

Eating Disorders: Not Just a Diet Gone Wrong

Kevin Wandler, MD

The following medications are mentioned as undergoing research trials, but are not yet FDA approved for the disorders mentioned: sertraline (Zoloft), citalopram (Celexa), fluvoxamine (Luvox), quetiapine (Seroquel), olanzapine (Zyprexa), aripiprazole (Abilify), and naltrexone (ReVia).

No commercial support was used in the development of this CME lesson.

KEY WORDS: Anorexia nervosa • Bulimia nervosa • Binge eating • Interdisciplinary treatment

LEARNING OBJECTIVES: The lesson will enable clinicians to (1) identify the signs and symptoms of eating disorders, (2) list the most common comorbid psychiatric conditions seen in eating disorders, and (3) inform patients of evidence-based treatment options for the treatment of eating disorders.

LESSON ABSTRACT: Eating disorders have the highest mortality rate of any mental illness due to either medical complications of the disorder or suicide. The causes of eating disorders are multifactorial with a biopsychosocial basis. In simplistic terms, they are often the result of out-of-control dieting. However, if it was that simple, there would be millions more with anorexia nervosa or bulimia nervosa. As part of the illness, patients diagnosed with anorexia nervosa are characteristically resistant to treatment. They have a distorted body image and often believe that they are overweight, fat, and ugly, which results in a corresponding lack of motivation for recovery. Gaining weight is counterintuitive for them. Through the bingeing and purging behaviors of patients diagnosed with bulimia nervosa, there is resultant significant damage to their bodies. Comorbid psychiatric conditions encountered in both anorexia nervosa and bulimia nervosa include depression, substance abuse, sexual abuse, and anxiety disorders. The complexity of identifying and treating eating disorders requires high suspicion in patients who suddenly lose weight or stop developing. In addition, those involved in high-risk activities or involved in careers with increased pressure for weight control, such as wrestling, gymnastics, dancing, ice skating, theater, and modeling, are at increased risk for the development of an eating disorder. Individuals who have a history of depression, anxiety, substance abuse, or trauma often have a comorbid eating disorder. One of the goals of early treatment is simply getting patients to realize that they are starving themselves to death. Treatment takes a team of professionals, including a primary care provider, a dietitian/nutrition therapist, a psychotherapist and/or family therapist, and a psychiatrist. Treatment can take place in a variety of settings, from outpatient to inpatient hospitalization, depending on the severity of the individual's illness.

What Are Eating Disorders?

Eating disorders (EDs) have the highest mortality rate of any mental illness. The mortality rate associated with anorexia nervosa is 6–12 times higher in women compared with the overall death rate (all causes) when adjusted for age. About 5%–10% of anorexic patients die within 10 years from the onset of the illness, 18%–20% die within 20 years, and only 50% report ever being cured.¹

Eating disorders are complex illnesses that develop over time from a combination of psychological, interpersonal, cultural, and physiological factors, resulting in a disturbance of thoughts and behaviors about food and weight, as well as an excessive concern about body shape or weight. These disorders are progressive in nature, affect males and females, and can have life-threatening consequences. Currently, the prevalence of eating disorders in the United States is approximately 0.9% for anorexia nervosa and 2%–3% for bulimia nervosa. Binge eating is at least as prevalent as bulimia nervosa and may be prevalent in as up to 8% of obese patients.²

Eating disorders are classified as a psychiatric disorder in the *Diagnostic Manual of Mental Disorders, 4th Edition, Text Revision* (DSM-IV-TR).³ They are classified into three major categories. Two specific types are anorexia nervosa and bulimia nervosa. The DSM-IV-TR also has a category called *eating disorders not otherwise specified* (EDNOS; e.g., anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified). This last category is more common than others as EDNOS may represent a combination of both anorexia and bulimia in patients who do not meet the criteria for either disorder alone. **One-third to one-half of patients diagnosed with anorexia nervosa will go on to develop bulimic symptoms and may shift between both disorders in a chronic fashion.**

The DSM-V,⁴ which is projected for release in May 2013, will have just a few changes. Amenorrhea will be eliminated altogether in anorexia nervosa. *Binge eating disorder* (BED) will be added as a distinct diagnostic category. There is insufficient evidence to have psychiatric diagnosis for obesity and overeating. The bulimia nervosa criteria will allow the diagnosis to be made when the binge/purge frequency is once a week instead of three times a week.⁴

Anorexia Nervosa

Even though “anorexia” and “anorexia nervosa” are often used interchangeably, they actually refer to different conditions. Anorexia is a lack or loss of appetite for food. Anorexia nervosa, on the other hand, is a clinical disorder in which someone refuses to maintain even a minimally normal ideal weight. People with anorexia nervosa have a fear of gaining weight, which paradoxically intensifies as they continue to lose weight. Despite significant weight loss, they continue to have body image distortions and consider themselves fat, ugly, or unattractive.

