



# Adolescent Eating Disorders: Early Identification and Management in Primary Care ©

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## OBJECTIVES

1. Describe the etiology and risk factors for common eating disorders.
2. State the diagnostic criteria for anorexia nervosa, bulimia nervosa, and binge eating disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition.
3. Outline the screening process for eating disorders.

4. Describe the details of a clinical assessment of an adolescent suspected of holding an eating disorder.
5. Recommend appropriate treatment options for patients with anorexia nervosa, bulimia nervosa, and binge eating disorder.

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Conflicts of interest: None to report.

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J Pediatr Health Care. (2022) 36, 618-627

0891-5245/\$36.00

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<https://doi.org/10.1016/j.pedhc.2022.06.004>

Eating disorders are complex, potentially life-threatening conditions characterized by disruptive eating behaviors that significantly impact physical and psychosocial functioning. The adolescent population is at an increased risk of developing eating disorders because of developmental changes affecting their perception. Eating disorders are associated with devastating medical complications and high mortality rates if left untreated. As the prevalence of eating disorders among adolescents continues to increase, it is important that clinicians are knowledgeable about early signs of disordered eating and facilitate timely evaluation and care coordination. Newly released clinical guidelines from the American Academy of Pediatrics are reviewed for early identification and management of eating disorders in children and adolescents. The epidemiology, risk factors, and medical complications for common eating disorders in primary care such as anorexia nervosa, bulimia nervosa, and binge eating disorder, are presented. An approach to screening for eating disorders, clinical assessment, and treatment options are outlined. *J Pediatr Health Care.* (2022) 36, 618–627

## KEY WORDS

Eating disorder, anorexia nervosa, bulimia nervosa, binge eating disorder

## INTRODUCTION

Eating disorders are complex, potentially life-threatening conditions characterized by disruptive eating behaviors that significantly impact physical and psychosocial functioning (American Psychiatric Association [APA], 2013). Eating disorders are associated with high mortality rates, impaired quality of life, and increased health care costs that typically manifest during adolescence (Ágh et al., 2016). Adolescents are among the most vulnerable populations at risk for developing eating disorders because of dramatic developmental changes that affect body image satisfaction and self-perception (Panton & Garzon-Maaks, 2021). It is estimated that 6% to 8% of adolescents develop an eating disorder (Galmiche, Déchelotte, Lambert, & Tavolacci, 2019). Recognizing eating disorders can be challenging for the primary care provider and may delay diagnosis and treatment. As the prevalence of eating disorders among adolescents continues to increase, it is important that clinicians are knowledgeable about early signs of disordered eating and facilitate timely evaluation and management to decrease the physical and psychological consequences later in life.

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition recognizes several eating disorders, including pica, rumination disorder, avoidant/restrictive food intake disorder, anorexia nervosa, bulimia nervosa, binge eating disorder, other specified feeding or eating disorder, and unspecified feeding or eating disorder (APA, 2013). Although the clinician may encounter several of these disorders in practice, the most common eating disorders are anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED; Sangvai, 2016).

The diagnostic criteria for AN, BN, and BED are provided in Table 1.

## EPIDEMIOLOGY AND RISK FACTORS

Prevalence rates of eating disorders have increased 25% worldwide and affect 10 per 100 adolescent females in the United States (American Academy of Child and, 2018; Treasure, Duarte, & Schmidt, 2020). Although higher rates are seen among adolescent females, eating disorders affect individuals of all genders, ages, races, ethnicities, body sizes and weight, sexuality, and socioeconomic status. It is estimated that up to 8% of women and 2% of men will be affected by an eating disorder during their lifetime (Klein, Sylvester, & Schvey, 2021).

According to Sacco & Kelly (2018), the estimated prevalence rates of AN, BN, and BED are 0.4%, 0.9% to 3%, and 1% to 3%, respectively. The incidence of AN peaks when aged 13 and 18 years. The onset of BN occurs later in adolescence, with a peak incidence between 17 and 18 years old. The average age of onset for BED is 12–13 years old for males and females (Sacco & Kelley, 2018).

