

# Management of child and adolescent eating disorders: the current evidence base and future directions

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Although eating disorders in children and adolescents remain a serious cause of morbidity and mortality, the evidence base for effective interventions is surprisingly weak. The adult literature is growing steadily, but this is mainly with regard to psychological therapies for bulimia nervosa and to some extent in the field of pharmacotherapy. This review summarises the recent research literature covering management in three areas, namely physical management, psychological therapies, and service issues, and identifies prognostic variables. Findings from the adult literature are presented where there is good reason to believe that these might be applied to younger patients. Evidence-based good practice recommendations from published clinical guidelines are also discussed. Suggestions for future research are made, focusing on 1) the need for trials of psychological therapies in anorexia nervosa, 2) applications of evidence-based treatments for adult bulimia nervosa to the treatment of adolescents, and 3) clarification of the benefits and costs of different service models. **Abbreviations:** CI: confidence interval; RCT: randomised controlled trial; RR: relative risk.

This review addresses current knowledge and recommendations about the management of eating disorders in young people between the ages of 8 and 18. It does not describe or refer to the literature on feeding problems and eating difficulties in younger children, which are common, but present with very different symptom patterns (see, e.g., Crist & Napier-Phillips, 2001, and Hutchinson, 1999, for reviews and data on feeding problems in this younger age-group). The term eating disorder is used here to indicate anorexia nervosa (AN), bulimia nervosa (BN) and associated disorders. Anorexia nervosa can arise from the age of around 8 years, whilst full bulimia nervosa appears very rare in those under 12 (Bryant-Waugh, 2000). Clinically significant variants of AN and BN do, however, occur in children and adolescents, probably at higher rates than full syndrome disorders. Such presentations usually involve a significant preoccupation with food, weight or shape, accompanied by eating disturbance, but do not meet full criteria for AN or BN. Some of the difficulties in applying diagnostic criteria are specific to this younger age group, whilst others reflect wider problems in terms of matching clinical populations to the existing classification systems. For example, it is known that across all ages, around half of all eating disorder patients do not meet full criteria for AN or BN (Turner & Bryant-Waugh, in press; Ricca et al., 2001). Current classification systems attempt to address this issue within the diagnostic category 'Eating Disorders Not Otherwise Specified' (EDNOS) (DSM-IV, American Psychiatric Association, 1994) or 'atypical' anorexia or bulimia nervosa (ICD 10, World Health Organisation, 1992).

Children and adolescents may also present with other types of clinical eating disturbance, including 'food avoidance emotional disorder' (Higgs, Goodyer, & Birch, 1989), 'selective eating' (Nicholls, Christie, Randall, & Lask, 2001), and other phobic disorders with eating difficulties as prominent presenting features (Bryant-Waugh, 2000). Management of these other types of eating disturbance does not form part of this review, as they appear to be quite distinct from the classic eating disorders of the AN and BN type in terms of core psychopathology, the characteristic overvaluation of weight and/or shape being absent (Cooper, Watkins, Bryant-Waugh, & Lask, 2002).

For the purposes of this review 'children' will generally refer to those between the ages of 8 and 12, and 'adolescents' to those between 13 and 18. However, the literature is very limited in terms of children, whilst those over 16 are often treated as adults and included in adult research series.

Difficulties in matching clinical presentations seen in childhood and adolescence to existing diagnostic criteria for eating disorders particularly arise in the case of AN in children (see Nicholls, Chater, & Lask, 2000). Whilst this may be less of an issue in terms of general clinical practice, it can pose a significant problem for researchers, who need to be able to define groups of patients studied with a degree of precision.

In children and adolescents there tend to be two types of age-related problem: firstly, there are difficulties inherent in the reliable assessment of psychopathology in this age group, and secondly, there are those related to the strict application of existing diagnostic criteria. Assessment can be difficult, as

children in particular may be unable to describe their thoughts, attitudes and behaviours clearly, or be unwilling or scared to do so truthfully. This means that information from parents or others can be helpful, but should not form an exclusive alternative, and underlying psychopathology should not be inferred. It also means that care needs to be taken to elicit information using age-appropriate measures and means. Standardised assessment of eating disorder psychopathology has been difficult in early-onset cases in part because of the lack of psychometrically sound measures for use in this age group. Some child adaptations of existing adult measures do exist, for example the child version of the Eating Attitudes Test – ChEAT (Maloney, McGuire, & Selibowitz, 1988), the child version of the EDI (Eating Disorder Inventory), known as the KEDS (Kids Eating Disorder Survey) (Childress et al., 1993), and the child version of the Eating Disorder Examination (Bryant-Waugh, Cooper, Taylor, & Lask, 1996). There are also other measures related to DSM-IV diagnostic categories, primarily designed for use with children and adolescents, which have eating disorder modules (e.g., the Diagnostic Interview for Children and Adolescents (DICA), which comes in both a child and an adolescent version – Welner et al., 1987). However, all these measures tend to suffer from a range of psychometric and practical drawbacks.

