

## CHAPTER 11



# EATING DISORDERS

### DEFINITION

DSM-5 defines the eating disorders, anorexia nervosa and bulimia nervosa, as follows: **Anorexia nervosa** is characterized by behaviors leading to a failure to maintain body weight above a level that is 15% below that expected for the individual's age and height. The diagnostic criteria also include intense fear of becoming fat (although this is no longer an essential criterion in DSM-5 as many individuals do not report the feeling of fear) even though one is underweight; severe restriction of food intake, often with excessive exercising; and distorted perception of body image and shape. The cessation of menstruation in postmenarchal females, which was a requirement in DSM-IV, has been removed in DSM-5, although it will be a frequent symptom. There are two subtypes of anorexia nervosa. In one, there is regular binge eating or purging and self-induced vomiting or use of laxatives or diuretics; in the other—restricting—type, these behaviors are not present.

Many features of **bulimia nervosa** overlap those of anorexia, such as excessive concern with body shape and weight, and the use of extreme measures to control weight. Bulimia is characterized by recurrent episodes of binge eating, with a feeling of lack of control over eating behavior during binges, and excessive dieting and exercise, with the use of large doses of appetite suppressants, laxatives, and/or diuretics in order to reduce weight. Despite this, weight tends to remain within the

normal range. An average of at least one episode per week of binge eating followed by compensatory behaviors, over a period of 3 months, is required to make the diagnosis according to the revised criteria in DSM-5 (in DSM-IV, an average of two episodes per week over a 6-month period was required). In DSM-5, the former division of bulimia nervosa into two subtypes—a purging type, in which vomiting or purging occurs, and a nonpurging type, in which there is excessive fasting or exercise without purging—has been removed, as it was not thought to be clinically helpful.

The biggest difference between anorexia and bulimia is that those with anorexia become excessively thin, whereas those with bulimia have roughly normal body weight. However, in DSM-5, a primary diagnosis of bulimia nervosa is applied only in the absence of features of anorexia. In DSM-5, “partial syndromes” of eating disorder that are recognized meet some but not all of the criteria for anorexia nervosa or bulimia nervosa. Examples might include females who meet the criteria for anorexia but have regular menses, or cases in which all the criteria for bulimia are met but the diagnostic behaviors occur less frequently than once a week or over shorter periods than 3 months. DSM-5 introduces the diagnostic category for “binge-eating disorder,” in which the compensatory behaviors characteristic of bulimia nervosa do not occur. It can be distinguished from simple overeating by the presence of feelings of guilt and embarrassment, with marked

distress, and often eating alone and in secret. The recognition of these variants presents a spectrum of eating disorders that may be different entities, or may merely represent differences in severity that may change over time in individual patients.

We wish to remind the reader that in the remainder of this chapter, inclusion criteria for studies will refer to DSM-IV or ICD-10 (or earlier) criteria as the research reviewed was conducted before DSM-5 was published.

In general, ICD-10 pays more attention than DSM-5 to defining the core criteria. For example, for anorexia, ICD-10 includes a Quetelet body mass index (BMI) of 17.5 or less alongside the defining criterion for weight as more than 15% below the minimum normal weight for the patient's age and height. This can have clinical significance, as can the inclusion in ICD-10 of the widespread endocrine disorder that accompanies anorexia nervosa. ICD-10 places less emphasis on distorted perception of body image as a defining criterion of anorexia nervosa, and it also does not consider subtypes of the disorder. ICD-10 includes a possible history of an earlier episode of anorexia nervosa in the definition of bulimia nervosa. It also includes a category for atypical bulimia nervosa covering presentations that fulfill some of the features of bulimia but in which the overall clinical picture does not justify the diagnosis.

Lask and Bryant-Waugh (2007) have summarized a range of other eating problems in children and young people. These disorders include the following:

- **Food avoidance emotional disorder**, in which the child is underweight and there is a long history of food fads and restrictions.
- **Selective eating**, in which concern about weight and calorie intake is absent but there is a very narrow range of preferred foods.
- **Restrictive eating**, in which children tend to eat small amounts of food and are small and light, possibly requiring food supplements in puberty.
- **Specific fear/phobia of eating**, which usually follows a trauma such as vomiting or a gastrointestinal illness.
- **Pervasive refusal syndrome**, in which a child refuses to eat and drink, and usually is not walking or talking. This life-threatening condition requires hospital admission.

Lask and Bryant-Waugh (2007) also give a useful summary of studies on the etiology of eating disorders. There is increasing evidence for the involvement of

genetic and neurodevelopmental factors. More studies are required, because findings have so far lacked consistency, but more recent studies support results from earlier twin studies indicating a genetic predisposition to anorexia nervosa. Heritability of anorexia nervosa was found to be high, especially in adolescent-onset restricting anorexia, whereas it was almost nonexistent in patients with bulimia nervosa (Treasure & Holland, 1990).

As in many other psychiatric disorders, significant events in an individual's life often precede manifestation of the disorder. External precipitants of anorexia nervosa have been identified in 50–100% of cases, including separation and loss, family disruption, new environmental demands, direct threats to self-esteem and, in a small number of cases, physical illness (P. E. Garfinkel & Garner, 1982); these precipitants are not specific to eating disorders.

## PREVALENCE

There do not appear to have been many recent studies of the prevalence of eating disorders apart from a large survey of 10,123 adolescents ages 13–18 years in the United States (S. A. Swanson, Crow, le Grange, Swendsen, & Merikangas, 2011). The authors found a lifetime prevalence of 0.3% for anorexia nervosa, with a 12-month prevalence of 0.2%. There was no difference between the sexes in prevalence; this is the first population study to have had this finding. Unlike findings from older studies mentioned below as a contrast, there was no significant difference according to socioeconomic class. The median age of onset was 12.3 years. Interestingly, in this study, anorexia nervosa was not comorbid with any other psychiatric condition apart from oppositional defiant disorder. This contrasts with the findings for bulimia (see below). Almost 90% of the sample with anorexia nervosa reported social impairment due to the disorder. The authors point out that the presence of disorders was assessed by an interview schedule that has not been validated for adolescents (the World Health Organization Composite International Diagnostic Interview). Other than the differences highlighted earlier in this paragraph, the results are not dissimilar from those of earlier studies.

Previously reported prevalences for **anorexia nervosa** vary from 0 per 1,000 among schoolgirls in Japan (Suzuki, Morita, & Kamoshita, 1990) to 1% in private schools in the United Kingdom (Crisp, Palmer, & Kalu-

cy, 1976; Szmukler, 1983), and 1.08% among Swedish adolescent girls below the age of 18 and 0.1% among boys (Råstam & Gillberg, 1992). The U.K. National Institute for Health and Clinical Excellence (NICE; 2004a) guidelines on eating disorders give a prevalence of 1 in 250 females and 1 in 2,000 males. There is a suggestion that the prevalence of eating disorder behaviors in boys is increasing (Rosen, 2010), but there have been no good-quality epidemiological studies. Reported rates depend on the way in which cases are identified and classified, the cultural context, whether both males and females are included in the study, and the age groups covered.

Both clinic and survey data show consistently higher rates for late-adolescent girls than for boys in the same age group. Among adolescents and young adults, about 5–10% of cases occur in males (A. Barry & Lippmann, 1990). In children, however, a number of studies have reported that between 19 and 30% of cases are boys (e.g., Bryant-Waugh, 1993; Fosson, Knibbs, Bryant-Waugh, & Lask, 1987; Higgs, Goodyer, & Birch, 1989). The distribution of childhood-onset anorexia nervosa between socioeconomic classes seems similar to that in adults, with overrepresentation of higher socioeconomic classes (Fosson et al., 1987; S. Gowers, Crisp, Joughin, & Bhat, 1991; Higgs et al., 1989), although this may be less pronounced than was originally thought to be the situation (P. E. Garfinkel & Garner, 1982; McClelland & Crisp, 2001). More up-to-date studies are required. There are methodological problems with relating concepts of socioeconomic class to those of eating disorders in different population samples. Only comparatively recently have there been reports of anorexia nervosa in individuals from African, Asian, Caribbean, or Chinese populations. Most of these reports relate to the children of migrant parents, and in such cases the eating disorder may be linked to intrapersonal and intrafamilial conflicts related to the adoption of Western values (Bryant-Waugh & Lask, 1995).

A growing literature suggests a link with autistic spectrum features for some children and adolescents with an eating disorder (Harrison, Sullivan, Tchanturia, & Treasure, 2009; Zucker et al., 2007). This has potential implications for treatment approaches and outcome, although more studies are required before we can be clear about the implications for treatment effectiveness.

Maloney, McGuire, Daniels, and Specker (1989) found that among school children ages 7–12 years, 10.4% reported binge eating and 6% scored in the an-

orexic range on a child version of the Eating Attitudes Test (Garner & Garfinkel, 1979); 1.3% reported vomiting to control weight.

