Anorexia nervosa in adults: Clinical features, course of illness, assessment, and diagnosis

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INTRODUCTION

Anorexia nervosa is characterized by an abnormally low body weight, intense fear of gaining weight, and distorted perception of body weight and shape [1]. The disorder has been recognized for hundreds of years across different cultures [2]. However, the term “anorexia” is a misnomer because patients often retain their appetite [3].

This topic reviews the clinical features, comorbid psychopathology, course of illness, assessment, diagnosis, and differential diagnosis of anorexia nervosa. The epidemiology, potential medical complications, evaluation for detecting medical complications, and treatment of anorexia nervosa are discussed separately, as is the refeeding syndrome as a complication of treatment.

- (See "Eating disorders: Overview of epidemiology, clinical features, and diagnosis".)
- (See "Anorexia nervosa in adults and adolescents: Medical complications and their management".)
- (See "Anorexia nervosa in adults: Evaluation for medical complications and criteria for hospitalization to manage these complications".)
- (See "Eating disorders: Overview of prevention and treatment", section on 'Anorexia nervosa'.)
- (See "Anorexia nervosa in adults and adolescents: The refeeding syndrome".)

CLINICAL FEATURES

Core features — The essential clinical features of anorexia nervosa are [1,3]:

- Persistent restriction of energy intake that leads to an abnormally low body weight
- Intense fear of gaining weight or becoming fat, or persistent behavior that prevents weight gain
- Distorted perception and/or importance of body weight and shape

Associated features — Anorexia nervosa is associated with other psychological and behavioral signs and symptoms, including [1-4]:

- Relentless pursuit of thinness
- Obsessional preoccupation with food (eg, collecting recipes or hoarding food)
- Fear of certain foods
- Restricted repertoire of foods
- Preference for low calorie foods (low energy density)
- Overestimating number of calories consumed
- Overusing condiments and/or artificially sweetened products
- Food-related rituals (eg, cutting food into small pieces or refusing to mix different types or colors of food on the plate)
- Concerns about eating in public
- Social withdrawal
- Exercise-related rituals (eg, walking or running a set distance each day; swimming a specified number of laps in a pool)
- Restlessness or hyperactivity
- Limited insight into or denial of core clinical features
- Resistance to treatment and weight gain
- Inhibited expression and dysregulation of emotions
- Feelings of ineffectiveness
- Poor sleep
- Low libido
- Dysphoria (eg, depressed or anxious mood)
- Inflexible thinking
- Perfectionism
- Need to control one’s environment
- Behavioral rigidity (eg, purchasing food only in certain stores or from certain salespeople, inability to accommodate to changes in schedule or environment)

Some of these features can persist in weight-restored patients with anorexia nervosa, reflecting either problems that predated onset of the eating disorder or long-term "scars" caused by starvation.

Multiple studies indicate that neuropsychological functioning in patients with anorexia nervosa is impaired [5,6]. As an example, one study compared acutely ill patients (n = 40) with healthy controls (n = 40); the groups were matched for sex and were similar in age and education [7]. Anorexia nervosa was associated with abnormalities in verbal learning and memory, visual learning and memory, visuospatial ability, working memory, executive functioning (planning, decision making, response inhibition), and motor function. Factors that mediated (explained) the relationship between anorexia nervosa and impaired cognition included nadir body mass index and depressive symptoms.

Another neurocognitive domain that has been studied in anorexia nervosa is decision-making. A meta-analysis of 16 studies assessed decision making with regard to reward in symptomatic patients (n = 507) and healthy controls (n = 633), using the Iowa Gambling Test, which measures the ability to make advantageous and disadvantageous choices [8]. Decision making was moderately to substantially worse in symptomatic patients, and the effect was independent of the lower body mass index and increased depressive symptoms observed in patients. By contrast, decision making in patients who had recovered from anorexia nervosa and in healthy controls was comparable.

Other aspects of reward learning and reward responsiveness have been assessed in patients with anorexia nervosa using neuropsychological tasks paired with functional brain imaging. One study used a monetary reward task during functional magnetic resonance imaging to assess reward learning in 21 patients both before and after treatment, and in 21 healthy controls who participated at two time points as well [9]. Compared with controls, patients with anorexia nervosa showed greater brain response to prediction error, both to the unexpected omission of reward, and to the unexpected receipt of reward; the last remained elevated even after treatment. These findings suggest that anorexia nervosa is associated with abnormal reward learning and reward responsiveness, which may contribute to the persistence of maladaptive food avoidance observed clinically.

Anorexia nervosa is often accompanied by comorbid psychopathology and general medical disorders, as well as suicidality. (See 'Comorbidity' below and 'Suicide' below.)

