting stimulant should be considered.[15] Patients then should be monitored for worsening sleep onset latency. The dose, the formulation (short- or longer-acting), and the timing of the drug should be adjusted as needed.[12,31] Long-acting formulations typically are well tolerated and preferred by patients.[1,32]

The relationships among ADHD, drug treatment, and sleep have been challenging to disentangle.[30] Children with ADHD often have poor sleep quantity and quality before drug treatment, and stimulant drugs often prolong sleep onset latency, decrease sleep efficiency, and shorten sleep duration.[33,34] The relationship between ADHD and sleep is an area of ongoing research.[35]

Pharmacogenetics is a growing field that may help to guide drug choices in the future. However, sufficiently reliable pharmacogenetic testing is not yet available to guide ADHD management.[36]

Nonstimulants. Nonstimulants that are FDA-approved for ADHD management in children age 6 and older and adolescents include atomoxetine and the alpha$_2$-adrenergic receptor agonists clonidine and guanfacine.[14,29] Nonstimulant drugs have been shown to be less effective than stimulant drugs. Nonstimulant drugs have an effect size (effect size = [(treatment mean – control mean)/control standard deviation]) of approximately 0.7 compared with an effect size of approximately 1.0 for stimulant drugs.[14]

Reasons for starting treatment with a second-line nonstimulant drug can include concerns about drug diversion or the presence of coexisting conditions (eg, use of an alpha-adrenergic receptor agonist to manage ADHD and a tic disorder).[1] Other drugs, such as antidepressants and atypical antipsychotics, are not FDA-approved for ADHD management.[29]

Atomoxetine should be started at a dose of 0.5 mg/kg/day to avoid the potential adverse effects of nausea, abdominal discomfort, and somnolence. The atomoxetine dose should be started at 0.5 mg/kg/day for 1 week, then titrated to 1 to 1.2 mg/kg/day as tolerated.[16] Clonidine or guanfacine also should be started at a low dose and the dose titrated weekly.[1,16]

Patients should take these drugs at a level dose for 2 to 6 weeks before effectiveness is evaluated. Adherence to the drug regimen as prescribed is important to improve symptoms. In adolescents, this may require targeted interventions to improve adherence, such as use of motivational interviewing techniques.[1]

Adverse drug effects. Stimulants can cause nausea, reduced appetite, weight loss, headache, abdominal discomfort, irritability, emotional lability, and insomnia.[16,26] The effect of stimulants on height gain has been debated. Some studies have shown no evidence of significant effect, although one study showed height suppression with chronic stimulant drug use in patients with ADHD.[37,38]

Significant cardiac issues are rare in children taking stimulants. The AAP recommends assessment of children starting stimulants with a targeted cardiac history (eg, history of cardiac disease, palpitations, syncope, or seizures; family history of sudden death; hypertrophic cardiomyopathy; long QT syndrome) and a physical examination, including a cardiac examination.[39] In some cases, combinations of drugs (eg, a stimulant with an alpha$_2$-adrenergic receptor agonist) might allow for smaller doses of the stimulant drug with fewer adverse effects.[1,14]

Adverse effects of atomoxetine include somnolence, nausea, and abdominal discomfort.[16] Liver enzyme level elevation and dysfunction have been reported but are rare.[40] Physicians should discuss with patients and parents the Black Box warning regarding a possible increased risk of suicidal ideation in children taking atomoxetine. However, results of a recent cohort study did not support increased risk with short-term use.[41]

Adverse effects of clonidine include somnolence, nightmares, and mood changes. Adverse effects of guanfacine include somnolence, hypotension, and constipation.[13]

Special Considerations

Preschool-Aged Children

In addition to the challenges inherent in the diagnosis of ADHD in preschool-aged children, the incidence of adverse effects attributable to stimulant drug use (eg, irritability, emotional outbursts, sleep problems) is greater in this age group than in school-aged children. The rate of intolerable adverse effects has been shown to be approximately 11% among preschool-aged children taking methylphenidate.[26] If required, a low starting dose of methylphenidate (ie, 2.5 mg 2 times/day) is recommended.[15] (Methylphenidate is not FDA-approved for use in children younger than 6 years.)

Adolescents

The use of stimulants to manage ADHD has been shown to improve driving performance in adolescents and young adults.[42] Longer-acting stimulant formulations or alpha$_2$-adrenergic receptor agonists may be helpful for adolescents with ADHD who drive after school hours. Psychosocial treatment, with or without drugs, has not been studied in adolescents as extensively as in younger children but such treatment may be helpful.[16]

Adolescents tend to have lower rates of adherence to pharmacotherapy and a higher risk of developing comorbid conditions, such as anxiety and depression. They also tend to have poorer judgment and decision-making skills (because of age and ADHD symptoms) in the context of emerging independence. Psychosocial treatment and close follow-up are recommended to provide education and improve adherence.[16]

Substance Abuse and Misuse

More than a dozen studies have examined the association between stimulant drug treatment of ADHD and substance use disorders. With the exception of the results of one study, a significant relationship has not been found.[43] Treatment with stimulants has been associated with a decreased risk of substance abuse.[44]

However, drug diversion (ie, the transfer or sale of drugs for illicit use) for the purposes of performance enhancement or recreation has been shown to begin as early as middle school.[11] One study found that lifetime diversion rates ranged from 16% to 29% among students with stimulant prescriptions. Approximately 5% to 9% of grade school- and high school-aged children and 5% to 35% of college-aged individuals reported stimulant misuse.[45]

Patients and families should be educated about the fact that stimulants are controlled substances in the United States. It is a violation of federal law to divert controlled substances such as stimulant drugs to others or to take them without a prescription. The use of stimulants should be monitored by parents and discussed directly with adolescents.[11]

Obesity

Emerging research suggests an association between ADHD and obesity. Studies suggest that impairments

in executive function may increase the risk of poor weight control in patients with ADHD. The influence of prefrontal function and reward pathways is being investigated.[46,47]

Case 1, cont'd. Sam benefits from treatment with a long-acting methylphenidate formulation. Parent and teacher reports show improvements in symptoms and behavior, including daydreaming, task completion, and social interactions with peers.

Monitoring

The AAP guideline recommends follow-up visits once per month after drug initiation to monitor vital signs, growth, and any adverse effects until a stable effective dose is set.[1,14] Physicians should ask about symptoms to assess for improvement. Drug dosage adjustments may be made by telephone between visits. After a stable effective dose is achieved, visits every 3 months are recommended for the first year, and then at least 2 times per year. The VAS follow-up form is a useful tool to provide data on effectiveness of the treatment regimen.[1]

Follow-up visits also are opportunities to evaluate progress with psychosocial or behavioral treatment, assess school progress, ask about any changes at home, and determine whether the patient or parents have any new or emerging concerns. Adherence to treatment is challenging to maintain over time.[48]

Outcomes

Individuals with ADHD are less likely to complete high school or to attend or graduate from college, and they tend to have difficulties with job performance, social interactions, and health outcomes.[44]

In follow-up of individuals at age 25 years who participated in the MTA study at ages 7 to 10 years, factors associated with ADHD symptom persistence into adulthood included more severe ADHD symptoms in adulthood. In this cohort, extended use of pharmacotherapy in childhood was not shown to reduce ADHD symptom severity in adulthood. Also, cumulative drug use was associated with suppression of adult height.[38]

Physicians often are asked whether children will grow out of ADHD. Studies using different populations, designs, diagnostic methods, and comorbid risks have attempted to address this question. The results have been inconsistent, with studies showing rates of persistence of ADHD into adulthood varying from 5% to 76%.[49] Recent studies conducted in several countries have found there may be little overlap between childhood and adult ADHD and that these may be two separate disorders.[50,51,52]

SECTION TWO
Learning Disabilities

Learning disabilities are estimated to affect 5% to 9% of US children. Risk factors include a family history of learning disabilities, environmental factors during gestation or birth, and social adversity. Individuals with learning disabilities may experience social exclusion and bullying, poor self-image, or underachievement. They may struggle with tasks and in settings that depend on reading, mathematical skills and reasoning, or written and verbal communication. The family physician often is the first to be approached by parents regarding learning delays in children. The initial evaluation should include a thorough history and physical examination for medical conditions and mental disorders that may manifest as or coexist with learning disabilities. Physicians should advise parents to request that the child's school administer tests for learning disabilities. Physicians should be aware of common tests used to assess for learning disabilities, understand the laws that support provision of special education, and recognize the main categories of learning disabilities. Interventions provided through an Individualized Education Program or Section 504 plan may include educational strategies, accommodations in test taking time or setting, speech or occupational therapy, and adaptive tools. Physicians should help connect families with children with learning disabilities with services and resources.

Case 1, cont'd. It has been 9 months since Sam visited your office for attention-deficit/hyperactivity disorder. Since his last visit, his behavior, organizational skills, and ability to complete tasks have improved but his teachers continue to be concerned about his academic performance, particularly with reading skills. His parents worry that he still may be rushing through work. They ask if he needs further evaluation or a drug dosage adjustment. They report no changes in appetite, sleep, overall mood, or family life, although they think that Sam is beginning to become discouraged. In discussing Sam's ongoing challenges in school, his father shares how he also struggled with school.

Prevalence

The prevalence of learning disabilities among children in the general US population is estimated to be between 5% to 9%.[53] In 2015-2016, approximately 13% of students ages 3 to 21 years received special education services, and 34% of these students had a specific learning disability.[54] Estimates of prevalence should be interpreted with caution, given that there are indications that rates of learning disability diagnosis are increasing for children in low-income households.[53]

Description, Causes, and Risk Factors

Learning disabilities are rooted in neurologic differences in brain structure and function. These disabilities are enduring and are not attributable to the influences of culture, economic disadvantage, or inadequate education.[55] Learning disabilities are not the result of depression or other mental disorders, such as anxiety or oppositional defiant disorder.