**Bulimia nervosa** was first formally described in the late 1970s (G. Russell, 1979). Bulimia is less visible than anorexia; in a substantial proportion of cases, mental health professionals do not see the individual until the disorder has been present for some time, unless it is accompanied by other self-harming behaviors. The few community surveys using diagnostic interviews that have been carried out yielded an average lifetime prevalence of around 1% for bulimia nervosa (Fairburn & Beglin, 1990; Fairburn, Jones, Peveler, Hope, & O'Connor, 1993a).

The American Academy of Pediatrics Committee on Adolescence has reported that bulimia nervosa affects 1–2% of adolescent girls in the United States (D. S. Rosen, 2010). Steiner and Lock (1998) reported that one-fifth of adolescents with bulimia nervosa are male. Experience suggests that the prevalence in males is increasing, but there are no high-quality studies confirming this impression. The typical age of onset for bulimia nervosa is between 15.73 and 18.1 years. Lewinsohn, Hops, Roberts, Seeley, and Andrews (1993) found a 1-year incidence of 0.75% for bulimia nervosa in a sample of 810 sixteen-year-old schoolgirls. Earlier studies that used DSM-III criteria gave higher prevalences than those that used DSM-III-R, because the revised criteria include a minimum frequency of binge eating, as well as measures to control weight. The large American study by S. A. Swanson et al. (2011) described earlier found a lifetime prevalence of 0.9% and a 12-month prevalence of 0.6% for bulimia nervosa. The median age of onset was 12.4 years. The female:male ratio was 3:1 in this study. There was no variation according to socioeconomic status, but there were high rates of comorbidity, particularly with anxiety and depression.

Many other studies have focused on eating disturbances related to bulimia. These conditions are assessed by a scalar approach, generally on the basis of self-completion questionnaires (Fombonne, 1995). In a review of these studies, S. G. Fairburn and Beglin (1990) pointed out that most research has used convenience samples (generally college students at selected universities) and self-report measures of doubtful diagnostic validity. The mean prevalence in studies using self-report questionnaires was 2.6% for bulimia nervosa, compared with 1% for diagnostic interview studies. One of the most striking results of self-report questionnaire studies is the high prevalence of symptomatic

features of eating pathologies. With a strict frequency criterion of “at least weekly,” the mean prevalences across studies of binge eating, self-induced vomiting, and laxative misuse were, respectively, 15.7, 2.4, and 2.7%, whereas 29% of subjects on average said they were currently following a strict diet or fasting (S. G. Fairburn & Beglin, 1990).

Repeat self-report surveys in North America on large samples of first-year college students at two universities in the Midwest (Pyle, Halvorson, Neuman, & Mitchell, 1986) and a replication study at Cambridge in the United Kingdom (P. J. Cooper, Charnock, & Taylor, 1987) gave little evidence of an increase in lifetime history of weekly binge or purging behavior (DSM-III criteria for bulimia). Studies of two large, comparable samples of 14- to 18-year-olds, surveyed in 1981 and 1986, reported significant reductions in the rates of dieting behaviors, binge eating, and excessive exercise, both currently and for prior attempts (C. L. Johnson, Tobin, & Lipkin, 1989). These authors also reported changes in attitudes, with a significant decline in concern about weight among respondents (and also among their friends and family) and a lower drive towards thinness. Average body weight and body dissatisfaction remained constant across the period between 1981 and 1986. The authors speculated that these attitudinal and behavioral changes reflected changes in the socio-cultural context. Since the time of these studies, there have been even more widespread influences, with the emergence of an antidieting literature in magazines and on the Internet. In addition, there are information and support websites, such as Beat ([www.b-eat.co.uk](http://www.b-eat.co.uk)), and peer support sites that aim to assist young people in overcoming eating disorders. In contrast, unfortunately, there are also “pro-ana” and “pro-mia” (pro-anorexia and pro-bulimia) websites, and social networking/image sharing sites that may promote extreme thinness as an ideal.

The new diagnostic group in DSM-5, which comprises those individuals fulfilling criteria for a diagnosis of binge-eating disorder, would in Europe currently be classified as having an atypical eating disorder. Previously, they would have been included in the category “eating disorders not otherwise specified” (EDNOS) in DSM-IV (American Psychiatric Association, 1994). Furthermore, the DSM-5 category “other specified feeding or eating disorder” now contains presentations such as purging and night eating syndrome. This is a rapidly developing area for research and treatment, particularly in light of the “epidemic” of obesity seen

in many countries, but at the time of this writing, the approach is to treat each case according to the disorder it most closely resembles. For example, if the main presenting problem is self-induced vomiting but below the threshold for a diagnosis of bulimia nervosa, the recommendation is to follow the pathway used to treat bulimia nervosa (NICE, 2004a).

## COMORBIDITY

A 3-year follow-up survey of 34 out of 39 consecutively admitted adolescent inpatients (32 girls and 7 boys) fulfilling DSM-III-R criteria for anorexia nervosa found anxiety disorders (41%) and affective disorders (18%) to be the most prevalent comorbid psychiatric diagnoses, with a highly positive correlation between eating disorder and depressive psychopathology, compared with healthy age-matched controls (Herpertz-Dahlmann & Remschmidt, 1993). Adolescents who had recovered from anorexia also scored higher on depression scales than the controls. The authors concluded that disturbance of psychosexual adjustment seems to be a core symptom of anorexia nervosa (Hsu, 1990) and is likely to persist into early adulthood in spite of a good overall outcome. The findings of a 7-year follow-up of the cohort (Herpertz-Dahlmann, Wewetzer, & Remschmidt, 1995) suggested that severity of depressive symptoms at admission does not correlate with severity of depression at follow-up, and that initial depressive psychopathology is not a valid prognostic indicator of outcome. However, at the time of follow-up, patients whose eating disorder persisted were also very likely to suffer from comorbid depression. In general, patients with worse outcomes also had higher levels of general psychopathology (Herpertz-Dahlmann, Wewetzer, Schulz, & Remschmidt, 1996).

Steinhausen (1997) suggested that “comorbidity” may not be an appropriate term to describe the association of other psychiatric disorders with anorexia, because it is unclear to what extent these psychiatric disorders are actually coexistent or present as a single disorder in individuals with a history of anorexia.

## NATURAL HISTORY

There have been no recent studies of the outcome of eating disorders in children and adolescents. Steinhausen, Rauss-Mason, and Seidel (1991) reviewed the literature

in English and German from the 1950s to the 1980s (68 studies with follow-up periods ranging from 1 to 33 years) on the outcome of eating disorders. Summarizing the findings of these studies, the authors reported that weight is restored in approximately 60% of patients; normalization of menstruation occurs in approximately 55% of females; eating behavior returns to normal in 44% of cases; and 20% of patients have a generally poor outcome, with chronic symptoms of eating disorder and poor psychosocial adaptation. Mortality was significant but had decreased in the most recent decade covered by the review to less than 5%. The authors note wide variation between the studies, which often gave contradictory judgments on outcome and prognosis; for example, between 50 and 70% of patients were restored to normal weight, and between 30 and 70% of patients established normal eating behavior. For both anorexia and bulimia nervosa, severity of the illness when first coming to medical attention and longer duration of illness are the strongest predictors of a poor outcome in some follow-up studies, but these findings have not always been replicated in other investigations.

A further review by Steinhausen (1997) concentrated on 31 outcome studies of patients with adolescent or preadolescent onset of eating disorders. This review was largely restricted to anorexia nervosa, since studies of samples solely with bulimia with onset during adolescence are scarce. Again, the study designs and the quantity and quality of information regarding outcomes were variable. There was general agreement that a good outcome entails recovery from all the defining symptoms of anorexia nervosa; a fair outcome represents improvement, but with some residual symptoms; and a poor outcome describes long-term chronicity. Crude mortality rates were based on a total of 918 patients, and ranged from 0 to 11%, with a mean of 2.16% ( $SD = 2.88\%$ ). Variations across studies were, to a large extent, dependent on the length of the follow-up period. Full recovery was found among 52% of subjects overall; 29% showed some improvement, and in 19% the disorder became chronic. The outcome was slightly better for the core symptoms, with normalization of weight occurring in 68% of patients, normalization of menstruation in 64%, and normalization of eating behavior in 52%. At outcome, a significant proportion of patients had further psychiatric diagnoses, including affective disorders (20.9%), neurotic disorders (26%), obsessive-compulsive disorders (12%), schizophrenia (6.5%), personality disorders (17.9%), and substance use disorders (18.9%).

