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POSITION PAPER

Eating Disorders in Adolescents:

Position Paper of the Society For Adolescent Medicine

Eating disorders are complex illnesses that are affecting adolescents with increasing frequency [1]. They rank as the third most common chronic illness in adolescent females, with an incidence of up to 5% [1–3]. Three major subgroups are recognized: a restrictive form in which food intake is severely limited (anorexia nervosa); a bulimic form in which binge-eating episodes are followed by attempts to minimize the effects of overeating via vomiting, catharsis, exercise, or fasting (bulimia nervosa); and a third group in which all the criteria for anorexia nervosa or bulimia nervosa are not met. The latter group, often called "eating disorder not otherwise specified" or EDNOS, constitutes the majority of patients seen in referral centers treating adolescents [4]. Eating disorders are associated with serious biological, psychological, and sociological morbidity and significant mortality. Unique features of adolescents and the developmental process of adolescence are critical considerations in determining the diagnosis, treatment, and outcome of eating disorders in this age group. This position statement represents a consensus from Adolescent Medicine specialists from the United States, Canada, United Kingdom, and Australia regarding the diagnosis and management of eating disorders in adolescents. In keeping with the practice guidelines of the American Psychiatric Association [5] and the American Academy of Pediatrics [6], this statement integrates evidence-based medicine, where available.

Diagnosis

Diagnostic criteria for eating disorders such as those found in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) [7] are not entirely applicable to adolescents [8]. The wide variability in the rate, timing and magnitude of both height and weight gain during normal puberty, the absence of menstrual periods in early puberty along with the unpredictability of menses soon after menarche, limit the application of those formal diagnostic criteria to adolescents. Many adolescents, because of their stage of cognitive development, lack the psychological capacity to express abstract concepts such as self-awareness, motivation to lose weight, or feelings of depression. In addition, clinical features such as pubertal delay, growth retardation, or the impairment of bone mineral acquisition may occur at subclinical levels of eating disorders [5,9–14]. Younger patients may present with significant difficulties related to eating, body image, and weight control habits without necessarily meeting formal criteria for an eating disorder [4,8,14–18]. The American Academy of Pediatrics has identified conditions along the spectrum of disordered eating that still deserve attention in children and adolescents [6]. It is essential to diagnose eating disorders in the context of the multiple and varied aspects of normal pubertal growth, adolescent development, and the eventual attainment of a healthy adulthood, rather than merely applying formalized criteria.

Medical Complications

No organ system is spared the effects of eating disorders [1,19–22]. The physical signs and symptoms occurring in adolescents with an eating disorder are primarily related to weight-control behaviors and the effects of malnutrition. Most of the medical complications in adolescents with an eating disorder improve with nutritional rehabilitation and recovery from the eating disorder, but some are potentially irreversible. Potentially irreversible medical complications in adolescents include: growth retardation if the disorder occurs before closure of the epiphyses [10,11,23–26]; loss of dental enamel with chronic

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vomiting [27]; structural brain changes noted on cerebral tomography, magnetic resonance imaging and single-photon computerized tomography studies [28,29]; pubertal delay or arrest [30,31]; and impaired acquisition of peak bone mass [9,13,32–35], predisposing to osteoporosis and increased fracture risk. These features underscore the importance of immediate medical management, ongoing monitoring and aggressive treatment by physicians who understand adolescent growth and development.

Nutritional Disturbances

Nutritional disturbances are a hallmark of eating disorders and are related to the severity, duration, and timing of dysfunctional dietary habits. Significant dietary deficiencies of calcium, vitamin D, folate, vitamin B12 and other minerals are found [18,36,37]. Inadequate intake of energy (calories), protein, calcium and vitamin D are especially important to identify, since these elements are crucial to growth and attainment of peak bone mass [38]. Moreover, there is evidence that adolescents with eating disorders may be losing critical tissue components (such as muscle mass, body fat, and bone minerals [9,18,39,40]) during a phase of growth when dramatic increases in these elements should be occurring. Detailed assessment of the young person's nutritional status forms the basis of ongoing management of nutritional disturbances [41].

