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## Identifying and Treating Eating Disorders

Committee on Adolescence

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# AMERICAN ACADEMY OF PEDIATRICS

## POLICY STATEMENT

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

Committee on Adolescence

### Identifying and Treating Eating Disorders

**ABSTRACT.** Pediatricians are called on to become involved in the identification and management of eating disorders in several settings and at several critical points in the illness. In the primary care pediatrician's practice, early detection, initial evaluation, and ongoing management can play a significant role in preventing the illness from progressing to a more severe or chronic state. In the subspecialty setting, management of medical complications, provision of nutritional rehabilitation, and coordination with the psychosocial and psychiatric aspects of care are often handled by pediatricians, especially those who have experience or expertise in the care of adolescents with eating disorders. In hospital and day program settings, pediatricians are involved in program development, determining appropriate admission and discharge criteria, and provision and coordination of care. Lastly, primary care pediatricians need to be involved at local, state, and national levels in preventive efforts and in providing advocacy for patients and families. The roles of pediatricians in the management of eating disorders in the pediatric practice, subspecialty, hospital, day program, and community settings are reviewed in this statement.

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ABBREVIATIONS. *DSM-IV*, *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; BMI, body mass index; *DSM-PC*, *Diagnostic and Statistical Manual for Primary Care*.

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#### INTRODUCTION

Increases in the incidence and prevalence of anorexia and bulimia nervosa in children and adolescents have made it increasingly important that pediatricians be familiar with the early detection and appropriate management of eating disorders. Epidemiologic studies document that the numbers of children and adolescents with eating disorders increased steadily from the 1950s onward.<sup>1-4</sup> During the past decade, the prevalence of obesity in children and adolescents has increased significantly,<sup>5,6</sup> accompanied by an unhealthy emphasis on dieting and weight loss among children and adolescents, especially in suburban settings<sup>7-10</sup>; increasing concerns with weight-related issues in children at progressively younger ages<sup>11,12</sup>; growing awareness of the presence of eating disorders in males<sup>13,14</sup>; increases in the prevalence of eating disorders among minority populations in the United States<sup>15-18</sup>; and the identi-

fication of eating disorders in countries that had not previously been experiencing those problems.<sup>3,4,19,20</sup> It is estimated that 0.5% of adolescent females in the United States have anorexia nervosa, that 1% to 5% meet criteria for bulimia nervosa, and that up to 5% to 10% of all cases of eating disorders occur in males. There are also a large number of individuals with milder cases who do not meet all of the criteria in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* for anorexia or bulimia nervosa but who nonetheless experience the physical and psychologic consequences of having an eating disorder.<sup>21-25</sup> Long-term follow-up for these patients can help reduce sequelae of the diseases; *Healthy People 2010* includes an objective (#18.5) seeking to reduce the relapse rates for persons with eating disorders including anorexia nervosa and bulimia nervosa.<sup>26</sup>

#### THE ROLE OF THE PEDIATRICIAN IN THE IDENTIFICATION AND EVALUATION OF EATING DISORDERS

Primary care pediatricians are in a unique position to detect the onset of eating disorders and stop their progression at the earliest stages of the illness. Primary and secondary prevention is accomplished by screening for eating disorders as part of routine annual health care, providing ongoing monitoring of weight and height, and paying careful attention to the signs and symptoms of an incipient eating disorder. Early detection and management of an eating disorder may prevent the physical and psychologic consequences of malnutrition that allow for progression to a later stage.<sup>23,24</sup>

Screening questions about eating patterns and satisfaction with body appearance should be asked of all preteens and adolescents as part of routine pediatric health care. Weight and height need to be determined regularly (preferably in a hospital gown, because objects may be hidden in clothing to falsely elevate weight). Ongoing measurements of weight and height should be plotted on pediatric growth charts to evaluate for decreases in both that can occur as a result of restricted nutritional intake.<sup>27</sup> Body mass index (BMI), which compares weight with height, can be a helpful measurement in tracking concerns; BMI is calculated as:

weight in pounds  $\times$  700/(height in inches squared)

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or

weight in kilograms/(height in meters squared).

Newly developed growth charts are available for plotting changes in weight, height, and BMI over time and for comparing individual measurements with age-appropriate population norms.<sup>27</sup> Any evidence of inappropriate dieting, excessive concern with weight, or a weight loss pattern requires further attention, as does a failure to achieve appropriate increases in weight or height in growing children. In each of these situations, careful assessment for the possibility of an eating disorder and close monitoring at intervals as frequent as every 1 to 2 weeks may be needed until the situation becomes clear.

A number of studies have shown that most adolescent females express concerns about being overweight, and many may diet inappropriately.<sup>7-10</sup> Most of these children and adolescents do not have an eating disorder. On the other hand, it is known that patients with eating disorders may try to hide their illness, and usually no specific signs or symptoms are detected, so a simple denial by the adolescent does not negate the possibility of an eating disorder. It is wise, therefore, for the pediatrician to be cautious by following weight and nutrition patterns very closely or referring to a specialist experienced in the treatment of eating disorders when suspected. In addition, taking a history from a parent may help identify abnormal eating attitudes or behaviors, although parents may at times be in denial as well. Failure to detect an eating disorder at this early stage can result in an increase in severity of the illness, either further weight loss in cases of anorexia nervosa or increases in bingeing and purging behaviors in cases of bulimia nervosa, which can then make the eating disorder much more difficult to treat. In situations in which an adolescent is referred to the pediatrician because of concerns by parents, friends, or school personnel that he or she is displaying evidence of an eating disorder, it is most likely that the adolescent does have an eating disorder, either incipient or fully established. Pediatricians must, therefore, take these situations very seriously and not be lulled into a false sense of security if the adolescent denies all symptoms. Table 1 outlines questions useful in eliciting a history of eating disorders, and Table 2 delineates possible physical findings in children and adolescents with eating disorders.

