

Chapter 18

EATING DISORDERS

GAIL H. MANOS, MD^{*}; JANIS CARLTON, MD, PhD[†]; GEORGIA DELA CRUZ, DMD, MPH[‡]; AND WILLIAM A. KELLEY, DO[§]

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^{*}Commander, Medical Corps, US Navy; Residency Program Director, Department of Psychiatry, Naval Medical Center, Portsmouth, Virginia 23708

[†]Commander, Medical Corps, US Navy Reserve; Department Head, Mental Health, Naval Hospital, Camp Lejeune, North Carolina, 28547

[‡]Lieutenant Colonel, Dental Corps, US Army; Dental Public Health Staff Officer, US Army Center of Health Promotion and Preventive Medicine, Directorate of Health Promotion and Wellness, 5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403

[§]Captain, Medical Corps, US Navy; Staff Psychiatrist, US Navy Aerospace Medical Institute, Pensacola, Florida 32501

INTRODUCTION

America's youth are simultaneously becoming more obese and, in desperate attempts to remain thin and live up to the model body presented by television and other media, increasing their risks and rates of eating disorders. For military recruits, body weight and fitness are not just for appearance's sake. In the 17- to 20-year-old age group, 13% to 18% of men and 17% to 43% of women are above the current weight standards for military recruitment.¹ Consequently, to what lengths will recruits go to meet or maintain proper weight standards?

While working with military populations, we heard stories about an academy midshipman who was on the "lettuce and five croutons diet" for 3 months; a senior petty officer who lost 20 pounds in 2 months on the "pizza, beer, and puke diet"; and an officer who lost an extra 10 pounds (at 12 different times) by not eating for 2 weeks before the personal fitness measurement. Many recruits use high-protein diets, starvation diets, diuretics, laxatives, purging, or other quick weight-loss techniques a few days or weeks before a scheduled weigh-in. Abnormal eating behaviors like these can become chronic, lead to development of eating disorders, and potentially compromise mental and physical health.

A diagnosis of an eating disorder is considered a disqualification for enlistment or commissioning. A waiver can be obtained, however, if the recruit can show records of successful treatment. Waivers are more difficult to obtain for officers than for enlisted personnel and are further tied to the recruitment needs of the service at the time of the request.

Recruits or officer candidates who develop or who are first diagnosed with an eating disorder during boot camp or academy training may be disenrolled. Each of the military academies reports having multidisciplinary treatment programs for officer candidates with eating disorders. These programs were developed from 1995 to 2002 in response to a recognized need in

this population. Attempts are made to treat and retain officer candidates, but failure to progress may result in disenrollment or graduation without commissioning. Instructions for handling overweight candidates or recruits are stricter in some cases than for those with eating disorders. An eating disorder is considered a psychiatric condition, but being overweight (or overfat) is not and may meet with more punitive action.

Whereas the actual rates of eating disorder diagnosis are generally low in military populations, abnormal eating and dieting behaviors are reported in 25% to 76% of individuals, with a significant increase around the time of personal fitness assessments (PFAs).² The rates of certain eating disorders in the military parallel those reported in high-risk groups such as athletes and dancers, who place an emphasis on thinness.^{3,4}

Only limited research has been performed on eating disorders or abnormal eating behaviors in recruits—a population in which a history of an eating disorder may be underreported because it is potentially disqualifying. Although recruits are unlikely to be overtly obese, some individuals may struggle at the border of weight standards and develop potentially unhealthy compensatory eating and dieting patterns as a result. Given the risk of serious medical complications, psychological morbidity, and generally dysfunctional dieting and eating behaviors, however, this area clearly warrants further study and attention to the development of an organized, effective assessment and treatment approach.

This chapter presents information on identification and recognition of eating disorders, medical complications, treatment, and prognosis. The authors also review available literature on eating disorder behaviors in military populations (including the limited research in academy cadets and midshipmen); discuss current policies with regard to recruits; and make recommendations for intervention and treatment in the enlisted recruit and officer candidate populations.

OVERVIEW OF EATING DISORDERS

Eating disorders consist of a group of increasingly common psychiatric and medical conditions that have been studied extensively in women and in select groups of men. Anorexia nervosa (AN) was described in the scientific literature by Sir William Gull (in 1873) as a "mental state [that] destroys the appetite."⁵ Bulimia nervosa (BN), marked by episodes of bingeing and purging, was first described in 1979.⁶ The current lifetime prevalence for women in the general population is 0.5% to 1% for AN and 1% to

3% for BN. Rates for men are much lower, about one tenth as high as those for women.⁷ Eating disorder not otherwise specified (EDNOS) is a residual category for those conditions that do not meet the full criteria for AN or BN. It is difficult to determine the true prevalence of EDNOS, but estimates range from 1% to 30%.⁸ It is estimated that only about one third of individuals with AN and 6% of those with BN receive mental healthcare.⁹ As many as 60% of treated cases fall into the EDNOS category.¹⁰

Anorexia Nervosa

AN is a psychiatric disorder characterized by extreme weight loss in the absence of a medical cause, refusal to regain weight, and intense determination to continue or maintain weight loss. Patients with AN may deny that they are underweight and take measures to conceal their emaciation with bulky clothes to avoid being “ordered” to gain weight by family or doctors. Typically, onset is between the ages of 13 and 20, peaking at 17 to 18 years of age.⁸ AN is defined by the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV),⁷ as the following:

1. the refusal to maintain body weight at or above a minimally normal weight and age (approximately 85% below ideal body weight);
2. intense fear of gaining weight or becoming fat, even though underweight;
3. disturbance in the way in which one’s body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of current low body weight; and
4. in postmenarcheal females, amenorrhea (ie, the absence of at least three consecutive menstrual cycles).

AN can be divided into restricting type (in which the individual does not engage regularly in bingeing or purging behaviors, but severely restricts caloric

intake) and the bingeing/purging type (in which the individual meets criteria for AN and engages regularly in bingeing/purging behaviors, such as self-induced vomiting and laxative or diuretic misuse). Exhibit 18-1 describes the warning signs and symptoms of AN.

Bulimia Nervosa

BN is defined according to the DSM-IV⁷ as the following:

1. recurrent episodes of binge eating, with the binge episode characterized by eating within a certain time period more food than most people would eat in the same time period and under the same circumstances, including a sense of lack of control over the eating during the episode;
2. recurrent inappropriate compensatory behavior to prevent weight gain;
3. binge eating and inappropriate behaviors occur at least twice weekly for 3 months;
4. self-evaluation is unduly influenced by body shape and weight; and
5. the disturbance does not occur exclusively during episodes of AN.