More recently, Steinhausen, Seidel, and Winkler Metzke (2000) reported on follow-up, at a mean of 5 years and a later mean of 11.5 years, of 60 adolescent patients with eating disorders (mean age 14.6 years at onset of the disease) consecutively admitted between 1979 and 1988 to a child and adolescent psychiatric department in a Berlin university. Patients were in treatment for a mean of 33% of the initial follow-up period, and a mean of 17% of the entire 11-year follow-up period. No predictors of treatment duration were found. Mortality was 8.3% at the second follow-up. The distribution of abnormal BMI indicated a trend of improvement with increasing duration of follow-up. In comparison with the 5-year follow-up, at 11.5-year follow-up, fewer patients showed symptoms of the full clinical picture of an eating disorder. Among the surviving patients, 80% recovered during the long-term course. There were few specific predictors of three outcome criteria: BMI, an eating disorders score, and a total outcome score. The BMI was significantly predicted by premorbid overweight at the first follow-up; at the second follow-up, it was again predicted by premorbid overweight and premorbid psychopathology, and by non-eating-related psychopathology among family members. A pathological eating disorders score was predicted by the duration of individual psychotherapy at the first follow-up and the duration of outpatient treatment at the second follow-up. The total outcome score correlated significantly with the duration of family therapy at the first follow-up and that of inpatient treatment at the second follow-up.

Three studies of adolescents have reported findings at 4-year (van der Ham, van Strien, & van Engeland, 1994), 6-year (I. C. Gillberg, Råstam, & Gillberg, 1994), and 7-year (Herpertz-Dahlmann et al., 1996) follow-up. There were no deaths in these studies. In the first study, of 25 adolescents with anorexia and 24 with bulimia ages 12–21 years (average age at intake, 16 years), 47% had good, 43% had intermediate, and 10% had poor outcomes after 4 years. Eight percent of the patients with anorexia developed bulimia. In the 6-year follow-up study, 51 young people with anorexia nervosa (mean age of onset, 14.3 years), a group which included a complete population of cases from one birth cohort, were compared with a sex-, age-, and school-matched group of 51 subjects on various measures of outcome at 21 years (6.7 years after reported onset, and 4.9 years after the original diagnostic study). There was no attrition. Forty-seven percent of the subjects with anorexia nervosa reported that they were recovered. All aspects

of outcome were worse among unrecovered subjects with anorexia nervosa than among the matched comparison group. Differences between the two groups were particularly pronounced with regard to aspects of social relationships. Poor outcome was associated with the presence of "empathy deficits," defined as problems in understanding other people's perspectives and difficulties in interacting reciprocally. The findings of this community-based study are similar to those of the clinic-based (or otherwise potentially biased) samples surveyed by Steinhausen et al. (1991). However, community-based patients were found to be as abnormal as those who had applied for treatment in clinics, both at the time of the original study and at follow-up (Råstam, 1992). In a 7-year follow-up of 34 adolescents from an inpatient sample, Herpertz-Dahlmann et al. (1996) reported that one patient had anorexia nervosa, four had bulimia nervosa, and 10 had EDNOS; the patients with persistent eating disorders mostly showed restrictive symptoms. Both the recovered and the unrecovered adolescents with anorexia were similar to a control group of young people in terms of occupational adjustment, social contacts, and dependency on family; however, they differed significantly in psychosexual functioning, and those with a worse outcome of the eating disorder displayed higher levels of general psychopathology. The authors of these studies caution that it does not seem advisable to regard normalization of eating behavior, weight, and menstrual pattern as sufficient criteria for defining a successful treatment outcome. The persistence of core symptoms, in particular, preoccupation with food and physical appearance, and disturbed body image, may increase the probability of relapse and chronicity, and be associated with continuing problems with social adaptation (Strober, Freeman, & Morrell, 1997).

North and Gowers (1999) studied 35 adolescents with anorexia nervosa, who were matched with psychiatric and community controls and followed up at 1 and 2 years. Those with anorexia with comorbid depression reported more abnormal cognitions, as measured on the Eating Disorders Inventory, than the other young people, but subjects with comorbid anorexia nervosa had an equally good outcome as those with anorexia alone.

Bryant-Waugh, Knibbs, Fosson, Kaminski, and Lask (1988) studied a younger sample of 30 children with an average age of onset of anorexia nervosa of 11.7 years, followed up for a mean of 7.2 years. One child had died directly as a result of the eating disorder, and the out-

come was good in only 60% of subjects. Poor prognostic factors included early age at onset (less than 11 years), depression during the illness, disturbed family life, and membership of a one-parent family or a family in which one or both parents had been married before. It should be noted that this study, and a second study with an older average age of onset (I. C. Gillberg et al., 1994), include all levels of severity, and a total population sample. In addition, the young people had followed a variety of treatment approaches, which are largely not described.

Steinhausen (1997) compared 31 studies of outcome in patients with age of onset of anorexia below 18 years, and 77 studies with older age of onset (Steinhausen, 2000), and found a slight trend for better global outcome and normalization of core symptoms for the younger patients.

Due to the relatively low frequency of symptoms of bulimia in younger patients, most of the knowledge about the prognostic relevance of these symptoms comes from the few existing studies of older patients. Three studies involving adolescent onset of symptoms found that bulimia and purgative abuse were associated with poor outcome (Kreipe, Churchill, & Strauss, 1989; F. E. Martin, 1985; Steiner, Mazer, & Litt, 1990). However, Steinhausen and Seidel (1993) found that the presence of symptoms of bulimia was not significantly related to outcome.

## TREATMENT

### Anorexia Nervosa

Due to the serious risks associated with not treating the eating disorders, it has not been possible to conduct studies with a placebo treatment or control group. Therefore, the limited number of intervention studies have understandably been clinical comparison studies, with children and adolescents randomly assigned to one or another treatment model, rather than "true" randomized controlled trials (RCTs) in which the control group receives no treatment, minimal treatment, or placebo treatment. A helpful summary of the literature on the efficacy of treatments in eating disorders is provided by Lock and Gowers (2005) in a review of the most robust studies identified in a literature search. Disappointingly, there were only five RCTs of the treatment of anorexia in adolescents, with a total of 207 subjects. The authors discuss four approaches: inpatient (day and

residential), individual, family, and psychopharmacological interventions.

Lock and Gowers (2005) pointed out the benefits of hospital admission for adolescents with this life-threatening illness. These include monitoring of physical health and safe weight restoration, avoiding the likelihood of refeeding syndrome, as well as an opportunity for the family to have some respite, and the availability of intensive psychological therapies. The authors pointed out that the services in the United States and the United Kingdom seem to have different emphases. In the United Kingdom there is an eclectic approach, using many, if not all, of the therapeutic approaches that have been found to be beneficial, with the additional provision of education. There is a tendency to avoid admission to an inpatient unit, and inpatient beds tend to be in short supply. In the United States and Australia, admissions are somewhat briefer and mainly focused on refeeding. Therapies are primarily provided on an outpatient basis.

Lock and Gowers (2005) also pointed out that the medical management of anorexia nervosa is based on clinical consensus opinion rather than evidence from RCTs. Not surprisingly, because there are significant medical risks, several health organizations have written guidelines relating to the treatment of anorexia nervosa (American Psychiatric Association Work Group on Eating Disorders, 2000; Ebeling et al., 2003; N. H. Golden et al., 2003; NICE, 2004a; Royal College of Psychiatrists, 2005). In the United Kingdom, NICE (2004a) emphasizes the need for age-appropriate units and stresses the importance of consent issues, as well as balancing the need for admission against the social and educational benefits or disadvantages. However, NICE made it clear in its guidelines that the evidence for treatments in this disorder is very sparse, and was unable to make any recommendations based on meta-analyses.

Regarding individual therapy, Lock and Gowers (2005) identified only two RCTs of individual approaches for eating disorders in this age group. The earliest study was the well-known RCT by Russell, Szukler, Dare, and Eisler (1987) demonstrating the superiority of family therapy over supportive individual therapy. Although the sample size was small, this study led all services to prioritize the provision of family therapy for adolescents with anorexia. The second clinical trial identified by the review is that by Robin et al. (1999). This study, which compared a specific individual approach, ego-oriented individual therapy

(EOIT), with family therapy, found an initial slight advantage of family therapy at the end of treatment. However, at 1-year follow-up, there was no difference between approaches, with both having an 80% success rate.

The authors conclude that there is more evidence for the benefits of family therapy from the findings of five RCTs (Eisler et al., 2000; le Grange, Eisler, Dare, & Russell, 1992; Lock, Agras, Bryson, & Kraemer, 2005; Robin et al., 1999; Russell et al., 1987), but they point out that all five studies used a similar family therapy approach based on that used at the Maudsley Hospital in the United Kingdom. This model is based on consulting with and encouraging the family to manage the patient's eating in order to promote weight gain, and it does not focus on the underlying causes of the anorexia. Another finding of the review was that the approach might be most effective if used separately with the parents and the patient if there are high levels of criticism from the family, and a suggestion that 10 sessions over 6 months may be effective. Lock et al. (2005) and Robin et al. (1999) used a manualized approach, which can be replicated. The studies of Eisler et al. (1997) and Robin et al. (1999) had follow-up data confirming maintenance of improvement. Only Lock et al. (2005) used the recommended Eating Disorder Examination (EDE) to assess outcome. The EDE (Fairburn & Cooper, 1993) is a psychometrically reliable and valid standardized interview designed to measure the severity of eating disorder pathology using a global scale and four subscales (Restraint, Eating Concern, Weight Concern, and Shape Concern).