Initial evaluation of the child or adolescent with a suspected eating disorder includes establishment of the diagnosis; determination of severity, including evaluation of medical and nutritional status; and performance of an initial psychosocial evaluation. Each of these initial steps can be performed in the pediatric primary care setting. The American Psychiatric Association has established *DSM-IV* criteria for the diagnosis of anorexia and bulimia nervosa (Table 3).<sup>24</sup> These criteria focus on the weight loss, attitudes and behaviors, and amenorrhea displayed by patients with eating disorders. Of note, studies have shown that more than half of all children and adolescents with eating disorders may not fully meet all *DSM-IV* criteria for anorexia or bulimia nervosa

**TABLE 1.** Specific Screening Questions to Identify the Child, Adolescent, or Young Adult With an Eating Disorder

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What is the most you ever weighed? How tall were you then? When was that?
What is the least you ever weighed in the past year? How tall were you then? When was that?
What do you think you ought to weigh?
Exercise: how much, how often, level of intensity? How stressed are you if you miss a workout?
Current dietary practices: ask for specifics—amounts, food groups, fluids, restrictions?
<ul style="list-style-type: none"><li>• 24-h diet history?</li><li>• Calorie counting, fat gram counting? Taboo foods (foods you avoid)?</li><li>• Any binge eating? Frequency, amount, triggers?</li><li>• Purging history?</li><li>• Use of diuretics, laxatives, diet pills, ipecac? Ask about elimination pattern, constipation, diarrhea.</li><li>• Any vomiting? Frequency, how long after meals?</li></ul>
Any previous therapy? What kind and how long? What was and was not helpful?
Family history: obesity, eating disorders, depression, other mental illness, substance abuse by parents or other family members?
Menstrual history: age at menarche? Regularity of cycles? Last menstrual period?
Use of cigarettes, drugs, alcohol? Sexual history? History of physical or sexual abuse?
Review of symptoms:
<ul style="list-style-type: none"><li>• Dizziness, syncope, weakness, fatigue?</li><li>• Pallor, easy bruising or bleeding?</li><li>• Cold intolerance?</li><li>• Hair loss, lanugo, dry skin?</li><li>• Vomiting, diarrhea, constipation?</li><li>• Fullness, bloating, abdominal pain, epigastric burning?</li><li>• Muscle cramps, joint pains, palpitations, chest pain?</li><li>• Menstrual irregularities?</li><li>• Symptoms of hyperthyroidism, diabetes, malignancy, infection, inflammatory bowel disease?</li></ul>

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while still experiencing the same medical and psychologic consequences of these disorders<sup>28</sup>; these patients are included in another *DSM-IV* diagnosis, referred to as eating disorder-not otherwise specified.<sup>24</sup> The pediatrician needs to be aware that patients with eating disorders not otherwise specified require the same careful attention as those who meet criteria for anorexia or bulimia nervosa. A patient who has lost weight rapidly but who does not meet full criteria because weight is not yet 15% below that which is expected for height may be more physically and psychologically compromised than may a patient of lower weight. Also, in growing children, it is failure to make appropriate gains in weight and height, not necessarily weight loss per se, that indicates the severity of the malnutrition. It is also common for adolescents to have significant purging behaviors without episodes of binge eating; although these patients do not meet the full *DSM-IV* criteria for bulimia nervosa, they may become severely medically compromised. These issues are addressed in the *Diagnostic and Statistical Manual for Primary Care (DSM-PC) Child and Adolescent Version*, which provides diagnostic codes and criteria for purging and bingeing, dieting, and body image problems that do not meet *DSM-IV* criteria.<sup>29</sup> In general, determination of total weight loss and weight status (calculated as percent below ideal body weight and/or as BMI), along with types and frequency of purging behaviors

**TABLE 2.** Possible Findings on Physical Examination in Children and Adolescents With Eating Disorders

Anorexia Nervosa	Bulimia Nervosa
Bradycardia	Sinus bradycardia
Orthostatic by pulse or blood pressure	Orthostatic by pulse or blood pressure
Hypothermia	Hypothermia
Cardiac murmur (one third with mitral valve prolapse)	Cardiac murmur (mitral valve prolapse)
Dull, thinning scalp hair	Hair without shine
Sunken cheeks, sallown skin	Dry skin
Lanugo	Parotitis
Atrophic breasts (postpubertal)	Russell's sign (callous on knuckles from self-induced emesis)
Atrophic vaginitis (postpubertal)	Mouth sores
Pitting edema of extremities	Palatal scratches
Emaciated, may wear oversized clothes	Dental enamel erosions
Flat affect	May look entirely normal
Cold extremities, acrocyanosis	Other cardiac arrhythmias

**TABLE 3.** Diagnosis of Anorexia Nervosa, Bulimia Nervosa, and Eating Disorders Not Otherwise Specified, From *DSM-IV*<sup>25</sup>