According to Treasure et al. (2020), risk factors contributing to the development of eating disorders include behavioral, psychosocial, biological, and psychological considerations. Adolescents with personality traits such as low self-esteem, perfectionism, and impulsivity, in conjunction with body image dissatisfaction, are at increased risk of disordered eating. Behavioral patterns, including weight control measures, obsession with body mass index, and social isolation, are often associated with AN and BN. Family and peer relationships play a key role in developing eating pathology. Peer pressure from friends, bullying, stressful environment in the family home, and thin-ideal internalization are important considerations among the psychosocial etiology of eating disorders. Risk factors for AN and BN often overlap. However, genome-wide association studies have shown strong evidence of genetic predisposition for AN compared with BN (Duncan et al., 2017; Watson et al., 2019a). A population cohort study by Watson et al. (2019b) suggested that environmental influences in the perinatal period (mothers at a lower birth weight) may also increase susceptibility to AN. The largest predictors of BED among adolescents are body image dissatisfaction and overeating (Stice, Gau, Rohde, & Shaw, 2017). Adolescents with chronic medical conditions that necessitate dietary restrictions (i.e., type 1 diabetes, food allergies, inflammatory bowel disease) may engage in adverse eating behaviors, predisposing them to eating disorders (Hornberger, Lane, & Committee on Adolescence, 2021).

## COMPLICATIONS

Hornberger et al. (2021) state that eating disorders can damage multiple organ systems and significantly impact the future health of adolescents. Most complications develop because of prolonged malnutrition, dramatic weight fluctuations, or purging. Cardiac complications are often seen as the result of AN in which electrocardiograph (ECG) abnormalities (sinus bradycardia and prolonged correct QT [QTc]

**TABLE 1. Diagnostic criteria for anorexia nervosa, bulimia nervosa, and binge eating disorder**

DSM-5 Eating Disorder Diagnosis	Diagnostic Criteria
Anorexia nervosa (AN)	<p>A. Restricting energy intake relative to requirements leads to significantly low body weight in the context of age, sex, developmental trajectory, and physical health. <i>Significantly low weight</i> is defined as a weight that is less than minimally normal or, for children and adolescents, less than minimally expected</p> <p>B. Intense fear of gaining weight, becoming fat, or persistent behavior that interferes with weight gain, even at a significantly low weight</p> <p>C. Disturbance in how one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight</p> <p>Subtypes of AN:</p> <ol style="list-style-type: none"> <li>1. Restricting type: this subtype describes presentations in which weight loss is accomplished primarily through dieting, fasting, and/or excessive exercise. During the last 3 months, the individual has not engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)</li> <li>2. Binge eating/purging type: during the last 3 months, the individual has engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas)</li> </ol>
Bulimia nervosa (BN)	<p>A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:</p> <ol style="list-style-type: none"> <li>1. Eating, in a discrete period (e.g., within any 2-hr period), an amount of food that is definitely larger than what most individuals would eat in a similar period under similar circumstances.</li> <li>2. A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)</li> </ol> <p>B. Recurrent inappropriate compensatory behaviors to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise</p> <p>C. Binge eating and inappropriate compensatory behaviors both occur at least once a week for 3 months</p> <p>D. Self-perception is highly influenced by body shape and weight</p> <p>E. The disturbance does not occur exclusively during episodes of AN</p>
Binge eating disorder (BED)	<p>A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:</p> <ol style="list-style-type: none"> <li>1. Eating, in a discrete period (e.g., within any 2-hr period), an amount of food that is definitely larger than what most people would eat in a similar period under similar circumstances.</li> <li>2. A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating)</li> </ol> <p>B. The binge eating episodes are associated with three (or more) of the following:</p> <ol style="list-style-type: none"> <li>1. Eating much more rapidly than normal.</li> <li>2. Eating until feeling uncomfortably full.</li> <li>3. Eating large amounts of food when not feeling physically hungry.</li> <li>4. Eating alone because of feeling embarrassed by how much one is eating.</li> <li>5. Feeling disgusted with oneself, depressed, or very guilty afterward.</li> </ol> <p>C. Marked distress regarding binge eating is present.</p> <p>D. Binge eating occurs, on average, at least once a week for 3 months.</p> <p>E. Binge eating is not associated with the recurrent use of inappropriate compensatory behavior as in bulimia nervosa and does not occur exclusively during BN or AN</p>

Note. Permission to reuse diagnostic criteria for anorexia nervosa, bulimia nervosa, and binge eating disorder was granted by the Diagnostic and Statistical Manual of Mental Disorders (DSM), Fifth Edition, (Copyright 2013). American Psychiatric Association.

intervals) and cardiac dysrhythmias are reported. Other complications related to AN include depression, delayed gastric emptying, growth retardation, and low bone mass density. BN effects related to purging behaviors can result in poor dentition, esophagitis, and fluid and electrolyte imbalances (Hornberger et al., 2021). The major complication of BED is obesity. Adolescents with BED are at a higher risk

of developing medical conditions associated with obesity, such as hypertension, type 2 diabetes, and metabolic syndrome (Mitchell, 2016).