Learning disabilities may result from insults to the developing brain during gestation or birth, such as oxygen deprivation, maternal illness, fetal exposure to drugs or alcohol, maternal malnutrition, premature labor, or low birth weight. Postnatal factors include exposure to toxins, such as lead; nutritional deprivation; and traumatic injury.[55] Studies of identical and fraternal twins show that learning disabilities are highly heritable.[56]

There is a higher prevalence of learning disabilities among individuals who live in poverty and experience social adversity.[55] An estimated 30% to 50% of children with a learning disability also have a coexisting mental disorder, compared with 8% to 18% of the general population of children.[57]

Children and adolescents with learning disabilities are more vulnerable to emotional distress and may struggle to access resources for coping. They may lack the skills required to manage social settings, engage in effective social problem-solving, and recognize and interpret social cues.[58] Individuals with learning disabilities can experience social exclusion and bully-

ing, poor self-image, or underachievement.[55,59] Being bullied has been shown to be associated strongly with psychosomatic symptoms and depression, as well as a higher number of health issues.[59]

Evaluation

The family physician often is the first to be approached by parents or to recognize developmental delays or disabilities, often based on concerns regarding poor academic performance. Early screening and diagnosis are critical in addressing learning disabilities and in reducing vulnerability to mental health complications and potential social adversity.

Criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) (*DSM-5*) can be helpful in determining if symptoms are suggestive of a learning disability. Patients may have difficulty with word reading, reading comprehension, spelling, written expression, numbers, or mathematical reasoning or calculation.[3] Common examples include delays in language and reading skills development in preschool-aged or elementary school-aged children, or an adolescent experiencing academic problems related to poor reading comprehension skills.

Physicians should record the patient history (including the learning and educational histories) and evaluate for potential medical conditions and mental disorders that may manifest as or coexist with learning disabilities. The physical examination should assess for physical abnormalities, dysmorphic features, and sensory deficits, such as in hearing and vision. Physicians also can incorporate informal questions to assess speech, reading, math, and language skills. This can include exploration of age-appropriate pronunciation of words, reading, math facts, and math calculations.[60] *Table 4* provides an approach to examining a child for potential learning disabilities using the acronym FM LEARNS.

In addition to assisting in identification of learning disabilities, the role of physicians is to advocate for management and intervention, address coexisting conditions, and collaborate in ongoing management with the school team and family members. A secondary role of physicians is to provide information on community resources and to mediate potential challenges between family members and the school team.[60]

Family physicians should be familiar with the common tests included in school evaluations for learn-

Table 4
FM LEARNS Acronym for Evaluation for Learning Disabilities

Acronym Element	Description
Family history	Ask about family history of developmental delay, ADHD, or learning problems. Ask about significant life changes or family events
Mood and behavior	Determine if there have been any concerns at home or school regarding emotional struggles or behavioral problems
Learning and school performance	Obtain report cards, behavioral checklists, and other reports from school
Early development	Ask about any complications or health issues during pregnancy, birth, and early development. Assess for a history of developmental problems or concerns
Appearance	Evaluate weight, height, head circumference, and genitalia. Assess for noticeable difficulties with gait, gross or fine motor skills, and coordination If any physical examination result or history is suggestive of a medical condition, obtain appropriate laboratory tests (eg, tests for iron deficiency, lead toxicity, thyroid dysfunction)
Reading, writing, and arithmetic	Use informal questioning and engagement to assess reading, writing, and arithmetic skills
Neurologic examination	Evaluate motor skills, coordination, muscle tone, and strength. Assess for tics or concerns regarding potential seizures
Sensory screening	Screen for hearing or vision impairments

ADHD = attention-deficit/hyperactivity disorder.

Table courtesy of Thomas W. Bishop, PsyD, with information from Phillips DM, Longlett SK, Mulrine C, Kruse J, Kewney R. School problems and the family physician. Am Fam Physician. *1999;59(10):2816-2824.*

ing disabilities. *Table 5* lists tests commonly used in psychoeducational evaluation. This list is not exhaustive and does not imply that all of these tests must be included.

Case 1, cont'd. Sam's parents bring you papers from a recent parent-teacher meeting that indicate Sam is lagging behind his peers in reading and writing skills but is meeting all other benchmark measures. Sam says he mostly likes school but thinks that he is not good at reading and finds writing to be difficult and unenjoyable. Results of vision and hearing tests are normal. There is no history of significant falls, seizures, or neurologic issues.

When you ask about the specific difficulties noted by parents and teachers, there are consistent concerns regarding Sam's understanding of grammar, word recognition, and other basic reading skills. You give Sam's parents a handout that explains how to approach the school for a psychoeducational evaluation and how an Individualized Education Program (IEP) may help.

Diagnostic Criteria

The two main sources that define the criteria that constitute a learning disability are the *DSM-5* and the Individuals with Disabilities Education Act (IDEA). IDEA is a set of laws intended to provide children with disabilities with the same opportunities for education as other children.[55]

IDEA defines a *specific learning disability* as[55]:

> A disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include a learning problem that is primarily the result of visual,

Table 5
Commonly Used Tests for Evaluation for Learning Disabilities

Domain	Instrument
Achievement	Wide Range Achievement Test, Fifth Edition (WRAT5) Wechsler Individual Achievement Test – Third Edition (WIAT-III) Woodcock-Johnson IV Tests of Achievement (WJ IV ACH) Peabody Individual Achievement Test – Revised/Normative Update (PIAT-R/NU)
Aptitude and intelligence	Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V) Kaufman Assessment Battery for Children, Second Edition (KABC-II)
Attention and concentration	Conners Parent Rating Scale – Revised (CPRS-R) and Conners Teacher Rating Scale – Revised (CTRS-R) ADD-H Comprehensive Teacher's Rating Scale (ACTeRS)
Behavioral rating	Child Behavior Checklist (CBCL) Behavioral Assessment System for Children, Third Edition (BASC-3)
Executive functioning	Stroop Color and Word Test
Memory	Wide Range Assessment of Memory and Learning, Second Edition (WRAML2)
Motor functioning	Beery-Buktenica Developmental Test of Visual-Motor Integration, Sixth Edition (Beery VMI-6)
Reading ability	Gray Oral Reading Tests, Fifth Edition (GORT-5) Test of Word Reading Efficiency – Second Edition (TOWRE-2)

Information from Aylward GP. Practitioner's Guide to Developmental and Psychological Testing: Critical Issues in Developmental and Behavioral Pediatrics. *New York: Plenum Publishing Company; 1994; Scarpina F, Tagini S. The Stroop Color and Word Test.* Front Psychol*. 2017;8:557; Pfeiffer B, Moskowitz B, Paoletti A, Brusilovskiy E, Zylstra SE, Murray T. Developmental Test of Visual-Motor Integration (VMI): An Effective Outcome Measure for Handwriting Interventions for Kindergarten, First-Grade, and Second-Grade Students?* Am J Occup Ther. *2015;69(4):6904350010p1-7.*

> hearing, or more abilities, of mental retardation*, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (20 U.S.C. § 1401 (30))
>
> *Now known as intellectual disability

The *DSM-5* description of a specific learning disorder overlaps with the IDEA definition in that the diagnosis requires persistent difficulties and "inaccurate or slow and effortful" academic skills and abilities. These skills must be found to be significantly below average on appropriate culturally sensitive tests, with the difficulties not better explained by other etiologies, such as developmental, neurologic, or sensory (ie, uncorrected vision or hearing) causes. There also must be indications that these difficulties significantly interfere with academic achievement, occupational performance, or activities of daily living.[3,61]

Learning disabilities are understood to be inherent in how an individual receives, stores, processes, retrieves, and communicates information.[55] More than 80% of students with learning disabilities show significant deficits in reading.[62] However, learning disabilities affect math and written expression as well as reading. Some individuals have limitations in information processing that are not specifically identified as learning disabilities but frequently are associated with learning disabilities, including auditory and visual processing deficits.[55]

The *DSM-5* requires at least one noted deficiency in reading skills and comprehension, spelling, written expression, or mathematical skills and reasoning that is not responsive to intervention and lasts for more than 6 months. The academic skills in question must be substantially and quantifiably below average for an individual's age, and significantly affect daily life.[3]

Learning disabilities can be broadly categorized into three main types: dyslexia (deficiencies in reading skills), dysgraphia (deficiencies in writing and written expression), and dyscalculia (deficiencies in mathematical skills) (*Table 6*).[3,55] Dyspraxia (deficiencies in muscle control) is occasionally included as a fourth category.[3]

Case 1, cont'd. Sam's parents bring in a report showing the school psychologist's psychoeducational evaluation for Sam that includes measures of his intellectual aptitude and potential, achievement, motor functioning, and reading ability. Based on that evaluation and a review of Sam's school work, the school IEP team determines that Sam is experiencing a combination of dyslexia and dysgraphia. The school then implements an IEP for Sam. Over several months, his academic progress improves.

Management

Management of learning disabilities may include use of educational and rehabilitative services. Educational services and interventions aim to help students navigate the school environment and benefit from instruction, whereas rehabilitative services focus on restoration of function.[60]

Learning disability interventions typically include educational strategies, such as use of a curriculum that strengthens phonologic awareness, includes classroom modifications, and incorporates multisensory instruction.[60] Patient referral for speech or occupational therapy may be helpful, depending on the needs of the child. Adaptive tools, such as audio recording and word processing programs, as well as accommodations in test taking time and setting, are common and often powerful tools in assisting children with learning disabilities.[63]

Table 6
Common Types of Learning Disabilities

Dyslexia	Characterized by difficulties with accurate and fluent word recognition, poor decoding, and poor spelling abilities; often reflected in poor reading comprehension
Dyscalculia	Characterized by difficulties in processing numerical information, learning arithmetic facts, and performing accurate and fluent calculations; often reflected in poor math reasoning skills
Dysgraphia	Characterized by difficulties with the physical mechanics of writing, written expression, and syntax structure and grammar; often reflected in poor penmanship and writing skills

Information from American Psychiatric Association. Neurodevelopmental disorders: specific learning disorder. Diagnostic and Statistical Manual of Mental Disorders. *5th ed. Washington, DC: American Psychiatric Association; 2013:67; Cortiella C, Horowitz SH.* The State of Learning Disabilities: Facts, Trends, and Emerging Issues. *New York: National Center for Learning Disabilities; 2014:1-46.*

Physicians should educate families to be cautious about the use of interventions that are controversial and have little or no supporting evidence, such as behavioral vision therapy.[60] Family physicians can help coordinate use of other services and community resources, including psychiatric care, when there are concerns regarding emotional functioning or comorbid conditions, such as attention-deficit/hyperactivity disorder (ADHD) or depression. Drugs are not useful in the management of learning disabilities but may be a part of management planning when comorbid conditions are present.