Anorexia Nervosa
1. Intense fear of becoming fat or gaining weight, even though underweight.
2. Refusal to maintain body weight at or above a minimally normal weight for age and height (ie, 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 body weight <85% of that expected).
3. Disturbed body image, undue influence of shape or weight on self-evaluation, or denial of the seriousness of the current low body weight.
4. Amenorrhea or absence of at least 3 consecutive menstrual cycles (those with periods only inducible after estrogen therapy are considered amenorrheic).
Types:
Restricting—no regular bingeing or purging (self-induced vomiting or use of laxatives and diuretics).
Binge eating/purging—regular bingeing and purging in a patient who also meets the above criteria for anorexia nervosa.
Bulimia Nervosa
1. Recurrent episodes of binge eating, characterized by:
a. Eating a substantially larger amount of food in a discrete period of time (ie, in 2 h) than would be eaten by most people in similar circumstances during that same time period.
b. A sense of lack of control over eating during the binge.
2. Recurrent inappropriate compensatory behavior to prevent weight gain; ie, self-induced vomiting, use of laxatives, diuretics, fasting, or hyperexercising.
3. Binges or inappropriate compensatory behaviors occurring, on average, at least twice weekly for at least 3 mo.
4. Self-evaluation unduly influenced by body shape or weight.
5. The disturbance does not occur exclusively during episodes of anorexia nervosa
Types:
Purging—regularly engages in self-induced vomiting or use of laxatives or diuretics.
Nonpurging—uses other inappropriate compensatory behaviors; ie, fasting or hyperexercising, without regular use of vomiting or medications to purge.
Eating Disorder Not Otherwise Specified (those who do not meet criteria for anorexia nervosa or bulimia nervosa, per <i>DSM-IV</i> )
1. All criteria for anorexia nervosa, except has regular menses.
2. All criteria for anorexia nervosa, except weight still in normal range.
3. All criteria for bulimia nervosa, except binges <twice a wk or <3 times a mo.
4. A patient with normal body weight who regularly engages in inappropriate compensatory behavior after eating small amounts of food (ie, self-induced vomiting after eating 2 cookies).
5. A patient who repeatedly chews and spits out large amounts of food without swallowing.
6. Binge eating disorder: recurrent binges but does not engage in the inappropriate compensatory behaviors of bulimia nervosa.

(including vomiting and use of laxatives, diuretics, ipecac, and over-the-counter or prescription diet pills as well as use of starvation and/or exercise) serve to establish an initial index of severity for the child or adolescent with an eating disorder.

The medical complications associated with eating disorders are listed in Table 4, and details of these complications have been described in several reviews.<sup>23,24,30–34</sup> It is uncommon for the pediatrician to encounter most of these complications in a patient with a newly diagnosed eating disorder. However, it is recommended that an initial laboratory assessment be performed and that this include complete blood cell count, electrolyte measurement, liver function tests, urinalysis, and a thyroid-stimulating hormone test. Additional tests (urine pregnancy, luteinizing and follicle-stimulating hormone, prolactin, and estradiol tests) may need to be performed in patients

who are amenorrheic to rule out other causes for amenorrhea, including pregnancy, ovarian failure, or prolactinoma. Other tests, including an erythrocyte sedimentation rate and radiographic studies (such as computed tomography or magnetic resonance imaging of the brain or upper or lower gastrointestinal system studies), should be performed if there are uncertainties about the diagnosis. An electrocardiogram should be performed on any patient with bradycardia or electrolyte abnormalities. Bone densitometry should be considered in those amenorrheic for more than 6 to 12 months. It should be noted, however, that most test results will be normal in most patients with eating disorders, and normal laboratory test results do not exclude serious illness or medical instability in these patients.

The initial psychosocial assessment should include an evaluation of the patient's degree of obsession

**TABLE 4.** Medical Complications Resulting From Eating DisordersMedical Complications Resulting From Purging

1. Fluid and electrolyte imbalance; hypokalemia; hyponatremia; hypochloremic alkalosis.
2. Use of ipecac: irreversible myocardial damage and a diffuse myositis.
3. Chronic vomiting: esophagitis; dental erosions; Mallory-Weiss tears; rare esophageal or gastric rupture; rare aspiration pneumonia.
4. Use of laxatives: depletion of potassium bicarbonate, causing metabolic acidosis; increased blood urea nitrogen concentration and predisposition to renal stones from dehydration; hyperuricemia; hypocalcemia; hypomagnesemia; chronic dehydration. With laxative withdrawal, may get fluid retention (may gain up to 10 lb in 24 h).
5. Amenorrhea (can be seen in normal or overweight individuals with bulimia nervosa), menstrual irregularities, osteopenia.

Medical Complications From Caloric Restriction

1. Cardiovascular  
Electrocardiographic abnormalities: low voltage; sinus bradycardia (from malnutrition); T wave inversions; ST segment depression (from electrolyte imbalances). Prolonged corrected QT interval is uncommon but may predispose patient to sudden death. Dysrhythmias include supraventricular beats and ventricular tachycardia, with or without exercise. Pericardial effusions can occur in those severely malnourished. All cardiac abnormalities except those secondary to emetine (ipecac) toxicity are completely reversible with weight gain.
2. Gastrointestinal system: delayed gastric emptying; slowed gastrointestinal motility; constipation; bloating; fullness; hypercholesterolemia (from abnormal lipoprotein metabolism); abnormal liver function test results (probably from fatty infiltration of the liver). All reversible with weight gain.
3. Renal: increased blood urea nitrogen concentration (from dehydration, decreased glomerular filtration rate) with increased risk of renal stones; polyuria (from abnormal vasopressin secretion, rare partial diabetes insipidus). Total body sodium and potassium depletion caused by starvation; with refeeding, 25% can get peripheral edema attributable to increased renal sensitivity to aldosterone and increased insulin secretion (affects renal tubules).
4. Hematologic: leukopenia; anemia; iron deficiency; thrombocytopenia.
5. Endocrine: euthyroid sick syndrome; amenorrhea; osteopenia.
6. Neurologic: cortical atrophy; seizures.

with food and weight, understanding of the diagnosis, and willingness to receive help; an assessment of the patient's functioning at home, in school, and with friends; and a determination of other psychiatric diagnoses (such as depression, anxiety, and obsessive-compulsive disorder), which may be comorbid with or may be a cause or consequence of the eating disorder. Suicidal ideation and history of physical or sexual abuse or violence should also be assessed. The parents' reaction to the illness should be assessed, because denial of the problem or parental differences in how to approach treatment and recovery may exacerbate the patient's illness. The pediatrician who feels competent and comfortable in performing the full initial evaluation is encouraged to do so. Others should refer to appropriate medical subspecialists and mental health personnel to ensure that a complete evaluation is performed. A differential diagnosis for the adolescent with symptoms of an eating disorder can be found in Table 5.