Menstrual irregularities or absence of menses becomes an issue in females diagnosed with an eating disorder. In girls who have not reached menarche, menstrual cycles are often delayed. If a female is using hormone replacement therapy or birth control pills, she may continue to have menses even though she is significantly underweight. The DSM-IV-TR suggests a body weight <85% of the ideal weight to make a diagnosis of anorexia nervosa. Weight loss is managed by restricting caloric intake or fasting, by exercising excessively, and/or by self-induced vomiting.

There are two subtypes of anorexia nervosa. Most common is the restricting subtype in which the affected individuals restrict their calories, fast, and often starve. The second subtype is binge eating/purging type in which the patients generally restrict their food intake but have periods of bingeing and/or purging. Some anorexics of this subtype do not binge at all but will purge almost everything they eat. While this may sound like bulimia nervosa, the key is that the individual with binge/purge type of anorexia will still meet all criteria for anorexia nervosa as listed in the DSM-IV-TR below.

DSM-IV-TR Criteria for Anorexia Nervosa (AN)⁴

Criteria:

- Refusal to maintain body weight at or above a minimally normal weight for age and height, for example, weight less than 85% of that expected or failure to make expected weight gain during period of growth, lead-

ing to body weight less than 85% of that expected.

- Intense fear of gaining weight or becoming fat, even though underweight.
- Disturbance in the way one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.
- In postmenarcheal females, amenorrhea—the absence of at least three consecutive menstrual cycles. A woman having periods only while on hormone medication (e.g., estrogen) still qualifies as having amenorrhea.

Type:

- *Restricting Type:* During the current episode of anorexia nervosa, the person does not regularly engage in binge eating or purging behavior (self-induced vomiting or misuse of laxatives, diuretics, or enemas).
- *Binge Eating/Purging Type:* During the current episode of anorexia nervosa, the person regularly engages in binge eating or purging behavior.

Bulimia Nervosa

Bulimia nervosa differs from anorexia nervosa primarily because the former lacks episodes of starving. Instead, bulimics engage in episodes of binge eating followed by frequent calorie-limiting compensatory mechanisms. A purge is a way for patients to get rid of the calories from the binge. Patients often report that there is nothing enjoyable about a binge, but the relief and satisfaction comes from the purging behavior. Compensatory measures most commonly include self-induced vomiting but may also include excessive use of laxatives or diuretics. Fasting and exercising excessively are types of purging behaviors as well. In fact, bulimia nervosa may be subclassified as a purging type when the individual regularly engages in self-induced vomiting, laxative abuse, and/or diuretic abuse. The nonpurging

type occurs when the individual engages in cycles of caloric restriction/fasting and/or excessive exercising. Bulimia nervosa shares some characteristics with anorexia nervosa. **Both bulimics and anorexics have a distorted body image, often thinking that they are fat, disliking their body shape, and seeing themselves as unattractive.** In addition, the anorexia nervosa binge eating/purging subtype is marked by episodes of bingeing and/or purging.

DSM-IV-TR Criteria for Bulimia Nervosa (BN)⁴

Criteria:

1. Recurrent episodes of binge eating characterized by both:
 - a. Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances.
 - b. A sense of lack of control over eating during the episode (such as a feeling that one cannot stop eating or control what or how much one is eating).
2. Recurrent inappropriate compensatory behavior to prevent weight gain, such as self-induced vomiting, misuse of: laxatives, diuretics, enemas, or other medications, fasting, or excessive exercise.
3. The binge eating and inappropriate compensatory behavior both occur, on average, at least twice a week for 3 months.
4. Self-evaluation is unduly influenced by body shape and weight.
5. The disturbance does not occur exclusively during episodes of anorexia nervosa.

Type:

- *Purging Type:* During the current episode of bulimia nervosa, the person regularly

engages in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

- **Nonpurging Type:** During the current episode of bulimia nervosa, the person uses other inappropriate compensatory behaviors.

Eating Disorder Not Otherwise Specified

Eating disorders not otherwise specified (EDNOS) is the third category of eating disorders. The DSM-IV-TR states that EDNOS is for eating disorders not meeting the criteria for any specific eating disorder. It is important to note that someone can still have an eating disorder or body image issues and not meet the diagnostic criteria. **Furthermore, not meeting the full criteria for anorexia nervosa or bulimia nervosa does not mean that the symptoms are less severe. Up to 50% of patients with an eating disorder meet the EDNOS criteria, making it the most common of all the eating disorders.**

DSM-IV-TR Criteria Eating Disorders—not Otherwise Specified (ED-NOS)⁴

EDNOS includes eating disorders that do not meet the criteria for any specific eating disorder. Examples include the following:

1. For female patients, all the criteria for anorexia nervosa are met except that the patient has regular menses.
2. All the criteria for anorexia nervosa are met except that, despite significant weight loss, the patient's current weight is in the normal range.
3. All the criteria for bulimia nervosa are met except that the binge eating and inappropriate compensatory mechanisms occur less than twice a week or for less than 3 months.
4. The patient has a normal body weight and regularly uses inappropriate compensatory

behavior after eating small amounts of food (e.g., self-induced vomiting after consuming two cookies).