Course and Outcome

Learning disabilities have been associated with lower levels of academic achievement in adulthood, particularly in individuals with reading difficulties.[55,64] Early evaluation and management of learning disabilities can help reduce the likelihood of secondary issues with self-confidence, social skills, anxiety, and depression.[55,60] Individuals who learn early on about the nature of their learning disabilities, use appropriate services, and do not define themselves by their struggles, have the opportunity to be more self-confident and overcome barriers.[55]

Patient Education and Resources

Physicians can assist students and their parents by educating them about student rights and how schools identify and address learning disabilities. Students with disabilities have rights under IDEA with its most recent 1997 amendment or under Section 504 of the Rehabilitation Act of 1973 (subsumed under the Americans with Disabilities Act of 1990).[55]

The IDEA authorizes funding for early education, mandates provision of special education services for school-aged students, and outlines the principles of service provision. IDEA requires the provision of a free and appropriate public education, the intentional identification and evaluation of students with disabilities, the development and implementation of an Individualized Education Program (IEP), and education that occurs within the least restrictive environment or with children without disabilities to the maximum extent possible. It also provides due process safeguards and states that decision-making will be shared between schools and parents and/or students.[55,65,66]

A free and appropriate public education is considered to be achieved when there is the provision of reasonable accommodations, including individualized instruction and support for a student to benefit educationally. However, schools are not required to provide the "best" services.[65]

Section 504 focuses on broad civil rights and prohibits discrimination against any individual with a disability. It requires a free and appropriate public education within the least restrictive environment for all levels of education, including colleges and universities. This covers public as well as private schools that receive federal funding.[55,65]

The IDEA uses a categoric definition of disability, such as a learning disability, intellectual disability, or speech or language impairment. Section 504 defines disability in terms of a functional impairment, which includes physical and mental impairments that frequently are associated with a medical diagnosis, such as ADHD, deafness, or asthma.[55,65]

Some school districts use a response to intervention approach to identify potential learning difficulties for all students and provide initial evidence-based interventions. This process gathers data on a child's specific difficulties and which interventions have been effective.[55]

Parents who are concerned about their child's academic performance should communicate closely with teachers. Physicians should encourage parents to work with their child's teacher, school counselor, and school psychologist if concerns persist, and to request a more extensive evaluation for learning disabilities at any time.

It is beneficial for parents and students to first seek evaluation through the school. It is not mandated that schools accept outside evaluations, and outside evaluations tend to be costly. Also, the school and teacher are familiar with the child and are likely to have a role in any intervention. Physicians can direct families to helpful local and national resources (*Online Resources*).

SECTION THREE
Eating Disorders

Eating disorders are common. The typical onset of eating disorders is in mid- to late adolescence, affecting females more often than males. However, rates of eating disorders are increasing among younger children, males, and minority groups. Warning signs include abrupt changes in weight or growth percentiles, a preoccupation with calories or weight, altered eating habits, excessive exercise, loss of menses, pubertal delay, and a distorted perception of body size. For patients with eating disorders that include dietary restriction (eg, anorexia nervosa, avoidant restrictive food intake disorder), common short-term medical sequelae include weight loss, bradycardia, hypotension, fatigue, and irritability. Effects on growth and bone health may be irreversible. In patients with disorders that involve binge eating or purging behaviors (eg, bulimia nervosa, binge-eating disorder), common issues include significant weight fluctuations, gastrointestinal dysfunction, and electrolyte disturbances. Most children and adolescents with eating disorders can be treated with outpatient management with medical monitoring, psychotherapy, and support from a dietitian. Family-based treatment is the recommended approach for adolescents with anorexia nervosa. Some patients need medical or psychological stabilization in the hospital, and others benefit from day management or residential programs for additional structure and support.

Case 2. Adam, a 13-year-old Asian American boy, comes to your office for a health maintenance visit. He tells you that he recently joined the cross-country running team at school. He also says he has been trying to eat healthy by avoiding carbohydrates and all processed foods. He is curious about his weight today. His parents are present at the visit and express concern that Adam has been losing too much weight. They note that he argues with them daily about food. His coach has expressed concern about Adam's weight loss and has suggested that he cut back on running. Adam says, "Everyone is overreacting," and "They want me to stay fat."

On physical examination, the body mass index (BMI) is below the 5th percentile on the BMI-for-age growth chart. You note in the medical record that the BMI-for-age previously was near the 50th percentile. The heart rate is 56 beats/min and the blood pressure is 92/47 mm Hg. Adam's behavior, with restrictive eating leading to significantly low weight and fear of being fat despite the low BMI for his age, is consistent with anorexia nervosa.

Epidemiology and Etiology

Eating disorders are common.[67] The lifetime prevalences of anorexia nervosa, bulimia nervosa, and binge-eating disorder are estimated to be 0.5% to 2%, 0.9% to 3%, and 2% to 3.5%, respectively.[67,68] The onset typically is in mid- to late adolescence.[67] Although eating disorders frequently are thought of as occurring mostly in adolescent white females, increasing rates are being recognized in males, in younger children, and among minority groups.[67,69,70] The main types of eating and feeding disorders are summarized in *Table 7.*

The etiology of eating disorders in children and adolescents involves a complex web of genetic predisposition, sociocultural and environmental influences, and psychological traits. Eating disorders have an estimated heritability of 40% to 60%.[71] For individuals with a genetic predisposition, a variety of other factors may increase the risk of developing an eating disorder, including dieting behaviors; type 1 diabetes; childhood obesity; familial eating issues; negative comments about weight, shape, and eating; a history of early puberty in females; or a history of sexual assault or abuse.[67,72,73,74,75]

Participation in sports can be associated with development of eating disorders. The risk is higher among participants in sports that focus on aesthetics (eg, gymnastics, figure skating) or have strict weight classes (eg, wrestling, rowing), or when initial weight loss may improve performance (eg, endurance running).[76,77] Although social media can be a source for social connections, maladaptive use of social media has been associated with increases in negative body image and disordered eating behaviors.[78]

Table 7

Summary of *DSM-5* Diagnostic Criteria for Feeding and Eating Disorders

Anorexia nervosa

Restrictive eating leading to lower than expected body weight (in context of healthy developmental trajectories)

Fear of weight gain or behaviors that interfere with weight gain

Disturbance in body image

Two types: restricting or binge-eating/purging

Bulimia nervosa

Binge eating episodes at least 1 time/week for 3 months:

- Unusually large amount of food consumed in a discrete period of time
- Perceived loss of control during episodes

Inappropriate compensatory behaviors to limit weight gain at least 1 time/week for 3 months (eg, self-induced vomiting, misuse of laxatives or diuretics, fasting, or excessive exercise)

Weight and shape overly influence self-worth

Not occurring exclusively in the context of anorexia nervosa

Binge-eating disorder

Binge eating episodes at least 1 time/week for 3 months:

- Unusually large amount of food consumed in a discrete period of time
- Perceived loss of control during episodes

With at least 3 of the following:

- Eating more rapidly than normal
- Eating until uncomfortably full
- Eating large quantities despite lack of hunger
- Eating alone because of embarrassment regarding amount
- Feeling of disgust, depression, or guilt after episodes
- Distress caused by binge eating

Lack of inappropriate compensatory behaviors

Not occurring exclusively in the context of anorexia nervosa or bulimia nervosa

Avoidant/restrictive food intake disorder

Insufficient intake because of lack of interest in food, avoidance based on sensory characteristics of food, or concern about adverse consequences of eating (eg, choking, vomiting)

Results in failure to meet nutritional needs: Weight loss, failure to achieve expected weight gain, significant nutritional deficiencies, dependence on oral nutritional supplements or enteral feeding, or interference with psychosocial functioning

Not attributable to a medical condition or not better explained by another mental disorder

No distortion in body image

Other specified feeding or eating disorder

Eating issues that fall below the threshold for frequency or duration, or do not meet the full criteria for these disorders (eg, atypical anorexia nervosa, which meets all criteria for anorexia nervosa but patient weight is above or within normal range)

DSM-5 = Diagnostic and Statistical Manual of Mental Disorders *(Fifth Edition).*

Information from American Psychiatric Association. Feeding and eating disorders. Diagnostic and Statistical Manual of Mental Disorders. *5th ed. Washington, DC: American Psychiatric Association; 2013:334-353.*

Certain psychological and personality traits also are risk factors for eating disorders, including perfectionism, neuroticism, greater sensitivity to social rewards, and low self-esteem.[79,80] Obsessive-compulsive and avoidant traits are associated with anorexia nervosa restricting type and binge-eating disorder, whereas greater impulsivity is associated with bulimia nervosa. Borderline personality disorder is associated with bulimia nervosa and anorexia nervosa binge-eating/purging type.[79] Binge eating has been correlated with the personality trait alexithymia, which is characterized by an inability to describe or recognize one's emotions.[73]

It is common for patients to have mood and eating disorders. The lifetime prevalence of at least one mood disorder in patients with anorexia nervosa ranges between 64% and 96% and in patients with bulimia nervosa between 50% and 90%.[81] Approximately 84% of adolescents with binge-eating disorder also meet criteria for at least one other mental disorder, with higher rates than the general population of mood disorders, attention-deficit/hyperactivity disorder, posttraumatic stress disorder, and substance use disorder.[73]

Warning Signs

Warning signs of eating disorders include abrupt changes in weight or growth percentiles, a preoccupation with calories or weight, altered eating habits, excessive exercise, loss of menses, pubertal delay, and a distorted perception of body

size.[67] There is a wide spectrum of disordered eating behaviors, and patients may shift among these over time.[3] Physical and behavioral warning signs that may signify the onset of an eating disorder are summarized in *Table 8*.