Males — The clinical features of anorexia nervosa for males and females are generally similar. One study of 99 patients hospitalized for anorexia nervosa found that the intensity of the core

clinical symptoms and the frequency of comorbid psychopathology were comparable for males and females, except that concern for weight was less severe in males than females [10].

Nonsuicidal self-injury — Impulsive or compulsive nonsuicidal self-injury (eg, skin cutting, picking, or burning with a lit cigarette) is often seen in anorexia nervosa. A meta-analysis of 16 studies (n >1800 patients) found a lifetime history of nonsuicidal self-injury in 22 percent [11]. However, heterogeneity across studies was moderate to large.

COMORBIDITY

Mental disorders — Psychiatric comorbidity is common among patients with anorexia nervosa [12]. However, many comorbid disorders are secondary to the eating disorder and resolve with weight restoration [13]. This is especially true for comorbid major depression, which is frequent but rarely accompanied by melancholia or psychosis [3]. Thus, treatment should initially focus upon anorexia nervosa and suicidality. Following remission, the patient should be reassessed for any comorbidities requiring treatment. Severe substance use disorder is the one exception, which should be prioritized to manage withdrawal phenomena [14].

Although the specific rate of comorbid disorders differs between epidemiologic surveys and studies in clinical settings, there is general agreement that patients with anorexia nervosa often suffer from [15-20]:

- Anxiety disorders
- Obsessive-compulsive disorder
- Body dysmorphic disorder
- Posttraumatic stress disorder
- Depressive disorders
- Substance use disorders
- Disruptive, impulse control, and conduct disorders

Screening for these comorbid disorders and their diagnostic criteria are discussed in separate topics.

A current comorbid disorder is diagnosed if it clearly preceded onset of the episode of anorexia nervosa or if the symptoms are not explained by starvation and not related to the eating disorder [2]. As an example, compulsive counting of caloric intake and expenditure is better conceptualized as a feature of anorexia nervosa, whereas compulsive checking of locks is better thought of as a feature of comorbid obsessive-compulsive disorder.

Most patients with anorexia nervosa have a lifetime history of at least one comorbid mental disorder (table 1). A nationally representative survey in the United States estimated that 56 percent of patients with anorexia nervosa had a lifetime history of at least one comorbid mental disorder and that 34 percent had three or more comorbid disorders [15]. The survey found that unipolar major depression was the most prevalent comorbid disorder; the lifetime prevalence in patients with anorexia nervosa was 39 percent. In addition, the lifetime rates for these comorbidities in patients with anorexia nervosa exceed the rates in the general population. As an example, the estimated lifetime prevalence of unipolar major depression in the general population is 23 percent [21]. Shared etiologic factors may account for some of the observed comorbidity involving anxiety and depressive disorders [14,22].

Lifetime onset of anorexia nervosa often begins prior to the lifetime onset of comorbid mood or substance use disorders [15,23]. Conversely, comorbid anxiety or impulse control disorders usually predate anorexia nervosa [15,24].

The association between comorbid mental disorders and the prognosis for anorexia nervosa depends upon the specific comorbid disorder [25,26]. Comorbid substance use disorder can adversely affect treatment outcome for eating disorders [12]. In addition, increased severity of comorbid alcohol use disorder is associated with increased mortality in anorexia nervosa [27]. By contrast, the relationship between comorbid depressive or anxiety disorders and prognosis for anorexia nervosa is not clear [12,28].

Personality disorders and traits — A variety of comorbid personality disorders and traits can occur in anorexia nervosa [12], and more than one disorder or trait can occur in the same patient. Diagnosis of a comorbid personality disorder rests upon the patient's history prior to onset of anorexia nervosa, given that anorexia nervosa can affect the patient's cognitions, emotions, and interpersonal functioning.

In a review of six studies that used diagnostic interviews, the most common personality disorders in patients with anorexia nervosa were [29]:

- Obsessive-compulsive (15 percent of patients with anorexia nervosa)
- Avoidant (14 percent)
- Dependent (7 percent)
- Narcissistic (6 percent)
- Paranoid (4 percent)
- Borderline (3 percent)

A subsequent study that used diagnostic interviews in 49 patients with anorexia nervosa found that 51 percent met criteria for at least one personality disorder, including avoidant (31 percent

of patients), paranoid (20 percent), obsessive-compulsive (18 percent), dependent (18 percent), borderline (10 percent), and narcissistic (6 percent) [30].

The classification, diagnosis, and treatment of personality disorders are discussed separately. (See "Overview of personality disorders".)