5. Repeatedly chewing and spitting out, but not swallowing, large amounts of food.
6. Binge eating disorder refers to recurrent episodes of binge eating in the absence of a regular inappropriate compensatory behavior characteristic of bulimia nervosa.

Two other types of disordered eating that will only be briefly mentioned here include binge eating disorder and night eating syndrome.

Binge Eating Disorder

BED, sometimes referred to as “compulsive overeating,” is believed to be the most common eating disorder and affects millions of Americans. **Similar to bulimia nervosa, those with binge eating disorder frequently consume large amounts of food while feeling a lack of control over their eating. They often eat when not hungry, as well as in secret.** However, this disorder is different from bulimia nervosa because people with BED usually do not engage in compensatory measures to get rid of their food (e.g., vomiting, laxatives, etc.). BED is believed to affect 1%–5% of the population and is often associated with being overweight or obese. Additionally, these patients often suffer from depression. As previously mentioned, BED is expected to be categorized in the DSM-V as a distinct disorder.⁵

Night Eating Syndrome

Night eating syndrome is estimated to affect 1.1%–1.5% of the general population, 6%–16% of patients in weight reduction programs, and 8%–42% of candidates for bariatric surgery. This condition is defined as evening hyperphagia (eating greater than 25% of the total daily calories at night) and staying awake at night accompanied with eating, usually in insomniac patients. Night eating syndrome may precede obesity.⁶

Risk Factors and Prevalence for Eating Disorders

Biological Factors:

The cause of eating disorders is very complicated. While the ultimate etiology of eating disorders remains unknown, they appear to result from a complex interaction of biological and environmental risk factors, including familial, psychological, developmental, and social variables.

The greatest risk factor for developing an eating disorder comes from being female. Women and adolescent girls have a nearly five to eight times higher rate of an eating disorder diagnosis than males. First degree relatives of patients with anorexia have a significantly increased prevalence of eating disorders, reportedly as high as 29%. Children of patients with anorexia nervosa have a 5% risk of developing anorexia nervosa. Children of patients with bulimia nervosa have a higher rate of eating disorders and substance abuse—particularly alcoholism as well as mood disorders and obesity.⁷

Like many other complex disorders, eating disorders most likely have a polygenetic etiology, with each gene having some effect. The genetic contribution is considered to be 40%–60%. Patients diagnosed with an eating disorder have several genetic traits that make them prone to develop such a disorder. These traits include anxiety, perfectionism, and low self-esteem.⁸ In fact, 59% of patients diagnosed with an eating disorder have had a premorbid diagnosis of anxiety disorder, and 67% had a lifetime prevalence.

Physiological and Neurobiological Factors

Starvation releases endogenous opioids that may contribute to the apparent ease in which anorexic patients deny their hunger. Binging and exercising also increase circulating levels of B-endorphins, which are chemically identical to exogenous opiates. Endorphins are potentially addictive because of their ability to stimulate dopamine in the brain's mesolimbic reward centers.⁹ There is also evidence to suggest that serotonin in the brain contributes to the dysregulation of appetite,

mood, and impulse control. There are reduced 5-HT_{2A} receptors and increased 5-HT_{1A} receptors in both patients with active eating disorders and patients in recovery from an eating disorder. Compulsive eating and compulsive drug seeking in drug addiction have a significant overlap correlation. In some obese patients, there is a reduction in ventral striatal dopamine. The lower the number of D₂ receptors, the higher the weight. It is hypothesized that some obese patients may eat to increase these reward circuits.¹⁰ The prevalence of eating disorders and substance use disorders in females shows that up to 55% of individuals with bulimia nervosa abuse alcohol or illicit drugs, and 27% of those with anorexia nervosa abuse alcohol or drugs, compared with 9% of the general population. Conversely, up to 35% of alcohol or illicit drug abusers have eating disorders compared with 3% of the population.²

Hormonal Influences

Puberty itself is speculated to be a trigger for the development of anorexia nervosa. **Approximately 40% of new cases occur in girls ages 15–19. Also, young female athletes may be at significant risk for anorexia. Exercising and dieting may “turn on” the eating disorder genes.** Testosterone appears to decrease the development of an eating disorder, which may be related to the observation that women have a five to eight times higher rate of developing eating disorders compared to men.¹¹

Psychosocial Factors

Parental attitudes toward eating, weight, and body shape strongly influence how children respond to food and body image. (However, parents are generally not to blame for their child developing an eating disorder.) A child's perceived pressure to be thin and criticisms from parents or siblings regarding weight issues strongly affect a child's body image and self-worth. The role models for children and young adults, such as fashion models and celebrities, have gotten thinner over the years. The adolescents' or children's first diet is often triggered by a comparison with others and their own thin-ideal. Media influences can directly cause body dissatisfaction and

dieting or abnormal eating. A study conducted in Fiji before and after the introduction of satellite TV to the island showed a significant increase in eating disorder behavior and body dissatisfaction in a very short time after satellite TV was introduced.¹²

Abuse has been associated with eating disorders in both women and men. Sexual abuse is a significant trauma and has been estimated to occur in up to 30% of patients diagnosed with an eating disorder. Bullying, another form of abuse, has also contributed to the development of eating disorders in many patients. Individuals with a substance use disorder are at higher risk for bulimia; those with depression, anxiety, and a history of trauma are at higher risk for both anorexia and bulimia.