Psychosocial And Mental Health Disturbances

Eating disorders that occur during adolescence interfere with adjustment to pubertal development [42] and mastery of developmental tasks necessary to becoming a healthy, functioning adult. Social isolation and family conflicts arise at a time when families and peers are needed to support development [43,44]. Issues related to self-concept, self-esteem, autonomy, and capacity for intimacy should be addressed in a developmentally appropriate and sensitive way [45,46]. Given that adolescents with eating disorders usually live at home and interact with their families on a daily basis, the role of the family should be explored during both evaluation and treatment [47,48], with particular attention given to the issues of control and responsibility for the adolescent within the family context.

Studies emphasize a frequent association between eating disorders and other psychiatric conditions. Important findings include a lifetime incidence of affective disorders (especially depression) of 50%–80% for both anorexia nervosa and bulimia nervosa; a 30%–65% lifetime incidence of anxiety disorders (especially obsessive-compulsive disorder and social phobia) for anorexia nervosa and bulimia nervosa; a 12%–21% rate of substance abuse for anorexia nervosa; and a 9%–55% rate for bulimia nervosa. Estimates of comorbid personality disorders among patients with eating disorders range form 20% to 80% [49,50]. All patients should therefore be carefully evaluated for comorbid psychiatric conditions.

Table 1. Indications for Hospitalization in an Adolescent With an Eating Disorder

One or more of the following justify hospitalization:

1. Severe malnutrition (weight ≤75% average body weight for age, sex, and height)
2. Dehydration
3. Electrolyte disturbances (hypokalemia, hyponatremia, hypophosphatemia)
4. Cardiac dysrhythmia
5. Physiological instability
   - Severe bradycardia (heart rate < 50 beats/minute daytime; <45 beats/minute at night)
   - Hypotension (< 80/50 mm Hg)
   - Hypothermia (body temperature < 96° F)
   - Orthostatic changes in pulse (> 20 beats per minute) or blood pressure (>10 mm Hg)
6. Arrested growth and development
7. Failure of outpatient treatment
8. Acute food refusal
9. Uncontrollable binging and purging
10. Acute medical complications of malnutrition (e.g., syncope, seizures, cardiac failure, pancreatitis, etc.)
11. Acute psychiatric emergencies (e.g., suicidal ideation, acute psychosis)
12. Comorbid diagnosis that interferes with the treatment of the eating disorder (e.g., severe depression, obsessive compulsive disorder, severe family dysfunction)

Treatment Guidelines

Eating disorders are associated with complex biopsychosocial issues that, under ideal circumstances, are best addressed by an interdisciplinary team of medical, nutritional, mental health and nursing professionals who are experienced in the evaluation and treatment of eating disorders and who have expertise in adolescent health [1].

Various levels of care should be available to adolescents with eating disorders (outpatient, intensive outpatient, partial hospitalization, inpatient hospitalization or residential treatment centers) [5,51]. Factors that justify inpatient treatment are listed in Table 1 [1,5,6]. These criteria, initially published by

the Society for Adolescent Medicine in 1995 [1], are in agreement with the recent revision of the American Psychiatric Association practice guidelines for the treatment of patients with eating disorders [5], the recently published American Academy of Pediatrics policy statement on identifying and treating eating disorders [6], and the American Dietetic Association position on nutrition intervention in the treatment of eating disorders [52]. In children and adolescents, physiologic or physical evidence of medical compromise can be found even in the absence of significant weight loss. Not infrequently, inpatient treatment becomes necessary because of failure of outpatient treatment. In severely malnourished patients, the risk of the "refeeding syndrome" should be avoided through gradual increase of caloric intake and close monitoring of weight, vital signs, fluid shifts and serum electrolytes (including phosphorus, potassium, magnesium and glucose)[53–57]. Parenteral feeding is very rarely necessary. Short-term nasogastric feeding may be necessary in those hospitalized with severe malnutrition. There is no evidence to support the long- term role of nasogastric tube feeding.

Optimal duration of hospitalization has not been established, although there are studies that have shown a decreased risk of relapse in patients who are discharged closer to ideal body weight compared to patients discharged at very low body weight [58]. The overall goals of treatment are the same in a medical or psychiatric inpatient unit, a day program, or outpatient setting: to help the adolescent achieve and maintain both physical and psychological health.

