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KEY POINTS:

The internist assists in the diagnosis of an eating disorder, coordinates care between team members, oversees the treatment plan, and manages any medical complications.

If an eating disorder is suspected, the clinician should always ask if the patient thinks she is too fat, too thin, or just right. Patients unhappy with their bodies can then be asked about particular behaviors such as eating habits, exercise, drug use, and binging. The amount of energy expended in weight or body issues can be a useful clinical clue.

Cessation of menstrual periods can be the earliest indication of an eating disorder.

Major life stresses such as divorce or death of a loved one can trigger an eating disorder. A family history can reveal other members with depression, obesity, eating disorders, or substance abuse. Sexual abuse may be a predisposing factor in some patients, although it is not a sensitive or specific predictor.

Eating disorders in adolescents and young adults: What's a primary care clinician to do?

ABSTRACT: Primary care clinicians play an important role in detecting and managing eating disorders, especially since the earlier the problem is identified and treatment initiated, the better the prognosis. Eating disorders can be readily detected by recognizing certain "red flags" and by asking appropriate questions.

Eating disorders are common in teens and young adults and can be life-threatening, but patients often conceal or deny their condition. Primary-care clinicians have a front-line role in detecting and managing eating disorders, as the earlier the problem is identified and treatment begun, the better the prognosis.[1]

This article describes what the internist should look for while taking the history and performing the physical examination, what questions to ask, and how to manage this problem. In particular, I advocate an individualized, team approach, working with the patient to set goals.

PREVALENCE

In the United States, 1% to 3% of young women suffer from anorexia nervosa.[2–5] The prevalence of bulimia nervosa may be even higher: although the estimate was 1% to 4% in some studies, several college surveys detected bulimic symptoms in as many as 18%.[3,6] Most patients are female, Caucasian, and adolescent,[7] but eating disorders are spreading to different ethnic groups, socioeconomic strata, and ages as well. Patients as young as 6 years and from myriad backgrounds have been seen. A 5% to 10% prevalence in boys has also been found.[3,7]

TABLE 1

DIAGNOSTIC CRITERIA FOR EATING DISORDERS*

ANOREXIA NERVOSA	BULIMIA NERVOSA
Refusal to maintain weight at or above a minimally normal weight for height and age (eg, weight loss leading to maintenance of body weight < 85% of that expected, or failure to make expected weight gain during period of growth, leading to a body weight < 85% of that expected)	**Recurrent episodes of binge eating**, characterized by: Eating a substantially larger amount of food in a discrete period of time than would be eaten by most people in similar circumstances in that time period A sense of lack of control over eating during the binge
Intense fear of becoming fat or gaining weight, even though underweight	**Inappropriate compensatory behaviors** used to prevent weight gain (eg, self-induced vomiting, use of laxatives, diuretics, fasting, excessive exercise)
Disturbed body image, undue influence of shape or weight on self-evaluation, or denial of the seriousness of the current low body weight	**Frequency.** The binges or inappropriate behaviors occur, on average, at least twice weekly for at least 3 months
Amenorrhea or absence of at least three consecutive menstrual cycles (those with periods only inducible after estrogen therapy are considered amenorrheic)	**Inappropriate self-evaluation,** unduly influenced by body shape or weight Bulimia does not occur exclusively during episodes of anorexia nervosa

*Adapted from *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, reference 9; used with permission from the American Psychiatric Association

DIAGNOSTIC CRITERIA

Anorexia nervosa

Anorexia nervosa, once described as the relentless pursuit of thinness,[8] manifests as a distorted body image, an intense fear of obesity, body fat, or foods containing fat, and extreme weight loss. **TABLE 1** lists the criteria for diagnosis proposed in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV).[9] Hallmarks include failure to gain weight during a period of growth, or weight loss leading to a body weight that stays less than 85% of that expected for the patient's height.