Evaluation

History

Obtaining the patient history from multiple sources may be necessary, as there often is ambivalence regarding changing behaviors in patients with eating disorders. Patients may not be forthcoming about their thoughts and behaviors if they do not perceive them as problematic or if they fear attempts to change their behaviors.[76]

To help identify problematic behavior patterns, the history should include weight and growth trends, body concerns, eating patterns and habits, physical activity, menstrual history, mood and social history, family history, current bothersome symptoms, and any prior treatment.[67,76] Specific questions that can help elucidate an eating disorder diagnosis are listed in *Table 9*.

A broad differential diagnosis should be considered, with examination for signs or symptoms of gastrointestinal disorders (eg, celiac disease, inflammatory bowel disease, superior mesenteric artery syndrome), endocrine disorders (eg, thyroid disorders, diabetes, Addison disease), chronic infections (eg, HIV infection, tuberculosis), emerging rheumatologic diseases, tumors and malignancies, and other mental disorders (eg, anxiety, depressive, substance use, obsessive-compulsive disorders).[67,76]

Physical Examination

A careful physical examination is a necessary part of establishing the diagnosis and assessing medical stability. An assessment of childhood growth curves can be extremely valuable, as malnutrition may manifest as a decrease in the percentile of body mass index (BMI)-for-age rather than actual weight loss.[67,76] When childhood growth information is not available, the 50th percentile BMI-for-age can be used as an estimated goal.

With nutritional insufficiency, cachexia may be obvious, with striking facial and proximal muscle wasting. Common dermatologic findings include diffuse thinning of scalp hair, skin pallor or hypercarotenemia, lanugo, angular stomatitis, oral ulcerations, cold extremities with acrocyanosis, and bruising or abrasions over the spine from excessive exercise.[67,76] Bradycardia, other cardiac arrhythmias, and mitral valve prolapse murmur may be noted on cardiovascular examination.[82]

Other common physical examination results include edema of the extremities as well as delayed or interrupted pubertal development. Cognitive slowing and a flat, irritable, or anxious affect are consistent with a starvation state. Focal neurologic results should lead to consideration of other conditions.

When induced vomiting is frequent, the patient may show salivary gland hypertrophy, palatal abrasions and petechiae, dental enamel erosions, and callus formation on the knuckles. Physical examination results associated with binge eating include abrupt weight increases, signs of metabolic syndrome (eg, elevated blood pressure, acanthosis nigricans) and salivary gland hypertrophy.[67,76,83]

Table 8
Warning Signs of Eating Disorders

Abrupt changes in weight or fall from expected growth curve percentiles
Pubertal delay
Loss of menses
Excessive or rigid exercise regimen, despite injury, fatigue, illness, or against the recommendations of parent, coach, or physician
Preoccupation with weight, food, or calories
Change in eating patterns
Eating secretly or feeling concerned about eating in public
Distorted view of body weight or shape
Withdrawal from friends and activities
Lower than normal heart rate, blood pressure, and temperature
Use of diet pills, vomiting, laxatives, or diuretics for weight loss

Information from Campbell K, Peebles R. Eating disorders in children and adolescents: state of the art review. Pediatrics. *2014;134(3):582-592; Rosen DS. Identification and management of eating disorders in children and adolescents.* Pediatrics. *2010;126(6):1240-1253; Golden NH, Katzman DK, Sawyer SM, et al. Update on the medical management of eating disorders in adolescents.* J Adolesc Health. *2015; 56(4):370-375.*

Laboratory Tests

The initial assessment should include a complete blood count; serum electrolyte levels, including phosphorous and magnesium; blood glucose and creatinine levels; liver function tests; urinalysis; and thyroid studies. A 12-lead electrocardiogram should be considered for most patients, particularly patients with bradycardia or at risk of electrolyte abnormalities. In females, amenorrhea is an indication for a urine pregnancy test and measurement of serum levels of luteinizing hormone, follicle-stimulating hormone, prolactin, and estradiol.[67,76]

If uncertainties about the diagnosis remain, additional tests might include erythrocyte sedimentation rate, screening for celiac disease, or imaging of the brain or gastrointestinal system.[76]

Case 2, cont'd. Adam says he has been counting calories with the help of a cell phone app and is keeping his intake below 1,500 kcal/day. He is unhappy with his body; he wishes he were thinner and had more muscle. He wants to be a faster runner, so he had been running an extra 1 to 2 miles after cross-country practice. However, lately he has been too tired to run the extra miles, and his times in competitions are becoming slower. Last week, he had to stop and rest during practice because of dizziness. He says he feels irritable and has had constipation.

The blood pressure level and heart rate remain low. You note that Adam has cool hands and feet, lanugo on the shoulders and back, and skeletal muscle wasting. Laboratory test results show a mild leukocytosis consistent with a starvation state. Electrocardiogram results show sinus bradycardia at 51 beats/min, with a normal corrected QT interval.

Management

The appropriate level of care for patients with eating disorders depends on the severity of the disorder, medical stability, accessible resources, and family preferences. Early intervention is important in improving outcomes.[67]

Outpatient Care

Most children and adolescents with eating disorders can be treated by a multidisciplinary outpatient team.[76] Outpatient care strategies include family-based treatment or individual therapy, continued medical monitoring, and support from a dietician.

In the past few decades, the management paradigm for patients with eating disorders has shifted, moving

Table 9
Questions to Ask in Assessment of Patients With Disordered Eating

Weight and growth trends

What were your highest and lowest weights in the past year?

Body concerns

How do you feel about your body?

Have you been trying to lose or gain weight?

What do you think of as your healthy weight?

Do you have a goal weight?

Eating patterns and habits

What is your usual timing of meals and snacks?

For the past 24 hours, what did you eat and drink?

Are you avoiding any types of foods (eg, carbohydrates, fats, meats, dairy)?

Do you take any vitamins or herbal or dietary supplements?

Have you recently changed to a vegetarian or vegan diet?

Have you changed your portion sizes?

Are you counting calories or setting calorie goals?

Binge eating

Do you consume large quantities of food in one sitting?

Do you have a sense of loss of control over eating?

How frequently does this type of eating occur?

Purging

Do you ever vomit after meals? If so, how frequently?

Do you use laxatives or diet pills? If so, which do you use, and how frequently?

Exercise

What types of exercise do you perform?

How long do you exercise? How often? At what level of intensity?

Have you experienced pain, injuries, stress fractures, or other conditions related to exercise?

Does a change in your exercise routine cause stress?

Menstrual history

At what age did your period start?

How regular are your menstrual cycles?

How many periods have you had in the past year?

When was the start of your last menstrual period?

continues

Table 9 *(continued)*

Questions to Ask in Assessment of Patients With Disordered Eating

Mood

Have you had any previous mental health issues?

Do you experience low, depressed, or irritable moods?

Do you feel worried, anxious, nervous, or have difficulty relaxing?

Do you have obsessive thoughts or compulsive tendencies?

Have you ever cut yourself or performed other self-harm behaviors?

Have you ever had suicidal thoughts or attempted suicide?

Social history

Do you use alcohol, tobacco/nicotine, or other drugs?

Do you use muscle-building or performance-enhancing supplements or drugs?

Do you use stimulants (eg, caffeine, amphetamine-dextroamphetamine, methylphenidate)?

Do you feel safe in your relationships? Are you afraid of anyone?

Has anyone forced or pressured you sexually?

Has anyone threatened you or physically hurt you?

How much time do you spend on social media?

Have you had any involvement with pro-eating disorder websites?

Family history

Have family members had obesity, eating disorders, substance use disorders, depression, or other mental health conditions?

Have there been any recent changes in your family's eating pattern?

Review of symptoms

Have you recently experienced:

- Fatigue, cold intolerance, dizziness, lightheadedness, or fainting?
- Easy bruising or bleeding?
- Palpitations, chest pain, exercise intolerance, or shortness of breath?
- Hair loss, changes in hair texture, dry skin, or problems with your teeth or gums?
- Abdominal fullness, constipation, diarrhea, nausea, vomiting (or vomiting blood), heartburn, or abdominal pain?
- Weakness or muscle cramps?

Previous treatment

What kind of treatment have you tried for this issue and for how long?

Did you find the treatment helpful or not helpful?

Information from Campbell K, Peebles R. Eating disorders in children and adolescents: state of the art review. Pediatrics. *2014;134(3):582-592; Rosen DS. Identification and management of eating disorders in children and adolescents.* Pediatrics. *2010;126(6):1240-1253.*

away from a view that saw a controlling family as a key contributor. The current approach recognizes the complex role of biologic factors in the etiology of eating disorders and views the family as the most important resource in patient recovery.[67,76]

The underlying principles of family-based treatment are that parents are not to blame for eating disorders, and that nutritional rehabilitation is of central importance in restoring healthy thought processes in relation to eating. Therefore, weight restoration under control of the parents is the initial focus of therapy.[67,76]

A key component of family-based treatment is externalization of the eating disorder. This means helping patients and parents regard the eating disorder as an illness that is not a choice. The goal then is to unite the patient, parents, and health care team in management. After weight and healthy eating patterns have been restored, later stages of family-based treatment gradually restore responsibility for eating to the patient while addressing general issues of psychological development.[67,76]

Even in communities without experienced family-based treatment clinicians, physicians can support the underlying principles of family-based treatment and can recommend helpful resources for parents.[84]

Intensive Outpatient Program/Partial Hospitalization Program

At the intensive outpatient program/partial hospitalization program level of care, patients continue to live at home but attend an eating disorder program during a portion of the day for several days per week. This level of care typically includes support and monitoring during meals and snacks along with individual and group therapy. Some programs have incorporated principles of family-based treatment in their approach, and some have an individual therapy focus.[76,85]

Residential Management

Patients who need full-time monitoring and supervision can participate in residential management, where they live at a facility for several weeks or months and participate in individual

and group therapy. Patients need to be medically stable for admission to a residential program.