The expertise of the treatment team who work specifically with adolescents and their families is as important as the setting in which they work. Traditional settings, such as a general psychiatric ward, may be less appropriate than an adolescent medical unit, if the latter is available [6,45,59–61]. Some evidence suggests a good outcome for patients treated on adolescent medicine units [60–62]. On a specialized psychiatric inpatient eating disorders unit for adolescents, Strober et al showed that 76% of patients met criteria for full recovery. This prospective study had a 10–15 year follow-up period and also showed that time to recovery was protracted, ranging from 57–79 months [63]. Smooth transition from inpatient to outpatient care can be facilitated by an interdisciplinary team that provides continuity of care in a comprehensive, coordinated, developmentally-oriented manner. Given the rate of relapse, recurrence, crossover (change from anorexia nervosa to bulimia nervosa or *vice versa*) and comorbidity, treatment should be of sufficient frequency, intensity and duration to provide effective intervention.

Mental health evaluation and treatment is crucial for all adolescents with eating disorders. The treatment may need to continue for several years [63]. To date, there is a paucity of research on the treatment of adolescents with anorexia nervosa. Evidence-based research supports family-based treatment for adolescents [48,64–66] and a manual has been published describing one of the treatment methods.[67]. Cognitive behavioral therapy is used in adults with anorexia nervosa but has not been evaluated in adolescents. There is some recent evidence to suggest that although antidepressants are of no clinical value in promoting weight gain, fluoxetine may be helpful in reducing the risk of relapse of symptoms in older adolescents with anorexia nervosa whose weight has been restored [68]. The most effective treatment for older adolescents with bulimia nervosa is cognitive behavioral therapy that focuses on changing the specific eating attitudes and behaviors that maintain the eating disorder [69,70]. Antidepressants have been shown to reduce binge eating and purging by 50% to 75% [5,71,72]. In addition, interpersonal psychotherapy [73] and dialectical behavior therapy [70] have also demonstrated some beneficial effect in older adolescents with bulimia nervosa. Medications may also be helpful in older adolescents with a co-morbid depression or obsessive or compulsive symptoms.

The optimum treatment of the osteopenia associated with anorexia nervosa remains unresolved. Current treatment recommendations include weight restoration with the initiation or resumption of menses, calcium (1300 – 1500 mg/day) [74] and vitamin D (400 IU/day) supplementation and carefully monitored weight-bearing exercise [75]. While hormone replacement therapy is frequently prescribed to treat osteopenia in anorexia nervosa [76], there are no documented prospective studies that have demonstrated the efficacy of hormone replacement therapy beyond standard treatment [33,77,78]. Hormone replacement therapy can cause growth arrest in the adolescent who has not yet completed growth [79]. The monthly hormone-induced withdrawal bleeding can also be misinterpreted by the adolescent as return of normal menstrual function and adequate weight restoration, and therefore interfere with the treatment process.

Barriers to Care

Interdisciplinary treatment of established eating disorders can be time-consuming, relatively prolonged and extremely costly. Lack of care or insufficient treatment can result in chronicity with major medical complications, social or psychiatric morbidity and even death. Barriers to care include lack of insurance, coverage with inadequate scope of benefits, low reimbursement rates, and limited access to health care specialists and appropriate interdisciplinary teams with expertise in eating disorders, which may be owing either to geography or insurance limitations. In addition to these extrinsic barriers, patients and families often demonstrate ambivalence or resistance to the diagnosis or treatment, which threatens active engagement in the recovery process.