In postmenarchal girls, a criterion for diagnosis is cessation of menses for at least three cycles. However, because anorexia nervosa varies in its severity, clinicians should not let an overly strict interpretation of the DSM-IV criteria keep them from recognizing and treating a patient with an eating disorder early. If a teen displays all the classic symptoms but has not yet lost weight or stopped having periods, management should still be aggressive and tailored to the individual.

Anorexia nervosa is further classified as "restricting" (if the patient does not regularly binge or purge), or "bulimic" (if a patient who otherwise presents with anorexia nervosa does go through binge-purge cycles).

Bulimia nervosa

In contrast to anorexia nervosa, bulimia nervosa is characterized more by binges than by purges. Thus, binge eating is the main symptom, but the patient compensates with behaviors to minimize weight gain. In fact, the term bulimia is derived from the Greek word for appetite like a bull. The DSM-IV provides precise criteria for this disorder as well (**TABLE 1**).

Nonspecific cases

Eating disorders exist on a continuum, and patients often shift over time from anorexia to bulimia, or vice versa. As many as 40% of persons with anorexia nervosa go through a bulimic phase during the course of recovery.[7] For those who do not meet the criteria for either disorder, the label "eating disorder not otherwise specified" is used.

Athletes. Intense athletes can walk a fine line between trying to "eat healthy" and having an eating disorder. College athletes engaging in intense competition may have highly abnormal dietary patterns: a survey found that up to 14% had engaged in self-induced vomiting, 16% had abused laxatives, 25% routinely used diet pills, and as many as one third had at least one unhealthy eating habit.[10] Among female college gymnasts, 62% reported having unhealthy eating behaviors, and two thirds said their coaches told them they were too heavy.[11] These findings may be

similar in high school athletes as well.

THE HISTORY: ASKING THE RIGHT QUESTIONS

Many patients present because of other related problems, and may in fact try to conceal or deny having an eating disorder. The clinician must therefore be alert to certain "red flags" (**TABLES 2 and 3**).

Issues of confidentiality

In taking a history, clearly define what confidentiality means, and tell the patient that all questions asked without a family member in the room will be kept confidential unless a problem is life-threatening or dangerous; this caveat builds confidence yet provides a safe limit for the patient, parents, and clinician. Taking time with the parents alone and with the teen alone can help address each party's concerns while helping to reveal any hidden agenda. Ask the patient all questions about risk-taking behaviors, vomiting, laxative use, and other sensitive issues without a family member in the room.

Some physicians prefer to take a history of chief complaint, medical symptoms, past medical history, family history, and other less-sensitive issues with both teen and parent together. They then ask the parents if they have any concerns they would like to discuss without the teen present, and finally question and examine the teen alone. This ordering of questioning helps reassure the teen that the clinician is not reporting his or her concerns to the parent.

How does the patient feel about his or her body?

If an eating disorder is suspected, always ask about the patient's body image. Does he or she worry about any "trouble spots," such as the stomach or thighs? Asking how hard the patient struggles to lose or maintain weight gives information on the effort expended on eating behaviors while acknowledging the stress the patient may feel about weight.

Also ask the patient the most she ever weighed and when, the least she ever weighed and when, and how much she would like to weigh. If, for example, a patient is 5 feet 8 inches tall and wants to weigh 105 pounds, suspect an eating disorder. Male wrestlers should not drop their weight by more than one weight class from their preseason weight.

Growth charts list appropriate weights and heights and can be used in children or adults. If a patient is at the 75th percentile for height but only the 10th percentile for weight, showing the patient the chart and pointing out this difference can provide an objective frame of reference and help him or her overcome denial.

Asking about behaviors

Exercise. Patients unhappy with their bodies should be asked if they try to control their weight or shape, and if so, how. If the patient uses exercise, how much, how often, what kinds of activities, what level of competition, and how much stress does he or she feel if a workout is missed? Extreme distress over a missed workout is a warning sign of a potential eating disorder.