Difficulties related to the strict application of existing criteria include the continuing lack of agreement and consistency regarding the ‘weight criterion’. Both the ICD-10 and DSM-IV classification systems require a generally similar level of body weight. In ICD-10, this is ‘at least 15% below normal expected weight for age and height’, and in DSM-IV: ‘refusal to maintain weight at or above a minimally normal weight for age and height – (e.g., ...body weight less than 85% of that expected...)’. It is very difficult to apply such a criterion cleanly as the calculation of expected weight needs to take into account any stunting of height as a consequence of dietary restriction, plus, ideally, access to premorbid weight and height charts as well as parental height and population norms. In adults a diagnostic cut-off of BMI at or below 17.5 is often used (e.g., Treasure, 1999), but this is not useful in a younger population where BMI norms are age and gender specific. An equivalent cut-off of BMI below the 2nd centile has been proposed for children and adolescents (Royal College of Psychiatrists, 2002), but not universally accepted. The interpretation of such criteria and how they are applied to young people varies greatly, raising issues about consistency in diagnosis.

It is difficult to be specific about the incidence and prevalence of eating disorders in children and adolescents. Varying rates have been reported and some of this variation is likely to be due to inconsistencies in the definition and diagnosis of eating disorders, as well as the method used in the process of case identification. No epidemiological studies have focused

exclusively on children, and adolescents have often been included in population-based studies of adults. A recent chapter reviewing epidemiological studies suggests that the average prevalence rate of AN in young females is around .3%, with incidence rates highest for females aged 15–19, who represent approximately 40% of all identified cases and 60% of female cases (van Hoeken, Seidell, & Hoek, 2003). The age range in the included studies was from 11 to 35 years, with various different screening methods and diagnostic criteria used. The four studies in the review dating from 1993 onwards are all of adolescents (aged 11–20), with an average prevalence rate of .5% (Rathner & Messner, 1993; Wlodarczyk-Bisaga & Dolan, 1996; Steinhausen, Winkler, & Meier, 1997; Nobakht & Dezhkam, 2000). Incidence and prevalence rates of AN in males are more rarely reported, but it has been noted that where they are, the female to male ratio is around 11 to 1 (van Hoeken et al., 2003).

For bulimia nervosa, two-stage surveys of prevalence rates in 11–20-year-olds published since 1993 suggest an average rate of just under 1% (Rathner & Messner, 1993; Wlodarczyk-Bisaga & Dolan, 1996; Santonastaso et al., 1996; Steinhausen et al., 1997; Nobakht & Dezhkam, 2000). Reported female to male ratios in the incidence of bulimia nervosa range from 33:1 to 27:1 (van Hoeken et al., 2003).

A recent Office for National Statistics survey (2000) reported a prevalence rate of eating disorders generally in UK 11–15-year-olds of 4 per 1,000, whilst a catchment area total population study in the NW of England (the TOuCAN trial) found that the median number of referrals to a generic Child and Adolescent Mental Health Service is 3 cases per year (Gowers, in preparation).

The question of whether rates of eating disorders are increasing in the younger age group is difficult to answer, despite repeated assertions in the popular press that this is the case. Some argue that apparent increases in incidence can be accounted for by a number of factors, including general population trends, changes in access to and the use of health care, and improved recognition of eating disorders. Perhaps of more immediate relevance to healthcare providers and clinicians is the fairly widespread observation that over the past decade there has been an increase in the numbers of children and adolescents presenting for treatment, and that healthcare expenditure in relation to eating disorders has risen significantly.