Patients with anorexia nervosa may also have comorbid traits that are not severe enough to meet criteria for a personality disorder, but nevertheless cause distress and impair functioning [12,29]:

- Perfectionism – Pursuing unrealistically high standards despite the occurrence of adverse consequences
- Compulsivity – Insisting upon order, symmetry, exactness, and control
- Narcissism – Craving admiration and external validation from others; excessive concern with physical appearance

The prognostic significance of comorbid personality disorders and traits is not clear [29,31].

General medical disorders — Patients with anorexia nervosa are at increased risk for general medical complications and disorders. (See "Anorexia nervosa in adults: Evaluation for medical complications and criteria for hospitalization to manage these complications" and "Anorexia nervosa in adults and adolescents: Medical complications and their management".)

COURSE OF ILLNESS

Recovery — Among patients with anorexia nervosa, approximately 50 percent have good outcomes (including weight gain), 25 percent have intermediate outcomes, and 25 percent have a poor outcome [32]. Better outcomes are associated with insight and successful interpersonal relationships; poor outcomes are associated with later age at onset of the eating disorder, longer duration of the illness, lower minimal weight, lower percent body fat after weight restoration, and comorbidity (eg, mood disorders, personality disorders, and alcohol and substance use disorders) [27,33-37].

Patients with anorexia nervosa who recover may nevertheless suffer persisting psychiatric problems. In a retrospective study of 70 female patients, those who no longer met criteria for anorexia nervosa still manifested relatively low body weight and cognitive features (perfectionism and cognitive restraint) of the disorder, as well as high rates of lifetime comorbid major depression, alcohol dependence, and anxiety disorders [38].

Many studies that examined course of illness in anorexia nervosa were performed at referral centers that specialized in treatment resistant patients who were often hospitalized, and outcomes may be better in community-based samples. In an 18-year, prospective observational study of a community based sample of individuals with anorexia nervosa (n = 51), most of whom received treatment, there were no deaths (see 'Mortality' below) and good outcomes occurred in 84 percent [39]. In addition, a retrospective population based study identified individuals with anorexia nervosa (n = 40) who were largely untreated and followed for up to 10 years; generally good outcomes were observed, including no deaths and weight restoration (body mass index ≥18.5 kg/m^2) in nearly 90 percent [40].

Relapse — Patients who recover from anorexia nervosa often relapse. The rate of relapse varies depending upon multiple factors such as how recovery and relapse are defined, the use of maintenance treatment, and the frequency and length of follow-up. Three prospective observational studies lasting one to nine years [41-43], and one randomized trial lasting one year [44], suggest that relapse occurs in approximately 35 to 55 percent of patients.

Following recovery from anorexia nervosa, no consistent predictors of relapse have been identified. However, one factor associated with relapse/weight loss in multiple studies is higher-level physical activity or exercise at the time of recovery [43,45]. In one of the studies (n = 61 inpatients), increased activity levels following weight restoration predicted greater weight loss one year after discharge, and the specific type of activity predictive of relapse was time spent “on the feet” (standing or walking), as opposed to frank exercise behavior. In addition, symptoms of obsessive-compulsive disorder may predict relapse [41,43]. Other factors associated with relapse across different studies include lower body mass index at the time of recovery [46], lower motivation to recover at the time of recovery [41], concern about body weight and shape at the time of recovery [43], and higher rate of weight loss in the first month following recovery [46].

Mortality

All cause — Observational studies indicate that anorexia nervosa is associated with increased rates of all-cause mortality:

- All-cause mortality is 4 to 14 times greater in patients with anorexia nervosa, compared with the general population [36,47-50]. Medical complications (eg, cardiovascular) of anorexia nervosa account for approximately 60 percent of the deaths in patients with anorexia nervosa [50]. (See "Anorexia nervosa in adults and adolescents: Medical complications and their management".)

- One registry study found that all-cause mortality was approximately two to three times greater in anorexia nervosa than in bipolar disorder, depression, and schizophrenia [48]. Other studies indicate that mortality is three to four times greater in anorexia nervosa than bulimia nervosa and binge eating disorder [47,50].

Most mortality studies for anorexia nervosa were performed at referral centers that specialized in treatment resistant patients who were often hospitalized, and mortality rates may be lower outside of these centers [40]. As an example, a retrospective community study examined mortality in 208 patients with relatively mild anorexia nervosa (most had never seen a psychiatrist and few had been hospitalized for the disorder) over a median follow-up of 22 years; all-cause mortality for patients and for the general population were comparable [51].

Suicide — Anorexia nervosa is often accompanied by suicidality, including suicidal ideation, action to prepare for an attempt, nonfatal attempt or self-harm, or death [52]. Compared with the general population, patients with anorexia nervosa have an elevated rate of suicide attempts and deaths. However, a registry study found that the rate of suicide deaths in anorexia nervosa was approximately half of that observed in bipolar disorder, depression, and schizophrenia [48].