Finally, the review of Lock and Gowers (2005) did not find any RCTs on the use of medication in adolescents with anorexia.

The relevant treatment studies in anorexia nervosa are reviewed in more detail below.

## **Physical Treatments**

### *Inpatient Treatment*

Weight restoration is the first major goal of any treatment for anorexia nervosa. In most studies, the need for refeeding and possibly bed rest is implicit; of course, this depends upon the stage at which treatment is instituted in individual cases, but it applies to all children with a DSM-5 diagnosis of anorexia nervosa, which depends on weight loss (or failure to gain weight as would be expected in a normal growing child/adolescent)

leading to a body weight 15% below that expected. Unfortunately, beyond the evidence that early intervention and hospitalization might be a positive prognostic factor (especially in younger patients; see Bryant-Waugh et al., 1988), there is a lack of solid empirical data to assist in selection of the type and setting of treatment intervention (Steinhausen & Glanville, 1983). Certain clinical criteria, such as severe emaciation (less than 70% of average weight for age and height), are definite indications for hospital treatment. Studies often do not report the exact treatments given during inpatient stays, and inpatient episodes indicate interventions with components that mostly cannot be distinguished or evaluated. However, inpatient treatment does have certain specific advantages. These include the fostering of what might otherwise be a fragile treatment alliance, greater awareness by the physician of complications and/or responses to intervention, and the possibility of using a psychoeducational approach that modifies the patient's eating behavior to foster healthy attitudes toward nutrition and ensures the maintenance of an acceptable weight.

Outpatient treatment might be considered when purging and vomiting are not part of the clinical picture, the family is very supportive, and the patient is highly motivated and cooperative. However, high motivation for treatment is unusual: Patients with anorexia characteristically deny that they are ill and in need of treatment. It has been suggested that motivational interviewing techniques would be helpful with denial of disorder and resistance to treatment (Vitousek, Watson, & Wilson, 1998).

No studies have distinguished between the efficacy of physical treatment offered alone and psychotherapeutic approaches offered alone; it is assumed that these should be combined as appropriate in individual patients. In the United Kingdom, a combined approach usually depends upon liaison between a pediatrician and a child and adolescent psychiatrist. The need for inpatient care often rests on individual clinical judgment, the home background of the young person, and whether the local services can offer a specialist service outside a residential setting.

A pediatric day treatment program has been used as an alternative to full hospitalization for refeeding in patients with anorexia. Danziger, Carcl, Varsono, Tyano, and Mimouni (1988) treated 32 adolescents with anorexia nervosa in a day treatment program in which parents were actively involved. The adolescents initially attended the program from 8 A.M. to 10 P.M. As

they approached their target weights, the adolescents were discharged and seen in outpatient sessions, three times a week, until they reached target weight, and less frequently afterward. Initially, parents supervised the patients after meals for 1 hour to prevent vomiting, and between meals to prevent ritualistic exercising. Parents observed how staff members handled the meals and later supervised the meals themselves. Family and individual psychotherapy accompanied a structured behavior modification program. At an average of 9 months after admission, follow-up indicated that 84% of patients reached and retained their ideal weight, 89% resumed menstruation, 59% overcame body image distortions, and 88% stopped ritualistic exercise. Parental involvement was regarded as very helpful, although there were no formal measures of parental responses to the program.

Gowers et al. (2007, 2010) described a large, well-designed influential study, known as the TOuCAN (Treatment Outcome for Child and Adolescent Anorexia Nervosa) trial, based in the north of England. The study included 167 adolescents ages 12–18 years, all with DSM-IV-diagnosed anorexia nervosa, who were randomized to three intervention groups: inpatient, specialist outpatient, and general outpatient receiving treatment via child and adolescent mental health services (CAMHS). This ambitious study covered a population of 7.2 million, 38 community CAMHS teams, and four inpatient units.

The initial duration of inpatient treatment was 6 weeks. The inpatient interventions were eclectic and nonmanualized. Weight gain of 800–1,000 g per week was expected for patients admitted to inpatient treatment.

The specialist outpatient treatment, which was provided by two services, was manualized. It involved an initial motivational interview and 12 cognitive-behavioral therapy (CBT) sessions, which included parental feedback. There were also parental counseling sessions that included the patient, and at least four dietary therapy appointments. The community CAMHS intervention was not manualized, but the duration of treatment was limited to 6 months.

Standardized outcome measures included: the Morgan–Russell Average Outcome Scale (MRAOS; H. G. Morgan & Hayward, 1988), a severity measure covering mental state, menstruation, nutritional status, and socioeconomic status, which has been adapted for use in adolescents; the Health of the Nation Outcome Scale for Children and Adolescents clinician (HoNO-



SCA; Gowers et al., 1999) and adolescent self-report (HoNOSCA-SR; Gowers, Levine, Bailey-Rogers, Shore, & Burhouse, 2002) versions; the Eating Disorder Inventory-2 (Garner, 1991); the Family Assessment Device (Epstein, Bishop, & Levin, 1983), which was used to assess family functioning; and the Mood and Feelings Questionnaire (Angold et al., 1995). All these measures were completed at baseline and at follow-up 1 and 2 years after the onset of interventions.

The mean length of stay for inpatients was 15.2 weeks; some patients stayed no more than 4 weeks, because they had gained weight and were keen to be discharged into the community. Adherence was only 49.1% for inpatient treatment, 74.5% for specialist outpatient treatment, and 69.1% for community CAMHS treatment. For the outpatient interventions, adherence required that no other intervention, such as admission, was needed.

At 1-year follow-up, there was no significant difference between the three groups as assessed using standardized outcome measures. However, there was a relatively poor outcome for those provided with inpatient treatment. Among patients receiving either outpatient intervention, the outcome was better for those who adhered to the treatment than for those who later became inpatients. Just over 19% had a good outcome at 1 year. There was further improvement at 2 years, with an overall good outcome for 33% of adolescents in the study, but 27% still had anorexia nervosa; 28% were still in treatment. As at 1 year, adolescents who had not been admitted from the outpatient groups fared better than adolescents who had received inpatient treatment. At 5 years, 64% of those followed up had made a good recovery (Gowers et al., 2010). Further analysis showed no difference in the effectiveness of inpatient versus outpatient treatment or specialist versus general outpatient treatment at any time point, when baseline characteristics were taken into account.

In terms of cost, general CAMHS treatment was slightly more expensive over the first 2 years of the study, largely because greater numbers of patients in this treatment arm were subsequently admitted to hospital after the initial treatment phase. The specialist outpatient program was most cost-effective. Outpatient treatment was more cost-effective than inpatient care. The costs associated with the treatment of anorexia are discussed further below.

In a user satisfaction evaluation of the study (Roots, Rowlands, & Gowers, 2009), the authors reported that parents were satisfied with all three interventions but

significantly more satisfied with the specialist outpatient treatment compared to standard community CAMHS treatment. The adolescents were significantly less satisfied with all the treatments than were their parents. The authors commented that the parents' expectations were unrealistically high, but the adolescents' expectations were not. The authors suggested that what seemed most important to both adolescents and parents was a warm, trusting relationship with a clinician who could provide hope at difficult times in the course of the illness.

### *Medication*

There have been no long-term RCTs of drug treatments for anorexia nervosa in children and adolescents. Kafantaris et al. (2011) reported an RCT of olanzapine treatment in 20 girls ages 12.3–21.8 years (median age 17.1 years). All of the subjects were already engaged in an eating disorder program. The treatment lasted 10 weeks. Fifteen subjects completed the trial. Olanzapine showed no benefits relative to placebo for weight or psychological symptoms. Holtkamp et al. (2005) reported a retrospective study comparing the outcomes of 19 adolescents treated with selective serotonin reuptake inhibitors with the outcomes of 13 patients who had not received medication. The authors reported no differences in outcome in terms of BMI, eating disorder symptoms, or affective symptoms, at the point of admission to hospital, at discharge from treatment, or at 1-year follow-up. Due to the design of the study and a lack of any RCTs, the results must be interpreted with caution. However, Leggero et al. (2010) reported a descriptive study, without a control group, of the effects of olanzapine treatment of girls ages 9.6–16.3 years with the restricting form of anorexia nervosa. For seven of the total sample of 13 girls, there was a significant improvement in BMI, and at least 50% improvement in symptoms of anorexia according to the Eating Attitudes Test. The authors suggest that the benefits of the medication were due to its reduction of excessive activity or hyperactivity. It is difficult to draw conclusions from this small study given the absence of a control group. NICE (2004a) advised that medication should be reserved for comorbid conditions.