### *Systematic reviews of treatment research*

*Anorexia nervosa.* Case series of anorexia nervosa have existed in the medical literature for well over 100 years (Gowers, 2001) and there is now a detailed body of evidence from cohort studies detailing outcome and prognostic factors. However, research into the aetiology and psychology of the condition

significantly outstrips that on management and the evidence base for the efficacy of treatments across all age groups is very weak (Treasure & Schmidt, 2002; NICE, 2003). Treasure and Schmidt (2003), on the basis of their systematic review, concluded that there was very little Level I or Level II evidence (that obtained from one or more randomised controlled trials (RCTs)) to support specific interventions for anorexia nervosa at any age. Indeed this review found support for only two *positive* conclusions and these were tentative. Firstly, there was limited evidence from one RCT (Dare, Eisler, Russell, Treasure, & Dodge, 2001) that various psychotherapies, including focal therapy, cognitive analytic therapy (CAT) and family therapy, were more effective than 'treatment as usual' (non-specific routine follow-up by a junior psychiatrist) for adults. Secondly, they found limited evidence from one small RCT (Crisp et al., 1991) that outpatient treatment was as effective as inpatient treatment in those adolescents and adults not so severely ill as to warrant emergency medical treatment. A further ten RCTs failed to detect a difference in the efficacy of various psychotherapies, or between psychotherapy and dietary advice, whilst a similar number of controlled drug trials failed to provide good evidence for their effectiveness in various physical and psychological aspects of the disorder. These reviewers noted, however, the small size of many of the trials, which were unlikely to have been powered to detect a difference between treatments had there been any, and also a wide variability in the quality and reporting of studies in terms of the CONSORT standards (Moher, Schultz, & Altman, 2001).

There are no comprehensive systematic treatment reviews focusing on the child and adolescent age group (Treasure & Schmidt, 2003). In part the explanation could be that anorexia nervosa of ICD-10 or DSM-IV diagnostic severity is a disorder of relatively low incidence, such that non-specialist services recruit at a low rate. In addition, as already discussed, children may receive a diagnosis of atypical AN or EDNOS because existing diagnostic criteria are not sufficiently developmentally sensitive. Other obstacles to treatment research are reviewed in the discussion.

*Bulimia nervosa.* This is a condition which has only appeared in the literature for a quarter of a century (Russell, 1979); however, treatments were beginning to be developed and tested within two years of its description (Fairburn, 1981). Indeed the body of treatment research for bulimia nervosa is now much greater than that for anorexia nervosa and generally of better quality (Treasure & Schmidt, 2003). A number of systematic reviews have been published (Whittal, Agras, & Gould, 1999; Bacaltchuk, Hay, & Mari, 2000; Hay & Bacaltchuk, 2002), but no controlled adolescent treatment trials have as yet been reported. Although BN is said to be around three times more

prevalent than AN in young females (van Hoeken et al., 2003), an older mean age of onset means that this, too, is a rare disorder in younger adolescents.

The systematic reviews that have been published have unanimously found benefits for cognitive behaviour therapy (CBT) in improving the specific symptoms and eating behaviours of bulimia nervosa and non-specific symptoms such as depression. Other psychotherapies, including interpersonal therapy (IPT), have yielded more modest findings (see below). Whittal et al. (1999) and Bacaltchuk et al. (2000), in reviews of antidepressant treatments, both found short-term reductions in bulimic symptoms and a small reduction in depressive symptoms. One systematic review (Bacaltchuk et al., 2000) found evidence for advantages of combination therapy (antidepressants plus psychotherapy) in producing remission and mood compared with antidepressants alone, but not in reducing binge frequency.

### *Extrapolating from the adult literature*

In the absence of a strong body of research in the child and adolescent eating disorder literature, it is tempting to draw conclusions from adult findings, but one should carefully consider the validity and limitations of doing so.

Arguments for:

- Adolescence is a developmental stage which is not defined merely by age. It can be argued that many young adults with eating disorders are still in the throes of addressing the challenges of adolescence and indeed adolescent developmental difficulties have been thought to underlie the aetiology of anorexia nervosa in particular (e.g., Crisp, 1995).
- The essential features of anorexia nervosa and bulimia nervosa are consistent across the age spectrum – in terms of characteristic behaviours (dieting, bingeing, purging), specific psychopathology (over-evaluation of the self in terms of weight and shape) and non-specific features (low self-esteem, perfectionism, poor interpersonal confidence).
- Much of the literature reports combined adolescent/adult case series without separate analysis.
- Finally, some of the treatments which have been found to be effective in adult eating disorders are effective in the treatment of adolescents with other conditions; that is to say, it is not developmentally inappropriate to use them in this age group. Examples include the use of cognitive behaviour therapy (CBT) (Harrington, Whittaker, Shoebridge, & Campbell, 1998) and antidepressants (Alderman, Wolkow, Chung, & Johnston, 1998) in adolescent depression and obsessive-compulsive disorder.