Nervous habits. Ask the family members whether the patient displays repetitive, anxious movements such as pacing or foot tapping. These restless movements may be a method of burning off calories or can be a sign of inner stress.

TABLE 2

SYMPTOMS OF ANOREXIA NERVOSA

- Constipation
- Bloating
- Early satiety (from delayed gastric emptying and slowed metabolism)
- Dry skin
- Cold intolerance
- Blue hands and feet
- Weakness
- Fatigue, low energy (despite high physical activity)
- Scalp hair loss
- Fainting
- Short stature (with earlier onset of eating disorders)
- Primary or secondary amenorrhea
- Nerve compression (from loss of padding)
- Easy bruising
- Frequent fractures due to osteopenia

TABLE 3

SYMPTOMS OF BULIMIA NERVOSA

- Mouth sores
- Dental caries
- Heartburn
- Chest pain
- Muscle cramps
- Weakness
- Bloody diarrhea (in laxative abusers)
- Easy bruising (from hypokalemia leading to platelet malfunction)
- Fainting
- Oligomenorrhea
- Amenorrhea

Diets, medications, vomiting. Also ask about diets tried, previous weight loss attempts, and use of laxatives, diuretics, caffeine, and vomiting. Ascertain the frequency, duration of use, and day of last use. If a patient admits to vomiting, ask how many times per day, what methods he or she uses (finger, toothbrush, ipecac, other), and whether there are particular triggers (eg, consuming a certain amount of food, or feelings of stress or anxiety).

Binges. Ask the patient if he or she ever binges, and if so, what constitutes a binge? How much, and what kinds of food are consumed? Are there any triggers for binging (eg, certain foods, time of day, boredom, anger)? How often do binges occur? Are they followed by vomiting? Some patients consume up to 20 000 calories at one time, and binge on junk foods or healthy foods.

Food habits. A 24-hour recall can help in obtaining a dietary history; the patient is asked to recount everything eaten the previous day. Be specific – asking how many bites or what size portion of each item is eaten can establish the severity of caloric restriction or binges, and tells the patient you understand that each bite may be a challenge. Does the patient skip breakfast, lunch, or dinner? Does he or she avoid any "taboo" foods? A person may start as a vegetarian, eating "healthy" and cutting out animal fat, and then proceed to avoid all forms of fat, and eventually protein or other essential items.

Many patients confuse a low-fat diet with a no fat diet; a low-fat diet for adolescents is 30 to 50 g per day

With society and the media telling people to pursue a low-fat lifestyle, many patients confuse a low-fat diet with a no-fat diet; in adolescence, a low-fat diet should provide 30 to 50 g of fat per day and two to three servings of protein.

Other factors

Menstrual history. Ascertain the age at menarche, the regularity of periods, and dates the two most recent menstrual periods started. If periods have ceased, how much did the patient weigh during her last period? Cessation of periods can occur before weight loss occurs, and menses can be expected to resume at approximately the same weight as when periods stopped.

Social history. Determine the level of schooling or career of the patient; many teens with anorexia nervosa can maintain excellent grades but slowly isolate themselves from family and friends.[2] The eating disorder can take up more and more time on a daily basis.

Also ask how well the family functions, as major life stresses such as divorce or death of a loved one may trigger an eating disorder. Has the patient been depressed or had any suicidal ideation? Family history can reveal other members with depression, obesity, eating disorders, or substance abuse. Sexual abuse may be a predisposing factor in some patients, although it is not a sensitive or specific predictor.[7]

Risk-taking behaviors should be assessed, including sexual activity and whether the patient smokes or uses drugs or alcohol, with all questions asked confidentially. These questions should be a routine part of any adolescent's visit. Patients with bulimia nervosa can be particularly at risk for nicotine addiction, binge drinking, sexual risk-taking, and other high-risk behaviors.