In most insurance plans the scope of benefits for treatment of eating disorders is currently insufficient. The labeling of the disorder as a purely psychiatric illness by some insurance companies usually limits the ability of health care providers to meet the medical, nutritional and psychological needs of patients in either the medical or psychiatric setting. In addition, some insurance companies limit the number of hospitalizations permitted per year, restrict the number of outpatient visits per year, establish lifetime caps on coverage, and preclude payment of some medical practitioners. Many plans limit the number of nutrition visits to one per year and the number of mental health visits to 6 or fewer per year. In addition, some treatment institutions have age limit policies that negatively affect treatment and limit access to care for older adolescents who may not satisfy the age limits at the institution able to provide the most appropriate care. The low reimbursement rates for psychosocial services that are common among insurers result in fewer qualified professionals being available who are willing to care for teenagers and young adults with eating disorders. Lack of compensation for care that is provided by hospitals, physicians and other professionals threatens the survival of existing programs. Insurance reimbursement for care provided by multiple disciplines is an essential element of appropriate treatment but is far from the norm. Comprehensive insurance coverage is important for adolescents suffering from the full spectrum of disorders, ranging from disordered eating to those with severe and chronic eating disorders. Treatment should be dictated by generally accepted guidelines [5,6] and should be based on clinical severity of the condition.

Many older adolescents who have had health insurance, no longer have it as young adults and withdraw from treatment owing to loss of coverage. Some insurers have limited or even reduced the age up to which students can continue to be covered as dependants under their parents' insurance. Some older adolescents who have lost insurance are unable to obtain new coverage because of limited eligibility based on the preexisting condition exclusions that are imposed by some insurance companies [80]. The withdrawal of treatment owing to loss of insurance often occurs at an age when unemployment or temporary employment, without benefits, is the norm; and individuals who are ages 18 through 24 years lack insurance at a higher rate than any other age group [81].

The Internet and "Pro-ana sites"

Approximately 49% of teenagers worldwide, have access to the Internet [82]. Therefore, many teenagers are able to access health information and other resources on the Internet. In addition to accessing reputable sites, adolescents also have access to websites that provide young people with harmful content. Such websites include pro-anorexia ("pro-ana") and pro-bulimia ("pro-mia") websites which are devoted to the maintenance, promotion, and support of an eating disorder. The proliferation of "pro-ana" and "pro-mia" websites is of great concern. These websites provide young people with ideas about how best to starve themselves or purge and how to avoid the detection of these behaviors by clinicians. These websites often promote anorexia nervosa and bulimia nervosa as a lifestyle choice and not as a disease. The number of such sites far exceeds that of professional or recovery sites [83]. Professionals should be aware of the existence of these sites and their content. Patients who wish to access medical information from the Internet, should be encouraged to seek out the websites of more reputable professional organizations.

Future Research

Several issues deserve further study. Examples include: (a) identification of psychosocial, psychiatric and biological risk factors that are associated with eating disorders in young people; (b) the prevention of eating disorders for adolescents who are at high risk; (c) creation and validation of brief, developmen-

tally-appropriate screening tools for use by primary care providers; (d) new therapeutic modalities for the treatment of osteopenia and osteoporosis in anorexia nervosa (type and amount of exercise, efficacy of calcium/Vitamin D supplementation, DHEA, IGF-1 and the bisphosphonates); (e) comparison of outcome of different treatment approaches, including early, interdisciplinary outpatient models; (f) improved delineation of diagnostic subgroups with respect to prognosis and treatment, and in particular, further clarification of the EDNOS subgroup; and (g) efficacy of psychopharmacologic agents. These studies will require collaboration of multiple disciplines from numerous sites in multicenter protocols. Publication of these studies in peer-reviewed medical journals and discussion at conferences are encouraged as a means of promoting and disseminating results of such studies and collaboration.

Position:

1. **The diagnosis of an eating disorder should be considered when an adolescent engages in potentially unhealthy weight-control practices, demonstrates obsessive thinking about food, weight, shape or exercise, or fails to attain or maintain a healthy weight, height, body composition or stage of sexual maturation for gender and age. An eating disorder can still be present in the absence of established diagnostic criteria.**
2. **Because of the potentially irreversible effects of an eating disorder on physical, psychological and emotional growth and development in adolescents, the high mortality and the evidence suggesting improved outcome with early treatment, the threshold for intervention in adolescents should be lower than in adults.**
3. **The evaluation and ongoing management of nutritional disturbances in adolescents with eating disorders should take into account the nutritional requirements of adolescents in the context of their age, pubertal development, and physical activity level.**
4. **Mental health intervention for adolescents with eating disorders should address the psychopathologic characteristics of eating disorders, the specific psychosocial tasks that are central to adolescence, and possible comorbid psychiatric conditions. Family-based treatment should be considered an important part of treatment for most adolescents with eating disorders.**
5. **The assessment and treatment of adolescents with an eating disorder should be interdisciplinary and, under ideal circumstances, is best accomplished by a team consisting of medical, nursing, nutritional and mental health disciplines. Treatment should be provided by health care providers who have expertise in managing the complexities of adolescent eating disorders. In addition, treatment should be provided by health care providers who have expertise in managing adolescents with eating disorders and who are knowledgeable about normal adolescent physical and psychological growth and development. Hospitalization of an adolescent with an eating disorder is necessary in the presence of severe malnutrition, physiologic instability, severe mental health disturbance or failure of outpatient treatment. Ongoing treatment should be delivered with appropriate frequency, intensity and duration until complete resolution.**
6. **Adolescents with eating disorders should not be denied access to care because of absent or inadequate health care coverage. Coverage should provide reimbursement for inpatient, partial hospitalization and outpatient interdisciplinary treatment that is dictated by the severity of the clinical situation and takes into account the developmental needs of the patient, should encompass the comprehensive range of benefits and providers needed, and should provide reimbursement at adequate levels. Adolescent health care providers should work with insurance companies to define appropriate strategies for the management of adolescents with eating disorders.**
7. **The Society for Adolescent Medicine does not support the content of pro-anorexia and pro-bulimia websites and discourages the creation and dissemination of these controversial and potentially dangerous sites.**
8. **Further research is essential to address unanswered questions in the field of adolescent eating disorders. Research priorities include prevention and early intervention, further exploration of the pathogenesis of early onset eating disorders, improvement of the current diagnostic classification system to consider the unique spectrum of early-onset eating disorders and the development of effective treatments for adolescent eating disorders. We also call upon private and public agencies to provide necessary funding to allow for advancement of knowledge in the prevention, etiology, and treatment of eating disorders in adolescents.**