Several treatment decisions follow the initial evaluation, including the questions of where and by whom the patient will be treated. Patients who have minimal nutritional, medical, and psychosocial issues and show a quick reversal of their condition may be treated in the pediatrician's office, usually in conjunction with a registered dietitian and a mental health practitioner. Pediatricians who do not feel comfortable with issues of medical and psychosocial

management can refer these patients at this early stage. Pediatricians can choose to stay involved even after referral to the team of specialists, as the family often appreciates the comfort of the relationship with their long-term care provider. Pediatricians comfortable with the ongoing care and secondary prevention of medical complications in patients with eating disorders may choose to continue care themselves. More severe cases require the involvement of a multidisciplinary specialty team working in outpatient, inpatient, or day program settings.

#### THE PEDIATRICIAN'S ROLE IN THE TREATMENT OF EATING DISORDERS IN OUTPATIENT SETTINGS

Pediatricians have several important roles to play in the management of patients with diagnosed eating disorders. These aspects of care include medical and nutritional management and coordination with mental health personnel in provision of the psychosocial and psychiatric aspects of care. Most patients will have much of their ongoing treatment performed in outpatient settings. Although some pediatricians in primary care practice may perform these roles for some patients in outpatient settings on the basis of their levels of interest and expertise, many general pediatricians do not feel comfortable treating patients with eating disorders and prefer to refer patients with anorexia or bulimia nervosa for care by those with special expertise.<sup>35</sup> A number of pediatricians specializing in adolescent medicine have developed this skill set, with an increasing number involved in the management of eating disorders as part of multidisciplinary teams.<sup>23,36</sup> Other than the most severely affected patients, most children and adolescents with eating disorders will be managed in an outpatient setting by a multidisciplinary team coordinated by a pediatrician or subspecialist with appropriate expertise in the care of children and adolescents with eating disorders. Pediatricians

**TABLE 5.** Differential Diagnosis of Eating Disorders

- Malignancy, central nervous system tumor
- Gastrointestinal system: inflammatory bowel disease, malabsorption, celiac disease
- Endocrine: diabetes mellitus, hyperthyroidism, hypopituitarism, Addison disease
- Depression, obsessive-compulsive disorder, psychiatric diagnosis
- Other chronic disease or chronic infections
- Superior mesenteric artery syndrome (can also be a consequence of an eating disorder)

generally work with nursing, nutrition, and mental health colleagues in the provision of medical, nutrition, and mental health care required by these patients.

As listed in Table 4, medical complications of eating disorders can occur in all organ systems. Pediatricians need to be aware of several complications that can occur in the outpatient setting. Although most patients do not have electrolyte abnormalities, the pediatrician must be alert to the possibility of development of hypokalemic, hypochloremic alkalosis resulting from purging behaviors (including vomiting and laxative or diuretic use) and hyponatremia or hypernatremia resulting from drinking too much or too little fluid as part of weight manipulation. Endocrine abnormalities, including hypothyroidism, hypercortisolism, and hypogonadotropic hypogonadism, are common, with amenorrhea leading to the potentially long-term complication of osteopenia and, ultimately, osteoporosis.<sup>37-40</sup> Gastrointestinal symptoms caused by abnormalities in intestinal motility resulting from malnutrition, laxative abuse, or refeeding are common but are rarely dangerous and may require symptomatic relief. Constipation during refeeding is common and should be treated with dietary manipulation and reassurance; the use of laxatives in this situation should be avoided.

The components of nutritional rehabilitation required in the outpatient management of patients with eating disorders are presented in several reviews.<sup>23,24,41-44</sup> These reviews highlight the dietary stabilization that is required as part of the management of bulimia nervosa and the weight gain regimens that are required as the hallmark of treatment of anorexia nervosa. The reintroduction or improvement of meals and snacks in those with anorexia nervosa is generally done in a stepwise manner, leading in most cases to an eventual intake of 2000 to 3000 kcal per day and a weight gain of 0.5 to 2 lb per week. Changes in meals are made to ensure ingestion of 2 to 3 servings of protein per day (with 1 serving equal to 3 oz of cheese, chicken, meat, or other protein sources). Daily fat intake should be slowly shifted toward a goal of 30 to 50 g per day. Treatment goal weights should be individualized and based on age, height, stage of puberty, premorbid weight, and previous growth charts. In postmenarchal girls, resumption of menses provides an objective measure of return to biological health, and weight at resumption of menses can be used to determine treatment goal weight. A weight approximately 90% of standard body weight is the average weight at which menses resume and can be used as an initial treatment goal weight, because 86% of patients who achieve this weight resume menses within 6 months.<sup>45</sup> For a growing child or adolescent, goal weight should be reevaluated at 3- to 6-month intervals on the basis of changing age and height. Behavioral interventions are often required to encourage otherwise reluctant (and often resistant) patients to accomplish necessary caloric intake and weight gain goals. Although some pediatric specialists, pediatric nurses, or dietitians may be able to handle this aspect of care alone, a combined medical and nutritional

team is usually required, especially for more difficult patients.<sup>46</sup>

Similarly, the pediatrician must work with mental health experts to provide the necessary psychological, social, and psychiatric care.<sup>47-49</sup> The model used by many interdisciplinary teams, especially those based in settings experienced in the care of adolescents, is to establish a division of labor such that the medical and nutritional clinicians work on the issues described in the preceding paragraph and the mental health clinicians provide such modalities as individual, family, and group therapy. It is generally accepted that medical stabilization and nutritional rehabilitation are the most crucial determinants of short-term and intermediate-term outcome. Individual and family therapy, the latter being especially important in working with younger children and adolescents, are crucial determinants of the long-term prognosis.<sup>50-53</sup> It is also recognized that correction of malnutrition is required for the mental health aspects of care to be effective. Psychotropic medications have been shown to be helpful in the treatment of bulimia nervosa and prevention of relapse in anorexia nervosa in adults.<sup>54-56</sup> These medications are also used for many adolescent patients and may be prescribed by the pediatrician or the psychiatrist, depending on the delegation of roles within the team.