Hospitalization

Hospitalization should be considered when a patient with an eating disorder is medically unstable or unsafe, based on multiple parameters (*Table 10*).[69,76,86] The primary medical goal of hospitalization is for the patient to reach physiologic stability through nutritional rehabilitation.

Table 10
Indications for Hospitalization of Children or Adolescents With Eating Disorders

Severe malnutrition: <75% of the median body mass index for age, sex, and height; or ongoing weight loss despite intensive management
Arrested growth and development
Electrolyte abnormalities (eg, hypokalemia, hyponatremia, hypophosphatemia)
Cardiac arrhythmia or a prolonged corrected QT interval
Acute food refusal
Physiologic instability
Severe bradycardia (heart rate <50 beats/min during the day and <45 beats/min at night)
Hypotension (<80/50 mm Hg)
Orthostatic changes in pulse (>20 beats/min) or blood pressure (decline of >10 mm Hg)
Hypothermia (<35.56°C [96° F])
Dehydration
Failure of outpatient treatment
Uncontrollable bingeing and purging
Medical complications related to malnutrition or eating disorder behaviors (eg, syncope, seizures, pancreatitis, hematemesis, esophageal tears, cardiac failure)
Acute psychiatric emergencies (eg, suicidal ideation, psychosis)

Information from Golden NH, Katzman DK, Kreipe RE, et al. Eating disorders in adolescents: position paper of the Society for Adolescent Medicine. J Adolesc Health. *2003;33(6):496-503; Rosen DS. Identification and management of eating disorders in children and adolescents.* Pediatrics. *2010;126(6):1240-1253.*

An oral refeeding protocol with additional nasogastric feeding as needed should be instituted initially, providing 1,400 to 2,000 kcal/day and increasing the number of calories each day until consistent weight gain is achieved.[69,87,88] Cardiac monitoring and serial testing of electrolyte levels are important. Testing should assess for decreases in phosphorous, potassium, magnesium, and glucose levels.[67,76]

Patients who are severely malnourished should be monitored for development of refeeding syndrome, which is characterized by hypophosphatemia, abrupt electrolyte and fluid level shifts, delirium, and cardiac arrhythmias.[67,69,76]

Case 2, cont'd. Because of Adam's rapid weight loss, bradycardia, and parental concerns, you consider hospitalization. However, Adam wants to avoid hospitalization, so he agrees to an outpatient management plan. He establishes care with a local therapist with experience in the management of eating disorders who uses many of the principles of family-based treatment. He agrees to discontinue all running and exercise. His parents take charge of food decisions and preparation. With the assistance of a dietitian, they plan to give Adam three meals and three snacks per day—initially aiming for approximately 2,000 kcal/day and increasing to 2,500 kcal/day over 1 week.

After 1 week, the electrolyte levels, including phosphorous and magnesium, are stable. After 2 weeks, Adam has gained 0.91 kg (2 lb), and you note improvements in the pulse and blood pressure. His parents continue to monitor his overall nutrition to continue weight restoration.

Specific Management Recommendations and Long-Term Considerations

Anorexia Nervosa

Psychotherapy. When feasible, family-based behavioral treatment is the treatment of choice for patients with anorexia nervosa, based on evidence from randomized controlled trials.[89,90,91] Other types of therapy that have been shown to be effective include systemic family therapy and insight-oriented individual psychotherapy.[89]

Few studies have been conducted that compare efficacy among nonoutpatient treatments for anorexia nervosa. However, initial inpatient weight restoration may improve longer-term outcomes, and treatment in a partial hospitalization program after a short inpatient stay may be comparable with longer treatment in an inpatient unit.[92,93]

Pharmacotherapy. Drugs should be considered only as an adjunctive treatment. (No drugs are

approved by the Food and Drug Administration for management of anorexia nervosa.) Selective serotonin reuptake inhibitors have been shown to be ineffective in adults with anorexia nervosa and their use has not been studied in children.[94] Although evidence is scant, low doses of atypical antipsychotics may be used to reduce anxiety and cognitive rigidity during the initial stages of weight gain in children and adolescents.[67] (This is an off-label use of atypical antipsychotics.)

Long-term complications. Prolonged malnutrition due to anorexia nervosa may result in growth failure and pubertal arrest. Bone health is of particular concern in adolescents. Low bone mineral density in anorexia nervosa is related to the combination of hypothalamic suppression, low insulinlike growth factor 1 level, and mineral and nutrient deficiencies. Although fracture risk has not been well studied in children and adolescents with anorexia nervosa, adults with a history of anorexia nervosa have a long-term fracture risk that is increased two- to threefold.[67,69]

When amenorrhea is present for 6 months or longer, a dual-energy x-ray absorptiometry scan should be considered. When low bone mineral density is identified, the treatment is weight restoration (which should lead to resumption of menses in females), along with optimal calcium and vitamin D intake. Use of hormonal combination oral contraceptives has not been shown to increase bone mineral density. Bisphosphonates are not recommended for treatment of low bone mineral density in adolescents because of potential adverse effects and minimal benefits.[69]

Anorexia nervosa is associated with the highest mortality rate among mental disorders, with approximately 20% of those mortalities from suicide. The standardized mortality ratio is 5.86 for anorexia nervosa, compared with 1.93 for bulimia nervosa, 2.65 for schizophrenia, 2.0 for bipolar disorder, and 1.55 for unipolar depression.[95]

Bulimia Nervosa

Psychotherapy. There are few randomized controlled trials of treatments for bulimia nervosa in youth. Cognitive behavioral therapy (CBT) and supportive psychotherapy may be effective, though family-based treatment has been shown to be more effective than individual supportive therapy.[89,96]

Pharmacotherapy. Results of multiple randomized controlled trials support the use of fluoxetine at a dosage of 60 mg/day for management of bulimia nervosa in adults.[97]

One small study used this dosage of fluoxetine in addition to psychotherapy for 8 weeks in 10 adolescent patients with bulimia nervosa ages 12 to 18 years. The treatment resulted in decreased numbers of weekly binges and purges, and improved clinical response measures.[97] (This is an off-label use of fluoxetine.) During the first few weeks of fluoxetine treatment, the benefits related to eating disorder symptoms occur independently of the effects on mood.

Other drugs that appear to be effective in adults with bulimia nervosa include topiramate and ondansetron.[94] (This is an off-label use of topiramate and ondansetron.)

Long-term complications. In patients with bulimia nervosa, cycles of bingeing and purging can lead to electrolyte abnormalities, arrhythmias, chronic esophagitis, and esophageal rupture. Laxative abuse can cause permanent bowel dysfunction.[67,76] When used as a purging method, exercise may be pursued obsessively and continued despite pain or injury, and can lead to repetitive strain injuries, including stress fractures.

Binge-Eating Disorder

Psychotherapy. In adults with binge-eating disorder, trials comparing CBT, interpersonal therapy, and behavioral weight loss programs showed that CBT and interpersonal therapy were effective in decreasing binge eating episodes, whereas behavioral weight loss programs were effective in achieving modest weight loss.[73] Dialectical behavior therapy and interpersonal psychotherapy also have been used in adults. These treatments are experimental in children and adolescents, as there are no well-established psychosocial treatments for binge-eating disorder in these populations.[89,98]

Pharmacotherapy. Several drugs have been studied in adults with binge-eating disorder, including lisdexamfetamine dimesylate (Vyvanse), fluoxetine, sertraline, and topiramate, but studies in children and adolescents are lacking.[73,98,99,100] (This is an off-label use of fluoxetine, sertraline, and topiramate.)

Long-term complications. The physical health complications related to binge-eating disorder include the expected morbidities associated with obesity and large weight fluctuations, including diabetes, hypertension, lipid abnormalities, and obstructive sleep apnea. Given the high risk of psychiatric comorbidities in patients with binge-eating disorder, physicians should assess for other mental disorders.[73,98]

SECTION FOUR

Depression in Adolescents

Rates of depression and suicide in adolescents have increased over the past decade, particularly among adolescent girls. Because depression frequently is underdiagnosed, the US Preventive Services Task Force recommends that physicians screen all adolescents ages 12 to 18 years at least annually for major depressive disorder. Adolescents with suicidal thoughts should work with their health care team and family members to create a safety plan that emphasizes a safe environment and provides for escalating levels of support in times of crisis. Patients who are suicidal may need emergency psychiatric evaluation. Management of depression should be guided by symptom severity. Mild depression may improve with brief, supportive appointments in the family medicine office. Moderate to severe depression likely will improve with a combination of cognitive behavioral therapy and a selective serotonin reuptake inhibitor. Fluoxetine and escitalopram are approved by the Food and Drug Administration for management of depression in adolescents. Pharmacotherapy typically is well tolerated but drug or dosage changes may be necessary based on adverse effects. The majority of adolescent patients respond well to treatment. Drug treatment should be continued for 9 to 12 months after symptom improvement.

Case 3. Alice, a 15-year-old girl, presents to your office for a health maintenance examination. She is in 10th grade and is having difficulty in most of her classes. Her parents are concerned about her academic performance but Alice says that she is not concerned. She does report being tired frequently. Despite being tired, she has difficulty falling asleep at night. She no longer interacts with her friends much, saying, "I just don't feel like it." She spends most of her time alone in her room. Alice did not want to come to this appointment today because, she says, "There is no point in doing anything."