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References

1. Fisher M, Golden NH, Katzman DK, et al. Eating disorders in adolescents: A background paper. J Adolesc Health 1995;16: 420–37.
2. Croll J, Neumark-Sztainer D, Story M, Ireland M. Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: Relationship to gender and ethnicity. J Adolesc Health 2002;31:166–75.
3. Leichner P. Disordered eating attitudes among Canadian teenagers. CMAJ 2002;166:707–8.
4. Bunnell DW, Shenker IR, Nussbaum MP, et al. Subclinical versus formal eating disorders: Differentiating psychological features. Int J Eat Disord 1990;9:357–62.
5. Yager J, Anderson A, Devlin M. American Psychiatric Association Practice Guideline for the Treatment of Patients with Eating Disorders. Am J Psychiatry 2000;157(Suppl):1–39.
6. American Academy of Pediatrics. Policy Statement. Identifying and treating eating disorders. Pediatrics 2003;111:204–11.
7. American Psychiatric Association. Diagnostic and Statistical Manual for Mental Disorders, 4th edition. Washington, DC: APA Press, 1994.
8. Nicholls D, Chater R, Lask B. Children into DSM don't go: A comparison of classification systems for eating disorders in childhood and early adolescence. Int J Eat Disord 2000;28:317–24.
9. Bachrach LK, Guido D, Katzman D, et al. Decreased bone density in adolescent girls with anorexia nervosa. Pediatrics 1990;86:440–7.
10. Nussbaum M, Baird D, Sonnenblick M, et al. Short stature in anorexia nervosa patients. J Adolesc Health Care 1985;6:453–5.
11. Root AW, Powers PS. Anorexia nervosa presenting as growth retardation in adolescents. J Adolesc Health Care 1983;4:25–30.
12. Katzman DK, Zipursky RB. Adolescents with anorexia nervosa: The impact of the disorder on bones and brains. Ann N Y Acad Sci 1997;817:127–37.
13. Castro J, Lazaro L, Pons F, et al. Predictors of bone mineral density reduction in adolescents with anorexia nervosa. J Am Acad Child Adolesc Psychiatry 2000;39:1365–70.
14. Nicolls D, Stanhope R. Medical complications of anorexia nervosa in children and young adolescents. Eur Eat Disord Rev 2000;8:170–80.
15. Casper RC, Offer D. Weight and dieting concerns in adolescents, fashion or symptom? Pediatrics 1990;86:384–90.
16. Maloney MJ, McGuire J, Daniels SR, Specker B. Dieting behavior and eating attitudes in children. Pediatrics 1989;84: 482–9.
17. Moore DC. Body image and eating behavior in adolescent girls. Am J Dis Child 1988;142:1114–8.
18. Schebendach J, Nussbaum MP. Nutrition management in adolescents with eating disorders. Adolesc Med 1992;3:541–58.
19. Becker AE, Grinspoon SK, Klibanski A, Herzog DB. Eating disorders. N Engl J Med 1999;340:1092–8.
20. Mehler PS, Gray MC, Schulte M. Medical complications of anorexia nervosa. J Womens Health 1997;6:533–41.
21. Palla B, Litt IF. Medical complications of eating disorders in adolescents. Pediatrics 1988;81:613–23.
22. Rome ES, Ammerman S, Rosen DS, et al. Children and adolescents with eating disorders: The state of the art. Pediatrics 2003;111:e98–108.
23. Danziger Y, Mukamel M, Zeharia A, et al. Stunting of growth in anorexia nervosa during the prepubertal and pubertal period. Isr J Med Sci 1994;30:581–4.
24. Golden NH, Kreitzer P, Jacobson MS, et al. Disturbances in growth hormone secretion and action in adolescents with anorexia nervosa. J Pediatr 1994;125:655–60.
25. Lantzouni E, Frank GR, Golden NH, Shenker RI. Reversibility of growth stunting in early onset anorexia nervosa: A prospective study. J Adolesc Health 2002;31:162–5.
26. Modan–Moses D, Yaroslavsky A, Novikov I, et al. Stunting of growth as a major feature of anorexia nervosa in male adolescents. Pediatrics 2003;111:270–6.
27. Hazelton LR, Faine MP. Diagnosis and dental management of eating disorder patients. Int J Prosthodont 1996;9:65–73.
28. Katzman DK, Zipursky RB, Lambe EK, Mikulis DJ. A longitudinal magnetic resonance imaging study of brain changes in adolescents with anorexia nervosa. Arch Pediatr Adolesc Med 1997;151:793–7.
29. Gordon I, Lask B, Bryant-Waugh R, et al. Childhood-onset anorexia nervosa: Towards identifying a biological substrate. Int J Eat Disord 1997;22:159–65.