There are certain sports in which eating disorders are prevalent. **The female athlete triad is recognized in athletic women with an eating disorder and manifests as amenorrhea, low body weight, and low bone density. For women, sports more prone to precipitate anorexia include those that require or favor a slim appearance, such as gymnastics, figure skating, and diving. Ballet can also be a causative factor. Cross country and marathon running also emphasize slimness for performance. For men, low-weight crew, low-weight wrestling, cycling, and rock climbing demand slimness; diving and figure skating also emphasize slimness and appearance.** Eleven Division I schools surveyed athletes from a variety of sports including football, wrestling, gymnastics, crew and Nordic skiing, about eating disorder behaviors and self-perception. Three percent of females were identified as having anorexia versus 0% males, and 9% of females were identified as having bulimia versus 0.1% males. Eleven percent of females and 13% of males reported binge eating on a weekly or greater basis.

Psychiatric Co-occurring Conditions

Anxiety and depressive disorders are the most common comorbid psychiatric conditions seen in patients diagnosed with an eating disorder. Anxiety disorders were identified in 59% of patients before they had an eating disorder, and nearly 67% have lifetime prevalence. As with many chronic illnesses, depression is seen as well. It is often difficult to sort out if the depression came before

the eating disorder or was a result of the eating disorder. Clearly, the treatment of depression in patients with an eating disorder includes weight restoration and normalization of eating behaviors. Trauma has shown higher rates of *posttraumatic stress disorder* (PTSD) than expected in patients with eating disorders. In one study, 74% of women attending residential treatment indicated that they had experienced significant trauma, and 52% reported symptoms consistent with a diagnosis of PTSD.¹⁴ Substance abuse has been seen in approximately 55% of patients with bulimia nervosa and 27% of patients with anorexia nervosa.²

Identification of Eating Disorders

For a psychiatrist, the majority of patients with anorexia are seen by a primary care provider first for menstrual irregularity or significant weight loss. Oftentimes, patients deny that they have an eating disorder, stating that they are just trying to lose weight. For a list of screening questions that can be easily administered in a busy office practice to help determine if a patient has an eating disorder, see Table 1.

Medical Evaluation of an Eating Disorder and Promotion of a Healthy Body Image¹⁵

All patients suspected or diagnosed with an eating disorder should have a complete medical examination. The screening questions above are just initial questions. This examination should include a full physical examination. Clearly, the presentation of anorexia nervosa is different from that of bulimia nervosa. In fact, the physical examination and laboratory findings in a patient with bulimia nervosa may be essentially normal.

When medically approaching a person who has experienced significant weight loss, you suspect the person may have an eating disorder if they are unconcerned about their weight loss; they continue to exercise—often excessively—and do not complain about fatigue. **The most common cause of weight loss in adolescents is dieting or anorexia nervosa, not malignancies, diabetes, or chronic infections.** However, in the appropriate patient presentation, these may necessitate further consideration.

Table 1
Screening Questions for the
Diagnosis of Eating Disorders

General questions about weight:

- What do you think your weight should be?
- How do you feel about your current weight?
- How often do you weigh yourself?
- When did you begin to lose weight?
- Do you or your family/friends have any concerns about your eating or exercising behaviors?
- What is the heaviest weight you gained so far? How tall were you then? When was that?

Diet history:

- What types of dieting or weight management have you tried?
- How many calories in a 24 hour period? Food types? Foods you avoid?
- Do you binge eat? Frequency?
- Do you purge by vomiting? Frequency?
- Do you use laxatives, diet pills, diuretics, or ipecac?

Exercise:

- How much do you exercise? How often? Level of intensity? Stress if you miss a workout?

Menstrual history:

- Age of menarche? Regularity of cycles? LMP?
- Are you on birth control or hormone replacement therapy?

Social history:

- Sexual history? History of physical or sexual abuse? Use of cigarettes, drugs, or alcohol?
- Family history of eating disorders, depression, anxiety, mental illness, obesity, and substance abuse.

Review of medical systems/symptoms:

- Specific to weight loss, lanugo hair, dehydration, constipation, diarrhea, abdominal pain, GI complaints in general, epigastric pain, and menstrual irregularities.