BN can be further divided into purging and non-purging types; during the latter—because the individual uses inappropriate compensatory behaviors, such as fasting or excessive exercise—they do not engage regularly in vomiting, laxative use, diuretics,

EXHIBIT 18-1

RECOGNITION SIGNS OF ANOREXIA NERVOSA

- Abnormal weight loss without a medical cause
- Severe restriction of food intake
- Denial of hunger and/or a problem with low weight
- Strict food preferences, such as complete avoidance of foods containing fat or strict vegetarianism
- Intense fear of gaining weight and determination to continue weight loss
- Abnormal reproductive functioning (loss of interest in sex, amenorrhea in females, low testosterone in males)
- Excessive exercise despite fatigue and weakness
- Unusual behaviors or rituals with meal preparation and eating
- Distorted perception of weight or body shape
- Inability to stop losing weight or decrease exercise
- Unrealistically high self-expectations; perfectionism with a sense of ineffectiveness
- Use of dangerous methods to lose weight
- Belief that body weight and shape are extremely important to self-esteem and self-definition
- Psychological symptoms of starvation (eg, depression, difficulty concentrating, social withdrawal)
- Physical signs of starvation (eg, sensitivity to cold, fine hair on the face or body, emaciation)

EXHIBIT 18-2**RECOGNITION SIGNS OF BULIMIA NERVOSA**

- Fluctuations in weight, usually within about 15 pounds of normal weight
- Fear of gaining weight
- Uncontrollable, secretive episodes of binge eating followed by attempts to purge by vomiting, laxatives, etc
- Excessive exercise for weight control
- Physical problems with the throat, stomach, and colon; swelling of the parotid glands
- Dental problems, tooth decay
- Psychological problems with depression, mood swings, impulsivity
- Dissatisfaction with body shape and preoccupation with weight loss
- Belief that body weight and shape are extremely important to self-esteem and self-definition
- Unrealistically high self-expectations; perfectionism with a sense of ineffectiveness

or enemas. Purging-type BN differs from purging-type AN in that patients with the latter are significantly underweight. The onset of BN is usually late adolescence to early adulthood. Signs and symptoms of BN are shown in Exhibit 18-2.

Eating Disorder Not Otherwise Specified

The EDNOS category is considered by some to be overly broad, whereas the criteria for BN or AN may be too rigid. Examples of EDNOS include meeting all the criteria of AN except for amenorrhea or weight, or meeting criteria for BN except for frequency of episodes. Binge-eating disorder (BED), bingeing without compensatory behaviors, is a category proposed in the DSM-IV

for further study. In the current diagnostic schema, individuals with BED would be diagnosed with EDNOS. The prevalence of recurrent binge eating in the general population has been estimated at 10% to 30%.¹¹

Obesity

Increasing media attention has shifted to overeating and obesity. According to the World Health Organization, a body mass index (BMI) of 18.5 to 24.9 is normal, a BMI of 25 to 29.9 is overweight, and a BMI greater than 30 is obese. The Centers for Disease Control and Prevention report that more than one half of the American population is overweight and nearly one third is obese.¹² Many people with obesity have BED.

ETIOLOGY

The etiology of eating disorders includes genetic, biological, sociocultural, psychological, familial, developmental, and comorbid factors.¹³ Although all the eating disorders are characterized by an abnormal relationship with food, and usually a disturbance in body image, the underlying factors vary with the type of eating disorder. Although it is important to understand etiological factors found commonly in the different eating disorders, it is also necessary to remember that each person is an individual with a complex history and a unique set of characteristics.

Biological Factors

Brain serotonin, norepinephrine, dopamine, endogenous opioids, and a variety of neuropeptides (eg, leptin, neuropeptide Y) have been implicated in appetite, food intake, satiety, and the development of eating disorders.¹⁴ Traditionally, the catecholamines,

particularly norepinephrine and dopamine, have been associated with appetite or onset of eating. Serotonin has been associated with satiety or cessation of an eating episode and specific carbohydrate cravings sometimes associated with binges. Disorders of appetite, satiety, or both, underlie abnormal eating behaviors. This may be relevant to the mechanism of action for medications, particularly antidepressants that modulate brain serotonin and catecholamine activity in the treatment of eating disorders.

Eating disorders co-occur more frequently in monozygotic twins (50% concordance rate) than in dizygotic twins (10% concordance) and are more likely to occur in first-degree relatives of patients with eating disorders than in the general population. Genetic factors account for 58% to 76% of the variance in AN and for 54% to 83% of the variance in BN, with a 7- to 12-fold increase in prevalence among relatives.¹⁵ Some studies have found a link between the serotonin receptor

5-HT_{2A} gene polymorphism in the promoter region and eating disorders.¹⁶ Enhanced 5-HT_{2A} receptor binding suggestive of serotonergic dysfunction has been found in AN and BN patients.¹⁷ Polymorphism of the 5-HT_{1B} receptor gene has also been linked to minimum lifetime BMI in women with BN.¹⁸ These findings suggest that some individuals are more at risk genetically than others to developing an eating disorder. The increasing incidence of these disorders in society may be the result of the sociocultural importance placed on body image and thinness that has allowed more people with a genetic predisposition for AN or BN to develop an eating disorder.

Although we do not yet understand all the complex peripheral and central mechanisms that regulate appetite, food intake, and body weight, for most people there is control of body weight around a relatively stable “set point” or “settling point,” which changes across the age span in a predictable manner. In those individuals with an eating disorder, regulation of appetite—and in many cases body weight—is thrown out of kilter. Periods of excessive food restriction that may be followed by binges ignore the biological signals of hunger and satiation. Sociobiologists may argue the theory that this is a natural holdover from a time when humans spent much of their time foraging or hunting for food and then needed to eat as much as possible before it was lost to competitors or spoilage.

Sociocultural Factors

Social and cultural factors are important in the development of both AN and BN. Although the stereotype persists that these disorders, particularly AN, are more common in higher socioeconomic groups, most of this evidence is based on small, uncontrolled case series.⁶ These eating disorders are most common in Western cultures, where tasty, high-calorie food is abundant. Evidence suggests that, as other cultures have become richer and more Westernized, body dissatisfaction has grown and eating disorders have increased.¹⁹

Obesity is considered a socioculturally driven eating disorder. Individuals and families are dining in restaurants more often, where the food served is often high in fat and in large portions. The media present conflicting signals: on one hand, there's the thin, happy family eating at fast food restaurants; however, on the other hand, there are magazines with not only the latest fad diet, but also with recipes for beautiful, high-calorie dishes. Eating is a social event or family time. From an early age, we learn to see tasty foods as a reward for good behavior or accomplishment. As individuals struggle to lose or maintain weight

by severely restricting intake or skipping meals, they may trigger the urge to binge or impulsively overeat, followed by guilt, and in the case of bulimics, purging or using other compensatory behaviors. In an effort to demonstrate control, patients with AN may simply refuse to indulge.

Psychological and Family Factors

There is a higher rate of eating disorders in families or first-degree relatives of individuals with eating disorders (approximately 10% vs 1%–3% in the general population). Although this may indicate a genetic component, there is also evidence²⁰ for learning and modeling within the family and from peers. Patients with eating disorders often report that their parents or siblings were overly concerned with body weight and external appearances. Often, their first diet was started in response to criticism from a family member or friend.

Families of patients with AN are often described as perfectionistic, with one or both parents described as authoritarian and having high expectations for their children. Psychological factors in the development of AN include a drive to perfection, unrealistic self-expectations, and perhaps a misdirected search for autonomy and self-control through control of food intake and weight. The primary comorbid psychiatric condition associated with AN is depression, although it is not clear if this is a preceding condition or a result of AN.

Families of patients with BN are more often described as chaotic, with a higher rate of mood disorders, substance abuse, and eating disorders. A history of sexual abuse during childhood has been reported in one third to nearly one half of the women with BN.^{21,22} A review of 53 controlled studies that examined the link between sexual abuse and eating disorders found that childhood sexual abuse was a risk factor for eating disorders, particularly BN, with psychiatric comorbidity.²³ Furthermore, women who had experienced both childhood sexual abuse and rape in adulthood had even higher rates of eating disorder behavior and marked impulsivity.²⁴ Conditions associated comorbidly with BN—including borderline personality disorder, substance abuse, and mood instability—have also been found²⁴ to be more prevalent in people with a history of childhood abuse. Childhood sexual abuse may lead to diminished self-esteem, development of maladaptive behaviors (including eating disorders), and placement of individuals at risk for further trauma.