30. Golden NH, Shenker IR. Amenorrhrea in anorexia nervosa: Etiology and Implications. In: Nussbaum MP, Dwyer JT (Eds). Adolescent Nutrition and Eating Disorders. Philadelphia: Hanley & Belfus Inc., 1992:503–18.
31. Russell GF. Premenarchal anorexia nervosa and its sequelae. J Psychiat Res 1985;19:363–9.
32. Biller BM, Saxe V, Herzog DB, et al. Mechanisms of osteoporosis in adult and adolescent women with anorexia nervosa. J Clin Endocrinol Metab 1989;68:548–54.
33. Golden NH, Lanzkowsky L, Schebendach J, et al. The effect of estrogen–progestin treatment on bone mineral density in anorexia nervosa. J Pediatr Adolesc Gynecol 2002;15:135–43.
34. Kreipe RE, Hicks DG, Rosier RN, Puzas JE. Preliminary findings on the effects of sex hormones on bone metabolism in anorexia nervosa. J Adolesc Health 1993;14:319–24.
35. Rigotti NA, Nussbaum SR, Herzog DB, Neer RM. Osteoporosis in women with anorexia nervosa. N Engl J Med 1984;311: 1601–6.
36. Rock CL, Curran-Celentano J. Nutritional management of eating disorders. Psychiatr Clin North Am 1996;19:701–13.
37. Hadigan CM, Anderson EJ, Miller KK, et al. Assessment of macronutrient and micronutrient intake in women with anorexia nervosa. Int J Eat Disord 2000;28:284–92.
38. Soyka LA, Misra M, Frenchman A, et al. Abnormal bone mineral accrual in adolescent girls with anorexia nervosa. J Clin Endocrinol Metab 2002;87:4177–85.
39. Forbes GB, Kreipe RE, Lipinski BA, Hodgman CH. Body composition changes during recovery from anorexia nervosa: comparison of two dietary regimes. Am J Clin Nutr 1984;40: 1137–45.
40. Scalfi L, Polito A, Bianchi L, et al. Body composition changes in patients with anorexia nervosa after complete weight recovery. Eur J Clin Nutr 2002;56:15–20.
41. Schebendach J, Reichert-Anderson P. Eating disorders. In: Mahan LK, Escott-Stump MA (eds). Krause's Food Nutrition and Diet Therapy. Philadelphia: WB Saunders Co, 2000:516–33.
42. Powers PS. Initial assessment and early treatment options for anorexia nervosa and bulimia nervosa. Psychiatr Clin North Am 1996;19:639–55.
43. Eisler I, Dare C, Russell GF, et al. Family and individual therapy in anorexia nervosa. A 5-year follow-up. Arch Gen Psychiatry 1997;54:1025–30.
44. North C, Gowers S, Byram V. Family functioning and life events in the outcome of adolescent anorexia nervosa. Br J Psychiatry 1997;171:545–9.
45. Kreipe RE, Uphoff M. Treatment and outcome of adolescents with anorexia nervosa. Adolesc Med 1992;3:519–40.
46. Yager J. Psychosocial treatments for eating disorders. Psychiatry 1994;57:153–64.
47. Lemmon CR, Josephson AM. Family therapy for eating disorders. Child Adolesc Psychiatr Clin N Am 2001;10:519–42, viii.
48. Russell GF, Szmukler GI, Dare C, Eisler I. An evaluation of family therapy in anorexia nervosa and bulimia nervosa. Arch Gen Psychiatry 1987;44:1047–56.
49. Herzog DB, Nussbaum KM, Marmor AK. Comorbidity and outcome in eating disorders. Psychiatr Clin North Am 1996; 19:843–59.
50. Johnson JG, Cohen P, Kotler L, et al. Psychiatric disorders associated with risk for the development of eating disorders during adolescence and early adulthood. J Consult Clin Psychol 2002;70:1119–28.
51. Kaplan AS. Psychological treatments for anorexia nervosa: a review of published studies and promising new directions. Can J Psychiatry 2002;47:235–42.
52. American Dietetic Association. Nutrition intervention in the treatment of anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified (EDNOS). Position Paper. J Am Diet Assoc 2001;101:810–9.
53. Fisher M, Simpser E, Schneider M. Hypophosphatemia secondary to oral refeeding in anorexia nervosa. Int J Eat Disord 2000;28:181–7.
54. 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;22:239–43.
55. Ornstein RM, Golden NH, Jacobson MS, Shenker IR. Hypophosphatemia during nutritional rehabilitation in anorexia nervosa: implications for refeeding and monitoring. J Adolesc Health 2003;32:83–8.
56. Beumont PJ, Large M. Hypophosphataemia, delirium and cardiac arrhythmia in anorexia nervosa. Med J Aust 1991;155: 519–22.
57. Solomon SM, Kirby DF. The refeeding syndrome: A review. JPEN J Parenter Enteral Nutr 1990;14:90–7.
58. Baran SA, Weltzin TE, Kaye WH. Low discharge weight and outcome in anorexia nervosa. Am J Psychiatry 1995;152: 1070–2.
59. Delaney DW, Silber TJ. Treatment of anorexia nervosa in a pediatric program. Pediatr Ann 1984;13:860–4.
60. Nussbaum M, Shenker IR, Baird D, Saravay S. Follow-up investigation in patients with anorexia nervosa. J Pediatr 1985;106:835–40.
61. Steiner H, Mazer C, Litt IF. Compliance and outcome in anorexia nervosa. West J Med 1990;153:133–9.
62. Kreipe RE, Churchill BH, Strauss J. Long–term outcome of adolescents with anorexia nervosa. Am J Dis Child 1989;143: 1322–7.
63. Strober M, Freeman R, Morrell W. The long-term course of severe anorexia nervosa in adolescents: survival analysis of recovery, relapse, and outcome predictors over 10–15 years in a prospective study. Int J Eat Disord 1997;22:339–60.
64. Eisler I, Dare C, Hodes M, et al. Family therapy for adolescent anorexia nervosa: the results of a controlled comparison of two family interventions. J Child Psychol Psychiatry 2000;41: 727–36.
65. Geist R, Heinmaa M, Stephens D, et al. Comparison of family therapy and family group psychoeducation in adolescents with anorexia nervosa. Can J Psychiatry 2000;45:173–8.
66. Robin AL, Siegel PT, Moye AW, et al. A controlled comparison of family versus individual therapy for adolescents with anorexia nervosa. J Am Acad Child Adolesc Psychiatry 1999; 38:1482–9.
67. Lock J, Le Grange D, Agra W, Dare C. Treatment Manual for Anorexia Nervosa: A Family Based Approach. New York: Guilford Press, 2001.
68. Kaye WH, Nagata T, Weltzin TE, et al. Double-blind placebo-controlled administration of fluoxetine in restricting and restricting-purging-type anorexia nervosa. Biol Psychiatry 2001; 49:644–52.
69. Fairburn C. A cognitive behavioural approach to the treatment of bulimia. Psychol Med 1981;11:707–11.
70. Agras WS, Walsh T, Fairburn CG, et al. A multicenter comparison of cognitive–behavioral therapy and interpersonal psychotherapy for bulimia nervosa. Arch Gen Psychiatry 2000;57:459–66.
71. Fluoxetine in the treatment of bulimia nervosa. A multicenter, placebo-controlled, double-blind trial. Fluoxetine Bulimia Nervosa Collaborative Study Group. Arch Gen Psychiatry 1992;49:139–47.