According to Fichter & Quadflieg (2016), the most serious complication seen among all eating disorders is death. AN has the highest mortality rate of all eating disorders, with a mortality rate five times higher than the general

population matched for age and sex (Fichter & Quadflieg, 2016). The main cause of natural and unnatural death for patients with AN are related to low body weight and suicide, respectively. All cases of unnatural death seen in BN and BED were caused by suicide (Fichter & Quadflieg, 2016). Most medical complications can be prevented or minimized through early efforts to restore the patient's optimal weight or cessation of purging behaviors (Hornberger et al., 2021).

## SCREENING

Primary care providers play a key role in detecting eating disorders early. Annual health care visits or preparticipation sports physicals provide an opportunity for routine screening for eating disorders. Using an empathic and nonstigmatizing approach can make adolescents feel more comfortable and secure when providing their history (Klein et al., 2021). Screening questions focused on eating, exercise patterns, and body image are invaluable in the initial assessment (Hornberger et al., 2021). It is appropriate to talk to family members to corroborate the patient's reported history and identify any concerns (Hornberger et al., 2021). Monitoring height, weight, and body mass index trends are extremely important. These measurements can be documented on a growth chart to help identify fluctuations in weight that may cue the clinician to suspect an eating disorder (Klein et al., 2021).

Screening tools offer objective information that may be overlooked or withheld during the initial evaluation. Three useful screening tools include the SCOFF questionnaire, the Eating Disorder Examination Questionnaire, and the Adolescent Binge Eating Disorder Questionnaire (ADO-BED). The SCOFF questionnaire consists of five questions and is administered verbally by the clinician (Box 1). A total score of two or greater indicates a likely diagnosis of AN or BN (Academy for Eating Disorders, 2021). The SCOFF

## BOX 1. SCOFF questionnaire

1. Do you make yourself Sick because you feel uncomfortably full?
2. Do you worry you have lost Control over how much you eat?
3. Have you recently lost more than One stone (6.3 kg.) in 3 months?
4. Do you believe yourself to be Fat when others say you are too thin?
5. Would you say that Food dominates your life?

Note. Permission to reuse the SCOFF Questionnaire was granted by the Academy for Eating Disorders (2021).

questionnaire is a preferred method in the primary care setting because of its simplicity and ease of administration (Luck et al., 2002). The Eating Disorder Examination Questionnaire is a 28-item self-reported questionnaire that assesses key diagnostic features of eating disorders. These diagnostic features are divided into subscales to include restraint, eating concerns, shape concerns, and weight concerns. High scores in each category indicate greater severity of an eating disorder pathology (Luce, Crowther, & Pole, 2008). Both questionnaires are valid and reliable tools for detecting eating disorders and are appropriate for primary care (Seferovic et al., 2019). The Adolescent Binge Eating Disorder Questionnaire is a 10-item questionnaire used to screen adolescents with obesity for BED (BOX 2). Positive answers to questions 1 or 2 or six or more positive answers in addition to the first two suggest further evaluation and referral to a specialist (Chamay-Weber et al., 2017). Other screening tools and resources are listed in Table 2. Any positive screenings or potential red flags during questioning warrants further exploration by the clinician.

## BOX 2. Adolescent Binge Eating Disorder Questionnaire

1. Do you sometimes have a strong craving to eat although you are not really hungry or you have recently eaten? Yes/no
2. In this situation, do you sometimes find yourself starting to eat and then being unable to stop? For example, have you in the past wanted to eat a few cookies and been unable to stop until the pack was empty? Yes/no
3. In these moments when you find yourself eating although you are not hungry or when you cannot stop eating
  - A. Do you sometimes feel the need to be alone, to isolate yourself to eat? Yes/no.
  - B. Do you sometimes have the feeling of being very detached, not really in the moment, as if you were eating while daydreaming? Yes/no.
  - C. Do you sometimes eat because you feel unsettled, unwell, sad, angry, or bored? Yes/No.
  - D. Do you sometimes feel you eat too much or that you eat more than others? Yes/No.
  - E. Do you sometimes have regrets or feel ashamed after you have eaten? Yes/No.
4. How often do you experience not being able to stop eating, or do you find yourself eating without being hungry? At least once a month/2–3 times a month/2–3 times per week/every day.
5. Since when have you experienced this? Less than 3 months/more than 3 months.
6. When you are in these situations, do you sometimes need to take action to eliminate what you have just eaten (exercise, skip the next meal, self-induce vomiting. . .)? Yes/No.