- **Suicide attempts** – A lifetime history of attempted suicide is found in roughly 10 to 25 percent of patients with anorexia nervosa [53-56]. One national registry study identified individuals with anorexia nervosa (n >8000) within a general population cohort (n >2,000,000); after adjusting the analyses for comorbid depressive disorders, anxiety disorders, and substance use disorders, the investigators found that suicide attempts were 1.7 times more likely among individuals with anorexia nervosa than the general population (odds ratio 1.7, 95% CI 1.6-1.9) [56].

  Factors that are associated with suicide attempts in anorexia nervosa include comorbid substance use disorders and a history of sexual abuse, as well as having a sibling with an eating disorder [53-59].

- **Suicide deaths** – Some studies have found that suicide accounts for approximately 25 percent of deaths in anorexia nervosa [47,49]. Other studies have found that the rate of suicide is roughly five times greater in patients with anorexia nervosa, compared with the general population [48,49,60]. As an example, a national registry study identified individuals with anorexia nervosa (n >8000) in a general population cohort (n >2,000,000). Death by suicide was six times greater in those with anorexia nervosa than the general population (odds ratio 6); after the analyses were adjusted for comorbid psychopathology,

the risk of suicide deaths was three times greater among individuals with anorexia nervosa (odds ratio 3) [56].

ASSESSMENT

The initial clinical evaluation of patients with a possible diagnosis of anorexia nervosa includes a psychiatric and general medical history, mental status and physical examination, and focused laboratory tests [61,62]. The clinical interview may be augmented with a self-report screening measure and a structured interviewing instrument. The initial assessment should address the diagnostic criteria, associated clinical features, comorbid psychopathology, and medical complications of anorexia nervosa, and may require multiple interviews [12]. Subsequently, the clinician should monitor the patient's response to treatment and assess the patient for new illnesses.

Many patients with anorexia nervosa are not forthcoming about their illness [3,63]. Symptoms of anorexia nervosa are often ego-syntonic, and thus the patient's presenting complaint may be anxiety, depression, or somatic discomfort due to medical complications such as pain with eating, bloating, or "inability to keep food down." In addition, some patients are ashamed of the disorder and may attempt to conceal their thinness by wearing bulky clothes and may inflate their body weight by hiding objects in their clothes and drinking water [64]. Denial of the illness may delay assessment until family members or friends are compelled to obtain psychiatric and medical care for the patient.

Establishing rapport with the patient can help elicit more information. At the beginning of the interview, simple questions about the patient's age, occupation, marital status, and referral source can put the patient at ease. In addition, directed and focused questions about eating disorder psychopathology may be helpful for patients who do not respond to open-ended questions [65]. Conveying a nonjudgmental, supportive, and knowledgeable attitude also helps. Collateral information should be sought from family members, who may more accurately report the patient's nutritional and exercise habits, and at times be the only informants to report the presence of vomitus in the house, finding laxatives or diuretics, or the patient regularly departing to the bathroom after meals [3]. Assessment of the family also engages them to support efforts at nutritional rehabilitation and other aspects of recovery.

Clinicians should also evaluate the patient's medical status [64,66]. Assessing and managing the medical complications of anorexia nervosa are discussed separately. (See "Anorexia nervosa in adults: Evaluation for medical complications and criteria for hospitalization to manage these

complications" and "Anorexia nervosa in adults and adolescents: Medical complications and their management".)

Screening instruments — Among the self-report measures that screen for eating disorders, we suggest the five-item SCOFF, which is discussed separately. (See "Eating disorders: Overview of epidemiology, clinical features, and diagnosis", section on 'Screening'.)

The diagnostic interview can be facilitated by first administering a self-report screening instrument [67]. Patients who screen positive for an eating disorder should be asked about the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnostic criteria for anorexia nervosa (table 2) and bulimia nervosa (table 3). Self-report instruments can save interviewer time, but are more prone to yielding false positives than clinician-administered instruments. Interviewer-administered instruments are discussed separately. (See "Bulimia nervosa in adults: Clinical features, course of illness, assessment, and diagnosis", section on 'Structured instruments'.)