Epidemiology

Rates of depression increase significantly at the onset of puberty.[101] Each year, nearly 9% of adolescents in the United States experience a major depressive episode, and a major risk factor is a family history of depression.[3,102]

Depression is more common in females, and the difference in rates between sexes has been increasing.[101,102] Between 2004 and 2014, the yearly risk of depression in adolescents increased from 4.5% to 5.7% in males and from 13.1% to 17.3% in females.[102] Other risk factors include a history of early childhood trauma, and exposure to adversity, such as having a single parent, living in poverty, receiving public assistance, or experiencing residential instability.[103,104]

Suicide Risk

In the United States, 2,061 adolescents ages 15 to 19 died by suicide in 2015, the second leading cause of mortalities in this age group.[105] Females have higher rates of depression and suicide attempts but males have significantly higher rates of death by suicide because they tend to choose more lethal means.[105,106] The suicide rate for males ages 15 to 19 years was 14.2 per 100,000 in 2015, up from 10.8 per 100,000 in 2007. Suicide rates for females ages 15 to 19 years have doubled between 2007 and 2015 to 5.1 per 100,000, the highest rate since 1975.[107] Risk factors for suicide are listed in *Table 11*.

The most common methods of suicide in the United States are firearms, hanging/strangulation/suffocation, and poisoning, whereas the most common methods in suicide attempts are ingestions and wrist cutting.[108] Although many suicides in adolescents are impulsive, 33% of adolescents who committed suicide left a note, 28% had disclosed their intent, and 20% had a previous attempt.[106]

Screening

Clinical interviews and medical record template guides are helpful in screening but under-identify patients with depression.[109] Because depression in adolescents remains undertreated, the US Preventive Services Task Force (USPSTF) recommends screen-

ing for major depressive disorder in all adolescents ages 12 to 18 years when resources are available for additional evaluation and care.[102,110] The optimal screening interval is unknown but screening at least annually is reasonable. There is insufficient evidence to assess the utility of screening in children younger than 12 years.[110]

The USPSTF does not specify use of a screening tool. The Patient History Questionnaire-9 (PHQ-9) is a widely used tool that is freely available for in-office use (*Figure 1*), and a modified version for adolescents exists.[111,112] Because of the high false-positive and false-negative rates of self-administered depression screening tools, it is important to clinically interview the adolescent and parents to make an accurate diagnosis.[104]

Diagnosis

The *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) (*DSM-5*) diagnostic criteria for major depressive disorder require that five or more symptoms be present during the same 2-week period, at least one of which is depressed mood or loss of interest or pleasure. The other symptoms are: depressed mood for most of the day and nearly every day; diminished interest or pleasure in all or almost all activities most of the day; significant weight gain or loss, or increase or decrease in appetite; insomnia or hypersomnia; psychomotor agitation or retardation; fatigue or energy loss; feelings of worthlessness or excessive or inappropriate guilt; diminished ability to think or concentrate; and recurrent thoughts of death or suicidal ideation.[3]

Other mood disorders to consider include persistent depressive disorder (previously called dysthymia), which is a more chronic condition interspersed with periods of normal mood and functioning, and bipolar disorder, which is characterized by depression alternating with episodes of mania, with excessive energy and poor judgment.[3] Mania is rare in children.[113] Adolescents who develop bipolar disorder often present with depression, mood swings, irritability, and other subthreshold symptoms before the diagnosis.[114]

As part of the evaluation for depression, physicians should consider medical conditions with symptoms similar to those of major depressive disorder, including hypothyroidism, mononucleosis, sleep disorders, anemia, chronic fatigue, and adverse drug effects. Substance use disorders frequently coexist with major depressive disorder, so any adolescent with behavioral or mood changes should undergo evaluation for such disorders.[3]

Case 3, cont'd. When you speak to Alice in private, she says that she sometimes does not care if she dies but she denies wanting to harm herself. The social isolation and poor mood started more than a month ago. She cannot remember the last time she felt happy or did anything fun. Neither she nor her parents remember her having any past episodes of extreme energy, grandiosity, or feeling like she did not need to sleep. Her mother has been treated occasionally for depression over the past 10 years.

Alice's Patient History Questionnaire-9 (PHQ-9) score is 19, which is consistent with moderately severe depression. She indicated that the items on the PHQ-9 that she checked make things "very difficult." Alice's symptoms are consistent with major depressive disorder.

Management

After diagnosis of depression in an adolescent, the patient and family members should be counseled about the diagnosis and treatment options.[104,115] Clinicians should define depression as an illness, differentiating it

Table 11
Risk Factors for Suicide in Children and Adolescents

Availability of a gun
Bipolar disorder
Conduct disorder
History of abuse
History of suicide attempts
Homicidal ideation
Major depressive disorder
Male sex (males tend to use more lethal methods)
Parental psychopathology
Substance abuse
Suicidal ideation
Young age (tend to have less intent but are more impulsive)

Information from Brent DA, Baugher M, Bridge J, Chen T, Chiappetta L. Age- and sex-related risk factors for adolescent suicide. J Am Acad Child Adolesc Psychiatry. *1999;38(12):1497-1505; Brent DA, Perper JA, Moritz G, et al. Psychiatric risk factors for adolescent suicide: a case-control study.* J Am Acad Child Adolesc Psychiatry. *1993;32(3):521-529; Sheftall AH, Asti L, Horowitz LM, et al. Suicide in elementary school-aged children and early adolescents.* Pediatrics. *2016;138(4):e20160436.*

*Over the **last 2 weeks,** how often have you been bothered by any of the following problems? (Use ✓ to indicate your answer)*	Not at all	Several Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you were better off dead or of hurting yourself in some way	0	1	2	3
For office coding	0	+ _____	+ _____	+ _____
			= total score	_____

*If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?*

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
❑	❑	❑	❑

Figure 1. Patient Health Questionnaire-9 (PHQ-9)

Note: The clinician should rule out physical causes of depression, normal bereavement, and a history of a manic/hypomanic episode.

Score: 5 to 9 = minimal symptoms; 10 to 14 = minor depression, dysthymia, or mild major depression; 15 to 19 = moderately severe major depression; >20 = severe major depression.

Developed by Spitzer RL, Williams JBW, Kroenke K, and colleagues, with an educational grant from Pfizer Inc. Reprinted from Patient Health Questionnaire (PHQ) Screeners. Available at https://www.phqscreeners.com/sites/g/files/g10049256/f/201412/PHQ-9_English.pdf.

from emotions such as sadness, irritability, boredom, and frustration. Management is dependent on the severity of symptoms and a treatment plan should be developed with input from the adolescent and parents.

Adolescents with positive screening results for depression should undergo a suicide risk assessment (ie, assessment of the potential for harm to the self and others) at the initial evaluation. Physicians should ask patients with depression or suspected depression about suicidal ideation or a suicide plan. Adolescents suspected to be at risk should undergo immediate evaluation and be referred for emergency psychiatric care or hospitalized.[115] Creation of a safety plan for patients also should be included in management, and this is discussed in a following section.[104]

For treatment, adolescents with mild depression may require only brief, supportive appointments with their family physician or a psychotherapist every 2 to 4 weeks for 2 to 3 months. These sessions are nondirective and often serve to assess for improvement or worsening of symptoms.[115]

For patients with moderate to severe depression, initial treatment with a combination of cognitive behavioral therapy (CBT) and a selective serotonin

reuptake inhibitor (SSRI) is recommended.[115] (This is an off-label use of some SSRIs.) One large clinical trial of adolescents ages 12 to 17 years with major depressive disorder evaluated the effectiveness of four treatments. After 12 weeks of treatment, the results showed that 35% of adolescents showed improvement with placebo, 43% improved with CBT, 61% improved with fluoxetine, and 71% improved with a combination of fluoxetine and CBT.[116]

Given the strong heritability of depression, it is not unusual for a family physician to suspect depression in one or both parents of an adolescent with depression. Intervening with family members with suspected depression may enhance the adolescent's response to psychotherapy.[117]

Psychotherapy

The conceptual basis of CBT is that thoughts influence feelings and behaviors at the same time that feelings and behaviors influence thoughts. The therapist helps patients to identify maladaptive thoughts and behaviors that influence mood. Key activities in CBT include helping the patient increase time spent in pleasurable activities, improve assertiveness and problem-solving skills to help reduce feelings of hopelessness, and reduce negative thoughts. The ideal CBT program includes homework tasks for adolescents and their parents.[118]

Other helpful psychotherapeutic approaches include interpersonal psychotherapy and dialectical behavior therapy.[119] Dialectical behavior therapy is particularly helpful for adolescents with suicidal ideation and self-harm-related behaviors.[120] When adolescents and family members decline use of pharmacotherapy, CBT is cost-effective alternative.[121]

Pharmacotherapy

Approximately 20% of adolescents diagnosed with depression report having been treated with a drug.[102] Fluoxetine is approved for treatment of depression in patients 8 years and older. The usual starting dosage is 10 to 20 mg/day. At least 4 weeks of treatment often are required for the drug to be effective.[29] Patients should be evaluated for drug effectiveness 6 to 8 weeks after therapy initiation.[119] The dosage may be titrated by 10 to 20 mg per month, up to a maximum dosage of 60 mg/day.[29]

Adolescents frequently have difficulty remembering to take a daily drug. Fluoxetine can be a useful choice in addressing this because its metabolic product, norfluoxetine, also has SSRI effects, creating a prolonged clinical half-life. This long half-life has allowed the development of an extended release version, usually prescribed at a dosage of 90 mg/week.[122] Although this formulation does not have a specific indication for use in adolescents, it may be useful to consider in patients with issues with drug adherence.