#### THE ROLE OF THE PEDIATRICIAN IN HOSPITAL AND DAY PROGRAM SETTINGS

Criteria for the hospitalization of children and adolescents with eating disorders have been established by the Society for Adolescent Medicine<sup>23</sup> (Table 6). These criteria, in keeping with those published by the American Psychiatric Association,<sup>24</sup> acknowledge that hospitalization may be required because of medical or psychiatric needs or because of failure of outpatient treatment to accomplish needed medical, nutritional, or psychiatric progress. Unfortunately, many insurance companies do not use similar crite-

**TABLE 6.** Criteria for Hospital Admission for Children, Adolescents, and Young Adults With Eating Disorders

##### Anorexia Nervosa

- <75% ideal body weight, or ongoing weight loss despite intensive management
- Refusal to eat
- Body fat <10%
- Heart rate <50 beats per minute daytime; <45 beats per minute nighttime
- Systolic pressure <90
- Orthostatic changes in pulse (>20 beats per min) or blood pressure (>10 mm Hg)
- Temperature <96°F

##### Bulimia Nervosa

- Arrhythmia
- Syncope
- Serum potassium concentration <3.2 mmol/L
- Serum chloride concentration <88 mmol/L
- Esophageal tears
- Cardiac arrhythmias including prolonged QTc
- Hypothermia
- Suicide risk
- Intractable vomiting
- Hematemesis
- Failure to respond to outpatient treatment

ria, thus making it difficult for some children and adolescents with eating disorders to receive an appropriate level of care.<sup>57-59</sup> Children and adolescents have the best prognosis if their disease is treated rapidly and aggressively<sup>36</sup> (an approach that may not be as effective in adults with a more long-term, protracted course). Hospitalization, which allows for adequate weight gain in addition to medical stabilization and the establishment of safe and healthy eating habits, improves the prognosis in children and adolescents.<sup>60</sup>

The pediatrician involved in the treatment of hospitalized patients must be prepared to provide nutrition via a nasogastric tube or occasionally intravenously when necessary. Some programs use this approach frequently, and others apply it more sparingly. Also, because these patients are generally more malnourished than those treated as outpatients, more severe complications may need to be treated. These include the possible metabolic, cardiac, and neurologic complications listed in Table 2. Of particular concern is the refeeding syndrome that can occur in severely malnourished patients who receive nutritional replenishment too rapidly.<sup>61</sup> The refeeding syndrome consists of cardiovascular, neurologic, and hematologic complications that occur because of shifts in phosphate from extracellular to intracellular spaces in individuals who have total body phosphorus depletion as a result of malnutrition. Recent studies have shown that this syndrome can result from use of oral, parenteral, or enteral nutrition.<sup>62-64</sup> Slow refeeding, with the possible addition of phosphorus supplementation, is required to prevent development of the refeeding syndrome in severely malnourished children and adolescents.

Day treatment (partial hospitalization) programs have been developed to provide an intermediate level of care for patients with eating disorders who require more than outpatient care but less than 24-hour hospitalization.<sup>65-68</sup> In some cases, these programs have been used in an attempt to prevent the need for hospitalization; more often, they are used as a transition from inpatient to outpatient care. Day treatment programs generally provide care (including meals, therapy, groups, and other activities) 4 to 5 days per week from 8 or 9 AM until 5 or 6 PM. An additional level of care, referred to as an "intensive outpatient" program, has also been developed for these patients and generally provides care 2 to 4 afternoons or evenings per week. It is recommended that intensive outpatient and day programs that include children and adolescents should incorporate pediatric care into the management of the developmental and medical needs of their patients. Pediatricians can play an active role in the development of objective, evidence-based criteria for the transition from one level of care to the next. Additional research can also help clarify other questions, such as the use of enteral versus parenteral nutrition during refeeding, to serve as the foundation for evidence-based guidelines.

## THE ROLE OF THE PEDIATRICIAN IN PREVENTION AND ADVOCACY

Prevention of eating disorders can take place in the practice and community setting. Primary care pediatricians can help families and children learn to apply the principles of proper nutrition and physical activity and to avoid an unhealthy emphasis on weight and dieting. In addition, pediatricians can implement screening strategies (as described earlier) to detect the early onset of an eating disorder and be careful to avoid seemingly innocuous statements (such as "you're just a little above the average weight") that can sometimes serve as the precipitant for the onset of an eating disorder. At the community level, there is general agreement that changes in the cultural approaches to weight and dieting issues will be required to decrease the growing numbers of children and adolescents with eating disorders. School curricula have been developed to try to accomplish these goals. Initial evaluations of these curricula show some success in changing attitudes and behaviors, but questions about their effectiveness remain, and single-episode programs (eg, 1 visit to a classroom) are clearly not effective and may do more harm than good.<sup>69-74</sup> Additional curricula are being developed and additional evaluations are taking place in this field.<sup>75</sup> Some work has also been done with the media, in an attempt to change the ways in which weight and dieting issues are portrayed in magazines, television shows, and movies.<sup>76</sup> Pediatricians can work in their local communities, regionally, and nationally to support the efforts that are attempting to change the cultural norms being experienced by children and adolescents.