Arguments against:

- In younger patients, eating disorders less commonly fall neatly into the ICD-10 or DSM-IV

categories; that is to say, atypical forms (EDNOS) occur more commonly. As treatments for EDNOS are poorly developed in adults, there might be little evidence in any case to draw on.

- The *treatment aims*, particularly in AN, are often different in adolescence, because of the different physical issues involved, i.e., where the onset is before growth and development are complete, treatment needs to address the completion of puberty and growth in psychological as well as physical terms (Nicholls & Bryant-Waugh, 2003). Whereas in the treatment of adults with AN recovery usually involves returning to a pre-morbid healthy physical condition, in younger patients it may be more a case of discovering and adjusting to a new state. In terms of weight targets this requires constantly revising upwards as healthy weight is recalculated with the attainment of greater height (Gowers, 2001). All this might indicate a need for a longer duration of treatment for younger cases, whilst a shorter duration of illness before treatment, in some, might argue for the opposite.
- When considering the literature on *pharmacotherapy*, one should be aware of the different pharmacodynamics and pharmacokinetics in children. In general the latter means that children and adolescents require higher doses of drugs per kg body weight to attain similar blood levels and therapeutic effect, owing to the child's more rapid liver metabolism and more efficient clearance by the kidney (Cawthron, 2001). A number of psychotropic drugs are not licensed for use in children, possibly limiting pharmacology trials.
- Irrespective of any consideration of aetiological variables, parents will usually need to be involved in the management of younger patients (Lock, Le Grange, Agras, & Fairburn, 2001). This is especially so if they are at risk and parental involvement is believed likely to reduce the risk. The treatment of both AN and BN includes aspects of behavioural management and parents will need to be involved if handling these is to be effective; at a practical level, parents usually have a role in shopping for food, meal planning and mealtime management. The involvement of siblings is generally regarded as beneficial, for the sibling if not for the patient, as this provides an opportunity for them to express fears or guilt and to dispel any false ideas about the nature of the condition, its likely causes and prognosis (Lock et al., 2001).
- Finally additional attention will need to be given to the different social and educational needs of this age group in treatment, particularly when treated in hospital (Nicholls & Bryant-Waugh, 2003).

### *The scope of this review*

This review provides a comprehensive summary of research published since 1993. In a small number of areas, where practice is influenced by key research

prior to this date, reference to earlier work is included. It covers management in the areas of physical management, psychological therapies and service provision, and identifies prognostic features.

### **Review method**

The three key clinical areas included in this review (physical management, psychological therapies, and service issues) were identified in association with members of the UK National Institute for Clinical Excellence (NICE) Guideline Development Group (NICE, 2003). Following electronic searches for systematic reviews and high-quality randomised controlled trials addressing treatment efficacy in the general field of eating disorders, specific attention was paid in this review to evidence relating to children and adolescents. A search was also undertaken of published and unpublished clinical guidelines. Electronic searches were made of the major electronic databases (MEDLINE, EMBASE, PsychINFO, CINAHL), the Cochrane Database of Systematic Reviews, the NHS R & D Health Technology Assessment database and Evidence Based Mental Health & Clinical Evidence (Issue 5).

### **Physical management**

The accepted management of child and adolescent eating disorders is based mainly on expert clinical opinion and cohort studies rather than research trials. A number of academic bodies (The American Psychiatric Association (APA), 2000; The Royal College of Psychiatrists, 2002; the National Institute for Clinical Excellence (NICE), 2003; the Finnish Medical Society – Ebeling et al., 2003; The Society for Adolescent Medicine – Kreipe et al., 1995) have published consensus guidelines, the last two specifically in relation to the management of children and adolescents. There is much greater emphasis in these on the physical management of AN than of BN. In the absence of RCT findings, the key issues in these guidelines with respect to physical management will be briefly reviewed.

### *Anorexia nervosa*

Kreipe et al. (1995), in the Society for Adolescent Medicine's position paper on eating disorders in adolescents, refer to the potentially irreversible effects on physical growth and development and argue that the threshold for medical intervention in adolescents should be lower than in adults. Of particular importance, they say, is the potential for permanent growth retardation if the disorder occurs before fusion of the epiphyses, and impaired bone calcification and mass during the second decade of life, predisposing to osteoporosis and increased fracture risk later on. They say that these features

emphasise the importance of immediate medical management and ongoing monitoring by physicians who understand normal adolescent growth and development.