Note. Permission to reuse the Adolescent Binge Eating Disorder Questionnaire was granted by Chamay-Weber, Combescure, Lanza, Carrard, & Haller (2017).

**TABLE 2. Resources for primary care providers**

Screening Tools	Resources
<ul style="list-style-type: none"> <li>• Eating Attitudes Test</li> <li>• Eating Disorder Screen for Primary Care</li> <li>• Eating Disorder Inventory-3</li> <li>• Eating Disorder Examination for Adolescents</li> </ul>	<ul style="list-style-type: none"> <li>• Academy for Eating Disorders (<a href="https://www.aedweb.org/home">https://www.aedweb.org/home</a>)</li> <li>• American Academy of Pediatrics</li> <li>• Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents, 4th edition</li> <li>• National Institute for Health and Care Excellence (<a href="https://www.nice.org.uk">https://www.nice.org.uk</a>)</li> <li>• National Eating Disorders Association (<a href="https://www.nationaleatingdisorders.org">https://www.nationaleatingdisorders.org</a>)</li> </ul>

## CLINICAL ASSESSMENT

A comprehensive assessment must be performed if an adolescent is suspected to have an eating disorder. Establishing an early diagnosis and determining the severity of presenting illness is critical for improved patient outcomes (Klein et al., 2021). This assessment includes obtaining a detailed history, psychosocial assessment, physical examination, laboratory testing, and diagnostic studies if indicated (Hornberger et al., 2021).

### History

When taking a history, it is important to include the patient's medical history, family history, nutritional status, dietary history, and a review of systems or concerns (Klein et al., 2021). When significant weight loss is noted in an adolescent, be specific in asking questions about eating and exercise patterns and any changes in these patterns (Hornberger et al., 2021). Further evaluation of a dietary history may include questions about calorie counting, laxative or diuretic use, history of dieting and diet pill use, body image, and goal weight. Because psychiatric comorbidity is common with eating disorders, a psychosocial assessment must include a thorough psychiatric history detailing any hospitalizations, family and peer relationships, physical or sexual abuse, and suicidal ideations (Hornberger et al., 2021). Areas of focus within the psychosocial assessment can be summarized using the Home, Education and Employment, Eating, Activities, Drugs, Sexuality, Suicide/Depression, and Safety technique (Panton & Garzon-Maaks, 2021). Patients may present with vague symptoms that are not exclusive to eating disorders which can prompt further investigation as these can be prodromal signs of disordered eating. These symptoms can include reported complaints of fatigue, stress, anxiety, constipation, and menstrual irregularities in females (Rowe, 2017).

### Physical Examination

Attention to growth measurements and vital signs is important in diagnosing an eating disorder. According to Hornberger et al. (2021), bradycardia, hypotension, and hypothermia may suggest features of AN. Tachycardia and orthostasis may indicate BN related to dehydration from purging behaviors. An electrocardiogram; QTc (electrocardiograph) is the recommended intervention for any abnormal vital signs, significant weight loss, or cardiovascular compromise (Hornberger et al., 2021).

Hornberger et al. (2021) stated that findings of cachexia; brittle hair and nails; and dry, scaly skin indicate AN. Adolescents presenting with cool, bluish discoloration of the extremities and poor perfusion can indicate cardiovascular complications associated with AN. A cardiac murmur may also be heard in these patients. Dental enamel erosions and chipped teeth are notable findings on a physical exam suggestive of BN. Examining the hands may reveal abrasions or calluses on the knuckles (Russell's sign) of patients who induce vomiting (Figure 1). Patients who practice compensatory behaviors seen in BN may have bruising or abrasions on the spine because of excessive sit-ups. A diagnosis of BED is considered when adolescents present with

**FIGURE. Russell's sign**

*Russell's sign*



Data from Kyukyusha, 2008 (<https://commons.wikimedia.org/w/index.php?curid=5053797>). (This figure appears in color online at [www.jpmedhc.org](http://www.jpmedhc.org).)