Pediatricians can also help support advocacy efforts that are attempting to ensure that children and adolescents with eating disorders are able to receive necessary care. Length of stay, adequacy of mental health services, and appropriate level of care have been a source of contention between those who treat eating disorders on a regular basis and the insurance industry.

Work is being done with insurance companies and on legislative and judicial levels to secure appropriate coverage for the treatment of mental health conditions, including eating disorders.<sup>77,78</sup> Parent groups, along with some in the mental health professions, have been leading this battle. Support by pediatrics in general, and pediatricians in particular, is required to help this effort.

## RECOMMENDATIONS

1. Pediatricians need to be knowledgeable about the early signs and symptoms of disordered eating and other related behaviors.
2. Pediatricians should be aware of the careful balance that needs to be in place to decrease the growing prevalence of eating disorders in children and adolescents. When counseling children on risk of obesity and healthy eating, care needs to be taken not to foster overaggressive dieting and to help children and adolescents build self-esteem while still addressing weight concerns.

3. Pediatricians should be familiar with the screening and counseling guidelines for disordered eating and other related behaviors.
4. Pediatricians should know when and how to monitor and/or refer patients with eating disorders to best address their medical and nutritional needs, serving as an integral part of the multidisciplinary team.
5. Pediatricians should be encouraged to calculate and plot weight, height, and BMI using age- and gender-appropriate graphs at routine annual pediatric visits.
6. Pediatricians can play a role in primary prevention through office visits and community- or school-based interventions with a focus on screening, education, and advocacy.
7. Pediatricians can work locally, nationally, and internationally to help change cultural norms conducive to eating disorders and proactively to change media messages.
8. Pediatricians need to be aware of the resources in their communities so they can coordinate care of various treating professionals, helping to create a seamless system between inpatient and outpatient management in their communities.
9. Pediatricians should help advocate for parity of mental health benefits to ensure continuity of care for the patients with eating disorders.
10. Pediatricians need to advocate for legislation and regulations that secure appropriate coverage for medical, nutritional, and mental health treatment in settings appropriate to the severity of the illness (inpatient, day hospital, intensive outpatient, and outpatient).
11. Pediatricians are encouraged to participate in the development of objective criteria for the optimal treatment of eating disorders, including the use of specific treatment modalities and the transition from one level of care to another.

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## REFERENCES

1. Whitaker AH. An epidemiological study of anorectic and bulimic symptoms in adolescent girls: implications for pediatricians. *Pediatr Ann.* 1992;21:752–759
2. Lucas AR, Beard CM, O'Fallon WM, Kurland LT. 50-year trends in the incidence of anorexia nervosa in Rochester, Minn.: a population-based study. *Am J Psychiatry.* 1991;148:917–922
3. Hsu LK. Epidemiology of the eating disorders. *Psychiatry Clin North Am.* 1996;19:681–700
4. Dorian BJ, Garfinkel PE. The contributions of epidemiologic studies to the etiology and treatment of the eating disorders. *Psychiatry Ann.* 1999;29:187–192
5. Troiano RP, Flegal KM, Kuczmarski RJ, Campbell SM, Johnson CL. Overweight prevalence and trends for children and adolescents: the National Health and Nutrition Examination Surveys, 1963 to 1991. *Arch Pediatr Adolesc Med.* 1995;149:1085–1091
6. Troiano RP, Flegal KM. Overweight children and adolescents: description, epidemiology, and demographics. *Pediatrics.* 1998;101(suppl):497–504
7. Strauss RS. Self-reported weight status and dieting in a cross-sectional sample of young adolescents: National Health and Nutrition Examination Survey III. *Arch Pediatr Adolesc Med.* 1999;153:741–747
8. Fisher M, Schneider M, Pegler C, Napolitano B. Eating attitudes, health risk behaviors, self-esteem, and anxiety among adolescent females in a suburban high school. *J Adolesc Health.* 1991;12:377–384
9. Stein D, Meged S, Bar-Hanin T, Blank S, Elizur A, Weizman A. Partial eating disorders in a community sample of female adolescents. *J Am Acad Child Adolesc Psychiatry.* 1997;36:1116–1123
10. Patton GC, Carlin JB, Shao Q, et al. Adolescent dieting: healthy weight control or borderline eating disorder? *J Child Psychol Psychiatry.* 1997;38:299–306
11. Krowchuk DP, Kreiter SR, Woods CR, Sinal SH, DuRant RH. Problem dieting behaviors among young adolescents. *Arch Pediatr Adolesc Med.* 1998;152:884–888
12. Field AE, Camargo CA Jr, Taylor CB, et al. Overweight, weight concerns, and bulimic behaviors among girls and boys. *J Am Acad Child Adolesc Psychiatry.* 1999;38:754–760
13. Andersen AE. Eating disorders in males. In: Brownell KD, Fairburn CG, eds. *Eating Disorders and Obesity: A Comprehensive Handbook.* New York, NY: Guilford Press; 1995:177–187
14. Carlat DJ, Camargo CA Jr, Herzog DB. Eating disorders in males: a report on 135 patients. *Am J Psychiatry.* 1997;154:1127–1132
15. Robinson TN, Killen JD, Litt IF, et al. Ethnicity and body dissatisfaction: are Hispanic and Asian girls at increased risk for eating disorders? *J Adolesc Health.* 1996;19:384–393
16. Crago M, Shisslak CM, Estes LS. Eating disturbances among American minority groups: a review. *Int J Eat Disord.* 1996;19:239–248
17. Gard MC, Freeman CP. The dismantling of a myth: a review of eating disorders and socioeconomic status. *Int J Eat Disord.* 1996;20:1–12
18. Pike KM, Walsh BT. Ethnicity and eating disorders: implications for incidence and treatment. *Psychopharmacol Bull.* 1996;32:265–274
19. Lai KY. Anorexia nervosa in Chinese adolescents—does culture make a difference? *J Adolesc.* 2000;23:561–568
20. le Grange D, Telch CF, Tibbs J. Eating attitudes and behaviors in 1435 South African Caucasian and non-Caucasian college students. *Am J Psychiatry.* 1998;155:250–254
21. Becker AE, Grinspoon SK, Klubanski A, Herzog DB. Eating disorders. *N Engl J Med.* 1999;340:1092–1098
22. Steiner H, Lock J. Anorexia nervosa and bulimia nervosa in children and adolescents: a review of the past 10 years. *J Am Acad Child Adolesc Psychiatry.* 1998;37:352–359
23. Fisher M, Golden NH, Katzman DK, et al. Eating disorders in adolescents: a background paper. *J Adolesc Health.* 1995;16:420–437
24. American Psychiatric Association, Work Group on Eating Disorders. Practice guideline for the treatment of patients with eating disorders (revision). *Am J Psychiatry.* 2000;157(1 suppl):1–39
25. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, 4th ed (DSM-IV).* Washington, DC: American Psychiatric Association; 1994
26. US Department of Health and Human Services. Mental health and mental disorders. In: *Healthy People 2010.* Vol II. Washington, DC: US Public Health Service, US Department of Health and Human Services; 2000. Available at: <http://www.health.gov/healthypeople/document/html/volume2/18mental.htm>. Accessed September 4, 2002
27. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al. *CDC Growth Charts: United States.* Hyattsville, MD: National Center for Health