A study²⁵ of 1,887 female recruits found that 57% had a history of childhood physical or sexual abuse or both, and 35% had been sexually assaulted as adults.

In addition, women who were raped as adults were 4.8-fold more likely to have experienced childhood sexual abuse. Trauma may also result in psychobiological changes, which increases vulnerability to develop-

ment of an eating disorder. These findings suggest that healthcare providers should ask about eating patterns, purging behaviors, and body image in female recruits with a history of abuse.

CLINICAL FEATURES

Eating disorders are often hidden.²⁶ The individual may consider these behaviors to be shameful or may lack insight into their pathological nature. Patients with restricting-type AN may move food around on their plates or otherwise disguise their lack of food consumption. Individuals with BN may eat but subsequently purge in secret. Those with AN may be easier to identify based on height and weight measurements and their emaciated appearance. A BMI less than 17.5 in a recruit from Western cultures, where food is abundant, should raise suspicion among healthcare workers and prompt further evaluation. It may be more difficult to spot BN or EDNOS among normal-weight individuals.

Medical Findings

Anorexia Nervosa

In addition to an emaciated appearance with sunken cheeks, prominent bone structure, low body fat, and muscle wasting, patients with AN may have dry skin, hypercarotinemia (manifested by a yellow-orange discoloration of the skin), lanugo (fine, downy hair covering the body to compensate for lower body temperature resulting from loss of body fat), acrocyanosis (digits of the hands and feet become blue and sweaty from decreased circulation), and atrophy of the breasts.²⁶⁻²⁸ Symptoms of concomitant hypothyroidism include hair loss, peripheral edema, and sensitivity to cold. Tachypnea and shortness of breath may result from metabolic alkalosis caused by vomiting. Conversely, metabolic acidosis may occur from laxative abuse.²⁹ Gastrointestinal symptoms include pain, bloating, and severe constipation (from starvation, chronic laxative abuse, or both) that may result in obstruction and megacolon. Exercise-induced disorders (eg, hernias, shin-splints, and other exercise-induced injuries) are also common.

Cardiac problems include mitral valve prolapse, QTc prolongation, sinus bradycardia, and arrhythmias from electrolyte imbalance (particularly hypokalemia).²⁶ Pneumomediastinum induced by vomiting³⁰ or cardiomyopathy (from ipecac poisoning)²⁶ may be seen on a radiograph. The second leading cause of death in AN is cardiac arrhythmia. Central nervous system changes include nonspecific electroencephalogram

changes and generalized, reversible atrophy associated with starvation and dehydration.

Osteoporosis occurs in half of the women with AN and can lead to compression fractures and kyphosis.^{31,32} Patients with AN have a 3-fold higher risk of fracture than those who do not. Bone loss may develop in as short a time as 6 months after onset of the illness and persist even after recovery, leading to a long-term risk of fractures. Fractures were found in 57% of women with AN in the ensuing 20-year period after onset.³³ Although most studies of osteoporosis in AN have focused on women, one study³⁴ found that 50% of men with eating disorders had lumbar spine and femoral neck bone densities more than two standard deviations below those of age-matched controls. Compared with women with eating disorders, this group of men had more severe bone loss. Andersen, Watson, and Schlechte³⁴ suggested that the correlation between reduced body weight in men and lowered testosterone led to more bone loss. Given the increased physical demands for recruits, those with AN may be at even higher risk for fractures. Conversely, healthcare providers should evaluate the possibility of AN in underweight recruits who present with fractures.

Bulimia Nervosa

Patients with BN and other binge/purge conditions usually have normal weight without the concomitant features of starvation. Even patients with bingeing/purging-type AN do not achieve as low a body weight as strictly AN patients. External examination may reveal damage to teeth and gums from acidic vomit. Russell's sign is the calloused posterior surface of one or more fingers used to induce vomiting. Physical findings include gastrointestinal disorders (eg, sequela of laxative abuse, esophageal tearing from excessive vomiting, and complications of electrolyte imbalance, including metabolic alkalosis and cardiac arrhythmias).^{26,29}

Dental Findings

Self-induced vomiting is one of the most destructive processes that can affect teeth (Exhibit 18-3). Stomach acids demineralize the outer layers of tooth enamel and allow them to be easily removed. If this happens

EXHIBIT 18-3**DENTAL COMPLICATIONS OF PURGING**

- Smooth erosion of the enamel or perimolysis
- Traumatized oral mucosal membranes and pharynx
- Variations in the periodontium
- Enlargement of the parotid or submandibular salivary glands
- Xerostomia (dryness of the mouth)
- Dental caries

repeatedly, the enamel will become thin and eroded, with a smooth, glassy appearance. This condition is seen most commonly on the lingual, occlusal, and incisal surfaces of the maxillary teeth; it is termed perimolysis when confined to these areas (Figure 18-1). Perimolysis is the most common oral finding in individuals who frequently purge.³⁵ Usually, erosion

is not clinically detectable until vomiting behavior has occurred for about 2 years. However, frequency of self-induced vomiting is a main determinant of the rate of progression and degree of dental erosion. Eventually, erosion may affect the occlusal and facial surfaces of the teeth, resulting in decreased vertical dimension (overclosure). If vomiting is frequent or chronic, loss of enamel can expose the underlying dentin, causing thermal sensitivity and making the teeth more susceptible to dental caries.

Patients with eating disorders may develop dental erosion caused by diet in other areas of the teeth. Several studies have reported^{36,37} that patients with restrictive AN tend to favor highly acidic, low-calorie foods, particularly raw citrus. In contrast to perimolysis, these foods tend to cause erosion on the buccal or facial surfaces of the teeth, which results in a dished-out appearance. Alveolar bone support of the teeth may be compromised.

Trauma to the oral mucous membranes or the oropharynx may occur in patients who engage in binge eating or self-induced vomiting. The rapid ingestion of food associated with binge eating may cause trauma,



Fig. 18-1. Individuals with bulimia nervosa purge frequently, and the teeth are often affected by stomach acids. The outer layers of the teeth are softened and demineralized. Consequently, the teeth become translucent and ragged because of enamel erosion, and erosion of the enamel can also occur on the lingual surface of the maxillary anterior teeth. These photographs are of two patients. The teeth of one patient show thinning, translucency, and wear on the incisal edges (a). The teeth of the other patient have erosion and wear of the enamel on the lingual surfaces, to the point that the dentin is exposed, on both the lingual surfaces of the anterior teeth (b) and the occlusal and palatal surfaces of the posterior teeth (c).

Photographs: Courtesy of Craig Mabrito, DDS.

as may the force of regurgitation. Objects used to induce vomiting may also injure the soft palate.