**TABLE 3. Differential diagnoses for eating disorders according to organ system**

Organ System	Differential Diagnosis
Neurological	<ul style="list-style-type: none"> <li>• Central nervous lesions</li> <li>• Increased intracranial pressure</li> <li>• Migraine</li> </ul>
Gastrointestinal	<ul style="list-style-type: none"> <li>• Celiac disease</li> <li>• Eosinophilic esophagitis</li> <li>• Gastroesophageal reflux disease</li> <li>• Inflammatory bowel disease</li> <li>• Pancreatitis</li> <li>• Peptic ulcer disease</li> </ul>
Infectious	<ul style="list-style-type: none"> <li>• Chronic infections</li> <li>• Intestinal parasite</li> </ul>
Psychiatric	<ul style="list-style-type: none"> <li>• Anxiety</li> <li>• Depression</li> <li>• Obsessive-compulsive disorder</li> <li>• Psychosis</li> <li>• Substance use disorder</li> </ul>
Endocrine	<ul style="list-style-type: none"> <li>• Adrenal insufficiency</li> <li>• Diabetes mellitus</li> <li>• Hypercortisolism</li> <li>• Hyperthyroidism</li> <li>• Hypothyroidism</li> </ul>
Genetic	<ul style="list-style-type: none"> <li>• Kleine–Levin syndrome</li> <li>• Prader Willi syndrome</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Food allergy</li> <li>• Medication side effects</li> <li>• Neoplasm</li> <li>• Superior mesenteric artery syndrome</li> </ul>

Note. Adapted from *Garzon, Starr, & Chauvin (2021) and Hornberger et al. (2021)*.

significant weight gain that deviates from previous growth chart trajectories. Other pertinent findings suggest BED are hypertension, acanthosis nigricans, and joint pain (Hornberger et al., 2021).

Many illnesses mask eating disorders; therefore, it is important that the clinician exclude other medical diagnoses. A list of differential diagnoses is provided in Table 3. However, a normal physical examination does not exclude an eating disorder, especially if the adolescent is in the early stages of the illness.

### Diagnostic Studies

Laboratory evaluation serves to help the clinician rule out other medical illnesses and provide baseline data during reassessment. Initial laboratory testing includes a complete blood cell count, comprehensive metabolic panel, liver function tests, thyroid-stimulating hormone level, and urinalysis. Screening for vitamin and mineral deficiencies can be obtained if indicated by the patient’s nutritional history and status (Hornberger et al., 2021). Electrolyte abnormalities can occur in BN from purging and laxative abuse (Sacco & Kelley, 2018). Leukopenia or anemia may be present with AN (Sacco & Kelley, 2018). Adolescent females presenting with amenorrhea require additional laboratory testing (i.e., urine pregnancy test and prolactin levels), and bone densitometry is considered when symptoms are persistent for more than 6–12 months because of an increased risk of low bone mineral density for age (Hornberger et al., 2021). Normal laboratory results do not rule out an eating disorder.

### TREATMENT

The American Academy of Pediatrics has newly released guidelines on identifying and managing eating disorders in children and adolescents (Hornberger et al., 2021). Most eating disorders are successfully treated in an outpatient setting. After diagnosing an eating disorder, the priority is to ensure the patient’s safety (Rowe, 2017). A patient who is medically or psychologically unstable requires hospitalization (Hornberger et al., 2021). Indications supporting

### BOX 3. Indications supporting hospitalization in an adolescent with an eating disorder

- One or more of the following justify hospitalization
1.  $\leq 75\%$  median body mass index (BMI) for age and sex (percent median BMI calculated as patient BMI/50th percentile BMI for age and sex in reference population  $\times 100$ )
  2. Dehydration
  3. Electrolyte disturbance (hypokalemia, hyponatremia, hypophosphatemia)
  4. Electrocardiograph abnormalities (e.g., prolonged corrected QTc or severe bradycardia)
  5. Physiologic instability:
    - a. Severe bradycardia (heart rate  $< 50$  beats per min [bpm] daytime;  $< 45$  bpm at night);
    - b. Hypotension (90/45 mmHg);
    - c. Hypothermia (body temperature  $< 96^\circ\text{F}$ ,  $35.6^\circ\text{C}$ );
    - d. Orthostatic increase in pulse ( $> 20$  beats per min) or decrease in BP ( $> 20$  mmHg systolic or  $> 10$  mmHg diastolic)
  6. Arrested growth and development
  7. Failure of outpatient treatment
  8. Acute food refusal
  9. Uncontrollable binge eating and purging
  10. Acute medical complications of malnutrition (e.g., syncope, seizures, cardiac failure, pancreatitis, and so forth)
  11. Comorbid psychiatric or medical condition that prohibits or limits appropriate outpatient treatment (e.g., severe depression, suicidal ideation, obsessive-compulsive disorder, type 1 diabetes mellitus)

Note. Permission to reuse indications supporting hospitalization in an adolescent with an eating disorder was granted by the Society for Adolescent Health and Medicine (Society for Adolescent Health and Medicine et al., 2015).

