

Early Identification of Eating Disorders in Primary Care Pediatrics

Diane DerMarderosian, MD, FAAP, and Allison Hall, LICSW

Food, nutrition and exercise are integral facets of our culture. At one point in their lives, most Americans have started a diet, attempted to change eating habits, gained or lost a few pounds and/or implemented a new exercise regimen in response to either their own or others' concerns about weight. These behaviors are often medically beneficial interventions that lead to a healthier and improved sense of self. For some individuals, however, thoughts and behaviors related to food, health and body become distorted, destructive and potentially fatal. At times, the margins between healthy and unhealthy cognitions and behaviors can be difficult to distinguish.

Identifying individuals at risk for developing an eating disorder can be challenging, however research highlights characteristics placing those at higher risk. The pathogenesis of eating disorders is multifactorial, with individual, family, cultural and genetic/biochemical conditions all playing a role. Evidence demonstrates that several psychiatric issues (including depression, obsessive-compulsive disorder and addictions) are more prevalent in patients with eating disorders.¹ Other risk factors include a family history of an eating disorder and a history of abuse. Of note, dieting has been found to be a proximal risk factor for developing disordered eating and eating disorders.² It is felt that some individuals are genetically/biochemically predisposed, and when combined with other factors such as cultural, psychological, environmental and family related issues, an eating disorder may result. The exact mechanism for the way in which genetic factors influence risk is not completely understood. However, there is evidence that the genetic effects may be "activated" by puberty.³ Neuroendocrine abnormalities are also being explored, including the role of Leptin, a hormone which is produced in adipose tissue.⁴

Research has revealed a steady increase in the rates of eating disorders in children and adolescents since the 1950s.⁵ Of note, studies demonstrate that more than 50% of children and adolescents with

Eating disorders do not meet **Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)** criteria for Anorexia nervosa or Bulimia nervosa. Although a revision of diagnostic criteria for DSM-V has been proposed with a specific focus on younger patients,⁶ at current these patients are often referred to as having partial syndromes or **Eating Disorder, Not Otherwise Specified (EDNOS)**.

Eating disorders can affect every organ system. Children and adolescents are at particular risk due to their active phase of growth and development.

There has been increasing prevalence in younger age groups, with males representing much higher numbers (about half) in patients 13 years and younger.¹ These younger patients can present diagnostic challenges as they may not report body dissatisfaction. In addition, nutritional compromise may manifest itself as growth failure or minimal forward movement during a period of expected growth, rather than significant weight loss. Female patients may not have experienced menarche at onset of illness,⁷ making the cessation of menses an irrelevant criterion.

Eating disorders are prevalent in modern society, with serious, potentially fatal, consequences.¹ In fact, Anorexia nervosa is associated with the highest mortality rate of any psychiatric disorder in the DSM-IV.¹ Some potentially life-threatening medical sequelae are difficult to detect with testing. Many patients who die from medical issues related to their eating disorders can have normal labs and studies. Of note, suicide attempts and

completed suicides are relatively common, especially for patients with bingeing and/or purging behaviors. A delay in appropriate treatment is associated with medical, psychological and social complications, which may not be reversible.

Because early diagnosis and multidisciplinary treatment results in better outcomes, it is crucial to recognize that these behaviors and patterns require treatment even if an individual denies them or minimizes their significance. Therefore routine screening by **Primary Medical Doctors (PMDs)** is essential and should be performed in the context of all pre-teen and adolescent annual health supervision and sports clearance visits. It is important for medical providers to remain vigilant to signs and symptoms indicative of disordered eating such as primary or secondary amenorrhea. Routine monitoring of height, weight and BMI longitudinally on growth charts helps identify concerning trends, even if weight loss is absent.¹ The Bright Futures guidelines and/or the SCOFF questionnaire can provide a helpful framework for this screening.⁸ If concerns arise in any of these areas, additional assessment and close monitoring are indicated.

Further assessment can occur in the primary care setting, or by referring to appropriate medical subspecialists and mental health providers. This assessment includes establishing the specific psychiatric diagnosis and co-morbidity, evaluating medical and nutritional status including level of risk. Performing an initial psychosocial evaluation including thoughts, feelings and functioning is essential.¹ A safety assessment should also be a part of this evaluation. Obtaining a collateral history from parents or other support people is imperative because individuals with eating disorders often have perceptions of health, body, and food that are not reality based. A comprehensive medical and nutritional history, physical exam, and selected laboratory tests are performed to clarify the diagnosis, determine severity, and guide treatment.