Salivary gland enlargement is seen in approximately 10% to 50% of patients who binge eat and then purge by vomiting. The gland most frequently involved is the parotid gland, and swelling usually occurs 2 to 6 days after binge/purge behavior. The enlargement often becomes persistent as the eating disorder progresses. Swelling may give a square, widened appearance to the mandible, but the involved gland is usually soft and painless on palpation. The duct is patent with normal salivary flow, and there is the absence of inflammation both clinically and histologically.^{38,39}

Laboratory Studies

Serum chemistry may show electrolyte disturbances. Patients who purge may develop hypokalemia, hypochloremia, and elevated serum bicarbonate.⁴⁰

Hypokalemia appears to be particularly common, occurring in up to one half of those who purge; however, the ratio of urinary sodium to urinary chloride may be a better predictor of purging behavior than serum hypokalemia.⁴¹ Metabolic acidosis with low serum bicarbonate may occur in laxative abusers.⁴⁰ Hyponatremia may result from water intoxication or a syndrome of inappropriate antidiuretic hormone.²⁶

Other laboratory abnormalities include anemia; leucopenia, neutropenia, and thrombocytopenia;⁴² hypercholesterolemia;⁴³ and euthyroid sick syndrome with normal thyroid-stimulating hormone and low triiodothyronine and thyroxine.^{26,44} Hypercarotinemias has been proposed as a laboratory marker for restricting-type AN, with a sensitivity of 62% and a specificity of 83% when a cutoff marker of 200 $\mu\text{g/mL}$ is used.⁴⁵ In one study of patients with AN, high serum creatinine and uric acid levels were associated with a chronic disease course, whereas low serum albumin and low body weight predicted lethality.⁴⁰

DIFFERENTIAL DIAGNOSIS

Medical conditions that must be considered in the differential diagnosis include inflammatory bowel disease, thyroid disease, abdominal malignancy, central nervous system disease or tumor, and new-onset diabetes mellitus. The psychiatric differential includes

depression, substance abuse, psychosis, and obsessive-compulsive disorder. Comorbidity with psychiatric conditions (including depression, psychosis, anxiety, personality disorder, and substance abuse) must also be addressed.

COURSE AND PROGNOSIS

Anorexia Nervosa

AN is associated with significant morbidity and mortality. It is usually a chronic, sometimes lifelong disease with low full recovery rates. In a review of studies⁴⁶ conducted with patients at least 4 years after onset of illness, approximately 24% had what was considered a poor outcome (eg, never reached target weight gain within 15% of normal, had not established regular menses). Another 44% were considered to have a good outcome (eg, achieved and maintained weight within 15% of normal, had regular menses). About 28% had outcomes that fell between poor and good. There was a 5% mortality rate. Even among those judged to be recovered based on body weight and menses, two thirds continued to have struggles with body image, obsessive preoccupation with weight and appearance, and disordered eating habits.

Crude 10-year mortality rates for patients receiving treatment for AN has been cited at 3.3% to 5.6%.^{47,48} Twenty-year mortality rates are 15% to 20%, with suicide and cardiac arrest the leading causes of death.^{49–52}

The annual mortality rate associated with AN is 12-fold higher than the annual death rate as a result of all causes of death for women in the general population 15 to 24 years of age.⁴⁹ AN is associated with social and functional impairments,⁴³ as well as with medical and psychiatric morbidities.⁵⁰

Bulimia Nervosa

There is limited evidence that some untreated patients with BN have modest rates of improvement or recovery. For patients treated with either psychotherapy or medication, the short-term improvement rates are 50% to 70%; however, relapse rates are high (30%–50% in 6 months–6 years follow-up).^{53,54} Longer term prognosis may be somewhat better. Patients with milder symptoms and less medical and psychiatric comorbidities who do not require hospitalization have a better course and prognosis.

The mortality rate for BN has been cited at 0.3% per year.⁵⁵ A metaanalysis of standardized mortality rates in BN 5 to 11 years after diagnosis found a 7-fold greater mortality rate than expected.⁵⁴

Eating Disorder Not Otherwise Specified

The only study to date that reported mortality information on EDNOS found that 4 of 28 subjects had died in an 11-year follow-up.⁵⁶ The risk of dying may

be greater in the first few years after diagnosis of an eating disorder. A review of 10 eating disorder populations found a 2% risk of dying for women in the first year after presentation and a 5% risk of dying for men in the first and second years.⁵⁶

ABNORMAL EATING IN MILITARY POPULATIONS

Research on eating disorders in military populations primarily consists of case reports⁵⁷⁻⁵⁹ and surveys of military populations within gender or service. These surveys generally rely on self-report, which in civilian populations has been shown to underestimate pathological weight-control behaviors.⁶⁰ A summary of the published literature assessing eating disorders in military populations is provided in Table 18-1.

Eating Disorders in Military Cadets

The prevalence of abnormal eating behaviors was evaluated by a survey in a cross-section of 310 female Reserve Officer Training Corps (ROTC) cadets.⁶¹ The survey found that 20% of the cadets met the screening criteria for being at risk for an eating disorder based on the cadets' endorsement of abnormal eating attitudes and behaviors (higher drives for thinness, body dissatisfaction, and bulimia scores). This risk was not impacted by the women's military service, because the survey was done on the first day of their ROTC training; hence, it reflected preexisting conditions. Cadets with unrecognized eating disorders may be impaired in the performance of their military duties or at risk for dangerous medical and psychological complications of their disorder. Furthermore, the pressure of military service could result in chronicity or exacerbation of abnormal eating behaviors. Notably, more than one in five women who met clinical criteria for an eating disorder in college still had an eating disorder 10 years later.⁶²

In response to a request from the US Naval Academy to investigate the prevalence of eating disorders in midshipmen in 1995, Holmes and Armstrong⁶³ surveyed the entire population of 3,100 active students and 999 reporting students to serve as a baseline (preenrollment). Holmes and Armstrong found that 9.6% of women and 2.8% of men reported symptoms of abnormal eating behaviors. Corresponding rates for the incoming class were 5.6% for women and 1.9% for men. In the same study, Holmes and Armstrong also reported that the diagnosable eating disorders were rare at the Naval Academy; however, self-limited, untreated, disordered eating behaviors were more common. Affected midshipmen were usually trying to lose weight to meet Navy standards for athletic

requirements or to make themselves more attractive. Of course, these behaviors are usually hidden for fear of embarrassment, disenrollment, or failure to be commissioned.

Armstrong⁶⁴ discussed factors that play a role in weight and eating behaviors in military cadets and midshipmen. He made comparisons with the general college population and athletes. Female midshipmen are approximately 10% of each class. In addition to the normal stresses of college, they undergo rigorous physical training and the heavy demands of indoctrination into the Navy. During the first plebe year, the social, psychological, academic, and physical demands are intense. Plebes are estimated to use about 4,000 kcal/d to meet the demands of physical training. Simultaneously, access to food is controlled. Commonly, the plebes lose weight and body fat. Stress injuries to the lower extremities are fairly common, and more than 50% of the plebes experience menstrual dysfunction.

In response to these findings, the Naval Academy instituted a three-level program that includes educating incoming midshipmen on recognizing signs of eating disorders in themselves and in classmates, intervention strategies, and a multidisciplinary treatment program for those who developed an eating disorder.

Abnormal Eating Behaviors in General and Special Military Populations

McNulty² surveyed prevalence and contributing factors of abnormal eating behaviors in 3,000 active duty women in the US Army, Navy, Air Force, and Marine Corps. The rate of AN was highest in the Marine Corps at 4.9%. Rates across the other services were Army, 1.3%; Navy, 1.1%; and Air Force, 0.8%. The rate of BN was again highest among marines at 15.9%. Rates in other services were Army, 4.3%; Navy, 5.2%; and Air Force, 9.3%. Rates of EDNOS were far higher: 62.8% of the total population met the criteria for this diagnosis. Again, the Marine Corps reported a significantly higher rate: 76.7%. The rates for the other services were Army, 57.4%; Navy, 61.2%; and Air Force, 58.6%. Notably, more than 60% of respondents had some type of eating disorder, and nearly every

Marine Corps respondent (97.5%) met criteria for an eating disorder. Of those with an eating disorder at the time of the survey, the overwhelming majority had no history of previous eating disorder and negative family histories. Fasting or purging increased during PFA periods, suggesting that the military environment may put women at risk for eating disorders and increased

use of unhealthy strategies of weight reduction to meet standards.