- Statistics; 2000. Available at: <http://www.cdc.gov/growthcharts/>. Accessed February 26, 2002
28. Bunnell DW, Shenker IR, Nussbaum MP, et al. Subclinical versus formal eating disorders: differentiating psychological features. *Int J Eat Disord*. 1990;9:357-362
  29. Wolraich ML, Felice ME, Drotar D, eds. *The Classification of Child and Adolescent Mental Diagnoses in Primary Care: Diagnostic and Statistical Manual for Primary Care (DSM-PC) Child and Adolescent Version*. Elk Grove Village, IL: American Academy of Pediatrics; 1996
  30. Palla B, Litt IF. Medical complications of eating disorders in adolescents. *Pediatrics*. 1988;81:613-623
  31. Fisher M. Medical complications of anorexia and bulimia nervosa. *Adolesc Med*. 1992;3:487-502
  32. Rome ES. Eating disorders in adolescents and young adults: what's a primary care clinician to do? *Cleveland Clin J Med*. 1996;63:387-395
  33. Mehler PS, Gray MC, Schulte M. Medical complications of anorexia nervosa. *J Womens Health*. 1997;6:533-541
  34. Nicholls D, Stanhope R. Medical complications of anorexia nervosa in children and young adolescents. *Eur Eat Disord Rev*. 2000;8:170-180
  35. Fisher M, Golden NH, Bergeson R, et al. Update on adolescent health care in pediatric practice. *J Adolesc Health*. 1996;19:394-400
  36. Kreipe RE, Golden NH, Katzman DK, et al. Eating disorders in adolescents. A position paper of the Society for Adolescent Medicine. *J Adolesc Health*. 1995;16:476-479
  37. Wong JCH, Lewindon P, Mortimer R, Shepherd R. Bone mineral density in adolescent females with recently diagnosed anorexia nervosa. *Int J Eat Disord*. 2001;29:11-16
  38. Grinspoon S, Thomas E, Pitts S, et al. Prevalence and predictive factors for regional osteopenia in women with anorexia nervosa. *Ann Intern Med*. 2000;133:790-794
  39. Castro J, Lazaro L, Pons F, Halperin I, Toro J. Predictors of bone mineral density reduction in adolescents with anorexia nervosa. *J Am Acad Child Adolesc Psychiatry*. 2000;39:1365-1370
  40. Golden NH, Shenker IR. Amenorrhea in anorexia nervosa: etiology and implications. *Adolesc Med*. 1992;3:503-518
  41. Schebendach J, Nussbaum MP. Nutrition management in adolescents with eating disorders. *Adolesc Med*. 1992;3:541-558
  42. Rock CL, Curran-Celentano J. Nutritional disorder of anorexia nervosa: a review. *Int J Eat Disord*. 1994;15:187-203
  43. Rock CL, Curran-Celentano J. Nutritional management of eating disorders. *Psychiatry Clin North Am*. 1996;19:701-713
  44. Rome ES, Vazquez IM, Emans SJ. Nutritional problems in adolescence: anorexia nervosa/bulimia nervosa for young athletes. In: Walker WA, Watkins JB, eds. *Nutrition in Pediatrics: Basic Science and Clinical Applications*. 2nd ed. Hamilton, Ontario: BC Decker Inc; 1997:691-704
  45. Golden NH, Jacobson MS, Schebendach J, Solanto MV, Hertz SM, Shenker IR. Resumption of menses in anorexia nervosa. *Arch Pediatr Adolesc Med*. 1997;151:16-21
  46. Kreipe R, Uphoff M. Treatment and outcome of adolescents with anorexia nervosa. *Adolesc Med*. 1992;3:519-540
  47. Yager J. Psychosocial treatments for eating disorders. *Psychiatry*. 1994; 57:153-164
  48. Powers PS. Initial assessment and early treatment options for anorexia nervosa and bulimia nervosa. *Psychiatry Clin North Am*. 1996;19:639-655
  49. Robin AL, Gilroy M, Dennis AB. Treatment of eating disorders in children and adolescents. *Clin Psychol Rev*. 1998;18:421-446
  50. Russell GF, Szmulker GI, Dare C, Eisler I. An evaluation of family therapy in anorexia nervosa and bulimia nervosa. *Arch Gen Psychiatry*. 1987;44:1047-1056
  51. Eisler I, Dare C, Russell GF, Szmulker G, le Grange D, Dodge E. Family and individual therapy in anorexia nervosa: a 5-year follow-up. *Arch Gen Psychiatry*. 1997;54:1025-1030
  52. North C, Gowers S, Byram V. Family functioning in adolescent anorexia nervosa. *Br J Psychiatry*. 1995;167:673-678
  53. Geist R, Heinmaa M, Stephens D, Davis R, Katzman DK. Comparison of family therapy and family group psychoeducation in adolescents with anorexia nervosa. *Can J Psychiatry*. 2000;45:173-178