Clinical evaluation — The clinical evaluation should assess [12,68,69]:

- Height and weight:
  - Current body weight and desired weight. Clinicians should measure weight and height as well as ask about them because the patient's self-report is often unreliable. Body mass index (calculator 1) should then be determined for comparison to population norms.
  - Recent weight changes, lifetime highest and lowest weights at adult height, stability of weight over time, and history of efforts to control weight and shape. A chronology should be established to determine whether current symptoms are acute or chronic.
- Frequency of self-weighing.
- Meal pattern:
  - Estimate typical daily caloric and nutrient (carbohydrates, fat, and protein) intake from both foods and beverage, and assess pattern of consumption, including times, amounts, and context.
- Present and past eating disorder symptoms:
  - Dietary restriction

- Attitudes about food, eating, body weight, and shape (including fear of becoming fat and resistance to gaining weight)
- Binge eating
- Compensatory behaviors such as purging (self-induced vomiting or misuse of laxatives, diuretics, or enemas), fasting, and exercise
- Ritualistic eating behaviors (eg, cutting food into extremely small pieces or refusing to mix different types or colors of food on the plate)

- Fear of gaining weight or becoming fat.
- Self-evaluation, self-esteem, and perception of body weight and shape.
- Menstrual status:
  - Last menstrual period
  - Regularity and extent of menses
  - Weight at which spontaneous menses occur
- Prescription medications:
  - Oral contraceptives can produce withdrawal bleeding that simulates menstrual periods
  - Emetics may be used to stimulate purging
- Suicidality – Anorexia nervosa may be accompanied by suicidality, including suicidal ideation, action to prepare for an attempt, and nonfatal attempt or self-harm. Patients with suicidality should be seen more frequently and perhaps hospitalized, depending upon the estimated level of risk (table 4) [12,63,70]. A specific suicide plan of high lethality or intent indicates the need for hospitalization. Risk factors, evaluation, and management of suicidality are discussed separately. (See "Suicidal ideation and behavior in adults".)
- Comorbid disorders, such as anxiety, mood, impulse control, substance use (nicotine, caffeine, cocaine, and stimulants may be used to curb appetite), and personality disorders.
- Psychosocial functioning.
- Prior treatment:
  - Psychotherapy
  - Pharmacotherapy

- Self-help groups

- Family history of eating disorders and other psychopathology.

In discussing onset of anorexia nervosa, the clinician should ask about interpersonal problems at that time [12]. It is worth noting that family members should not be blamed for causing the illness because there is no evidence that families cause eating disorders; however, there are families who are not supportive and who may contribute to problems with self-esteem and body image.

As part of the mental status examination, the clinician should note behavioral restlessness or fidgeting. Impaired attention, concentration, and thought process can indicate cognitive impairment, including delirium related to medical complications of low weight and/or purging. Anxious or depressed affect should be assessed. Insight and judgment can be evaluated by asking about the patient's target weight and treatment-seeking behaviors.

Medical complications of anorexia nervosa that can be found on history and physical examination are discussed separately. (See "Anorexia nervosa in adults: Evaluation for medical complications and criteria for hospitalization to manage these complications", section on 'Medical evaluation'.)

Structured instruments — Structured, interviewer-administered instruments are available for diagnosing anorexia nervosa and other eating disorders, but are seldom used in routine clinical practice. These structured instruments are discussed separately. (See "Bulimia nervosa in adults: Clinical features, course of illness, assessment, and diagnosis", section on 'Structured instruments'.)

Measurement based care — We suggest that at each visit, clinicians weigh the patient wearing as little clothing as appropriate (eg, hospital gown) and after voiding. Clinicians should also ask about daily caloric intake, the number of hours spent exercising and walking each day, and the number of binge-eating and purging episodes that occurred each week since the last visit. Measurement based care can help identify nonresponders and detect residual symptoms. Symptomatic change over time can also be assessed with self-report measures [71], such as the 36-item Eating Disorder Examination Questionnaire [72,73].

DIAGNOSIS

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and the World Health Organization's International Classification of

Diseases-10th Revision (ICD-10) can each be used to diagnose anorexia nervosa. We use the DSM-5 criteria; however, the two sets of criteria overlap considerably.

Diagnostic and Statistical Manual — A DSM-5 diagnosis of anorexia nervosa requires each of the following criteria (table 2) [1]:

- Restriction of energy intake that leads to a low body weight, given the patient's age, sex, developmental trajectory, and physical health
- Intense fear of gaining weight or becoming fat, or persistent behavior that prevents weight gain, despite being underweight
- Distorted perception of body weight and shape, undue influence of weight and shape on self-worth, or denial of the medical seriousness of one's low body weight

There is no single standard for what constitutes a minimally normal weight [1,3]. Determining whether body weight is abnormally low depends upon individual factors such as body frame, skeletal structure, and racial ethnicity. DSM-5 suggests that a minimally normal weight for height is a body mass index (BMI; ratio of weight in kg divided by height in m^2) (calculator 1) equal to 18.5 kg/m^2; this is consistent with ICD-10 as well as the United States Centers for Disease Control and Prevention. Some clinicians obtain normal adult weight for height by using standardized tables such as the Metropolitan Life Insurance Height-Weight Tables (table 5), which are actuarial tables developed in 1983 to predict the longest lifespan [74-76].