In a survey of 423 active duty Army women (officers and enlisted personnel) from medical and field commands, Lauder and colleagues⁶⁵ found that 142 (33.6%) women were at risk for abnormal eating behaviors. These at-risk women admitted to abnormal eating

TABLE 18-1

SUMMARY OF ABNORMAL EATING BEHAVIOR STUDIES IN MILITARY POPULATIONS

Subjects	N	Findings	Study																				
Army ROTC	310	20% subjects with increased bulimic behaviors, body dissatisfaction, drive for thinness	Lauder TD. Abnormal eating behaviors in female Reserve Officer Training Corps cadets. <i>Mil Med.</i> 2001;166:264–268.																				
Women in the Army, Navy, Air Force, and Marines	3,000	<table> <tr> <th></th><th>AN (%)</th><th>BN (%)</th><th>EDNOS (%)</th></tr> <tr> <td>Marines</td><td>4.9</td><td>15.9</td><td>76.7</td></tr> <tr> <td>Navy</td><td>1.1</td><td>5.2</td><td>61.2</td></tr> <tr> <td>Air Force</td><td>0.8</td><td>9.3</td><td>58.6</td></tr> <tr> <td>Army</td><td>1.3</td><td>4.3</td><td>57.4</td></tr> </table>		AN (%)	BN (%)	EDNOS (%)	Marines	4.9	15.9	76.7	Navy	1.1	5.2	61.2	Air Force	0.8	9.3	58.6	Army	1.3	4.3	57.4	McNulty P. Prevalence and contributing factors of eating disorder behaviors in active duty service women in the Army, Navy, Air Force, and Marines. <i>Mil Med.</i> 2001;166:53–58.
	AN (%)	BN (%)	EDNOS (%)																				
Marines	4.9	15.9	76.7																				
Navy	1.1	5.2	61.2																				
Air Force	0.8	9.3	58.6																				
Army	1.3	4.3	57.4																				
Army women	423	33.6% abnormal eating or purging behaviors and increased body dissatisfaction; 8% diagnosed with eating disorder; 3.1% situational eating disorder	Lauder T, Williams MV, Campbell CS, Davis GD, Sherman RA. Abnormal eating behaviors in military women. <i>Med Sci Sports Exerc.</i> 1999;31:1265–1271.																				
Army women with “at-risk” eating behaviors	108	None with female athlete triad (osteoporosis, amenorrhea, eating disorder)	Lauder T, Williams M, Campbell C, Davis G, Sherman R. The female athlete triad: Prevalence in military women. <i>Mil Med.</i> 1999;164:630–635.																				
Navy men	1,425	<table> <tr> <th></th><th>AN (%)</th><th>BN (%)</th><th>EDNOS (%)</th></tr> <tr> <td>Men</td><td>2.5</td><td>6.8</td><td>40.8</td></tr> <tr> <td>Women</td><td>1.1</td><td>12.5</td><td>36.0</td></tr> </table>		AN (%)	BN (%)	EDNOS (%)	Men	2.5	6.8	40.8	Women	1.1	12.5	36.0	McNulty P. Prevalence and contributing factors of eating disorder behaviors in active duty Navy men. <i>Mil Med.</i> 1997;162:753–758.								
	AN (%)	BN (%)	EDNOS (%)																				
Men	2.5	6.8	40.8																				
Women	1.1	12.5	36.0																				
Navy women (nurses)	1,323		McNulty P. Prevalence and contributing factors of eating disorder behaviors in a population of female Navy nurses. <i>Mil Med.</i> 1997;162:703–706.																				
Air Force weight-management patients + Civilian weight-management patients + Military control population	155	Air Force group: 4 times more purging behaviors than civilian group, 2–5 times more purging behaviors than military control group; great fluctuations in weight	Peterson AL, Talcott GW. Bulimic weight-loss behaviors in military versus civilian weight-management programs. <i>Mil Med.</i> 1995;160:616–620.																				
Israeli Army women diagnosed with anorexia	16	6/1,000 had AN; 16 treated with CBT and clomipramine; 12 returned to full duty; 3 returned to limited duty; 1 discharged	Mark M, Rabinowitz J, Rabinowitz S, Gaoni B, Babur I, Danon Y. Brief treatment of anorexia nervosa in military personnel. <i>Hosp Community Psychiatry.</i> 1993;44:69–71.																				

AN: anorexia nervosa
BN: bulimia nervosa
CBT: cognitive-behavior therapy

EDNOS: eating disorder not otherwise specified
ROTC: Reserve Officer Training Corp

or purging behaviors more than once a month for 3 months, or high scores of body dissatisfaction and a drive for thinness associated with a BMI less than 21. Of the 142 women deemed at risk by the survey, 108 completed a structured interview with a board-certified psychiatrist. Of this number, 33 were diagnosed with an eating disorder. The other women had specific stressors, such as PFA periods, that prompted their abnormal eating behaviors. Therefore, 8% of the total sample was diagnosed with an eating disorder, and 3.1% met criteria for an eating disorder situational to the military environment. In a follow-up study of this same population, Lauder et al⁶⁶ evaluated their subjects for the prevalence of the female athlete triad, defined by the presence of an eating disorder, amenorrhea, and osteoporosis. They found no subjects who met the full triad, although, as they pointed out, the military physical activities that the subjects participated in may have had a protective effect on bone mass density.

McNulty⁶⁷ surveyed 1,425 Navy men from medical and line communities. She reported prevalence for AN (2.5%), BN (6.8%), and EDNOS (40.8%) in this population. Purging behaviors increased dramatically (up to 15%) during PFA periods. Fasting during these times occurred in nearly one third of respondents. Stressors of military life significant for AN, BN, or EDNOS included failing to select for school, fear of being kicked out, mandatory physical fitness, nonsupport of a supervisor, height/weight requirements, and rotating shifts. McNulty further reported that some sailors spoke of anger and discouragement over the PFA and their personal struggles with weight. One soldier even reported past suicidal ideation associated with the issue.