hospitalization are listed in [Box 3](#) (Society for Adolescent Health and [Medicine et al., 2015](#)). Once safety is established, the clinician is responsible for coordinating care with other health care professionals experienced in pediatric eating disorders. A multidisciplinary treatment team involving the clinician, a mental health professional, and a dietician is ideal for [improving patient outcomes](#). [\(Clinicians can address\)](#) the nutritional needs of patients. Nutritional repletion is an important focus of treatment; management and education from the clinician are crucial. Determining a treatment goal weight is a key step in restoring a healthy weight, and consultation with a dietician may be necessary ([Hornberger et al., 2021](#)). The treatment goal weight is based on height, weight, age, pubertal stage, and growth trajectories before illness ([Klein et al., 2021](#)). It is important to continue closely monitoring the patient's progress with regular follow-up appointments every 3–6 months or sooner ([Hornberger et al., 2021](#)).

[Hornberger et al. \(2021\)](#) state that education on reestablishing eating patterns is fundamental in the treatment process. Clinicians can guide the patient and the family on appropriate dietary recommendations. Avoid recommending calorie counting, which may encourage preexisting disordered thinking ([Klein et al., 2021](#)). Instead, education on nutrient-dense foods and beverages is encouraged, as this can maximize energy intake without needing to take in large volumes of food ([Hornberger et al., 2021](#)). The Dietary Guidelines for Americans: 2020–2025 offers examples of nutrient-dense choices ([U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2020](#)). A slow reintroduction of foods that have been avoided is suggested for patients with AN, but with guidance from the multidisciplinary team ([Klein et al., 2021](#)). For patients with BN and BED, suggest eating three regular meals and three snacks a day to help decrease the urge and frequency to binge ([Hornberger et al., 2021](#)). Oral supplements, such as multivitamins with calcium and vitamin D, and protein drinks, may be prescribed ([Hornberger et al., 2021](#)). It is paramount that the clinician offers reassurance to the patient and their families that common somatic complaints (i.e., bloating, constipation, fatigue) improve with regular eating patterns ([Hornberger et al., 2021](#)). Progress may be slow, and celebrating small victories can help motivate the patient to continue to reach their goals.

### Psychological Interventions

The main treatment for eating disorders is family-based therapy (FBT) and cognitive behavioral therapy (CBT; [Hay, 2020](#)). The clinician refers the patient to treatment resources that align with their diagnosis and keeps up to date on treatment progress. Referral for psychological care, nutritional consultation, and inpatient and/or outpatient therapy may be indicated.

The current literature and guidelines suggest FBT, the Maudsley method, as the first-line treatment for adolescents with eating disorders ([Hornberger et al., 2021](#)). The effectiveness of FBT is established for AN and BN; however,

there is limited evidence to support its use in BED. According to [Hornberger et al. \(2021\)](#), FBT is a treatment approach that focuses on achieving recovery as a family rather than on the underlying cause of the eating disorder. The family meets with an FBT-certified therapist, who assists in guiding the family through the three phases of FBT.

In the first phase, the parents take full responsibility for reestablishing healthy dietary patterns and interrupting disordered eating behaviors. In phase two, the adolescent gradually regains control over their eating while the parents continue to provide support. By phase three, weight is restored, and treatment goals shift to focus on developing a healthy balanced lifestyle for the adolescent ([Hornberger et al., 2021](#)). A family-based approach yields better outcomes, including higher remission rates and increased weight gain, than individual therapy ([Klein et al., 2021](#)).

CBT is recommended for patients with BN and BED and can also be used as an alternative therapy in AN ([Klein et al., 2021](#)). CBT focuses on helping individuals identify and change disruptive thinking and behavioral patterns ([Hornberger et al., 2021](#)). Treatment strategies are used to help the patient better understand how their disordered eating is negatively affecting them and learn to use problem-solving skills to cope with their eating disorders ([American Psychological Association, 2017](#)). During a CBT session, the psychotherapist helps the patient constructively address their problems, while learning techniques to relieve mental and physical stress to change behavioral patterns ([American Psychological Association, 2017](#)). Adolescents with BED can benefit from this treatment as it is demonstrated to decrease binge eating behavior compared with other forms of therapy ([Klein et al., 2021](#)).