Evaluating a Patient with an Eating Disorder:

Below is an outline of specific parameters to look for in a patient with anorexia. A good history and physical examination results will rule out most medical causes of weight loss and will point you in the direction of an eating disorder. Naturally, the height and weight are where one would begin. If this is an adolescent and you have growth charts, this can be helpful to trend the weight history.

- **Physical examination**
 - **Height, weight**

- **Vitals: orthostatic blood pressure, pulse, respirations, and temperature**
- **Examination of the mouth and teeth, skin, cardiac, abdomen, and extremities**

- **Laboratory testing**

- **Serum electrolytes, glucose, calcium, magnesium, phosphorus, and albumin**
- **Amylase**
- **Complete blood count with differential**
- **Liver function tests (SGOT, SGPT, and bilirubin)**
- **Serum BUN and creatinine**
- **Thyroid function tests (T3, T4, and TSH)**
- **Urinalysis**
- **Stool guaiac**

- **EKG**

- **DEXA (dual-energy X-ray absorptiometry)—measurement of bone density**

Medical Evaluation of a Patient with Anorexia Nervosa

In the medical evaluation of a patient with anorexia, the most striking physical findings are extreme weight loss, muscle wasting, and muscle weakness. Hair losses from the scalp and lanugo hair on the body are also very common. Table 2 shows a summary of the physical signs and symptoms.

A *body mass index* (BMI) < 18.5 is considered underweight. While the BMI is not the best measure for the ideal weight range, it is easy to calculate. Another method to estimate the *ideal body weight* (IBW). This measurement is a simple formula developed by Dr. G. J. Hamwi and has been popular since the mid 1960s. As an example, suppose you have a female patient who is expected to weigh 100 pounds if she is 5 feet tall, with an additional 5 pounds for every inch over 5 feet. If a patient is 5 foot 7 inches, she is expected to weigh approximately 135 pounds. If a patient weighs 85% or less of their IBW, this is one criterion for anorexia nervosa.

Table 2
Physical Signs and Symptoms in
Patients with Anorexia Nervosa

Physical signs and symptoms:

- Extreme weight loss or flattening of growth curve on a growth chart in an adolescent
- Muscle wasting/muscle weakness
- Bony protuberances
- Lanugo hair
- Bradycardia (pulse <60)
- Hypothermia (complaints of being cold)
- Hypotension and orthostatic hypotension (complaints of dizziness and light headedness especially when getting up from lying down)
- Edema and puffy face and ankles
- Hair loss
- Amenorrhea
- Lack of sex drive

Laboratory findings seen
in patients with anorexia nervosa:

- Leukopenia (low white blood cell count)
- Anemia (low red blood cell count)
- Hypercholesterolemia (high cholesterol)
- Hypoglycemia (low glucose)
- Hypophosphatemia (low phosphate)
- Hyponatremia (low sodium)
- Bradycardia, hypotension BP, 90/60 mm Hg, orthostatic BP changes
- Elevated TSH
- Low bone density for age

Moreover, patients with malnutrition and dehydration will have abnormal vital signs. If the pulse increases more than 20 beats/min and the *blood pressure* (BP) drops more than 10 mm Hg upon standing from a seated position, further follow-up is warranted because these measures are pathologic. Temperature regulation is often poor in anorexia, and patients often have temperatures under 97°F. Pulse is frequently under 60 bpm.

Laboratory findings are often very confusing unless you are familiar with the population. The data are summarized in Table 2. Often, there is elevated cholesterol level, which necessitates putting the patients on low cholesterol diets. There are often abnormalities in the thyroid, leading to the use of thyroid replacement. Anemia and leukopenia are due to the malnutrition and contribute to fatigue and increased risk of infections in the population. Hyponatremia is often due to excessive water consumption as these patients try to appear to

weigh more or to control their appetite by keeping their stomach full.

Calcium, magnesium, potassium, and phosphate need to be closely monitored when the patients start to restore their weight in an effort to avoid the refeeding syndrome. **The refeeding syndrome occurs when patients who are medically compromised due to starvation begin to refeed too quickly. When refeeding, the carbohydrates ultimately lead to the release of insulin, which in starved patients leads to deficiencies of calcium, magnesium, potassium, and phosphate. This may ultimately lead to cardiovascular collapse¹⁶ but can be prevented by stabilizing the deficiencies first and refeeding slowly, with continued monitoring of magnesium, phosphate, and potassium.**

Bone density screening is recommended for women with 6 months or more of being diagnosed with anorexia nervosa. The treatment of low bone density in this population of patients is unclear. Hormone replacement therapy has not been helpful in young patients diagnosed with an eating disorder. Weight restoration until the return of menses, along with diet fortified with calcium and vitamin D, is the current treatment recommendation.