In a similar survey of 1,323 female Navy nurses, McNulty⁶⁸ reported the prevalence of AN (1.1%), BN (12.5%), and EDNOS (36%). To lose weight rapidly, these respondents reported skipping meals (44.4%), binge eating (19.2%), exercising excessively (16.9%), using diet pills (8.5%), using laxatives (7.1%), and vomiting (3%). Poor body image and satisfaction were predictors of eating disorders, as were height (in AN) and weight (in BN). Work-related stressors that adversely impacted on eating disorder behaviors included working in an undesired area or in the intensive care unit, rotating shifts, and being a staff nurse. It is unclear if the high rates of BN and EDNOS, compared with the general population, were related to their status as military officers or their occupation as nurses. Other studies of eating behaviors in nursing students have found conflicting results. A study of female medical students and nursing students found abnormal eating behaviors in one fifth of the respondents, with a higher rate in the nursing students.⁶⁹ Another study found a

similar rate of overall abnormal eating behaviors in nursing, medical, and art students (~20%), but no difference among the three groups.⁷⁰

Peterson and Talcott⁷¹ compared the prevalence of bulimic weight-loss behaviors in patients enrolled in an Air Force weight-management program with civilians enrolled in a weight-management program and with normal military controls. The Air Force members in the weight-management program vomited, engaged in strenuous exercise, or used the sauna/steam room four times more than the civilian group. They were 2- to 5-fold more likely than the military comparison group to engage in bulimic weight-loss behaviors. They also lost more weight than the other two groups: 53% of the Air Force members in the weight-management program, but only 10% of the other two groups reported a weight loss of more than 10 pounds in 1 month. The Air Force members in the weight-management group also showed more variability, with 41% gaining more than 5 pounds in 1 week, compared with 27% in the civilian group and 14% in the military control group. Fixed-interval reinforcement operant conditioning may have affected the fluctuations in weight and heightened weight-loss behaviors seen in the Air Force weight-management group, because they were required to weigh-in every month on a specified date. Thus, they may have continued with their routine eating habits until just a few days before the weigh-in and made drastic, last-minute attempts to drop weight, similar to the behaviors seen in the 6-month PFA cycles.

Carlton et al⁷² surveyed eating disorders in a mixed military population at a large Navy medical center. A relatively high percentage of respondents were men, officers, or both, which reflected the general makeup of the population studied. The average BMI reported by the respondents, both men and women, would put them in the overweight category. More than 50% of respondents reported a BMI of 25 or greater.

Overall, the findings were consistent with those of other studies on eating and dieting behavior in the military, with high rates of body image dissatisfaction, abnormal patterns of eating and dieting, and a high correlation between these behaviors and the PFA cycle. Nearly 40% of respondents reported bingeing or bingelike behaviors, 18% or more reported some type of purging behavior, and 25% reported fasting. These behaviors were associated with worrying about the PFA and were more likely to occur in those with higher BMI, poor body image, or both. A high percentage of the study population reported dissatisfaction with body appearance and self-esteem dependent on body image. Females scored higher; however, data indicated that a significant proportion of men in the

Navy are dissatisfied with their bodies and engage in abnormal eating behaviors. These unhealthy attitudes and behaviors were common even though the sample was from a medical command; however, other studies in Navy personnel have found lower rates of abnormal eating behaviors in healthcare workers (30%) and medical doctors (6%), compared with that in shipboard service members (65%).⁶⁷

Although the data indicate that one third or more of the population sample exhibited abnormal eating and weight-loss behaviors, only 2% had actually been clinically diagnosed.⁷² This finding is consistent with other indications that eating disorders are underre-

ported in the military, even at a medical command. It is not surprising that service members are reluctant to come forward. In addition to the stigma, the diagnosis may be grounds for disqualification from many assignments, mandatory enrollment in weight-loss programs, denial of promotion, and involuntary separation from service. McNulty² reported that in fiscal year 1995, approximately 5,000 people were discharged from military service for failure to meet weight standards. Military providers may be reluctant to diagnose eating disorders because they are traditionally considered difficult to treat and may end a service member's career.

TREATMENT ISSUES IN THE RECRUIT

It is clear that abnormal eating and weight-loss behaviors are more prevalent in military populations than in the general population. It is likely that this disparity is related to sociocultural factors of military service, with its pressure to meet height/weight standards and fear of adverse action for failure to comply. Some recruits entering service already show evidence of eating disorders.⁶¹ Additionally, the pressure for fitness in the recruit setting, particularly in the academies, is high⁷³ and may exacerbate subclinical cases⁷⁴ or contribute to the development of abnormal eating behaviors. Furthermore, the mean weight of young adults, the population from which recruits are typically drawn, has increased over the past several decades. Data from the Third National Health and Nutrition Examination Survey,¹ conducted from 1988 through 1994 by the Centers for Disease Control and Prevention, found that at least 13% of men ages 17 through 20, and 17% of women the same age, would fail the military's screening test for weight. The percentages were higher in certain minority groups.

Recruits who do not meet standards upon entry to the military may feel extra pressure and may engage in compensatory behaviors that could become chronic throughout their military careers. Interestingly, the maximum allowable weight for women is set significantly lower than that for men of the same height—despite recommendations from the World Health Organization that BMI be gender neutral.¹ The Marine Corps have an even more restrictive weight standard; consequently, female marines have a higher percentage of weight failure measurements despite being a leaner group.²

A survey⁷⁵ of 32,144 Air Force personnel who completed basic training from August 1995 to August 1996 found that maximum allowable weight standards were more stringent for women than for men. The BMI may correlate poorly with body composition and does not

necessarily reflect physical fitness.^{76,77} An analysis⁷⁸ of anthropometric measurements and fitness test performance data on 1,038 male and 347 female soldiers at three Army posts showed that body-fat estimations that included an abdominal circumference for women reduced the number of female soldiers who exceeded standards and resulted in a comparable prevalence of 12% male and female soldiers classified as "overfat." Friedl and Leu⁷⁸ concluded that a body-fat allowance for young soldiers scoring well on the physical fitness test could have benefited up to 25% of those individuals who exceeded fat standards. This would place more emphasis on fitness and less on body shape.

Recruits in the military academies may be subject to a rigorous physical training curriculum that allows for few differences between male and female cadets.^{79–81} In a survey of female cadets at the US Military Academy at West Point, New York, Welch⁸² found that 74% had developed secondary amenorrhea. Interestingly, amenorrhea may precede the development of AN, although this does not imply that all of these cadets developed AN. The academies function as microsocieties, and the pressure to conform to an idealized body image may lead to abnormal eating patterns in these athletic cadets much as higher rates of eating disorders have been found in athletic women within the civilian community.⁸³ Disordered eating patterns may be further enhanced by poor nutritional habits. In a survey of 118 male and 86 female West Point cadets, the women reported consuming 24% to 32% of their energy intake by snacking, which often substituted for meals.⁸⁴ Women who snacked instead of eating evening meals in the dining hall consumed less than 70% of the recommended dietary allowances of vitamin B₆, folate, vitamin A, magnesium, and zinc. Poor nutrition and societal pressure to meet military weight standards and the intense physical fitness demands of the academies can lead to abnormal eating

patterns and compensatory behaviors, which may then become chronic. Attempts to improve nutrition in military test sites by simply labeling meal selections (eg, percentage of minimum daily requirements, calorie content) have failed,⁸⁵ although nutritional education has made a difference in reducing eating disorders in other populations.⁸⁶ What may be needed instead is a more comprehensive plan of emphasizing fitness (not thinness) and true nutritional education (not just food labeling).

Suitability for service of patients with eating disorders needs to be addressed. It is our opinion that most individuals who come to psychiatric attention as recruits with

eating disorders, particularly patients with AN with a low BMI (< 17.5) and those with frequent purging behaviors, should be administratively separated from the military at entry level. As noted previously, eating disorders are chronic conditions with significant morbidity and mortality risks. The emphasis that the military culture places on thinness is likely to further aggravate eating disorders. Nonetheless, treatment for these conditions may be initiated (particularly in addressing medical compromise) while processing for separation. Recruits with subsyndromal eating disorders or EDNOS may be treatable if they display good insight and are highly motivated for continued military service.