Medical complications can occur in younger subjects before evidence of significant weight loss (Kreipe et al., 1995). In treating the malnourished patient, care should be taken to avoid the re-feeding syndrome, by regular monitoring of heart rate, orthostatic vital signs and serum electrolytes, including phosphorus, glucose, magnesium and potassium (Royal College of Psychiatrists, 2002). This review, however, has drawn attention to the limitations of serum electrolyte levels in assessment of total body electrolytes, which may be depleted with normal serum levels. Also, it notes that re-feeding syndrome is more common with parenteral than enteral feeding and regular serum electrolyte measurement may be necessary less frequently in those eating food in hospital.

*Oral feeding requirements.* When considering nutritional management, Kreipe et al. (1995) state that adolescents have specific nutritional requirements, taking into account their pubertal status and activity level. The Royal College of Psychiatrists (2002) recommends an energy intake in excess of 3000 kcal/day, while the American Psychiatric Association (APA, 2000) suggest 70–100 kcal/kg body weight/day during weight gain and 40–60 kcal/kg/day during the weight maintenance phase. Rome et al. (2003) suggest that food intake should be expected to achieve a weight gain of .3–.4 lb (130–180 g) per day during a life-threatening phase and 1–2 lb (450–900 g) per week if treated as an outpatient. Untoward effects of re-feeding caused by a sudden increase in metabolic load can be reduced by starting on relatively small amounts of food and increasing slowly (Royal College of Psychiatrists, 2002), and the Finnish guideline (Ebeling et al., 2003) sets a more modest target in the early stages of 1000–1200 kcal/day.

*Management of medical complications.* The Royal College of Psychiatrists (2002) has issued detailed guidance on the management of electrolyte replacement in the event of specific deficiencies. They recommend that intravenous replacement should only be considered under the supervision of a physician and with ECG monitoring.

The treatment of osteopenia and vitamin deficiency is reviewed below. NICE (2003) and Ebeling et al. (2003) draw attention to the adverse dental effects of vomiting and recommend specific preventative guidance on oral hygiene.

*Target weights.* Ebeling et al. (2003) argue that defining a target weight is essential, with the minimum objective being a weight which enables resumption of a normal menstrual cycle. Most

consider a weight at (Ebeling et al., 2003) or close to (Lask, 1993) 100% weight for height to be desirable, based on findings from ovarian ultrasonography.

### *Bulimia nervosa*

There is little in the guidelines to direct the physical management of BN. A key objective in planning dietary programmes is to break the vicious cycle between dieting and binge eating (Ebeling et al., 2003).

Lethal medical complications are rare in BN (NICE, 2003), but trauma to the gastro-intestinal tract, fluid and electrolyte imbalance and renal dysfunction can occur. As in anorexia nervosa, attention to the adverse dental effects of vomiting and specific preventative guidance on oral hygiene is recommended (NICE, 2003; Ebeling et al., 2003). Neither Kreipe et al. (1995) or Rome et al. (2003) make significant reference to aspects of the physical management in BN.

### *Areas for further research*

In the absence of research trials in the area of physical management, the field is very open. Some areas do not lend themselves easily to RCT design. There are considerable gaps in knowledge around the long-term consequences of physical aspects of eating disorders and their treatment. For example, what are the very long-term consequences of malnutrition on bone density, fertility and growth and to what extent are these reduced by energetic intervention to achieve 100% expected body weight as opposed to more modest targets?

### *Pharmacological treatment*

*Drug studies.* The use of psychotropic medication is not considered a first-line treatment of choice in eating disorders. However, the appropriate use of medication can have a place in management as part of a more comprehensive treatment package. This section reviews drug studies published over the past decade, and summarises current recommendations and practice with regard to the use of medication in children and adolescents.

*Drug studies in AN.* There are very few randomised controlled trials of the use of medication in the treatment of AN, and only one systematic review (Treasure & Schmidt, 2002). Recent research (RCTs published 1993 or later only) is summarised below by drug type:

*Antidepressants.* There have been two recent studies investigating the use of fluoxetine in AN, one as an adjunct to an inpatient regime, and the other when administered post-discharge after weight gain in hospital: Attia, Haiman, Walsh, and Flater (1998) found that fluoxetine made no significant difference to weight gain, eating symptoms or depressive

symptoms compared to placebo when added to an inpatient regime. However, Kaye et al. (2001) found that the administration of fluoxetine after discharge from inpatient treatment (involving weight gain) did have a significant beneficial effect in terms of preventing relapse. Ten out of 16 in the fluoxetine group remained well one year post-discharge compared to only 3 out of 19 in the placebo group. Both these studies involved relatively small numbers of adult women with a DSM IV diagnosis of AN.