There is ongoing support for dialectical behavioral therapy (DBT) as an alternative and adjunctive treatment for adolescent eating disorders ([Reilly et al., 2020](#)). The goal of therapy is to address and treat dysregulated behaviors and emotions often associated with eating disorders ([Reilly et al., 2020](#)). The skills offered in therapy include training in mindfulness, emotional regulation, distress tolerance, and interpersonal effectiveness ([Reilly et al., 2020](#)). A recent pilot study by [Peterson, Van Diest, Mara, & Matthews \(2020\)](#) demonstrated the effectiveness of adjunctive DBT in weight gain, reducing disordered eating behaviors and depressive symptoms, and increasing effective coping skills in adolescents with AN. Similar pilot studies have reported limited benefits in reducing maladaptive behaviors in BED and BN ([Peterson et al., 2020](#)). Although preliminary data on DBT shows potential as a primary or adjunctive intervention, continued research is needed to explore the efficacy and effectiveness of this approach.

Cognitive remediation therapy is an emerging treatment for adolescents with AN designed to improve neurocognitive abilities through interactive engagement ([Giombini et al., 2018](#)). Therapy sessions involve cognitive exercises that help individuals learn to become more flexible in their thinking style and apply those skills to their daily practices ([Eichen, Matheson, Appleton-Knapp, & Boutelle, 2017](#)). Cognitive remediation therapy differs from other

psychological interventions because therapy specifically aims to improve cognitive processes (cognitive flexibility, decision making, and central coherence) that are known executive function impairments associated with AN (Eichen et al., 2017). Although studies on cognitive remediation therapy show promise as an adjunctive treatment, future work is still needed.

### Pharmacotherapy

There are no medications approved by the United States Food and Drug Administration (FDA) for eating disorders in adolescents. Therefore, pharmacotherapy should be reserved for treating comorbid mental health conditions such as depression or obsessive-compulsive disorder (Hornberger et al., 2021). Selective serotonin reuptake inhibitors have been studied in the treatment of AN that demonstrated little effectiveness in promoting weight gain or improving symptoms (Hornberger et al., 2021; Muratore & Attia, 2021). There is growing evidence for the use of olanzapine, a second-generation atypical antipsychotic, in treating AN (Muratore & Attia, 2021). Studies have suggested that olanzapine may be useful for promoting weight gain in adults; however, the effectiveness of treatment is unclear for adolescents, and the medication is not FDA-approved for adolescents with AN (Han, Bian, & Chen, 2022; Himmerich, Kan, Au, & Treasure, 2021). Fluoxetine is the only FDA-approved pharmacological agent indicated for BN in adults (Hornberger et al., 2021). Although caution is advised, fluoxetine may be considered for adolescents with co-occurring major depressive disorder and/or obsessive-compulsive disorder (Hornberger et al., 2021). The antiepileptic topiramate has shown effectiveness in treating BED in adults; however, safety concerns limit its use in adolescents (Hornberger et al., 2021). Lisdexamfetamine, a central nervous system stimulant, was approved by the FDA to treat moderate to severe BED in adults; however, more studies on the safety and tolerability are needed in the adolescent population (Guerdjikova et al., 2019).

### Day Treatment Programs

Day treatment or partial hospitalization programs are considered when outpatient interventions are unsuccessful or daily professional supervision is needed (Klein et al., 2021). These programs may prevent hospitalization; however, a strong commitment from the patient and support from the family is the cornerstone to success. Day treatment programs involve treatment for 6–8 hrs/day, and the length of stay at residential treatment programs can be as long as a few weeks to months, which may not be a feasible option for the patient (Hornberger et al., 2021). Caution is advised to clinicians and patients when choosing a treatment program as many are not accredited organizations (Hornberger et al., 2021).

### Hospitalization

Patients hospitalized for malnutrition secondary to AN require medically supervised nutritional restoration. The

risks of refeeding too quickly may cause rapid metabolic changes (hypophosphatemia) and progressive multiorgan dysfunction seen in refeeding syndrome (Hornberger et al., 2021). To mitigate these effects, hospitals have adopted lower-calorie refeeding protocols that begin at 1,200–1,400 kilocalories/day and slowly increase by 200 kilocalories every other day (Garber et al., 2021). Current research supports hospitals moving toward a higher calorie refeeding protocol beginning at 2,000 kilocalories/day as a safe, effective, and cost-efficient approach to maximizing weight gain (Garber et al., 2021). A randomized clinical trial of hospitalized adolescents with AN reported that treatment with higher calorie refeeding achieved lower rates of hypophosphatemia, reduced length of hospital stays by 3–6 days, and a greater overall weight gain of 0.8 kg compared with lower-calorie refeeding (Garber et al., 2021).