### *Psychosocial Treatments*

There is a variety of psychosocial treatment approaches to anorexia nervosa. Comparative studies that evaluate

the effects of such treatments are scarce. Currently, the main psychotherapeutic approaches used with adolescent patients with anorexia are individual psychotherapy, behavior therapy, and family therapy. There is little doubt that young people with anorexia benefit from multifaceted treatment programs (Steinhausen, 1985; Steinhausen & Seidel, 1992), but there has been little work to evaluate the effects of different components of treatment for different patients. The exceptions include most studies that report on behavioral methods.

### *Individual Psychotherapy*

In 1995, Steinhausen cautioned that most of the experience of individual psychotherapy as a treatment for anorexia nervosa came from the treatment of adults. Unfortunately, so far, there have been only a limited number of studies of individual psychotherapeutic or behavioral approaches in young people. Most clinicians are now aware of the conclusion reached by Steinhausen (1995) that individual psychotherapy is unlikely to be of benefit in a young person with anorexia nervosa unless they have intact cognitions and sufficient motivation to undertake therapy. These factors are likely to be absent in patients who are emaciated or severely depressed, when the course of the illness is chronic, when there is severe intellectual limitation, when the family sabotages therapeutic efforts, or with a very young preadolescent. Experience derived from the treatment of adults indicates that continuing psychotherapy after discharge from hospital treatment may contribute to the prevention of relapses.

EOIT was compared with behavioral family systems therapy (BFST) in a random-assignment controlled study (Robin, Bedway, Siegel, & Gilroy, 1996; Robin, Siegel, Koepke, Moye, & Tice, 1994). This study is described below in the section "Family Therapy." Since that comparison, there has been very little research into the best individual behavioral or psychotherapeutic approach for anorexia nervosa in adolescents, and the emphasis remains on family work and medical management. However, the TOuCAN study (described earlier) had as one of its three comparison groups a specialist outpatient treatment, as described by Gowers and colleagues (Gowers, 2006; Gowers et al., 2007; Gowers & Smyth, 2004), which comprised a manualized individual CBT intervention in combination with parental counseling, dietary therapy, and multimodal feedback. The outcome of this intervention was similar in efficacy to treatment as usual (TAU), but there were fewer

hospital admissions for patients receiving the specialist treatment than for those receiving TAU.

### *Family Therapy*

Lock et al. (2010) reported an RCT comparing family-based treatment (FBT) with individual therapy in a sample of 121 adolescents ages 12–18 years with DSM-IV-diagnosed anorexia nervosa. Each subject received 24 hours of individual therapy or FBT on an outpatient basis over 12 months. Assessments were undertaken at baseline, at the end of treatment, and at 6- and 12-month follow-up posttreatment. The outcome measures were full remission from anorexia nervosa, defined as normal weight ( $\geq 95\%$  of expected weight for sex, age, and height) and a mean global EDE score within 1 *SD* of published means; and partial remission ( $> 85\%$  of expected weight for sex, age, and height).

Both treatments led to considerable improvement and were similarly effective in producing full remission at end of treatment. However, FBT was more effective in facilitating full remission at both follow-up points. FBT was significantly superior to individual therapy for achieving partial remission at end of treatment but not at follow-up.

These findings confirm the findings of earlier studies. For example, an earlier, influential RCT compared family therapy with individual supportive therapy in cases of anorexia and bulimia nervosa (G. F. M. Russell et al., 1987). The 80 patients included in the study, 57 with anorexia and 23 with bulimia, were admitted to a specialized unit in order to restore their weight to normal. The patients with anorexia nervosa were divided into three subgroups: (1) patients with age of onset less than or equal to 18 years and duration of illness less than 3 years; (2) those with age of onset less than or equal to 18 years and duration of illness more than 3 years; and (3) those with onset of illness at age 19 years or older. Patients with bulimia nervosa formed a fourth subgroup. After entry into the appropriate subgroup, patients were randomly allocated to family therapy or individual therapy. It was not possible to maintain blindness to the two forms of treatment, but to reduce bias, the person carrying out assessments at follow-up was not involved in the provision of treatment. The family therapy included all members of the patient's household. The individual therapy, devised as the control treatment, was made more systematic than usual clinical practice by virtue of more frequent sessions, which lasted 1 hour and were consistently supervised.

This therapy was supportive, educational, and problem-centered, and included cognitive, interpretative, and strategic therapies. The patients allocated to the two treatments were closely matched. After 1 year of psychological treatment, some of which was on an outpatient basis following discharge from the unit, the family therapy was found to be more effective than individual therapy in patients whose illness was not chronic and had begun before age 19 years. In older patients, individual supportive therapy tended to be more effective than family therapy in terms of weight gain, but the improvement fell short of recovery in most patients. There were no significant differences between the two forms of therapy in the two remaining subgroups of patients, that is, the younger patients with chronic anorexia and patients with bulimia nervosa.

Positive results were also obtained with conjoint family therapy and individual therapy in a small population of young adolescents with recent-onset anorexia nervosa—a group that is known to have a good prognosis (Robin, Siegel, & Moye, 1995).

The study sample group of 80 patients reported by G. F. M. Russell et al. (1987) was followed up after 5 years and showed significant improvements, mainly attributable to the natural outcome of anorexia nervosa, with improvement most evident in the early-onset and short duration group (Eisler et al., 1997). Significant benefits attributable to the previous psychological treatments were still evident, favoring family therapy for patients with an early onset and short history of anorexia nervosa, and favoring individual supportive therapy for patients with late-onset anorexia nervosa. This study also highlighted the relevance of multiple domains of family functioning (not limited to eating-related conflict) in anorexia nervosa and its management. Hall (1987) also reported that family therapy is advantageous in younger patients with a recent onset of illness who live in an intact nuclear family and have cooperative parents.

Robin et al. (1994) compared BFST and EOIT in a random-assignment outcome study with 22 adolescent girls meeting DSM-III-R criteria for restricting anorexia nervosa. Each patient received 10–16 months of therapy and was reassessed at the end of the treatment period and at 1-, 2.5-, and 4-year follow-up. In BFST, the family members were seen together. The parents were placed in control of the young person's eating, unhealthy beliefs were challenged through cognitive restructuring, and strategic/behavioral strategies were adopted in an attempt to improve the family dynamics and communication. EOIT comprised weekly individ-

ual sessions that focused on identifying the dynamics underlying self-starvation and helping the adolescent to develop the ego strength to cope with life stresses without resorting to self-starvation. In additional parental sessions held twice a month, parents were advised to relinquish control over eating to the therapist and patient, and to prepare to accept a changed, more assertive adolescent. BFST produced greater weight gain than EOIT from pre- to postassessment. Both BFST and EOIT were found to be effective treatments for anorexia nervosa; 66% of the subjects reached their target weight by the end of the intervention, and 80% of girls in the BFST group had reached their target weight by 1-year follow-up. Both therapies produced equal improvements in eating attitudes, depressed affect, and interoceptive awareness, which were maintained at 1-year follow-up and in the limited number of subjects who reached the 4-year follow-up. Family functioning was assessed through self-report and videotaped interaction measures of general conflict and eating-related conflict (Robin et al., 1995). Neither group acknowledged any general family conflict before or after treatment, yet both displayed high levels of negative communication before treatment, which improved considerably after treatment. Both groups reported and exhibited high levels of conflict over eating, which improved after treatment.

The absence of a no-treatment or attention-placebo control group makes it difficult to rule out the possibility that the positive changes were due to nonspecific factors in the therapeutic situation in this study (Robin et al., 1999). In addition, analyses that included several subjects who were lost to follow-up revealed that although at postassessment there were no differences in BMI between those who did and did not participate in follow-up, nonparticipants reported more negative eating attitudes, poorer ego functioning, and more conflict over eating than did participants. Furthermore, more patients treated with family therapy than with individual therapy required hospitalization, despite random assignment. Even though the amount of family and individual therapy was compared in hospitalized versus nonhospitalized cases, the intensive inpatient refeeding program might have given hospitalized adolescents an advantage. However, the milder degree of starvation seen in the larger number of nonhospitalized patients who received EOIT could have biased the results in the opposite direction.

Robin et al. (1999) concluded that including the parents is important for the success of treatment for

younger adolescents with anorexia nervosa, but that it is not necessary for the adolescent and the parents to be together for all therapy sessions. Therapy needs to continue long enough not just to restore weight but also to address attitudes toward eating, depressive affect, self-efficacy, and family relationships. Finally, they conclude that even with comprehensive multidisciplinary interventions such as those evaluated in their study, not all adolescents with anorexia nervosa improve: 20–30% of the adolescents did not reach their target weight, and 40–50% did not reach the 50th percentile of BMI by 1-year follow-up.