Medical Evaluation of a Patient with Bulimia Nervosa

Bulimic patients may not have any obvious physical findings on history or physical exam (see Table 3). The most common findings include perimolysis, erosion of the enamel of the teeth (up to 40%), sialadenosis, enlargement of the parotid glands (10%–50%), and elevated amylase (10%–66%). Angular cheilosis and gingivitis are rare.¹⁷

Russell's sign refers to the presence of scars and calluses on the dorsum of the hand due to the placement of the hand into the mouth for self-induced vomiting. This is a commonly observed sign. Complaints of gastroesophageal reflux disease, fatigue, and lethargy are also common, though nonspecific. Orthostatic vitals with pulse elevation from lying to standing, as seen in anorexia, may also be observed.

Laboratory abnormalities typically show hyperamylasemia, hypokalemia due to self-induced vomiting, lax-

Table 3
Physical Signs and Symptoms in
Patients with Bulimia Nervosa

Physical signs and symptoms:

- Perimolysis—dental enamel erosion on the inner aspects of the front teeth
- Parotid hypertrophy—swollen salivary glands
- Russell’s sign—scars/calluses on the dorsum of the hand (due to the placement of the hand in the mouth to self-induce vomit)
- Angular cheilosis
- Dehydration
- May see evidence of self-injurious behavior (scars, cuts, or scratches on arms, thighs, and abdomen)
- Irregular menses
- Heart palpitations
- Esophageal burning
- Fatigue and lethargy

Laboratory findings seen in patients
with bulimia nervosa:

- Hyperamylasemia (elevated amylase)
- Hypokalemia (low potassium)
- Hyponatremia (low sodium)

ative and diuretic misuse, and hyponatremia. Stabilization of the laboratory findings is critical and necessary as bulimic purge behaviors are controlled.

Treatment of Eating Disorders

Patients diagnosed with an eating disorder do not want to gain weight. Many patients are often very resistant to interventions, as denial is a hallmark of this disease. After medical assessment and clearance, the initial goal is medical stabilization. Eating disorder professionals include a team of individuals who are trained and have experience in working with this population. With a team approach of medical therapy, nutritional therapy, individual therapy, family therapy, and pharmacotherapy, there is hope and the possibility of a full recovery. Although 50% of individuals fully recover, sadly 10% die in the first 10 years of their illness.

Weight restoration generally requires the assistance of a dietitian or a nutrition therapist. Nutrition therapists specialty trained in working with eating disorder patients can be of great assistance. In addition to helping their patients counter food rituals, they can dispel incorrect beliefs regarding high calorie foods and work to

expand restrictive diets. Many of these patients report upon assessments that they are vegan or vegetarian. However, majority of these patients have chosen a pseudo-vegetarian lifestyle simply as a way to reduce calories by eliminating animal protein sources, such as beef, and not replacing with vegetable protein sources, such as peanut butter or tofu. This needs to be closely evaluated by the dietitian.

For anorexia nervosa, the weight gain goals depend on the condition of the patient at the time of the treatment. If a patient is greater than 85% of their ideal weight, this can be tried as in outpatient with a weight gain goal of 0.5–1 pound a week. Nutritional counseling, coupled with close monitoring of weight gain, is imperative to the treatment process.

For a patient who weighs less than 85% of their ideal body weight, gaining weight as an outpatient is more challenging. Addressing the refeeding syndrome needs coordination between nutrition and primary care for close monitoring, as well as family support. This is why these individuals are best managed in a specialty inpatient setting. The goals for weight gain in an inpatient unit are 2–4 pounds a week. This often requires caloric consumption of 3000–3500 kcal/day or a maximum of 70–100 kcal/kg of body weight. The use of a nasogastric tube can be helpful in the inpatient setting if it is not used punitively. Refeeding can take place at night, and a patient can get up to 1800 kcal while sleeping and then consume 1200–2000 kcal orally during the day.

In both an inpatient and an outpatient setting, meal coaching is a must. This not only allows careful monitoring of patients, but is also a chance to model a “normal” eating behavior. After meals, processing feelings about the meal can be useful because the meal time is often associated with increased anxiety in most patients. Every supervised meal is an opportunity for an exposure therapy session. Bathroom monitoring after meals is especially important in patients with bulimia nervosa and purging history. Often, 1–2 hours after meals, the bathrooms are monitored for purging behaviors.

Psychotherapy:

Many models of psychotherapy have been used in the treatment of eating disorders. Clearly, family involvement is necessary because this is a disease that starts very early.

As described above, when approaching a psychotherapy patient diagnosed with an eating disorder, the question is where to start. After general medical and psychiatric stabilization, many patients with eating disorders have anxiety disorders, obsessive-compulsive disorder, depression, and or substance abuse, which should be concurrently addressed along with the eating disorder. A large percent have posttraumatic stress disorder, and others have been victims of bullying. Below is a list of various therapies found helpful in treating patients with eating disorders and the co-occurring psychiatric disorders. Individual psychotherapy may include:

- **Behavior therapy**
- **Exposure with response prevention (ERP)**
- **Cognitive behavior therapy (CBT)**
- **Dialectical behavior therapy (DBT)**
- **Psychodynamic therapy**
- **Interpersonal psychotherapy (IPT)**
- **Motivational enhancement therapy/motivational interviewing (MI)**
- **Psychoeducation**
- **Supportive therapy**