Fassino et al. (2002) conducted a trial of citalopram versus placebo in women aged between 16 and 35 with AN treated on an outpatient basis and found no statistically significant difference in weight gain between the two groups.

*Anti-psychotics.* Despite the apparent increasing use of some of the newer antipsychotics in the management of AN, there are no published RCTs to support this practice. The only study of anti-psychotics in the past decade is that of Ruggerio et al. (2001), who compared the use of fluoxetine, amisulpiride and clomipramine in adult inpatients with a DSM-IV diagnosis of AN. They found no significant differences in weight gain across the three groups, and no significant differences on other variables, including weight phobia, body image disturbance, amenorrhoea, or binge/purge frequency.

*Cisapride.* There is one RCT investigating the use of cisapride in the inpatient management of adults with AN (Szmukler, Young, Miller, Lichtenstein, & Binns, 1995). Results showed no significant difference in weight gain compared to placebo over an 8-week trial period. However, cisapride is not recommended in the treatment of AN, due to increased risk of cardiac irregularities, and has been withdrawn in many countries because of this (Treasure & Schmidt, 2001).

*Zinc.* Low levels of zinc in patients with AN have been thought by some to contribute significantly to reduced dietary intake, resulting in the practice of zinc supplementation. There is one RCT in the past decade which compared rates of weight gain in older adolescent and adult inpatients receiving zinc gluconate versus placebo (Birmingham, Goldner, & Bakan, 1994). No difference in average daily weight gain was detected.

*The management of osteoporosis.* Anorexia nervosa, and the endocrine disturbance that accompanies it, is known to have a negative effect on bone density. Consequently, patients may receive medication to manage or prevent the development of osteopenia and/or osteoporosis. Gordon and colleagues have published two RCTs on the use of oral dehydroepiandrosterone (DHEA) in young women with anorexia nervosa. The first of these (Gordon et al., 1999) found that the administration of DHEA in varying doses over a three-month period

resulted in some improvement in bone turnover and osteocalcin levels, but that bone mineral density (BMD) and body composition did not show significant improvements. The second study (Gordon et al., 2002), which ran for a year, compared the use of oral DHEA and HRT in postmenarcheal young women with AN. This showed no significant change with the use of either drug in terms of lumbar BMD, but did find significant improvement in hip BMD in both groups.

The effects of recombinant human insulin-like growth factor 1 (rhIGF-1) on bone turnover and bone density have been investigated by Grinspoon and colleagues. In one study the authors concluded that short-term administration of rhIGF-1 increases bone turnover in a dose-dependent manner in women with DSM-IV AN (Grinspoon et al., 1996). A subsequent study (Grinspoon, Thomas, Miller, Herzog, & Klibanski, 2002) additionally explored the effects of oral contraceptive administration on bone density, and concluded that the administration of rhIGF-1 but not oral contraceptives resulted in significant change in spinal bone density, and that rhIGF-1 also improved bone turnover.

Finally, an RCT by Klibanski and colleagues investigating the effects of oestrogen on trabecular bone loss in young women with AN concluded that oestrogen supplementation did not confer significantly beneficial effects in terms of bone health (Klibanski, Biller, Schoenfeld, Herzog, & Saxe, 1995).

*Existing practice and recommendations around the use of drugs in the management of AN in general.* The above studies have led to the widely held view that the regular use of drugs is not justified in the management of primary anorexia nervosa, and should be reserved for cases complicated by comorbid diagnoses. With regard to depression, opinion is divided. Some hold that the depression that is commonly associated with low weight AN tends to lift with restoration of physical health, and should be managed through psychotherapy accompanying weight gain. Others favour the use of selective serotonin reuptake inhibitors (SSRIs) even at low weight, although there is little evidence to support this. Clearly, in presentations complicated by a worsening of depressive symptoms, severe anxiety or obsessive-compulsive disorder, the use of medication can be appropriately considered. Tranquillisers or antihistamines are also often used symptomatically to reduce the high levels of anxiety present with AN. Although there are no controlled studies, low doses of the atypical antipsychotics are being used to alleviate anxiety during re-feeding (Bruna & Fogteloo, 2003).