Following these two studies, other researchers have set out to evaluate further the effects of family therapy in anorexia nervosa. Eisler et al. (2000) compared two forms of outpatient family intervention for anorexia nervosa in a randomized treatment trial. Forty adolescent patients with anorexia nervosa were assigned to conjoint family therapy (CFT) or separated family therapy (SFT), using a stratified design controlling for levels of criticism using the Expressed Emotion index. Therapists were required to undertake both forms of treatment. The distinctiveness of the two therapies was ensured by separate supervisors conducting live supervision. Measurements were taken on admission to the study and at 3 months, 6 months, and end of treatment. On a global measure of outcome, the two forms of therapy were associated with equivalent end-of-treatment results and considerable improvements in nutritional and psychological state. SFT was superior to CFT for patients with high levels of maternal criticism. Symptomatic change was also more marked with SFT, whereas CFT was associated with considerably more psychological change. Critical comments between parents and patients were significantly reduced, critical comments between parents also decreased, and warmth between parents increased. The authors highlight a common finding in this and other controlled studies in adolescents: The treatments that encourage parents to take charge of the adolescent's eating are effective in bringing about both symptomatic and psychological change.

Eisler, Simic, Russell, and Dare (2007) reported a 5-year follow-up of their original sample (Eisler et al., 2000). All but two of the original sample of 40 adolescents were traced. More than 75% had a complete resolution of eating disorder symptoms. No patients had died, and only 8% of those who had reached a healthy weight at the end of treatment had had any degree of relapse. One patient had subsequently been diagnosed with bulimia nervosa, and two others had subdiagnos-

tic symptoms of bulimia. The only difference in outcomes was that patients from families in which there were high levels of maternal criticism fared less well with CFT at 5-year follow-up than they had at the end of treatment. This was borne out by a relative lack of weight gain in the 5 years since the end of treatment.

The authors suggest that for families in which there are high levels of criticism, CFT should not be used early on in treatment, but if these families with high expressed emotion make progress with SFT, they may then be able to engage in CFT.

Lock, Couturier, Bryson, and Agras (2006) reported a study of the dropout rate from family therapy of 86 adolescents with anorexia. Ninety-one percent of the participants were female. Their mean age was 15.1 years (range 11.95–18.37 years), and the mean duration of illness was 11.1 months. Three-fourths of the participants' families were nuclear, 14% were single-parent, and 11% were reconstituted. Nineteen percent of the group had a binge-eating or purging subtype of eating disorder. The participants were randomized to either long-term (20 sessions over a period of 12 months) or short-term (10 sessions over 6 months) treatment. The approach used was a manualized FBT, with the aims of supporting parents and providing them with skills to deal with the problems presented by anorexia, and of helping the young person return to a normal weight and cease weight-losing behaviors.

The authors reported an 11% rate of dropout from treatment. The only significant predictors of dropout were the presence of comorbid psychiatric illness and randomization to the longer treatment condition. Sixty-eight percent of participants were in remission at the end of treatment. The presence of comorbid depression, anxiety, and obsessions both reduced the remission rate and increased the dropout rate. Lower levels of family cohesion and expressiveness, which the authors suggest represent lower levels of enmeshment and criticism, also predicted remission rates. A decrease in family relations scores from baseline to 6 months increased the chance of remission at 1 year, suggesting that treatment improved family relationship difficulties. The authors suggested that helping the family to refocus on the "fight" against anorexia (externalization) rather than the struggle with the child decreases expressed emotion. Weight gain at Sessions 2 and 9 was also a predictor of remission at 12 months, and the authors suggested that this indicates the influence of early behavioral change. Interestingly, hospitalization did not predict the outcome.

Rhodes and colleagues (Rhodes, Baillie, Brown, & Madden, 2008; Rhodes, Brown, & Madden, 2009) have described an interesting augmentation to the Maudsley model of FBT, which they describe as parent-to-parent consultation. In this intervention, parents who had completed the Maudsley treatment acted as consultants to those who were embarking on treatment. Twenty families of adolescent girls ages 12–16 with anorexia were randomized into two groups, one receiving standard outpatient treatment and the other receiving additional parent-to-parent consultation in which the experienced parents met with the new parents between Sessions 3 and 5. Four of the girls had comorbid obsessive–compulsive disorders. All the patients had previously been admitted to hospital due to medical complications of malnutrition; all had received nasogastric refeeding but no psychological interventions. The average length of stay in hospital was 42 days. Patients were randomized to one of the FBT groups, with therapy commencing 1 week following discharge from hospital. Patients were discharged at their minimum safe weight (82.53% of ideal body weight).

Outcome was measured in the same way as for all the Maudsley treatment studies:

- Good outcome: Body weight is maintained within 15% of ideal weight and menstrual cycles are regular.
- Intermediate outcome: Body weight has risen to within 15% of ideal weight, but amenorrhea persists.
- Poor outcome: The patient weighs less than 15% below ideal weight or has developed symptoms of bulimia.

Nine of the 20 patients had a good outcome, six had an intermediate outcome, and five had a poor outcome. The parent-to-parent consultation did not lead to a significant benefit in terms of percentage of ideal body weight at completion of treatment, but it was associated with an immediate increase in the rate of weight gain. This led the authors to suggest that parent-to-parent consultation could be a useful adjunct to treatment for some families. The parents in the consultation group reported benefits in terms of feeling more empowered. The authors suggest that the consultation primarily provides emotional support and hope to families.

### *Multifamily Therapy*

Multifamily therapy for anorexia (Asen, 2002; Dare & Eisler, 2000; Scholz, Rix, Scholz, Gantchev, & Thomke,

2005), a practice that relies heavily on the work of Laqueur (1972) with patients with chronic schizophrenia, is based on the Maudsley model of family therapy. Although there have not yet been any RCTs, some studies have indicated that this intervention is promising.

Dare and Eisler (2000) and Scholz et al. (2005) reported on their services in London and Dresden, Germany, respectively. At each center, six to eight adolescents and their families are included in a multifamily group and are offered up to 20 whole days of therapy over 12 months. The aim is that each family learns from other families. Essentially, the treatment is divided into three phases. Phase 1, which comprises an intensive 5-day period of treatment, focuses on the symptoms and aims to support the parents in regaining authority and managing the symptoms. In Phase 2, which involves 2 days' treatment per month, the family examines relationship issues and transgenerational problems. Phase 3, which involves 1 day of therapy per month, is future-oriented; it focuses on relapse prevention and explores issues of independence for both the adolescent and parents. The authors argue that this intervention can be used to prevent many very sick adolescents from requiring inpatient admission. They also argue that “the whole of its effects is more than the sum of each of its parts” (Scholz et al., 2005, p. 139). At the time of writing their report, Dare and Eisler (2000) had treated 14 adolescents (seven with anorexia and seven with bulimia) using this model. All patients had been referred for possible inpatient admission.

### *Costs of Treatment for Anorexia*

Lock, Couturier, and Agras (2008) reported on a descriptive study of the costs of a variety of treatment modalities in relationship to the outcomes. Their study involved 86 subjects ages 12–18 years (mean age, 15.2 years), all of whom had DSM-IV-diagnosed anorexia nervosa. The adolescents and their families were treated with manualized family therapy (Dare & Eisler, 1997; Lock, le Grange, Agras, & Dare, 2001), for an average of 9 months and 14 outpatient sessions (Lock et al., 2005). The participants' average duration of illness was around 1 year; 10% were male and 22% were from ethnic/minority groups; 19% had the binge–purge subtype of anorexia nervosa; 30% had been hospitalized because of medical concerns (low blood pressure, bradycardia, and abnormally low body temperature); 14% were receiving psychotropic medications for depression or anxiety.

Nine of the subjects dropped out of treatment and a further eight were lost to follow-up. At the end of treatment, 96% of the adolescents weighed more than the cutoff for a diagnosis of anorexia nervosa; 67% had healthy scores on the EDE, a standardized assessment tool for anorexia nervosa (Passi, Bryson, & Lock, 2003), and a BMI greater than 20.

Lock et al. (2008) found that 72% of the costs were due to hospital care; costs for outpatient treatment constituted 19% of the total, and the remaining expenditure was for outpatient medical monitoring. They suggested that the relatively low cost of outpatient treatment can be explained by the model they used, which “employed parents as the main agents for change” (p. 327), negating a requirement for individual and group therapies. The cost was similar to that proposed by Crow and Nyman (2004), around \$36,200 per individual. What remains to be explored is whether the clinical indications for hospitalization are correct, because there have been no systematic studies of the indicators for admission. A study with larger numbers of subjects is required.

An article by Byford et al. (2007) set out to establish the clinical and cost-effectiveness of inpatient, specialist outpatient, and general outpatient services for adolescents with anorexia nervosa (the TOuCAN study, described earlier). The economic evaluation took a broad view of the costs of provision of all interventions, including the costs of health care, social services, and education provision (Gowers et al., 2007), and used data collected at the 1- and 2-year follow-up points using the Child and Adolescent Service Use Schedule (CA-SUS). This schedule, previously developed by the authors in earlier research with young people, was adapted for the purpose of the 2007 study (B. Barrett, Byford, Chitsabesan, & Kenning, 2006; Byford et al., 1999; Harrington et al., 2000).