If patients have an inadequate response to fluoxetine or experience problematic adverse effects, a different SSRI can be prescribed. The only other SSRI approved by the Food and Drug Administration (FDA) for management of depression in adolescents is escitalopram. The starting dose for adolescents ages 12 to 17 years is 10 mg/day and the dosage may be titrated in 5 mg increments to 20 mg/day based on patient response.[29]

Sertraline, although not FDA-approved for management of depression in adolescents, is indicated for management of obsessive-compulsive disorder in children ages 6 and older.[29] Pooled data have shown modest benefit in management of adolescent depression, yet patient response does not appear to be as robust as with fluoxetine.[123] Data on citalopram show a relatively poorer response.[124] Use of paroxetine and fluvoxamine typically is not recommended in children and adolescents with depression.[29,124]

If patients do not benefit from an appropriate dosage of an SSRI, the next step is to offer a trial of venlafaxine, a serotonin-norepinephrine reuptake inhibitor (SNRI).[119] (This is an off-label use of venlafaxine.)

Adverse Drug Effects

All the SSRIs share similar adverse effect profiles, though some tend to be more activating (eg, sertraline) and some more sedating (eg, fluvoxamine).[125,126] The most common adverse effects tend to be minor, including abdominal discomfort, nausea, diarrhea, and mild headache. A small number of patients develop fatigue and somnolence, while others may develop

Adolescents with positive screening results for depression should undergo a suicide risk assessment (ie, assessment of the potential for harm to the self and others) at the initial evaluation.

insomnia, frequent awakenings, or vivid dreams. Most of these symptoms may resolve over time.[127]

Most adverse drug effects can be avoided through use of low starting doses, titration of dosages slowly as tolerated, and by decreasing the dose if adverse effects occur. SNRIs have similar adverse effect profiles as those of SSRIs, with the additional potential for increases in blood pressure.[128]

A significant adverse effect in this age group is sexual dysfunction. One study found that more than 50% of adults taking SSRIs report some type of sexual dysfunction, such as decreased libido, diminished arousal, or anorgasmia.[129] SSRI-associated sexual dysfunction is reported in as many as 25% of adolescents, and developmentally appropriate counseling should be provided.[130]

Behavioral activation or agitation may occur with SSRIs, which may manifest as increased impulsivity, irritability, or silliness. These symptoms may occur in 3% to 8% of patients, particularly in younger adolescents and children. Not all adolescents who develop activation or hypomania while taking antidepressants have bipolar disorder but it often is difficult to distinguish unipolar depression with activation from bipolar disorder with SSRI-induced mania. Complicating matters is that adolescents with bipolar disorder may have experienced subtle or brief episodes of hypomania that often are overlooked as typical adolescent behavior.[127]

In 2004, the FDA issued a public health advisory and began to require Black Box warnings for antidepressants used in children and adolescents. The advisory warned of an increased risk of suicide in pediatric patients, based on reports of suicidality in patients taking paroxetine. In 2006, the warning was extended to adult patients ages 18 to 24 years. The warning recommends that prescribers weigh risks and benefits.[29,131] It is interesting to note that suicide rates in the United States decreased during the decade before the Black Box warning was issued, although the cause of this decrease cannot be clearly identified.[132]

After the Black Box warning, prescriptions for SSRIs decreased significantly, as did rates of depression diagnosis. Although causality cannot be inferred, suicide rates have increased significantly since the Black Box warning first appeared.[133] Subsequent research has not identified an increased risk of suicide deaths or attempts among patients taking antidepressants but there is a 0.7% greater risk of suicidal thoughts among patients taking these drugs.[134] This increased risk may be decreased by concurrent participation in CBT.[135]

Safety Planning

As part of management, all adolescents with suicidal thoughts should have a safety plan, which differs from a safety contract.[104] Safety contracts involve asking suicidal patients to sign a written statement or to verbally agree not to harm themselves. However, there is no evidence that safety contracts have an effect on future suicide risk.[136]

A potentially more useful intervention involves helping the patient to create a personalized safety or crisis response plan. A safety plan helps the patient and family members improve the safety of their environment and identify progressively more intensive coping and support strategies, depending on the level of suicidality that a patient is experiencing.[137] The plan should involve family members in the monitoring of risk factors for suicide.[104]

The plan also should include the securing or removal from the home of lethal means (such as firearms) and have the family assist in restricting patient access to lethal means outside the home.[104] Although limiting access can decrease suicide by these methods, families frequently may not adhere to these recommendations.[138]

An example of a written safety plan template is available through the National Suicide Prevention Lifeline website.[139] Adolescents who are unable to create a reliable safety plan may require emergency psychiatric evaluation and assessment.

Treatment Discontinuation

Approximately 80% of adolescents will notice improvement in symptoms after 3 months of combination treatment. Treatment should continue for at least 9 to 12 months to decrease the likelihood of recurrence.[140] After this time period, the dosage of the SSRI should be tapered and the drug discontinued.[29] However, the timing should be flexible and dependent on concurrent stressors in the patient's life. Continuation and frequency of psychotherapy appointments can be more flexible and based on individual patient needs.

Although the long half-life of fluoxetine makes discontinuation less problematic with it than other SSRIs, the dosages of all antidepressants should be tapered by approximately 25% to 50% per week until discontinuation. Abrupt cessation of SSRIs may result

in anxiety, dizziness, fatigue, myalgias, chills, and nausea.[141]

Case 3, cont'd. After you discuss depression with Alice, she helps to create a safety plan. She agrees to distract herself when she feels hopeless or unsafe and says she will alert her parents if this approach does not help. You prescribe fluoxetine 20 mg/day and refer her to a psychotherapist for cognitive behavioral therapy.

Alice returns in 3 weeks. She has had no change in symptoms, has experienced no adverse drug effects, and has visited the therapist for a first appointment. She returns 3 weeks later with only minimal improvement in symptoms, so you increase the fluoxetine dosage to 40 mg/day. After 1 month at this dose, she reports that her symptoms have improved significantly. She continues visiting the therapist weekly. Two months later, the symptoms have resolved, and she has started visiting the therapist monthly. After 1 year, she is able to discontinue taking fluoxetine, and she completes high school without a recurrence of depression.

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Online Resources

American Academy of Pediatrics
National Initiative for Children's Healthcare Quality Vanderbilt Assessment Scale (6 to 12 years; parent and teacher forms)

Website: https://www.nichq.org/resource/nichq-vanderbilt-assessment-scales

American Psychiatric Association
Attention-deficit/hyperactivity disorder (ADHD) resources

Website: https://www.psychiatry.org/patients-families/adhd/what-is-adhd

Center for Parent Information and Resources
Resources for Families of Children with Disabilities

Website: https://www.parentcenterhub.org

Children and Adults With Attention-Deficit/Hyperactivity Disorder (CHADD)
ADHD resources

Website: http://www.chadd.org/

Department of Education, Office of Special Education and Rehabilitative Services (OSERS)

Website: http://www2.ed.gov/about/offices/list/osers/index.html

Healtychildren.org
ADHD resources

Website: https://www.healthychildren.org/English/health-issues/conditions/adhd/Pages/Understanding-ADHD.aspx

Learning Disabilities Association of America

Website: https://ldaamerica.org

Multi-Health Systems
Conners behavioral rating scale (age 2 years to adulthood; parent, teacher, or self-report)

Website: https://www.mhs.com/MHS-Assessment?prodname=conners3

National Center for Learning Disabilities
Website: http://www.ncld.org

National Institutes of Mental Health
ADHD information

Website: https://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml

Nolo's IEP Guide: Learning Disabilities by Lawrence M. Seigel
Website: http://www.nolo.com/sites/default/files/SPRING_2014_catalog_Nolo.pdf

Suggested Reading

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Websites accessed November 2018

Posttest Questions

1. According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria, which one of the following is a core sign or symptom that is consistent with a diagnosis of attention-deficit/hyperactivity disorder with a predominantly inattentive presentation?

- ❑ A. Acting impulsively.
- ❑ B. Distractibility.
- ❑ C. Fidgetiness.
- ❑ D. Talking excessively.

2. Which one of the following is true of attention-deficit/hyperactivity disorder?

- ❑ A. It affects 6% to 8% of adults.
- ❑ B. It affects 12% to 14% of children age 4 to 17 years.
- ❑ C. It has four presentations, according to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition).
- ❑ D. It is more common among adolescent males than adolescent females.

3. According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria, which one of the following is necessary to make a diagnosis of attention-deficit/hyperactivity disorder (ADHD) in an adolescent?

- ❑ A. A family history of ADHD in two or more first-degree relatives.
- ❑ B. A positive behavioral rating scale score from a school.
- ❑ C. Symptom onset before age 15 years.
- ❑ D. Symptoms that impair function.

4. Which one of the following is the first-line recommended approach for management of attention-deficit/hyperactivity disorder in a 4-year-old child?

- ❑ A. A combination of behavioral therapy and pharmacotherapy.
- ❑ B. Behavioral therapy.
- ❑ C. Pharmacotherapy.

5. Which one of the following is true of use of stimulant drugs in the management of attention-deficit/hyperactivity disorder (ADHD)?

- ❑ A. Approximately 90% of patients with ADHD show a reduction in symptoms with the first stimulant taken.
- ❑ B. Cardiac issues are common in children taking stimulants.
- ❑ C. Stimulants often prolong sleep onset latency in children.
- ❑ D. Stimulant use is associated with a higher risk of substance use disorder.

6. Which one of the following statements about learning disabilities is true?

- ❑ A. Coexisting mental disorders are rare.
- ❑ B. Learning disabilities are not heritable.
- ❑ C. Learning disabilities can lead to social exclusion and bullying.
- ❑ D. Socioeconomic status does not appear to be a factor.

7. Of the following tests that are used in psychoeducational evaluation of children for learning disabilities, which one assesses aptitude and intelligence?

- ❑ A. Beery-Buktenica Developmental Test of Visual-Motor Integration, Sixth Edition (Beery VMI-6).
- ❑ B. Conners Parent Rating Scale - Revised (CPRS-R) and Conners Teacher Rating Scale-Revised (CTRS-R).
- ❑ C. Kaufman Assessment Battery for Children, Second Edition (KABC-II).
- ❑ D. Woodcock-Johnson IV Tests of Achievement (WJ IV ACH).