72. Walsh BT, Wilson GT, Loeb KL, et al. Medication and psychotherapy in the treatment of bulimia nervosa. Am J Psychiatry 1997;154:523–31.
73. Fairburn CG. Interpersonal psychotherapy for bulimia nervosa. In: Garner DM, Garfinkel PE (eds). Handbook of Treatment for Eating Disorders. New York: Guilford Press, 1997: 278–94.
74. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes for Calcium PMVDaF. Washington, DC: National Academy Press, 1997.
75. Golden NH. Osteopenia and osteoporosis in anorexia nervosa. Adolesc Med 2003;14:97–108.
76. Robinson E, Bachrach LK, Katzman DK. Use of hormone replacement therapy to reduce the risk of osteopenia in adolescent girls with anorexia nervosa. J Adolesc Health 2000;26:343–8.
77. Klibanski A, Biller BM, Schoenfeld DA, et al. The effects of estrogen administration on trabecular bone loss in young women with anorexia nervosa. J Clin Endocrinol Metab 1995; 80:898–904.
78. Grinspoon S, Thomas L, Miller K, et al. Effects of recombinant human IGF-I and oral contraceptive administration on bone density in anorexia nervosa. J Clin Endocrinol Metab 2002;87: 2883–91.
79. Frank GR. The role of estrogen in pubertal skeletal physiology: Epiphyseal maturation and mineralization of the skeleton. Acta Paediatr 1995;84:627–30.
80. Silber TJ, Robb AS. Eating disorders and health insurance understanding and overcoming obstacles to treatment. Child Adolesc Psychiatr Clin N Am 2002;11:419–28, xii.
81. Collins SR, Schoen C, Tenney K. Rite of Passage? Why Young Adults Become Uninsured and How New Policies Can Help. The Commonwealth Fund, 2003.
82. Skinner H, Biscope S, Poland B. Quality of internet access: Barrier behind internet use statistics. Soc Sci Med 2003;57:875–80.
83. Chesley EB, Alberts JD, Klein JD, Kreipe RE. Pro or con? Anorexia nervosa and the Internet. J Adolesc Health 2003;32: 123–4.