DSM-5 classifies current severity of anorexia nervosa according to BMI (calculator 1):

- Mild – BMI 17 to 18.49 kg/m^2
- Moderate – BMI 16 to 16.99 kg/m^2
- Severe – BMI 15 to 15.99 kg/m^2
- Extreme – BMI <15 kg/m^2

Patients lose weight and/or maintain a low body weight in various ways that typically include reducing total food intake. Patients may begin by excluding highly caloric foods, but dietary restraint usually leads to a restricted diet that is sometimes limited to only a few foods. Patients may also fast for a day or longer and exercise excessively such that it interferes with important activities, or occurs at inappropriate times, in inappropriate settings, or despite injury. In addition, patients may purge (ie, induce vomiting or misuse laxatives, diuretics, or enemas). Purging with laxatives, diuretics, or enemas does not rid the body of unwanted calories, but does cause a temporary loss of bodily fluids that may result in a lower measured weight and feeling of relief [77]. Self-induced vomiting is also associated with significant retention of

calories. Medical complications of purging are discussed separately within the context of bulimia nervosa. (See "Bulimia nervosa and binge eating disorder in adults: Medical complications and their management", section on 'Medical complications of bulimia nervosa'.)

Fear of gaining weight or becoming fat usually does not abate with weight loss; rather, the fear often increases despite continued weight loss [1].

Disturbed body image manifests in different ways [1]. Some patients believe they are overweight, while others are concerned that specific body parts are fat. As a result, patients may excessively weigh themselves, measure body parts, or view themselves in a mirror. In addition, self-esteem depends upon body weight and shape; weight loss is viewed as an achievement and sign of self-discipline, whereas weight gain is a failure of self-control. Patients may concede that they are emaciated, but usually deny the medical complications of starvation. Some authorities view distorted body image as an overvalued idea rather than a delusion, even when the distortion is expressed as a false, fixed belief [3].

Anorexia nervosa usually causes a functional hypothalamic amenorrhea in postmenarchal females, characterized by low levels of luteinizing hormone and follicle-stimulating hormone (despite low estrogen levels) [78,79]. Although amenorrhea was required in previous editions of the Diagnostic and Statistical Manual for diagnosing anorexia nervosa, this is no longer the case in DSM-5 because patients who menstruate but otherwise meet criteria for anorexia nervosa have outcomes similar to patients who do not menstruate [1,80-82]. (See "Anorexia nervosa: Endocrine complications and their management".)

DSM-5 describes two subtypes of anorexia nervosa, based upon symptoms during the past three months: restricting and binge-eating/purging [1]. The restricting subtype is characterized by dieting, fasting, or excessive exercise, and the absence of recurrent binge-eating (eating an amount of food that is clearly larger than most people would eat under similar circumstances) or purging. The binge-eating/purging subtype is characterized by recurrent (eg, once per week) episodes of binge-eating or purging. Crossover between the two subtypes of anorexia nervosa occurs often, especially from the restricting subtype to the binge/purge subtype; this raises questions about their predictive validity for course of illness [83-85].

Patients who meet some but not all of the diagnostic criteria for anorexia nervosa are given the diagnosis of other specified feeding or eating disorder [1]. (See 'Other specified feeding or eating disorder' below.)

International Classification of Diseases — The ICD-10 diagnostic criteria for anorexia nervosa overlap considerably with the DSM-5 criteria [1,86]. ICD-10 does not specifically operationalize

the diagnosis of anorexia nervosa, but does describe the following clinical features that are found in patients:

- Deliberate weight loss to a low weight
- Fear of fatness
- Excessive concern with body shape
- Restricted diet
- Undernutrition that causes medical complications (eg, endocrine)
- Excessive exercise
- Purging (eg, self-induced vomiting or abuse of diuretics)

Diagnostic stability — The diagnosis of anorexia nervosa often changes to bulimia nervosa [87-90]. As an example, a prospective observational study followed 88 patients with anorexia nervosa at intake for up to seven years, and found that diagnostic crossover to bulimia nervosa occurred in 34 percent [84]. Among the 34 percent, approximately half subsequently crossed back over to anorexia nervosa. Diagnostic crossover may be more likely to occur in patients with comorbid psychopathology (eg, depression or substance use disorders) [87,88,91].