A comprehensive history includes questions about highest and lowest weight, desired weight, perceived healthy weight, exercise history including how patient feels on days she/he can't exer-

cise. In addition, a diet history including intake, portion sizes, food restrictions, picky eating, ritualized eating habits, calorie/fat/carbohydrate counting, and amounts of non-caloric fluid intake is es-

sential. Exploring bingeing/purging history (including vomiting, laxative use, diuretic use, ipecac use, over-exercise), anabolic steroid use, stimulant or other drug use, menstrual history, elimination history, and physical/sexual abuse history is necessary. A family history should include asking about obesity, eating disorders, depression, other mental illness, and substance abuse.¹

A complete **review of symptoms (ROS)** is obtained to determine the presence of symptoms associated with malnutrition, vomiting or other medical causes of weight loss. Physical exam findings sometimes found in patients with eating disorders are listed in Table 1. The differential diagnosis (Table 2) is extensive and should be explored thoroughly to diagnose and treat the patient appropriately. This includes consideration for a co-morbid medical and/or psychiatric diagnosis. Key medical populations to consider are those with Type 1 Diabetes mellitus, thyroid disease and Inflammatory Bowel Disease.

Eating disorders can affect every organ system. Children and adolescents are at particular risk due to their active phase of growth and development. Medical complications associated with eating disorders can be caused by malnutrition, bingeing/purging behaviors, or refeeding. A full screening should be performed with the understanding that normal laboratory values don't exclude medical instability or serious illness. Initial assessment includes a CBC, Chem 10, LFTs, UA, Thyroid function tests, ESR, total IgA and TTG. An EKG is completed. In patients with amenorrhea, a pregnancy test, LH, FSH, estradiol, and prolactin should be performed. Other testing including radiological tests (CT, MRI, upper/lower GI system studies) should be performed if clinically indicated. In boys, a free and total testosterone is done. A bone density study is recommended in girls with amenorrhea for more than six months or in boys with severe malnutrition, acute weight loss or low testosterone. Low levels can be associated with nutritional compromise.

If medical complications are identified, they should be addressed immediately. The majority of medical complications resolve after judicious nutritional restoration, resolution of unhealthy eating behaviors and recovery from the eating

Table 1. Physical Exam Findings in Patients with Eating Disorders

- Carotenemia
- Edema
- Hypothermia
- Cold extremities/acrocyanosis
- Russell sign (callous on knuckles from self-induced emesis)
- Abrasions/bruising on spine from excessive exercise
- Thinning hair
- Dry skin
- Lanugo
- Atrophic breasts/atrophic vaginitis
- Sialoadenitis
- Angular stomatitis
- Dental erosion
- Palatal scratches
- Flat/anxious affect
- Delayed or interrupted puberty
- Sinus Bradycardia
- Other Cardiac Arrhythmias
- Cardiac murmur
- Orthostatic vital sign changes
- Low blood pressure

Source: Physical Examination Findings Sometimes Seen in Children and Adolescents With Eating Disorders. (table) Rosen D. Identification and Management of Eating Disorders in Children and Adolescents. *Pediatrics*. 2010;126(6):1240-53.

Table 2. Differential Diagnosis of Eating Disorders

- Endocrine**
 - Hypothyroidism, Diabetes Mellitus, other endocrine disorders (hypopituitarism, Addison disease)
- Gastrointestinal**
 - Inflammatory Bowel Disease
 - Celiac Disease
- Infectious Disease**
 - Chronic Infections (HIV, tuberculosis, others)
- Other Psychiatric Disorders**
 - Obsessive Compulsive Disorder
 - Anxiety Disorders
 - Depression
 - Substance Abuse
- Other Disorders**
 - CNS Lesions (including malignancies)
 - Other Cancers
 - SMA Syndrome (Superior Mesenteric Artery Syndrome)

Source: Differential Diagnosis of Eating Disorders (table). Rosen D. Identification and Management of Eating Disorders in Children and Adolescents. *Pediatrics*. 2010;126(6):1240-53.

disorder. However, potentially irreversible medical effects include: growth retardation, loss of dental enamel in the context of chronic vomiting, structural brain changes, pubertal delay/arrest, and impaired acquisition of peak bone mass and subsequent increase in fracture risk.⁹

As part of the initial evaluation, it is important to determine the most appropriate level of care. In order for psychological interventions to be effective, medical stabilization and nutritional rehabilitation are imperative. If significant medical or nutritional compromise exist, an inpatient medical stay may be necessary. The Society for Adolescent Medicine recommendations for inpatient admission which include one or more of the following: severe malnutrition (weight < 75% IBW), dehydration, electrolyte disturbance, cardiac dysrhythmia, physiological instability (bradycardia with HR < 50 daytime and < 45 at night), hypotension (80/50 mm Hg), orthostatic changes in pulse, arrested growth and development, failure of outpatient treatment, uncontrollable bingeing and purging, acute medical complications of malnutrition, acute psychiatric emergencies, or co-morbid diagnoses that interfere with treatment.¹⁰