8. Which one of the following is the minimum length of time a deficiency must persist to meet the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria for a specific learning disability?

- ❑ A. More than 6 months.
- ❑ B. More than 1 year.
- ❑ C. More than 2 years.
- ❑ D. More than 3 years.

9. A child has difficulty with accurate and fluent word recognition along with poor decoding and spelling abilities. This results in poor reading comprehension. This learning disability can be categorized as which one of the following types?

- ❑ A. Dyscalculia.
- ❑ B. Dysgraphia.
- ❑ C. Dyslexia.
- ❑ D. Dyspraxia.

10. Students with disabilities have rights under the Individuals with Disabilities Education Act (IDEA) or under Section 504 of the Rehabilitation Act of 1973. Which one of the following is specifically characteristic of Section 504?

- ❑ A. Decisions about services are made by the schools and then communicated to parents and students.
- ❑ B. Disability is defined in terms of a functional impairment, which includes physical and mental impairments.
- ❑ C. Education is provided in a facility where students with disabilities are separated from students without disabilities.
- ❑ D. Schools are required to provide the best services possible.

11. Which one of the following statements is true of the risk of developing an eating disorder in individuals with a genetic predisposition?

- ❑ A. A history of childhood obesity decreases the risk.
- ❑ B. A history of late puberty in females increases the risk.
- ❑ C. Having type 1 diabetes increases the risk.
- ❑ D. Participation in sports decreases the risk.

12. Which one of the following physical examination findings is associated with binge eating?

- ❑ A. Bruising or abrasions over the spine.
- ❑ B. Facial muscle wasting.
- ❑ C. Palatal abrasions and petechiae.
- ❑ D. Salivary gland hypertrophy.

13. Principles of family-based treatment of eating disorders in children and adolescents include nutritional rehabilitation to restore healthy thought processes related to eating.

- ❑ A. True.
- ❑ B. False.

14. Which one of the following statements is true when a severely malnourished patient with an eating disorder requires a refeeding protocol?

- ❑ A. An intensive outpatient management program is recommended for support and monitoring during refeeding.
- ❑ B. Nasogastric feeding tubes are the preferred method for initiation of refeeding.
- ❑ C. The initial refeeding intake should be 1,000 to 1,200 kcal/day.
- ❑ D. The patient should be monitored for development of refeeding syndrome.

15. Which one of the following statements about pharmacotherapy in children and adolescents with eating disorders is correct?

- ❑ A. Drugs should be considered only as an adjunctive treatment for anorexia nervosa.
- ❑ B. Ondansetron is the first-line treatment for binge-eating disorder.
- ❑ C. Selective serotonin reuptake inhibitors are the first-line treatment for anorexia nervosa.
- ❑ D. Use of combination oral contraceptives has been shown to improve bone mineral density in females with anorexia nervosa.

16. Which one of the following mental health disorders is associated with the highest mortality rate?

- ❑ A. Anorexia nervosa.
- ❑ B. Bipolar disorder.
- ❑ C. Bulimia nervosa.
- ❑ D. Unipolar depression.

17. Which one of the following statements about suicide in adolescents is true?

- ❑ A. Hanging is the most common method of suicide in the United States.
- ❑ B. Less than 5% of adolescents who committed suicide left a note.
- ❑ C. Rates of death by suicide are higher in males than in females.
- ❑ D. Rates of suicide attempts are higher in males than in females.

18. The US Preventive Services Task Force (USPSTF) recommends screening for major depressive disorder in adolescents when resources are available for additional evaluation and care. Which one of the following statements is also true of the USPSTF recommendation?

- ❑ A. Screening is recommended in all children and adolescents 10 years and older.
- ❑ B. Screening is recommended in all adolescents ages 12 to 18 years.
- ❑ C. Screening should be performed 2 times per year or more.
- ❑ D. Use of the Patient History Questionnaire-9 (PHQ-9) is recommended for screening.

19. In addition to fluoxetine, which one of the following drugs is approved by the Food and Drug Administration for management of depression in adolescents?

- ❑ A. Citalopram.
- ❑ B. Escitalopram.
- ❑ C. Paroxetine.
- ❑ D. Sertraline.

20. Which one of the following statements about management of depression in adolescents is true?

- ❑ A. Behavioral activation or agitation may occur in 20% to 30% of younger adolescents and children taking selective serotonin reuptake inhibitors.
- ❑ B. Limiting access to lethal means has not been shown to prevent deaths by suicide.
- ❑ C. Safety plans, whether verbal or written, include asking suicidal patients to agree to not harm themselves.
- ❑ D. Treatment should continue for at least 9 to 12 months.

Posttest Answers

Question 1: The correct answer is B.
According to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition), attention-deficit/hyperactivity disorder has three presentations: a predominantly inattentive presentation (difficulties with sustaining attention, listening, distractibility, forgetfulness, organizing, and completing tasks), a predominantly hyperactive/impulsive presentation (difficulties with talking excessively, restlessness, fidgetiness, acting impulsively), and a combined presentation (six or more of nine symptoms in each category). *See page 11 and Table 2.*

Question 2: The correct answer is D.
Among children and adolescents, boys are more likely to meet diagnostic criteria for attention-deficit/hyperactivity disorder. *See page 11.*

Question 3: The correct answer is D.
The *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) diagnostic criteria require the presence of six or more of nine symptoms in the inattentive and/or hyperactive/impulsive domains in two or more settings (eg, home, school, community) for at least 6 months, before age 12 years, along with evidence of functional impairment. *See page 13.*

Question 4: The correct answer is B.
The American Academy of Pediatrics clinical practice guideline recommendations for management of attention-deficit/hyperactivity disorder vary by age. For preschool-aged children (age 4 to 5 years), evidence-based parent- and/or teacher-administered behavioral therapy is the first-line treatment. *See page 14.*

Question 5: The correct answer is C.
Children with attention-deficit/hyperactivity disorder often have poor sleep quantity and quality before drug treatment, and stimulant drugs often prolong sleep onset latency, decrease sleep efficiency, and shorten sleep duration. *See page 15.*

Question 6: The correct answer is C.
Individuals with learning disabilities can experience social exclusion and bullying, poor self-image, or underachievement. *See pages 18-19.*

Question 7: The correct answer is C.
The Kaufman Assessment Battery for Children, Second Edition, is a commonly used test for evaluation for learning disabilities that assesses aptitude and intelligence. *See Table 5.*

Question 8: The correct answer is A.
For diagnosis of a learning disability, the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) requires at least one noted deficiency in reading skills and comprehension, spelling, written expression, or mathematical skills and reasoning that is not responsive to intervention and lasts for more than 6 months. *See page 21.*

Question 9: The correct answer is C.
Learning disabilities can be broadly categorized into three main types: dyslexia (deficiencies in reading skills), dysgraphia (deficiencies in writing and written expression), and dyscalculia (deficiencies in mathematical skills). Dyslexia is characterized by difficulties with accurate and fluent word recognition, poor decoding, and poor spelling abilities; often reflected in poor reading comprehension. *See page 21 and Table 6.*

Question 10: The correct answer is B.
Section 504 of the Rehabilitation Act of 1973 defines disability in terms of a functional impairment, which includes physical and mental impairments that frequently are associated with a medical diagnosis, such as attention-deficit/hyperactivity disorder, deafness, or asthma. *See page 22.*

Question 11: The correct answer is C.
For individuals with a genetic predisposition, a variety of factors may increase the risk of developing an eating disorder, including dieting behaviors; type 1 diabetes; childhood obesity; familial eating issues; negative comments about weight, shape, and eating; a history of early puberty in females; or a history of sexual assault or abuse. *See page 23.*

Question 12: The correct answer is D.
Physical examination results associated with binge eating include abrupt weight increases, signs of metabolic syndrome (eg, elevated blood pressure, acanthosis nigricans) and salivary gland hypertrophy. *See page 25.*

Question 13: The correct answer is A.
The underlying principles of family-based treatment are that parents are not to blame for eating disorders, and that nutritional rehabilitation is of central importance in restoring healthy thought processes in relation to eating. *See page 27.*

Question 14: The correct answer is D.
Patients who are severely malnourished should be monitored for development of refeeding syndrome, which is

characterized by hypophosphatemia, abrupt electrolyte and fluid level shifts, delirium, and cardiac arrhythmias. *See page 28.*

Question 15: The correct answer is A.
In children and adolescents with anorexia nervosa, drugs should be considered only as an adjunctive treatment. (No drugs are approved by the Food and Drug Administration for management of anorexia nervosa.) *See pages 28-29.*

Question 16: The correct answer is A.
Anorexia nervosa is associated with the highest mortality rate among mental disorders, with approximately 20% of those mortalities from suicide. The standardized mortality ratio is 5.86 for anorexia nervosa, compared with 1.93 for bulimia nervosa, 2.65 for schizophrenia, 2.0 for bipolar disorder, and 1.55 for unipolar depression. *See page 29.*

Question 17: The correct answer is C.
Males have significantly higher rates of death by suicide because they tend to choose more lethal means. *See page 30.*

Question 18: The correct answer is B.
The US Preventive Services Task Force recommends screening for major depressive disorder in all adolescents ages 12 to 18 years when resources are available for additional evaluation and care. *See page 31.*

Question 19: The correct answer is B.
Besides fluoxetine, the only other selective serotonin reuptake inhibitor approved by the Food and Drug Administration for management of depression in adolescents is escitalopram. *See page 33.*

Question 20: The correct answer is D.
Treatment of depression in adolescents should continue for at least 9 to 12 months to decrease the likelihood of recurrence. *See page 34.*

Notes

Notes

The next edition of AAFP FP Essentials™ *will be:*

Infectious Disease


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AMERICAN ACADEMY OF FAMILY PHYSICIANS