### BARRIERS TO CARE

The recovery rate of adolescents with eating disorders is approximately 70% with early identification and treatment (Hornberger et al., 2021). However, the costs associated with treatment and the shortages of adolescent psychiatrists can hinder progress (Findling & Stepanova, 2018; Hornberger et al., 2021). The average annual cost of treatment per individual with an eating disorder is estimated at \$12,000 in the United States (Streatfeild et al., 2021). Unfortunately, having medical insurance (public or private) does not guarantee coverage, as insurance carriers can determine what costs they will cover for eating disorder treatment (Hornberger et al., 2021). The coverage gaps in insurance lead to limited treatment options and create a substantial financial burden for patients and families.

Those who continue to seek treatment, despite costs, may be challenged with finding an adolescent psychiatrist specializing in eating disorders. Because of the inadequate number of mental health professionals, patients are forced to be placed on long waitlists (3 months to a year) and delayed in timely treatment access (Vollert et al., 2019). Therefore, it is important for the clinician to acknowledge these barriers and offer assistance and resources to patients and families in need of treatment.

### CLINICAL IMPLICATIONS

A delay in recognizing an eating disorder is the most important implication for the clinician. Treatment delays are problematic because of the adverse medical complications and high mortality rates of these disorders. Eating disorders are complex, and clinicians need to be aware of the importance of early detection and intervention for improved patient outcomes (Klein et al., 2021).

Adolescence is a challenging developmental period with patients at risk for developing eating disorders. Clinicians must know the risk factors and early signs of eating disorders during annual health maintenance visits or preparticipation sports examinations. An initial evaluation involving diet and exercise history, growth trajectories, and vital signs can provide an index of suspicion for the presence of an eating

disorder. If an eating disorder is suspected, it is important to complete a comprehensive assessment that includes, at minimum, a psychosocial assessment, suicide risk appraisal, and physical examination.

Once a diagnosis is made, coordination of care with a specialized team in pediatric eating disorders is needed. The risk for suicide is high in adolescents with eating disorders, and consulting a mental health specialist must be considered when arranging a multidisciplinary team (Hornberger et al., 2021). The multidisciplinary team can assist the clinician in deciding appropriate treatment options and providing the patient and family with resources to help manage any acute or long-term medical complications. Ongoing monitoring of the patient is key to preventing relapse. Follow-up appointments should reassess growth parameters and any abnormal findings, monitor treatment progress, assess for new concerns, include patient education, and provide continued support for the patient and their family.

Eating disorders are severe, life-threatening conditions that significantly affect the physical and psychological development of adolescents. Clinicians will likely encounter eating disorders in the primary care setting and play a key role. It is important for the clinician to become familiar with predisposing factors and warning signs of disordered eating. Prompt identification, diagnosis, and connecting the patient and family with appropriate care and resources can ensure a better prognosis for the patient and minimize its disease burden.

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## POSTTEST QUESTIONS AND ANSWERS

- The average age of onset for binge eating disorder is which of the following?
  - 12–13 years
  - 14–15 years
  - 16–17 years
  - 18–19 years
- Adolescents with personality traits such as low self-esteem, perfectionism, and impulsivity, in conjunction with body image dissatisfaction, are at increased risk of disordered eating.
  - True
  - False
- Which eating disorder is associated with the complications of hypertension, type 2 diabetes, and metabolic syndrome?
  - Anorexia nervosa
  - Binge eating disorder
  - Bulimia nervosa
  - Pica
- The risk for suicide is low in adolescents with eating disorders.
  - True
  - False
- Most medical complications of eating disorders can be prevented or decreased through early efforts to restore the patient's optimal weight or cessation of purging behaviors.
  - True
  - False
- The symptoms of bradycardia, hypotension, and hypothermia may suggest features of which eating disorder?
  - Anorexia nervosa
  - Binge eating disorder
  - Bulimia nervosa
  - Pica
- Dental enamel erosions, chipped teeth, abrasions, or calluses on the knuckles are notable findings on a physical examination suggestive of which eating disorder?
  - Anorexia nervosa
  - Binge eating disorder
  - Bulimia nervosa
  - Pica
- Which is the first-line treatment for adolescents with eating disorders?
  - Family-Based Therapy
  - Dialectical Behavioral Therapy
  - Cognitive Remediation Therapy
  - Cognitive Behavioral Therapy
- Calorie counting should encourage reestablishing eating patterns and obtaining treatment weight goals.
  - True
  - False
- Numerous medications are approved by the U.S. Food and Drug Administration for eating disorders in adolescents.
  - True
  - False

Answers available online at [ce.napnap.org](http://ce.napnap.org).