Additional group psychotherapy includes:

- **CBT**
- **Psychodynamic**
- **Psychoeducational**
- **Interpersonal**

Family-based Therapy (Maudsley):

One unique therapy showing evidence based on the treatment of anorexic adolescents is family-based therapy or the Maudsley approach. This is an intensive outpatient treatment where parents play an active role to help restore their child's weight to normal levels. The next expectation is for parents to be able to give control over eating back to the adolescent. This is done in the home and monitored by a therapist. In the beginning,

the parents monitor all the meals. Family-based therapy has been shown to be more effective than other forms of therapy in adolescents with anorexia nervosa. This modality is beneficial for families able to participate, most notably those with whom the patient still lives and will not be leaving home in the near future.

Psychotropic Medications:

More than any other psychiatric illness, eating disorders are largely resistant to pharmacological intervention. **There are currently no FDA-approved medications for anorexia nervosa.** One would think that antidepressants would be the first-line treatment for anorexia nervosa because they are the first-line treatment for frequent comorbid psychiatric illnesses, such as depression, anxiety, obsessive-compulsive disorder, and bulimia nervosa. Research has shown that psychotropic medications are helpful in some patients with comorbid conditions, however their use as a whole has been largely disappointing in this patient population. Perhaps their most effective role is once weight restoration has occurred.

The simplest marker to measure in treating a patient diagnosed with anorexia nervosa is weight gain. The challenge comes in trying to convince an anorexic patient to take a medication that may make her gain weight. A concern is that if the weight gain is purely from the medication, would the patient lose weight if they stopped the medication? Studies have been done with several antidepressants, with a meta-analysis evaluation of the efficacy of antidepressants in treating anorexia nervosa, concluding that there was no significant evidence that antidepressants were better than placebo for improving weight gain or eating disorder psychopathology.¹⁸

In a study in weight-restored anorexic patients, it was shown that adding *fluoxetine* (Prozac) to CBT had no significant improvement in anorexic patients who had CBT therapy alone.¹⁹ Studies have been conducted on other medications such as *sertraline* (Zoloft) and *citalopram* (Celexa), with no significant drug effect on weight gain in an outpatient setting.

Bupropion (Wellbutrin) is a different type of medication compared to the *selective serotonin reuptake inhibitors* (SSRIs) because the former has noradrenergic and dopaminergic reuptake inhibiting effects. It shows a sig-

nificant response in patients with bulimia nervosa in binge eating and purging, but it has a high seizure rate in these patients. Moreover, the FDA put a black box warning on this medication for eating disorder patients in general, particularly patients binge eating and purging.

Medications that are undergoing research trials for the treatment of eating disorders include antidepressants such as *sertraline* (Zoloft), *citalopram* (Celexa) and *fluvoxamine* (Luvox). They have shown some promise in decreasing binge episodes. In addition, second-generation antipsychotics such as *quetiapine* (Seroquel) have had favorable improvement in BMI in adolescents. *Olanzapine* (Zyprexa) has been shown to help patients with anorexia nervosa for body image disturbance, weight gain and cognition. Other atypical antipsychotics such as *aripiprazole* (Abilify) are being reviewed for the treatment of anorexia nervosa as well as *naltrexone* (ReVia) for binge/purge behavior in bulimia nervosa.

The only FDA-approved medication for an eating disorder is fluoxetine. Fluoxetine has an approval for bulimia nervosa and shows a 45% reduction in bingeing and a 29% reduction in vomiting when prescribed at 20 mg/day. At 60 mg/day, fluoxetine shows a 67% reduction in bingeing and a 56% reduction in vomiting.²⁰

Levels of Care

The key to the management of an individual diagnosed with an eating disorder is to find the correct level of care, which ranges from inpatient hospitalization to outpatient treatment. The criteria for anorexia nervosa are clear as the symptoms of medical compromise are more apparent than in a patient diagnosed with bulimia nervosa. Specialized treatment programs throughout the United States offer varied levels of eating disorder treatment.

The American Psychiatric Association Practice Guidelines for the Treatment of Patients with Eating Disorders has a level of care guidelines for patients with

eating disorders. Basically, the more medically and psychiatrically stable, the lower the level of care. A patient diagnosed with bulimia nervosa is often first seen in an outpatient or partial hospital setting. Patients with medical compromise necessitate hospitalization and acute stabilization. If a patient is not progressing at a lower level of care, they then meet the criteria for a higher level of care. The levels of care are (in order of lower to higher level) outpatient, intensive outpatient (meeting several days a week for several hours a day), partial hospitalization (meeting 5–7 days a week for 6–12 hours a day), residential (7 days a week, 24 hour nursing care available), and inpatient hospitalization care.