There were no significant differences among the three groups at either 1- or 2-year follow-up on the MRAOS. Resource use in the groups was also very similar except for inpatient and outpatient contacts: The nonspecialist (community CAHMS) outpatient treatment group spent more time in hospital and had more outpatient contacts on average than the specialist outpatient or inpatient groups. The specialist outpatient group spent the least amount of time in hospital.

In terms of the costs of treatment, there were no statistically significant differences among the three groups. As in the study of Lock et al. (2008), hospital costs made up the greatest percentage of total costs

(93% in each group), with few community health and social services being used. The authors report that the annual service costs of caring for this group of young people were high—on average, almost £17,000 per patient per year.

A small, randomized study of 25 female adolescents requiring hospitalization (Geist, Heinmaa, Stephens, Davis, & Katzman, 2000) indicated that whereas both groups (which were offered family therapy and family group psychoeducation, respectively) achieved weight restoration following a 4-month period of treatment, the less expensive treatment, family group psychoeducation, was as effective as family therapy. At 4 months, no significant change was recorded in the psychological functioning of either the adolescents or parents in either group, and subsequent readmissions were reported equally among both groups.

## **Bulimia Nervosa**

Most intervention studies for bulimia nervosa have included a high proportion of subjects who were 18 years or older at the time of the study, because this is a condition predominantly of young adults, although many adolescents do have symptoms of bulimia (as discussed earlier).

## **Physical Treatments**

### *Inpatient and Outpatient Treatment*

Most patients with bulimia nervosa can be treated in the community on an outpatient basis (Hsu, 1990; J. E. Mitchell et al., 1990), and less than 5% require inpatient care (Fairburn, Marcus, & Wilson, 1993b). Occasionally there are physical complications due to frequent vomiting or purging; in such situations, physical interventions may be required to stabilize the patient's condition. No outcome studies so far have specifically examined the effectiveness of inpatient interventions in children and adolescents with bulimia.

### *Medication*

Fluoxetine is approved for the treatment of bulimia nervosa in adults, but to date there has been only one open-label study of fluoxetine treatment of adolescents with bulimia nervosa (Kotler, Devlin, Davies, & Walsh, 2003). This study used a small sample of 10 female adolescents ages 12–18 years with a DSM-IV diagnosis of

bulimia nervosa or EDNOS. Subjects weighed between 85 and 120% of the 50th centile on standard weight charts for their age. Well-validated standardized symptom scales measuring eating disorder and affective symptoms were completed weekly. Side effects were also monitored. Each adolescent received 4 weeks of psychosocial therapy (supportive counseling, including psychoeducation) prior to commencing the medication. Fluoxetine was titrated up to a daily dose of 60 mg, commencing at 20 mg/day for 3 days, increasing to 40 mg/day for 3 days, then increasing to the maintenance dose of 60 mg/day, which was taken for 8 weeks. All 10 patients completed the treatment. Reported side effects included sleep difficulties, drowsiness, headache, and appetite reduction. There was a significant reduction in the frequency of binge and purge symptoms. Self-reported anxiety symptoms also decreased significantly, but symptoms of depression did not. The results of this study should be interpreted with caution, because there was no placebo control group.

As yet, there have been no RCTs of drug treatment of bulimia nervosa in children and adolescents.

## **Psychosocial Treatments**

### *Family Therapy*

Given the success of FBT in adolescents with anorexia nervosa, it has recently been adapted for and used in the treatment of adolescents with bulimia nervosa. Similar to its use in anorexia nervosa, the aim of FBT in bulimia is to encourage the family to be involved in reducing the adolescent's binge-eating and purging behaviors. In contrast to the large number of RCTs of treatments for bulimia nervosa among adults, only two RCTs have evaluated treatments for adolescents (le Grange, Crosby, Rathouz, & Leventhal, 2007; Schmidt et al., 2007).

le Grange et al. (2007; le Grange, Crosby, & Lock, 2008a; le Grange, Doyle, Crosby, & Chen, 2008b) reported an interesting randomized treatment clinical trial that compared the effect of 20 sessions of a manualized FBT for bulimia nervosa (FBT-BN) with that of 20 sessions of a manualized individual supportive psychotherapy (SPT), given over a 6-month period. Participants were recruited through the Eating Disorders Program at the University of Chicago. The sample comprised 80 adolescents ages 12–19 years (average 16.1 years), of whom 46% met full DSM-IV criteria for a diagnosis of bulimia nervosa and 54% partially fulfilled criteria for bulimia nervosa; 97.5% of the

sample was female. The mean duration of illness was 21.2 months; 47.5% of the sample had a comorbid mood disorder and 3.8% had an additional anxiety disorder. Forty-one of the subjects were assigned to FBT-BN and 39 to SPT.

The FBT-BN was given in three phases. The first phase, which involved weekly sessions over a period of 2–3 months, consisted of temporarily giving parents control over the adolescent's eating behaviors. Sessions always commenced with the therapist meeting with the patient to review what the patient would like discussed with the family and to review symptoms of the illness. The remainder of the session was spent with the whole family, discussing ongoing eating disorder symptoms and how the family could support the adolescent to reduce these behaviors. The eating disorder was seen as separate from the patient, which, the authors explained, helps to unite the family against the illness. The second phase involved fortnightly sessions focused on returning control over eating to the adolescent. The third phase consisted of supporting the family to deal with the effects of bulimia on usual adolescent developmental issues.

The SPT was an adaptation of a manualized SPT for adults with bulimia nervosa, derived from earlier work (Fairburn, Kirk, O'Connor, & Cooper, 1986). Like FBT-BN, the SPT was divided into three phases: (1) 2–3 months of weekly sessions to establish a sound therapeutic relationship, obtain a detailed history and description of the eating disorder, and help the patient identify potentially responsible underlying problems; (2) fortnightly sessions to encourage the patient to explore underlying emotional problems, to foster independence, and to facilitate self-disclosure, expression of feelings, and talk about subjects of current concern; and (3) monthly sessions to review underlying issues and encourage the patient to consider the extent to which these remain a problem and how they could be managed in the future.

Response was assessed using the EDE (Z. Cooper & Fairburn, 1987). Other measures used were the Beck Depression Inventory (BDI; A. T. Beck & Steer, 1987), a 21-item measure of dysphoria and depressive symptoms; the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Kaufman et al., 1997), which is a semistructured diagnostic interview designed to measure past and current episodes of psychiatric disorders in children and adolescents; and the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979), a 10-item measure of an individual's overall

self-esteem. Remission was defined as abstinence from bingeing and purging in the previous 28 days.

Nine subjects failed to complete the therapy. The authors found that there was a significantly better response to FBT compared to SPT midway through the trial, at treatment end, and at 6-month follow-up. They also found that symptom reduction by Session 6 predicted remission at the end of treatment and at 6-month follow-up. The authors suggested that if there were no significant reduction in symptoms by Session 6 in clinical situations, then this would indicate the need for a change in treatment.

Using the same sample as that described by le Grange et al. (2007, 2008a, 2008b), Zaitsoff, Doyle, Hoste, and le Grange (2008) investigated the therapeutic alliance between the adolescent and therapist in both treatment modalities (FBT-BN and SPT). The authors expected that using a family approach would negatively impact the therapeutic alliance; U. Schmidt et al. (2007) reported difficulty in recruiting subjects to their study, because adolescents were reluctant for their parents to be involved in the treatment (discussed later). The tools used to examine the therapeutic alliance included the Helping Relationships Questionnaire (L. B. Alexander & Luborsky, 1986). Contrary to expectations, therapeutic alliance and treatment acceptability were similar for both modalities, with both interventions leading to a strong therapeutic alliance and high levels of treatment acceptability as rated by the adolescent. Adolescents with more severe symptoms at the start of treatment had formed a weaker alliance midway through the FBT-BN treatment, but this difference was no longer significant by the end of treatment. For the SPT intervention, a stronger therapeutic alliance midway through treatment was associated with a significantly greater reduction in eating disorder symptoms over the course of treatment. Both adolescents and parents reported that FBT-BN led to greater symptom reduction than did the SPT intervention. This study therefore suggests that adolescents develop a strong therapeutic alliance in both therapies, but FBT-BN is significantly more effective in reducing symptoms of bulimia.