If an inpatient medical admission is required for stabilization, judicious refeeding is essential. This includes slow, progressive advancement of balanced nutrition including appropriate percentages of carbohydrate, protein and fat. Patients require close monitoring for evidence of refeeding syndrome, including frequent laboratory testing, as the refeeding process can precipitate significant abnormalities which require immediate treatment.¹

While most children and adolescents with eating disorders are treated in the outpatient setting, additional levels of care include medical inpatient, eating disorder inpatient, residential, partial hospitalization/day treatment and intensive outpatient treatment. Resources vary from area to area. Regardless of the level of care, early, multi-disciplinary treatment including nutritional, medical and mental health professionals is a cornerstone of successful treatment. Although individual and family based therapy can both positively impact short term outcomes, family based treatment has been found to be more effective in supporting longer term remission.¹¹

The prognosis of eating disorders in adolescents varies greatly in the literature. However, adolescent outcomes are significantly better than those reported in adults. While the illness course is often protracted, a majority of these patients recover medically and behaviorally from their eating disorders. Moreover, mortality rates are lower in adolescents than those in adults.¹²

Barriers to appropriate treatment which include inadequate insurance reimbursement and insufficient access to mental health care underscore the need for education and advocacy on the local and national level. Through advocacy for health care reform and otherwise, barriers to appropriate treatment such as inadequate insurance reimbursement and access to mental health care can be eliminated. Primary care providers play an invaluable role in preventing, diagnosing and treating eating disorders. Having a high index of suspicion, being familiar with the signs and symptoms of eating disorders and being knowledgeable of available treatments are critical for early diagnosis which leads to improved outcomes and is potentially life-saving. Moreover, primary care providers, based on their longstanding relationships with families, can provide vital support as these illnesses have a significant impact on all family members.

REFERENCES

1. Rosen D. Identification and management of eating disorders in children and adolescents. *Pediatrics*. 2010;126(6):1240-53.
2. Striegel-Moore RH, Bulik CM. Risk factors for eating disorders. *Am Psychol*. 2007;62(3):181-98.
3. Mazzeo SE, Bullik CM. Environmental and genetic risk factors for eating disorders: what the clinician needs to know. *Child Adolescent Psychiatr Clin N Am*. 2009;18(1):67-82.
4. Hebebrand J, Muller TD, Holtkamp K, Herpertz-Dahlmann B. The role of leptin in anorexia nervosa: clinical implications. *Mol Psychiatry*. 2007;12(1):23-35.
5. Whitaker, AH. An epidemiological study of anorectic and bulimic symptoms in adolescent girls: implications for pediatricians. *Pediatr Ann*. 1992;21(11):752-59.
6. Bravender T, Bryant-Waugh R, Herzog D, et al. Workgroup for Classification of Eating Disorders in Children and Adolescents. Classification of child and adolescent eating disturbances. *Int J Eat Disord*. 2007;40(suppl):S117-S122.
7. Peebles R, Wilson JL, Lock JD. How do children with eating disorders differ from adolescents with eating disorders at initial evaluation. *J Adolesc Health*. 2006;39(6):800-5.

8. Morgan JF, Reid F. The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *BMJ*. 1999;319(7223):1467-68.
9. Katzman DK. Medical complications in adolescents with anorexia nervosa: a review of the literature. *Int J Eat Disord*. 2003;37(suppl):S52-S59.
10. Golden NH, Katzman DK, Kreipe RE et al. Eating disorders in adolescents: position paper of the Society for Adolescent Medicine. *J Adolesc Health*. 2003;33(6):496-503 Top of Form.
11. Lock J, Le Grange D, Agras WS, Moyer A, Bryson SW, Jo B. Randomized clinical trial comparing family-based treatment with adolescent-focused individual therapy for adolescents with anorexia nervosa. *Arch Gen Psychiatry*. 2010 Oct;67(10):1025-32.
12. Steinhausen HC. Outcome of eating disorders. *Child Adolesc Psychiatr Clin N Am*. 2009; 18(1):225-42.

Diane DerMarderosian, MD, FAAP, is Assistant Professor (Clinical) at the Warren Alpert Medical School of Brown University, and Medical Director of the Hasbro Eating Disorders Program. She is an Advisory Board Member of the Multi-Service Eating Disorders Association, and a member of the Academy of Eating Disorders.

Allison Hall, LICSW, is a Clinical Social Worker for the Eating Disorder Program at Hasbro Children's Hospital.

Disclosure of Financial Interests

The authors and/or their spouses/significant others have no financial interests to disclose.

CORRESPONDENCE

Diane DerMarderosian, MD, FAAP
Hasbro Children's Hospital
593 Eddy Street, Potter Basement
Providence, RI 02903
phone: (401)444-8638
fax: (401)444-2085
e-mail: DDerMarderosian@lifespan.org