THE PHYSICAL EXAMINATION

Persons with anorexia nervosa usually appear emaciated, often wearing oversized clothing in layers both to hide their bodies and to preserve body warmth. Lanugo hair may cover the body, and the skin may look loose or flabby from loss of subcutaneous tissue. Reflexes may be slightly diminished. Hair and skin may be dry and coarse. Often, breast atrophy or atrophic vaginitis or both occur, due to lack of subcutaneous tissue in the former and lack of estrogen in both. Some patients have pitting edema of the extremities, and one third have cardiac murmurs due to a floppy mitral valve with prolapse (reversible with weight gain). Orthostatic hypotension and hypothermia from functional hypothyroidism can be found, and the patient may have sinus bradycardia secondary to myocardial wasting. However, many patients may appear entirely

normal.

Persons with bulimia nervosa may have Russell's sign (callouses on one or more knuckles caused by repetitive trauma from scraping the teeth during finger-induced vomiting). Palatal scarring can also be found occasionally, along with mouth sores and classic dental erosions of the lingual and occlusal surfaces of the incisors from repeated contact with gastric acid.[12] Dental erosions can lead to thermal hypersensitivity.

Height and weight should be measured with the patient wearing a hospital gown after voiding. A growth chart can be exceedingly helpful in determining if a patient is too thin for her height, particularly in patients younger than 18 years.

The specific gravity of the urine helps assess hydration; if the specific gravity is 1.005 or less, the patient may be drinking excess water to falsely increase his or her weight.

Take the vital signs with the patient both supine and standing, and note any orthostatic changes.

TABLE 4

LABORATORY EVALUATION FOR A PATIENT WITH AN EATING DISORDER

STRONGLY RECOMMENDED	CONSIDER
Complete blood count with differential	Thyroid function tests
Sedimentation rate (if cannot rule out inflammatory bowel disease or other cause of weight loss)	Luteinizing hormone, follicle-stimulating hormone, prolactin levels (for those with amenorrhea lasting more than 6 months)
Urinalysis	Assessment of estrogen status (serum estradiol or vaginal smear)
Electrolytes (including calcium and phosphorus)	Prothrombin time, partial thromboplastin time (if easy bruising)
Electrocardiogram (if heart rate is < 50)	Stool occult blood, stool fat (if suspicious history)
	Magnetic resonance imaging (for those with headaches, neurologic symptoms and in most males with suspected eating disorders)

LABORATORY EVALUATION

The diagnosis of an eating disorder is mainly clinical, with no confirmatory laboratory test available.[7] If a patient has a history suggestive of a specific disease such as inflammatory bowel disease or rheumatoid arthritis, it should be ruled out with an evaluation performed in a logical fashion rather than "shotgun" style. Imaging studies rarely are necessary unless the history suggests a specific disease.

Remind the patient that test results are expected to be normal, and normal tests results do not exclude an eating disorder; rather, they help indicate problems that need to be corrected expediently. This explanation can mitigate denial of an eating disorder in the presence of normal lab values, a common occurrence in both patients and families.

Common abnormalities

TABLE 4 lists appropriate laboratory tests. Abnormalities can result from caloric restriction, binging, or purging. However, most values are normal in patients with eating disorders.

Sinus bradycardia is common in patients who restrict calories, and electrocardiography should be performed on all patients with heart rates less than 50 beats per minute.

Leukopenia occurs in 23% of patients who experience starvation,[13] owing primarily to increased margination of the white blood cells; thus, most patients do not show increased risk of infection.

The erythrocyte sedimentation rate is normal or low; an elevated value should trigger further search for underlying organic cause.

Hemoglobin levels may be falsely elevated as a result of dehydration; in vegetarians, chronic poor iron intake can lead to microcytic anemia.

Blood urea nitrogen. Although renal function remains normal in most patients with eating disorders except in precipitous, severe weight loss, the blood urea nitrogen level can be high in dehydration or low from poor protein intake.