The following warrants inpatient hospitalization:²¹ Wt. <85% IBW, HR near 40, orthostatic BP changes > 20 bpm HR or >10 mm Hg drop of diastolic BP, BP <80/50 mm Hg, hypokalemia, hypophosphatemia/hypomagnesemia, and poorly controlled diabetes.

Summary

The goal of the treatment team is to get the patient diagnosed with an eating disorder to first realize that they are starving themselves and then to help them achieve medical and psychiatric stability. The treatment of eating disorders includes a team of experts. There is resistance to getting well, resistance to taking medications, resistance to therapy, and resistance to giving up the ineffective behaviors. That being said, with a team approach of medical therapy, nutritional therapy, individual therapy, family therapy, and pharmacotherapy, there is hope and the possibility of a full recovery. Fifty percent of individuals fully recover; however, sadly enough, 10% die in the first 10 years of their illness. Early identification and intervention in high-risk groups—females, athletes, models, actors, and high school and college females—may improve the outcomes. Finally, after medical stabilization, treating the comorbid psychopathology, including substance abuse and trauma, is necessary.■

About the Faculty

Kevin Wandler, MD: *Dr. Wandler is an Assistant Professor of Psychiatry, Internal Medicine and Pediatrics; Director of the Eating Disorder Recovery Center in the Department of Psychiatry, College of Medicine at the University of Florida in Gainesville, FL.*

References

1. Steinhausen HC. The outcome of anorexia nervosa in the 20th century. *Am J Psychiatry*. 2002;159(8):1284-1293.
2. Hudson JI, Hiripi E, Pope HG, Jr., Kessler RC. The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biol Psychiatry*. Feb 1 2007;61(3):348-358.
3. APA. *Diagnostic and Statistical Manual of Mental Disorders - 4th edition text revision (DSM-IV-TR)*. Washington, DC: American Psychiatric Association; 2000.
4. APA. <http://www.dsm5.org/ProposedRevisions/>. 2012. Accessed Feb 1, 2012.
5. Smith DE, Marcus MD, Lewis CE, Fitzgibbon M, Schreiner P. Prevalence of binge eating disorder, obesity, and depression in a biracial cohort of young adults. *Ann Behav Med*. 1998;20(3):227-232.
6. Stunkard A, Allison K, Lundgren J. Issues for DSM-V: night eating syndrome. *Am J Psychiatry*. 2008;165(4):424.
7. Root TL, Pinheiro AP, Thornton L, et al. Substance use disorders in women with anorexia nervosa. *Int J Eat Disord*. 2010;43(1):14-21.
8. Kaye W. Neurobiology of anorexia and bulimia nervosa. *Physiol Behav*. 2008;94(1):121-135.
9. Huebner HF. *Endorphins, eating disorders, and other addictive behaviors - 1st edition*. New York: Norton; 1993.
10. Volkow ND, Wise RA. How can drug addiction help us understand obesity? *Nat Neurosci*. 2005;8(5):555-560.
11. Culbert KM, Breedlove SM, Burt SA, Klump KL. Prenatal hormone exposure and risk for eating disorders: a comparison of opposite-sex and same-sex twins. *Arch Gen Psychiatry*. Mar 2008;65(3):329-336.
12. Becker AE, Burwell RA, Gilman SE, Herzog DB, Hamburg P. Eating behaviours and attitudes following prolonged exposure to television among ethnic Fijian adolescent girls. *Br J Psychiatry*. 2002;180:509-514.
13. Johnson C, Powers PS, Dick R. Athletes and eating disorders: the National Collegiate Athletic Association study. *Int J Eat Disord*. 1999;26(2):179-188.
14. Gleaves DH, Eberenz KP, May MC. Scope and significance of posttraumatic symptomatology among women hospitalized for an eating disorder. *Int J Eat Disord*. 1998;24(2):147-156.
15. AMA. *Eating Disorders and Promotion of Healthy Body Image (Resolutions 420 and 423, A-06): AMA 2007*.
16. Mehanna HM, Moledina J, Travis J. Refeeding syndrome: what it is, and how to prevent and treat it. *BMJ*. 2008;336(7659):1495-1498.
17. Woodmansey KE. Recognition of bulimia nervosa in dental patients: implications for dental care providers. *Gen Dent*. 2000;48(1):48-52.
18. Claudino AM, Hay P, Lima MS, Bacaltchuk J, Schmidt U, Treasure J. Antidepressants for anorexia nervosa. *Cochrane Database Syst Rev*. 2006(1):CD004365.
19. Walsh BT, Kaplan AS, Atria E, et al. Fluoxetine after weight restoration in anorexia nervosa: a randomized controlled trial. *JAMA*. 2006;295(22):2605-2612.
20. Fluoxetine in the treatment of bulimia nervosa. A multicenter, placebo-controlled, double-blind trial. Fluoxetine Bulimia Nervosa Collaborative Study Group. *Arch Gen Psychiatry*. 1992;49(2):139-147.
21. APA. *Treatment of patients with eating disorders - 3rd edition*. Washington, DC: American Psychiatric Association; 2006.