U. Schmidt et al. (2007) also studied the effectiveness of FBT for bulimia nervosa in adolescents. This study involved 85 adolescents ages 13–20 years, based in the United Kingdom, with DSM-IV-diagnosed bulimia nervosa or EDNOS (defined as binge eating less than twice a week or for less than 3 months, or the use of inappropriate compensatory behaviors without bingeing in patients with normal body weight). The ad-

olescents were randomized to either FBT or individual CBT-guided self-care supported by a health professional. The family therapy was adapted from the Maudsley model for FBT in anorexia, described earlier. The treatment was manualized and included 13 sessions, with two individual sessions, over a 6-month period. The CBT-based treatment was a manualized approach used with adults with bulimia nervosa (Perkins and Schmidt, 2005); it was given in 10 weekly sessions, with three monthly follow-up sessions and two optional sessions with a family member or close friend. The early CBT sessions focused on the function of bulimia in the adolescent's life, and on motivation to change. This was followed by psychoeducation about the maintenance of symptoms, and adolescents were taught to self-monitor their thoughts, behaviors, and emotions. Goals were set using problem-solving strategies. Relapse prevention was discussed in the follow-up sessions.

Assessments of the response to the interventions included a semistandardized interview referred to as the "EATATE," which was based on the EDE. The authors also used the Short Evaluation of Eating Disorders (S. Bauer, Winn, Schmidt, & Kordy, 2005).

Fifteen of the 54 patients (27.7%) who were eligible for the study failed to enter because they did not want their parents involved. At 6 months, significantly more adolescents (42%; 95% confidence interval [CI] [26%, 59%]) in the self-help group successfully abstained from bingeing, compared with 25% in the family therapy group (95% CI [13%, 42%]). However, in both groups there was a significant improvement between 6 and 12 months, with no significant difference between the two therapies in terms of levels of bingeing at 12 months and vomiting at 6 and 12 months. The reason for the early superiority of CBT-guided self-care is unclear.

The authors also looked at the costs of treatment using the Client Service Receipt Inventory (Beecham, 1995; Beecham & Knapp, 1992). As they had expected, the cost was significantly lower for guided self-care than for family therapy between baseline and 6 months (£245.63 vs. £409.35).

The findings of U. Schmidt et al. (2007) contrast with those of le Grange et al. (2007, 2008a, 2008b), who found that family therapy was superior to individual therapy. It is therefore difficult to make clear recommendations as to which form of therapy is preferred.

In a third intervention study on an adolescent sample, Doyle, McLean, Washington, Hoste, and le Grange (2009) reported an RCT of FBT in bulimia nervosa. The authors were interested in understanding the im-



pact of belonging to a single-parent family on the outcome and response to treatment in bulimia nervosa, even though recommendations are provided to clinicians for adjusting FBT for use with single-parent families. In justifying their reasoning for undertaking the study, the authors stated that the goal of FBT is to use the family as a resource and help the parents to have a united approach. They suggest that single parents have less resource available due to not having a coparent available for support. The authors also hypothesized that therapists may have a bias in favor of conventional two-parent families. A third reason for suggesting that family status may be significant in determining outcome comes from the findings of an FBT study in single-parent families with adolescents with anorexia nervosa (Lock et al., 2005), which indicated that family status interacts with the length of treatment needed.

Doyle et al. (2009) studied 41 adolescents (40 female, 1 male) ages 12–17 years, from a range of ethnic backgrounds, with either threshold or subthreshold bulimia nervosa. “Subthreshold bulimia nervosa” was defined as a case meeting all DSM-IV criteria for bulimia nervosa, with the exception of the frequency of bingeing or purging behaviors. The adolescents were randomized to FBT as part of a larger RCT studying treatments for bulimia in adolescents (le Grange et al., 2007). They were divided into two groups according to whether they belonged to single-parent or two-parent families.

Standardized instruments, including the EDE, were used to assess the severity of symptoms. Other instruments used were the K-SADS (Kaufman et al., 1997), the BDI (A. T. Beck, Steer, & Garbin, 1988), and the RSE (R. Robins, Hendin, & Trzesniewski, 2001; Rosenberg, 1965).

The treatment provided was a manualized program of FBT-BN comprising 20 sessions of outpatient visits over a 6-month period, as described by le Grange et al. (2007) and outlined earlier in this chapter.

There was no significant difference in treatment outcomes between the single-parent and two-parent groups at posttreatment or at 6-month follow-up. Patients in both groups showed significant reductions in eating disorder behavior and depressive symptoms, as well as increases in self-esteem.

### *Individual Approaches*

There has been only one RCT of individual therapies in bulimia nervosa apart from that of le Grange et al.

(2007, 2008a, 2008b), which reported that SPT was less effective than FBT. U. Schmidt et al. (2007) studied a cognitive therapy approach based on an individual CBT-guided self-care model used in adults and found it to be as effective as a family therapy model, and less expensive. This study is discussed in the section “Family Therapy.” It is clear that more studies are required before definitive guidelines can be drawn up, but the U. Schmidt et al. study does suggest that a CBT-based guided self-care approach is effective and more cost-effective than the family intervention.

### **SUMMARY**

Eating disorders are found in between approximately 0.1 and 1.0% of children in Western developed societies. Preoccupation with appearance, thinness, weight, and food intake is common among children of school age, but it is not possible to predict which of these children will go on to develop an eating disorder. Eating disorders are still more common in girls than in boys, but the difference is decreasing, and cases are emerging at younger ages. There is an increase in prevalence from puberty to older adolescence. Eating disorders cause significant short- and long-term morbidity and mortality. Mortality in anorexia nervosa with an age of onset before 18 years is reported to be up to 11%, with a mean mortality of 2.16% across studies. Approximately 20% of young people with eating disorders remain significantly impaired in the long term, and about 50% recover, although there is great variation between studies in the proportions of young people who regain and maintain normal weight, establish normal eating behavior, and (in females) resume menstruation.

### **Anorexia Nervosa**

- There is clinical consensus that in anorexia nervosa restoration of weight is the first major goal of treatment.
- There is insufficient evidence to make definitive recommendations about treatment settings (due to limited studies), but specialist outpatient treatment has been shown to have a better medium-term outcome than nonspecialist inpatient treatment. There is insufficient evidence about longer term outcomes and about specialist inpatient treatment. In situations of acute physical risk, inpatient or medical treatment settings may be required.

- Despite the clinical consensus that specialist inpatient units are needed for the treatment of eating disorders, there is no clear evidence for or against the effectiveness of such units.
- There is strong evidence (at least six RCTs) that a manualized family therapy is an effective intervention for anorexia nervosa.
- There is strong evidence (several well-designed RCTs) that in families with high levels of intrafamilial conflict, family therapy can still be helpful when the parents are seen separately from the adolescent, if the adolescent does not wish to join.
- There is conflicting evidence (RCTs have shown family therapy to be more effective, but one study found that a manualized CBT approach was more likely than TAU to reduce the need for inpatient treatment and hence improved the outcome) that manualized CBT may be useful in treating adolescents with anorexia nervosa.
- There is no evidence for the use of medication to treat anorexia nervosa, on the basis of the lack of RCTs. Medication may be useful in treating comorbid illnesses or extreme overactivity and overexercising.

### Bulimia Nervosa

- There is some evidence (two RCTs) in this age group that a manualized family therapy approach is effective in adolescents with bulimia nervosa.
- There is some evidence (only one RCT) for a manualized individual cognitive-behavioral approach.
- There is conflicting evidence for the superiority of either a manualized family therapy or manualized individual cognitive-behavioral approach, due to the findings of one comparison trial in adolescents with bulimia, which found that in the short term (at treatment end and 6-month follow-up) the individual approach was superior, but at long-term follow-up (12 months), the treatments were equally effective. However, the individual approach was more cost-effective.
- There is limited evidence (due to the lack of RCTs and a very small sample in a single open-label study) for the use of fluoxetine in adolescents with bulimia nervosa.

## IMPLICATIONS

### Clinical

- Given the morbidity and mortality associated with eating disorders, and indications that (particularly family) interventions can be effective, early recognition of children and young people with these conditions is desirable. This requires education of community professionals in primary care and in schools.
- Services must be available to offer rapid assessment and intensive, multimodal, sustained treatment programs, with inpatient care when necessary for physical treatment of children and young people with severe physical symptoms and signs.
- Given the evidence base for family therapy, services require sufficient resources to make this intervention promptly available. Family therapists should be trained in manualized approaches for eating disorders.
- Opportunities for families to meet with and provide support to other families with a child who has anorexia nervosa should be facilitated.
- Where family therapy services cannot be provided or are not applicable, manualized cognitive-behavioral programs should be made available for adolescents who present with anorexia and/or bulimia nervosa.
- It is best to treat some young people presenting with bulimia nervosa first with a manualized CBT-guided self-care approach, particularly if this is the patient's first choice of treatment and no serious family dysfunction is detected at the assessment.

### Research

- In light of the difficulty in treating children with chronic eating disorders, longitudinal research is needed to improve the identification in children and young people of eating patterns that are likely to progress to significant eating disorders, and which may benefit from early interventions.
- Given the seriousness of these disorders, research on the value added by specialist inpatient units is urgently needed.
- RCTs need to be developed to find effective treatments for the newly DSM-5-categorized binge-eating disorder.