Hypokalemia usually is associated with use of laxatives or vomiting; electrolyte abnormalities tend to normalize quickly once the purging stops.

Cholesterol levels may be falsely elevated in patients with eating disorders during starvation. The causes are threefold: triiodothyronine levels (T_3), which affect cholesterol breakdown, may be depressed; cholesterol-binding globulin may be low; and with fatty infiltration, intrahepatic cholesterol may leak into the peripheral circulation.[7]

Thyroid function tests can reveal a euthyroid sick syndrome, with decreased peripheral conversion of thyroxine (T_4) to T_3,

and a high or high-normal level of reverse triiodothyronine.[4,14] These changes most likely represent the body's adaptive response to starvation by reducing the metabolic rate in the face of decreased energy stores.[15] Teens with anorexia nervosa should not be given thyroid hormone solely on the basis of a low T_4 level until they have resumed eating and have low T_4 levels confirmed after 1 to 2 months of appropriate nutrition.[12]

Other hormones. Patients with amenorrhea may have low or normal follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels. Hypercortisolemia has been associated with osteopenia in patients with eating disorders.[12,16]

Appropriate tests for amenorrheic patients

The laboratory evaluation for an amenorrheic patient with a suspected eating disorder should include measurements of thyroid-stimulating hormone, FSH, LH, and prolactin, and a measure of estrogen status (serum estradiol level or vaginal smear). The vaginal smear (maturation index) is obtained by rubbing the vaginal wall with a saline-moistened cotton-tipped swab, rolling the swab on a slide, and spraying the slide with fixative. Results are read as a percent of superficial, intermediate, and parabasal (less mature) cells, with 1 point for each superficial cell, 1/2 point for each intermediate cell, and 0 for parabasal cells. A sum greater than 40 implies some estrogen effect, with a sum of 50 to 60 seen in most pubertal girls. In prepubertal and hypoestrogenic girls a sum of 0 to 30 is typical, while a sum of 31 to 55 is seen in hypoestrogenic adults.[17]

Remind the patient that laboratory results are expected to be normal, and that normal results do not exclude an eating disorder

ISSUES IN MANAGING EATING DISORDERS

Value of a team approach

Treatment usually requires a multidisciplinary approach.[18] The team should consist of an internist, pediatrician, or other clinician for ongoing medical monitoring, a dietitian, a therapist, often a family therapist, and occasionally a psychopharmacologist. Communication between team members is key, as patients may intentionally or inadvertently sabotage therapy by playing care team members against each other or by diverting attention from themselves. The patient's illness may be an attempt to draw attention away from a difficult family situation; therefore, family therapy is sometimes crucial.

For patients dabbling in an eating disorder but without firmly entrenched behavior, the team may vary according to the patient's needs. If the problem disappears before first visit with a therapist, then the intervention truly was early. However, in patients with anorexia nervosa or bulimia nervosa, problem behaviors usually resurface quickly, and the team approach should be pursued more aggressively.

Role of the internist

The internist or pediatrician assists in the diagnosis, coordinates care between team members, oversees the plan to ensure adequate nutrition, and recognizes and manages any medical complications in an ongoing fashion. Visits may be weekly, monthly, or daily, depending on patient needs and what the insurance company will allow. For instance, many insurers are reluctant to authorize hospitalization for eating disorders, and as a result, sicker patients may need intensified outpatient management.

At each medical visit, take the pulse and blood pressure with the patient both lying and sitting or standing; orthostatic changes may be a reason for hospitalization. Review the objective physical findings with the patient, and give clear information about growth, menses, osteopenia, and other issues.[19]

Working with the patient

Once an eating disorder has been diagnosed, medical visits should focus mainly on identifying health risks posed by the unhealthy behaviors and creating a treatment plan to work with the patient towards health. A diagnostic label may not always be helpful initially, as many patients and families carry misconceptions about eating disorders.