DIFFERENTIAL DIAGNOSIS

Anorexia nervosa is the most common cause of substantial weight loss in young adolescent females in western countries, and the diagnosis is often clear because patients present with emaciation in conjunction with self-induced starvation and intense fear of fatness [3]. However, specific symptoms of anorexia nervosa (eg, weight loss) may overlap with symptoms of other psychiatric and medical illnesses [1,14]. Patients with these other illnesses are generally concerned about their weight loss and do not restrict their diet or exercise excessively; in addition, body image is usually not distorted. Some of the illnesses that resemble anorexia nervosa can also occur in conjunction with anorexia nervosa (eg, unipolar major depression). (See 'Comorbidity' above.)

Eating disorders

Bulimia nervosa — Bulimia nervosa (table 3) and anorexia nervosa (table 2) are both marked by overvaluation of body shape and weight [1]. In addition, patients with bulimia nervosa binge eat and purge, as do many patients with anorexia nervosa. Making the correct diagnosis is essential for treatment.

The key distinguishing feature of anorexia nervosa is an abnormally low body weight (body mass index <18.5 kg/m^2), given the patient's age, sex, developmental trajectory, and physical

health. By contrast, patients with bulimia nervosa usually maintain a body weight at or above a minimally normal level [1]. Secondarily, the low weight that occurs in anorexia nervosa is accompanied by structural and physiologic sequelae (eg, reduced cardiac mass and bone density) that are not found in bulimia nervosa. Additional information about the differential diagnosis between anorexia nervosa and bulimia nervosa and their medical complications is discussed separately. (See "Bulimia nervosa in adults: Clinical features, course of illness, assessment, and diagnosis", section on 'Anorexia nervosa' and "Anorexia nervosa in adults and adolescents: Medical complications and their management" and "Bulimia nervosa and binge eating disorder in adults: Medical complications and their management".)

Avoidant/restrictive food intake disorder — Patients with avoidant/restrictive food intake disorder have poor energy and nutritional intake that can lead to low body weight, as occurs in anorexia nervosa [1]. However, restriction of energy intake in avoidant/restrictive food intake disorder is due a lack of interest in food, aversion to the sensory characteristics (eg, appearance, smell, or taste) of food, or concern about aversive consequences of eating (eg, choking or vomiting). By contrast, restricted energy intake in anorexia nervosa is accompanied by fear of gaining weight or becoming fat, and disturbance in the way that body weight and shape are perceived and experienced. (See "Eating disorders: Overview of epidemiology, clinical features, and diagnosis", section on 'Avoidant/restrictive food intake disorder'.)

Other specified feeding or eating disorder — In the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), patients who meet some but not all of the diagnostic criteria for anorexia nervosa can be diagnosed “other specified feeding or eating disorder,” along with the reason that the criteria are not met [1]. As an example, obese patients who demonstrate the signs and symptoms of anorexia nervosa during rapid weight loss to a normal weight are given the diagnosis, “other specified feeding or eating disorder, atypical anorexia nervosa.”

The DSM-5 diagnosis “atypical anorexia nervosa” denotes patients who have lost a significant proportion of their body weight and exhibit the psychological and behavioral features of anorexia nervosa (see 'Diagnostic and Statistical Manual' above), but whose weight is normal or greater than normal [1]. Retrospective studies suggest that losing as little as 5 or 10 percent of one’s body weight may be associated with these psychological features [92], and that physiologic correlates of anorexia nervosa, such as decreased bone mineral density and fat mass index, may also occur in atypical anorexia nervosa [93]. These findings suggest the possibility of overlap in the pathophysiology of anorexia nervosa and atypical anorexia nervosa. Until these two disorders are more clearly delineated, we reserve the diagnosis of anorexia nervosa for patients who are below expected weight (<18.5 kg/m^2), either through weight loss,

or, in the case of children and adolescents, failure to meet expected gains. Atypical anorexia nervosa is diagnosed in those who are not underweight, but who have experienced a significant loss of their body weight and exhibit the behavioral and psychological features of anorexia nervosa.

In addition, the diagnosis “unspecified feeding or eating disorder” can be used in situations in which patients meet some but not all of the diagnostic criteria for anorexia nervosa, and clinicians choose not to specify the reason that the criteria are not met [1]. This includes cases in which information is lacking to diagnose anorexia nervosa (eg, in an emergency department).

Patients with clinically meaningful symptoms of anorexia nervosa that do not rise to the level of meeting criteria for the diagnosis are nevertheless treated for the disorder. (See "Eating disorders: Overview of prevention and treatment", section on 'Anorexia nervosa'.)

Other psychiatric disorders — Specific symptoms of anorexia nervosa are similar to symptoms that occur in [1,2]:

- **Unipolar major depression** – Decreased weight often occurs in major depressive disorder. However, the weight loss in major depression is due to loss of appetite and is not intentional, and reluctance to gain weight and distorted body image are not present. In addition, depressed patients are usually anergic; by contrast, anorexia nervosa patients often exercise excessively.