  54. Jimerson DC, Wolfe BE, Brotman AW, Metzger ED. Medications in the treatment of eating disorders. *Psychiatry Clin North Am*. 1996;19:739-754
  55. Walsh BT, Wilson GT, Loeb KL, et al. Medication and psychotherapy in the treatment of bulimia nervosa. *Am J Psychiatry*. 1997;154:523-531
  56. Strober M, Freeman R, De Antonio M, Lampert C, Diamond J. Does adjunctive fluoxetine influence the post-hospital course of restrictive-type anorexia nervosa? A 24-month prospective, longitudinal follow up and comparison with historical controls. *Psychopharmacol Bull*. 1997;33: 425-431
  57. Silber TJ, Delaney D, Samuels J. Anorexia nervosa. Hospitalization on adolescent medicine units and third-party payments. *J Adolesc Health*. 1989;10:122-125
  58. Silber TJ. Eating disorders and health insurance. *Arch Pediatr Adolesc Med*. 1994;148:785-788
  59. Sigman G. How has the care of eating disorder patients been altered and upset by payment and insurance issues? Let me count the ways [letter]. *J Adolesc Health*. 1996;19:317-318
  60. Baran SA, Weltzin TE, Kaye WH. Low discharge weight and outcome in anorexia nervosa. *Am J Psychiatry*. 1995;152:1070-1072
  61. Solomon SM, Kirby DF. The refeeding syndrome: a review. *JPEN J Parenter Enteral Nutr*. 1990;14:900-97
  62. Birmingham CL, Alothman AF, Goldner EM. Anorexia nervosa: refeeding and hypophosphatemia. *Int J Eat Disord*. 1996;20:211-213
  63. Kohn MR, Golden NH, Shenker IR. Cardiac arrest and delirium: presentations of the refeeding syndrome in severely malnourished adolescents with anorexia nervosa. *J Adolesc Health*. 1998;22:239-243
  64. Fisher M, Simpser E, Schneider M. Hypophosphatemia secondary to oral refeeding in anorexia nervosa. *Int J Eat Disord*. 2000;28:181-187
  65. Kaye WH, Kaplan AS, Zucker ML. Treating eating-disorder patients in a managed care environment. Contemporary American issues and Canadian response. *Psychiatry Clin North Am*. 1996;19:793-810
  66. Kaplan AS, Olmstead MP. Partial hospitalization. In: Garner DM, Garfinkel PE, eds. *Handbook of Treatment for Eating Disorders*. 2nd ed. New York, NY: Guilford Press; 1997:354-360
  67. Kaplan AS, Olmstead MP, Mollen L. Day treatment of eating disorders. In: Jimerson D, Kaye WH, eds. *Bailliere's Clinical Psychiatry, Eating Disorders*. Philadelphia, PA: Bailliere Tindall; 1997:275-289
  68. Howard WT, Evans KK, Quintero-Howard CV, Bowers WA, Andersen AE. Predictors of success or failure of transition to day hospital treatment for inpatients with anorexia nervosa. *Am J Psychiatry*. 1999;156: 1697-1702
  69. Killen JD, Taylor CB, Hammer LD, et al. An attempt to modify unhealthful eating attitudes and weight regulation practices of young adolescent girls. *Int J Eat Disord*. 1993;13:369-384
  70. Neumark-Sztainer D, Butler R, Palti H. Eating disturbances among adolescent girls: evaluation of a school-based primary prevention program. *J Nutr Educ*. 1995;27:24-31
  71. Neumark-Sztainer D. School-based programs for preventing eating disturbances. *J Sch Health*. 1996;66:64-71
  72. Carter JC, Stewart DA, Dunn VJ, Fairburn CG. Primary prevention of eating disorders: might it do more harm than good? *Int J Eat Disord*. 1997;22:167-172
  73. Martz DM, Bazzini DG. Eating disorder prevention programs may be failing: evaluation of 2 one-shot programs. *J Coll Stud Dev*. 1999;40: 32-42
  74. Hartley P. Does health education promote eating disorders? *Eur Eat Disord Rev*. 1996;4:3-11
  75. Story M, Neumark-Sztainer D. Promoting healthy eating and physical activity in adolescents. *Adolesc Med*. 1999;10:109-123
  76. Becker AE, Hamburg P. Culture, the media, and eating disorders. *Harv Rev Psychiatry*. 1996;4:163-167
  77. Andersen AE. Third-party payment for inpatient treatment of anorexia nervosa. *Eat Disord Rev*. 1997;7:1, 4-5
  78. Stein MK. House bill aims to raise eating disorder awareness. *Eat Disord Rev*. 2000;11:1-2

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