Denial can be addressed gradually if the

TABLE 5

INDICATIONS FOR HOSPITALIZATION IN EATING DISORDERS

- Severe malnutrition (weight < 75% of ideal body weight)
- Dehydration
- Electrolyte imbalances (hypokalemia, hypophosphatemia)
- Electrocardiographic abnormalities
  - Sinus bradycardia (rate < 50 beats per minute)
  - Prolonged corrected Q-T interval
  - Arrhythmias
- Physiologic instability
  - Hypotension
  - Hypothermia
  - Bradycardia
  - Orthostatic changes on pulse or blood pressure or both
  - Syncope
- Arrested growth and development
- Failure of outpatient management
- Intractable vomiting, binging, or purging
- Acute food refusal
- Precipitous weight loss in a short time period
- Suicidal ideation or acute psychosis
- Comorbid diagnosis interfering with the treatment of the eating disorder (major depression, obsessive compulsive disorder, severe family dysfunction)

patient's medical status is stable. If the patient continues to deny having a problem, use the patient's signs and symptoms to emphasize that he or she suffers from a defined illness that is treatable but, untreated, has potentially life-threatening complications, including risk of sudden cardiac death.

Acknowledging the patient's distress over body image conveys empathy for her dilemma: dissatisfaction with her body vs need for better nutrition. Try to establish an alliance with the patient to work towards health; physicians rarely win power struggles with patients with an eating disorder. Discuss hospitalization criteria (**TABLE 5**),[7,16,18,20,21] and reiterate the long-term goals, including preventing osteopenia, preserving fertility, and eventually leading a normal life.

A working plan

Gaining weight. A reasonable goal for outpatients with anorexia nervosa is to gain 1/2 to 2 lb/week until a minimum weight goal has been reached. Inpatient weight gain should be at a rate of 0.4 lb/day. Faster rates of weight gain have been associated with cardiac failure and the refeeding syndrome.[22–24] The greatest risk for myocardial decompensation occurs during refeeding, possibly due to a slowed response in building of cardiac muscle in the face of a rapid increase in blood volume and afterload.[25] Refeeding can also precipitate hypophosphatemia, with the body's supply of phosphorus quickly used to replete low adenosine triphosphate and energy levels.

Patients experiencing psychologic difficulty eating solid foods can take liquid supplements, but should ideally take in enough calories from foods. In bulimic patients with normal weight, the goal is to stabilize the weight using behavior modification and other strategies to prevent binging and purging.

Getting enough protein and fat. In both disorders, patients should try to eat two to three servings of protein per day at first, and 30 to 50 g of fat for a low-fat diet. Fat intake may need to be increased slowly; a patient consuming 0 to 2 g of fat per day might work towards increasing to 5 g in the first week, then 8 to 10 g, then 12 to 15 g, then 20 g, and eventually 30 to 50 g.

Calcium requirements can be met with milk, calcium-fortified orange juice, or chewable supplements; estimated needs are 1200 to 1500 mg daily (at least three or four glasses of milk).[3,26,27]

Taking responsibility. Encourage the patient to take responsibility for the meal plan, while you monitor her health; this arrangement keeps parents and families from serving as police and discourages the use of mealtimes as a battleground between patient and family.

Behavior modification can take the form of rewards given after each day, week, and month without binging or purging; these rewards are most useful when planned and implemented by the patient, with support as needed by family and the care team. Rewards need not be monetary; patients have identified a trip to a mall or a special place, phone

privileges, and other events as suitable rewards.

Exercise may need to be restricted in patients with anorexia nervosa with low heart rates or who fail to meet weight goals. If the heart rate is more than 50 beats per minute, exercise can be restarted or used to justify added caloric intake.

At all times, emphasis must be placed on your conviction that the patient will get better. Your sense of empathy with the patient's struggles, combined with medical limit-setting and the shared goal of preserving his or her life, can help tip the scale in the patient's recovery. ■

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