*Existing recommendations around the use of drugs in the management of AN in children and adolescents.* A recent article from the US aiming to build on existing background and position papers on the management of children and adolescents with eating

disorders (Rome et al., 2003) provides some guidance on the use of drugs in this age group, stating that 'supplementary multivitamins, calcium, zinc, iron, or folate' might be prescribed for young people with eating disorders 'as needed'. It further suggests that 'if delayed gastric emptying is delaying refeeding, cisapride or metoclopramide can be prescribed', adding that extreme caution should be used in the event that the patient is bradycardic, has prolonged QT interval, is extremely malnourished, or is on SSRIs – which together arguably include most patients with acute AN. Rome et al. (2003) also suggest that where purging or reflux has resulted in oesophagitis, histamine-2 blockers and/or proton-pump inhibitors can be used in adolescents. Finally, they state that SSRIs may be appropriately prescribed in near normal weight adolescents with eating disorders, or weight restored AN patients.

The optimum treatment of osteopenia and vitamin deficiency is controversial, but Kreipe et al. (1995) recommend calcium 1300–1500 mg/day and Vitamin D (400 IU/day). They consider sex hormone replacement therapy to be unhelpful as it can cause growth arrest and the illusion of a healthy reproductive system.

Another practice guideline for the treatment of children and adolescents with eating disorders, produced by a multidisciplinary group from Finland (Ebeling et al., 2003), contains more cautious recommendations. Here the use of fluoxetine as supportive medication in weight restored patients is put forward as possibly being of benefit, and short-acting benzodiazepine administered before meals suggested as a means of reducing eating-related anxiety. In view of the known risk of adverse medication-related effects in severely malnourished patients, these authors suggest that the use of medication should really only be justified in weight restored patients – i.e., that medication is not normally justified in the management of acute primary AN. It is clear that existing guidelines regarding pharmacological treatments in children and adolescents differ greatly, perhaps more related to local and national practice, than on the basis of research evidence.

*Drug studies in BN.* Over the past decade, more RCTs have been carried out exploring the effects of drugs in the management of BN than of AN. Hay and Bacaltchuk (2001) have conducted a systematic review of recent research in this area. They conclude that although antidepressants of various types have been shown to reduce bulimic behaviours in the short term (by achieving reduction or cessation of bingeing and/or purging behaviours), there is inconclusive evidence about the persistence of these effects.

*Antidepressants.* There are two recent systematic reviews of the use of antidepressants in the treatment of bulimia nervosa (Whittal et al., 1999; Bacaltchuk et al., 2000). These reviews both found that

antidepressants reduced bulimic symptoms. Bacaltchuk and colleagues further concluded that there was no significant difference in effect between different classes of antidepressants, but also that there had been too few trials to exclude a clinically important difference (Hay & Bacaltchuk, 2002).

Fluoxetine has been shown to be effective in the reduction of bulimic behaviours in the short term, at three times the dose recommended for depressive disorders (60 mg in BN). It has more recently been shown to be of potential value in preventing relapse. Romano, Halmi, Sarkar, Koke, and Lee (2002) showed that continued fluoxetine treatment was associated with a significantly longer time to relapse, although this study had an extremely high attrition rate (131 out of 150 participants left the study early).

*Anti-emetics.* The anti-emetic ondansetron has been investigated in terms of its effects on controlling bingeing and purging behaviours in BN. Faris et al. (2000) found that the mean number of binge and purge episodes was halved in BN patients following a 4-week administration period. However, this drug is not currently recommended for routine prescription in the absence of sufficient trials, plus knowledge about physiological mechanisms in BN (Bruna & Fogtelloo, 2003).

*Existing recommendations around the use of drugs in the management of BN in general.* The above studies can be taken to demonstrate that the appropriate use of medication can be of clear benefit to people with BN. Antidepressants have been shown to reduce bulimic symptoms in the short term, but evidence supporting their use in maintenance treatment is lacking (Hay & Bacaltchuk, 2001). Many experts in the field of eating disorders believe that psychotherapy (CBT or IPT) remains the treatment of choice (see below). In some cases, patients may have to wait to access such treatment, or they may not have access to therapists trained and experienced in the use of the evidence-based psychotherapies in eating disorders. Under such circumstances, the use of medication, which can contribute to a reduction in bulimic behaviours, can be considered. There is also some evidence that the use of medication can add modestly to the benefits of psychological treatment in BN (Walsh et al., 1997). In summary, it appears that the use of medication alone will rarely be sufficient for full and lasting recovery from BN.