MEDICAL AND PSYCHIATRIC TREATMENT OF EATING DISORDERS

Anorexia Nervosa

Medical Assessment and Treatment

Patients with AN have poor insight into their conditions. They may perceive their low body weight as an accomplishment and have limited motivation to change their behaviors.⁸⁷ The American Psychiatric Association guidelines recommend that patients weighing less than 75% of ideal body weight be treated on an inpatient basis.⁸⁸ Other indications for hospitalization are shown in Exhibit 18-4. The hospital utilization rate for individuals with AN is higher than that for any other psychiatric disorder except schizophrenia and organic mental disorders.⁸⁹ The cost of treatment is substantial and is estimated to be even higher than that for schizophrenia.⁹⁰ Some patients may refuse treatment out of dread of weight gain and limited insight. In these cases, involuntary hospitalization may be necessary. Patients involuntarily committed for AN may show short-term benefit as manifested by weight gain, but have a higher mortality rate than those who undergo treatment voluntarily.⁹¹ With changes in managed care, treatment for AN is increasingly moving toward partial-day programs or outpatient treatment. Hospitalization is often reserved for patients with serious life-threatening medical complications or those who can afford to pay privately.

Once diagnosed with AN, an individual's general medical condition should be assessed. Medical comorbidities, if they exist, must be addressed, although many (such as electrolyte imbalance) may resolve or improve once malnutrition and purging behaviors are rectified. Patients who require hospitalization need careful management because rapid refeeding can lead to gastric bloating, edema, and, rarely, congestive heart failure.⁹² Vitamin supplementation, with calcium at

doses of 1,000 to 1,500 mg in addition to a multivitamin, is recommended.⁹³

Because zinc deficiency has been linked to AN through inhibition of release of neuropeptide Y,⁹⁴ supplementation with this mineral may be beneficial in promoting recovery from AN and improving these patients' levels of anxiety and depression.⁹⁵ In a controlled trial of 35 female inpatients with AN, supplementation with 100 mg/d zinc promoted a rate of increase of BMI twice that of placebo.⁹⁶

EXHIBIT 18-4

INDICATIONS FOR HOSPITALIZATION IN ANOREXIA NERVOSA*

- Limited motivation to change abnormal eating behaviors
- Intractable (or rapid) weight loss despite treatment
- Refusal to eat
- Prolonged QT interval
- Bradycardia $\leq$ 40 beats per minute
- Arrhythmia
- Hypothermia
- Symptomatic hypotension
- Less than 75% ideal body weight
- Persistent suicidal ideation
- Need for withdrawal/detoxification from laxatives, diet pills, or diuretics

*This list is not all-inclusive, and a decision to admit should always be based on a clinical assessment of the patient's psychiatric and general medical conditions.

Psychotherapy

There are fewer controlled trials in the psychotherapeutic management of AN, compared with BN.⁹⁷ No studies through 2004 clearly identify one approach as superior to others; however, family therapy for adolescent patients may be one of the more effective treatments.^{98,99} Family therapy is impractical for recruits. Although better studied in BN, cognitive behavior therapy (CBT)—in which cognitive distortions of body image and feelings of self-worth are addressed—has been applied with some success to patients with AN.¹⁰⁰

The treatment plan should involve a multidisciplinary team, including experts in mental health, nutrition, and internal medicine or primary care. The therapeutic approach should be to treat the whole patient. It is often better to focus away from food and toward resolving underlying issues of self-esteem and perfectionism.

Medications

Controlled trials of medications in the treatment of AN are summarized in Exhibit 18-5. Restoring weight and subsequent metabolic stabilization are treatment priorities for patients with AN. Cyproheptadine (32 mg/d) was found to improve weight gain in patients with restricting-type AN but not those with bingeing/purging type AN.⁹⁹ Tricyclic antidepressants (TCAs) have not only not been shown effective, but also given their potential lethality, may even be risky in this patient population.^{101,102} Selective serotonin reuptake inhibitors (SSRIs) have not been found useful in low-weight patients,¹⁰³ but they can be effective at higher doses (60 mg) in preventing relapse in those who have regained weight.¹⁰⁴ This may be because of the general state of malnutrition of the low-weight patients with

AN, resulting in deficiency of tryptophan, the amino acid required for serotonin synthesis.¹⁰⁵ Antipsychotic drugs may have an augmenting role, particularly in patients with AN who have poor insight into their conditions.¹⁰⁶⁻¹⁰⁹ However, not all studies have demonstrated the efficacy of antipsychotics,^{110,111} and their use may have serious adverse effects in this population.⁹³

Mark et al⁷⁴ reported on a treatment protocol implemented by the Israel Defense Forces to treat AN in their armed forces. They surveyed, weighed, and measured all female soldiers over a 6-month period. In this sample, 6 of every 1,000 (0.6%) female soldiers were anorexic. Requirements for enrollment in the treatment program were an identifiable trigger for the disorder, motivation for treatment and military service, a social support system, and self-acknowledgment of the eating disorder. As part of the treatment program, the soldiers were educated on the serious medical nature of AN and were instructed that they could be discharged if they failed or refused treatment. Service members were hospitalized for 4 to 6 weeks. During this time, they underwent a thorough medical workup, were placed on a high-calorie diet, and set goals for weekly weight gain. Therapy was based on a CBT model. All patients were initially given clomipramine to decrease obsessional ruminations, and this drug was tapered off over several months. Of the 16 patients followed in the study for 1 year after discharge from the program, 12 were returned to full duty, 3 were returned to limited duty, and 1 was discharged.

EXHIBIT 18-5

MEDICATIONS EFFECTIVE IN PLACEBO-CONTROLLED TRIALS FOR ANOREXIA NERVOSA

- Zinc
- Cyproheptadine
- Cisapride (subjective improvement in gastric emptying)
- Fluoxetine (after weight restoration)
- Naltrexone

EXHIBIT 18-6

INDICATIONS FOR HOSPITALIZATION IN BULIMIA NERVOSA*

- Changes in vital signs (pulse, blood pressure)
- Syncope
- Hypothermia
- Suicide risk
- Alcohol or drug abuse
- Uncontrolled vomiting
- Hematemesis (vomiting of blood)
- Arrhythmia
- Electrolyte imbalance
- Need for withdrawal from laxatives, diet pills, and diuretics

*This list is not all-inclusive, and a decision to admit should always be based on a clinical assessment of the patient's psychiatric and general medical conditions.

Bulimia Nervosa

Literature to guide treatment of BN is fairly extensive; hospitalization is seldom necessary unless there are medical complications (Exhibit 18-6). Compared with AN, there is more evidence that BN can be treated more effectively with medication, although psychotherapy remains the cornerstone of treatment. The most established treatment for BN is CBT; in one study,¹¹² however, fewer than 10% of patients with bulimia who received psychotherapy were treated with this type of therapy. Guided self-help manuals that use CBT principles have also been found effective.^{103,113} Even with CBT, it is estimated that only 50% of patients with BN recover.¹¹⁴

Medications

Patients with BN who fail to respond to psychotherapeutic techniques may benefit from pharmacotherapy.¹¹⁰ Medications that have been shown effective in treatment of BN are listed in Exhibit 18-7. Controlled trial data have shown efficacy for TCAs^{115–119} and monoamine oxidase inhibitors,^{120,121} with the latter demonstrating some superiority.¹²² Both TCAs and monoamine oxidase inhibitors may have potential lethal adverse effects in this patient population (potentially made worse by underlying electrolyte imbalance) and are not currently recommended as first-line treatment. Fenfluramine, a serotonergic agonist withdrawn from the market, was shown to be superior to both placebo and desipramine (a TCA).¹¹⁶ The SSRI

antidepressants are, similarly, serotonergic agonists and theoretically may work through a similar mechanism. Fluoxetine at high doses (60 mg/d) was superior to placebo in two 8-week trials^{123,124} and one 16-week trial.¹²⁵ Fluoxetine's efficacy in BN, as with the TCAs,^{117,126} is not a secondary effect of its antidepressant properties.^{127,128} As many as one third of initial responders may relapse by the end of 1 year despite continued treatment,¹²⁵ suggesting that, whereas continued treatment may afford some protective effect, additional treatments may be needed for sustained effectiveness.