- **Social phobia** – Patients with either social phobia or anorexia nervosa may be embarrassed to eat in public. However, patients with social phobia recognize that the fear is excessive or unreasonable, and they are not emaciated.

- **Obsessive-compulsive disorder** – Obsessions and compulsions regarding food can occur in both anorexia nervosa and obsessive-compulsive disorder. However, patients with obsessive-compulsive disorder are not emaciated and recognize that the preoccupations and behaviors are excessive or unreasonable.

- **Body dysmorphic disorder** – Patients with anorexia nervosa may be excessively preoccupied with an imagined defect in body appearance, as occurs in body dysmorphic disorder. However, the preoccupation in anorexia nervosa concerns body weight (“fatness”) or shape, whereas in body dysmorphic disorder the imagined defect typically involves the face or head. In addition, body dysmorphic disorder does not manifest with emaciation and a fear of becoming fat.

- **Psychotic disorders** – Psychotic patients may have delusions about food (eg, food is poisoned), refuse to eat, and lose weight. In contrast to anorexia nervosa, these psychotic disorders usually do not include fear of gaining weight or distorted body image.

- **Attention deficit hyperactivity disorder (ADHD)** – Restlessness and impaired concentration are common to both ADD/ADHD and anorexia nervosa. However, in anorexia nervosa, these symptoms are typically due to low weight and improve with normalization of body weight.

Screening for comorbid disorders and their diagnostic criteria are discussed separately.

General medical disorders — If the diagnosis of anorexia nervosa is not clear, the medical evaluation should account for general medical illnesses that can present with weight loss, malabsorption, or secondary amenorrhea. (See "Anorexia nervosa in adults: Evaluation for medical complications and criteria for hospitalization to manage these complications", section on 'Excluding medical disorders'.)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Eating disorders".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

- Basics topic (see "Patient education: Anorexia nervosa (The Basics)")

SUMMARY

- The core features of anorexia nervosa are persistent restriction of energy intake that leads to an abnormally low body weight; intense fear of gaining weight or becoming fat, or persistent behavior that prevents weight gain; and distorted perception of body weight and shape. Other features include perfectionism, cognitive and behavioral rigidity, feelings of ineffectiveness, inhibited expression of emotions, social withdrawal, poor insight, resistance to treatment, restlessness or hyperactivity, as well as symptoms and signs related to food and eating, such as preoccupation with food and rituals related to meals. (See 'Clinical features' above.)

- Patients with anorexia nervosa frequently have a lifetime history of comorbid psychiatric disorders, including anxiety, depressive, impulse control, substance use, and personality disorders. In addition, patients are at increased risk for general medical complications and disorders. (See 'Comorbidity' above.)

- Among patients with anorexia nervosa, approximately 50 percent have good outcomes (including weight gain), 25 percent have intermediate outcomes, and 25 percent have a poor outcome. Anorexia nervosa is associated with increased rates of all-cause mortality, and suicide deaths occur more often in patients than the general population. (See 'Course of illness' above.)

- The diagnostic interview can be facilitated by first administering a self-report instrument that screens for eating disorders. We suggest the five-item SCOFF. (See 'Screening instruments' above and "Eating disorders: Overview of epidemiology, clinical features, and diagnosis", section on 'Screening'.)

- The initial clinical evaluation should assess height, weight, meal patterns, present and past eating disorder symptoms (dietary restriction; attitudes about body weight and shape, food, and eating; binge eating; compensatory behaviors such as purging, fasting, and exercise; and ritualistic eating behaviors), menstrual status, suicidality, comorbid psychiatric disorders, psychosocial functioning, and family psychiatric history.

  Clinicians should also assess suicidality, including suicidal ideation, action to prepare for an attempt, and nonfatal attempt or self-harm. Patients with suicidality should be seen more frequently and perhaps hospitalized, depending upon the estimated level of risk. A specific suicide plan of high lethality or intent indicates the need for hospitalization (table 4). (See 'Clinical evaluation' above.)

- The diagnosis of anorexia nervosa according to the Diagnostic and Statistical Manual, Fifth Edition (DSM-5) is summarized in the table (table 2). The diagnostic criteria of the International Classification of Diseases-10th Revision (ICD-10) overlap considerably. (See 'Diagnosis' above.)

- Although certain diagnostic criteria for anorexia nervosa (table 2) and bulimia nervosa (table 3) are the same, body weight is usually low in anorexia nervosa and normal or above normal in bulimia nervosa. The differential diagnosis for anorexia nervosa also includes other psychiatric and medical disorders, but these illnesses typically do not present with intentional weight loss or fear of gaining weight. (See 'Differential diagnosis' above.)

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