There are limited data on the efficacy of the other SSRIs for acute treatment of BN, although fluvoxamine has been found effective in preventing relapse in patients with BN who had responded to inpatient behavioral psychotherapy.¹²⁹ Among the newer, non-SSRI antidepressants, only bupropion has been studied in a controlled trial. Although highly effective in reducing bingeing, there was a 5.8% incidence of seizure.¹³⁰ As a result, this agent is contraindicated in BN. As a class, antidepressants reduce binge eating by 61.4% (remission rate: 22%) and reduce purging by 58.9% (remission rate: 34%).¹³¹ Unfortunately, up to 45% of patients who respond to pharmacotherapy may relapse in the first 6 months.¹³²

Several studies have compared psychotherapy to pharmacotherapy and failed to find any advantage of combining medication with therapy versus therapy alone.^{133–135} Results from two metaanalyses found that combination approaches had higher remission rates, although adding medication to therapy increased the drop-out rate.^{136,137} In summary, the preference is to treat BN with psychotherapy, primarily CBT, or a combination of psychotherapy and medication.

EXHIBIT 18-7

MEDICATIONS EFFECTIVE IN PLACEBO-CONTROLLED TRIALS FOR BULIMIA NERVOSA

- Tricyclic antidepressants (desipramine, imipramine)
- Monoamine oxidase inhibitors (phenelzine, isocarboxazid)
- Fenfluramine
- Fluoxetine
- Bupropion*
- Trazodone
- Naltrexone (high dose)
- Ondansetron
- Topiramate

*Contraindicated in treatment of bulimia because of increased risk of seizure.

Eating Disorder Not Otherwise Specified

Because EDNOS is a nonspecific diagnostic category, treatment approaches depend on symptoms. The one category of EDNOS for which there appears to be a growing body of literature is BED. In general, the treatment resembles that for BN, with outcome measures defined by reduction in bingeing. The best-studied psychotropic agents used to treat BED and obesity are antidepressants and anticonvulsants. SSRIs have been found effective in double-blind trials for treatment of BED.^{138,139} The anticonvulsant topiramate has also been found effective in double-blind trials for BED associated with obesity,¹⁴⁰ and a similar agent, zonisamide, was also associated with significant weight loss in a double-blind trial of obese adults.¹⁴¹ Alternatively, agents specifically marketed for weight loss (including phentermine, sibutramine, and orlistat¹⁴²) have been used to treat weight gain in overweight or obese

patients with BED. Although several agents have been found effective for short-term weight loss, there are relatively few data on long-term efficacy with these agents. A review of the Cochrane database system found that, compared with placebo, the number of patients achieving 10% or more weight loss was 12% higher with orlistat and 15% higher with sibutramine in double-blind trials that lasted more than 1 year.¹⁴³ However, there was significant attrition in these studies, with an average of 33% of those on orlistat and 43% of those on sibutramine dropping out.

Dental Treatment of Eating Disorders

Patients with eating disorders should be counseled on several important principals of oral care.¹⁴⁴ Toothbrushing should never be performed immediately after the mouth is exposed to stomach acid. Demineralized enamel is vulnerable to removal by abrasive forces such as toothbrushing. Following acid exposure, patients should rinse with a buffering or alkaline solution to neutralize the acid and allow the saliva to remineralize the tooth, thereby reducing damage from demineralization. Options include 0.5% sodium fluoride-sodium bicarbonate in water, liquid antacids, slightly alkaline mineral water, or plain water. For daily

acid exposure, a neutral sodium fluoride mouthrinse or prescription fluoride gel may be necessary to prevent dental erosion. Acidic foods and drinks should be avoided. Acidic foods include citrus fruits, pineapple, and lemon candies. Acidic drinks include apple or citrus fruit juice, carbonated beverages (all kinds that contain citric or phosphoric acid), and alcohol (particularly white wine).¹⁴⁴

Patients who experience xerostomia (dryness of the mouth, which may result from antidepressant treatment) should be advised to use artificial saliva preparations to lubricate the oral tissues, avoid carcinogenic foods or drinks, and use sugarless or xylitol-containing candies or mints. Sucking on these items can stimulate increased salivary flow, which may buffer oral acids. Increased saliva flow also increases the concentration of calcium, phosphate, and hydroxyl ions, which may aid remineralization. Xylitol may also be beneficial because of its bacteriostatic properties.¹⁴⁴

Patients with eating disorders should be referred to a dentist for an evaluation of dental erosion, salivary flow rate, and oral mucosa condition. Comprehensive dental procedures should not be performed until vomiting behavior is significantly improved or the patient has recovered completely. Until that occurs, proper home care is recommended.¹⁴⁴

SUMMARY

Over the last several decades, eating disorders have increased in prevalence in Western society, with the most prevalent eating disorder being EDNOS. Athletes in sports that place an emphasis on weight have an increased risk. Military service members are also at higher risk. Although the prevalence of eating disorders for men in the general population is one tenth that for women, men in the military services may have an increased risk.

Recruits may enter the service already symptomatic, and unique aspects of military service and culture may lead to development of an eating disorder. Because eating disorders carry a high rate of morbidity and mortality and are frequently chronic, military physicians must be aware of their diagnosis and treatment. In the military, the emphasis on body shape and meeting cyclical height/weight requirements may lead to poor nutritional habits and abnormal eating behaviors.

Treatment for AN, the least common eating disorder, may require hospitalization if the service member weighs less than 75% of her or his ideal body weight. The first priority is restoration of nutritional status and body weight, as well as treatment for comorbid medical conditions that may have developed. Of the established treatments, CBT is best. Pharmacotherapy with the SSRI fluoxetine may be helpful after weight

is restored.

BN is also ideally treated with CBT. Whereas TCAs and monoamine oxidase inhibitors have been found effective, fluoxetine is the first-line pharmacotherapeutic choice. However, medication alone is an inferior treatment to either CBT or CBT combined with medication. Those who fail to benefit from psychotherapy may benefit from medication management.

There is no clear treatment for EDNOS, the most prevalent of the eating disorders, because it is a broad category. Those who struggle with being overweight may have BED. In addition to CBT, certain classes of psychotropic drugs (SSRIs, orlistat, sibutramine, topiramate, and zonisamide) may be helpful; but as with AN and BN, the primary treatment is likely to be CBT.

Recruits who require medical attention for an eating disorder, particularly with a BMI lower than 17.5 or with purging behaviors, should be strongly considered for entry-level separation. Some of the increased risks of acquiring an eating disorder in the military may be attributed to situational factors—in particular, the cyclical height/weight measures. To reduce the development of abnormal eating behaviors among general recruits, nutritional education and emphasis on fitness, not fatness, may be beneficial.

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