*Existing recommendations around the use of drugs in the management of BN in adolescents.* Ebeling et al. (2003) briefly review the drug studies in BN and conclude that 'there is no evidence justifying the use of medication as the only or primary treatment for bulimia in children and adolescents'. However, taking into account the general reservations above, cautious extrapolation of research findings to older

adolescents justifies the use of antidepressants as adjunctive treatments.

### Areas for further research

In anorexia nervosa, drug research is hampered by concerns about unwanted effects on the physically compromised patient. Much interest to date has focused on the potential of drugs to enhance weight gain, rather than to influence the psychological aspects of the disorder and thereby, longer-term outcomes. Trials of post weight-restoration treatment might hold most promise.

In bulimia nervosa further research is required to ascertain the impact of antidepressants on binge eating and mood in the younger age group and in particular the persistence of any beneficial effect after discontinuing treatment.

### Psychological therapies

Although there are a considerable number of studies of psychological therapies in the recent eating disorders literature, a number of methodological issues make for difficulties in combining results in meta-analysis and reaching firm conclusions about the merits of them.

They can be classified as:

- *Heterogeneity within therapies of the same name.* Two examples are the range of different models of family therapy (e.g., 'Behavioural Family Systems Therapy', Robin et al., 1999; 'Emotionally Focussed Family Therapy', Johnson, Maddeaux, & Blouin 1998) and 'generic' CBT as opposed to CBT for eating disorders (Fairburn et al., 1991).
- *A range of outcome measures.* In anorexia nervosa these vary from measures of weight gain to multi-dimensional composite measures of physical and psychosocial wellbeing (e.g., the Morgan–Russell Outcome Assessment Scale – Morgan & Hayward, 1988). In bulimia nervosa, some studies report the number of subjects achieving abstinence in bingeing or purging while others merely report reductions in these behaviours.
- *Timing of follow-up.* This varies in different studies from end of treatment to later follow-up of variable timing. In anorexia nervosa outcome is sometimes measured at discharge from inpatient treatment and in other studies considerably later.
- *Entry criteria.* Treatment is commenced in some studies at presentation to the service, i.e., as a first-line treatment, whilst in other reports (e.g., Russell et al., 1987; Eisler et al., 1997) it follows weight restoration in hospitalisation – this is sometimes referred to as a 'relapse prevention' paradigm.
- *Other concurrent therapy.* In the treatment of anorexia nervosa in particular, many studies are carried out on inpatients who will be receiving a range of other treatments alongside the specific

therapy being studied. Others temporarily hospitalise those whose weight falls below a certain level, without much consideration of the impact of this on the intervention being studied.

### Principles of psychological treatment

Many reviewers have drawn attention to the importance of the therapeutic relationship in treating adolescents with AN. In particular, they stress the desirability of a relationship which can be maintained over time and an empathic engagement (e.g., Ebeling et al., 2003; NICE, 2003). Many eating disordered young people find it hard to acknowledge that they have a problem and are ambivalent about change, in part because of the positive value placed by those with anorexia nervosa on their behaviour. In BN, the young person may fear that the therapist will share their feelings of guilt and shame around bingeing and vomiting; dispelling these beliefs is an early therapeutic goal. Kreipe et al. (1995), in the Society for Adolescent Medicine's position statement, recommend that psychological interventions should address not only the characteristic eating psychopathology but also mastery of the developmental tasks of adolescence and the psychosocial issues central to this age group. They consider family therapy should also be central to the treatment.

### Non-specific research findings

NICE (2003) concluded that there is limited evidence that a range of specific psychological treatments for AN with more therapeutic contact is superior to 'treatment as usual' (with a lower rate of contact) in terms of mean weight gain and the proportion of patients recovered (based on a meta-analysis of three studies,  $n = 198$ ).

There is insufficient evidence from 6 small RCTs to suggest that any particular specialist psychotherapy (Cognitive Analytic Therapy (CBT), Interpersonal Therapy, family therapy, or focal psychodynamic therapy) is superior to others in the treatment of adult patients with AN either by the end of treatment or at follow-up (NICE, 2003, based on 6 studies,  $n = 297$ ). These trials also provided insufficient evidence to conclude that any one specific psychotherapy was more acceptable to patients than others.

There are no controlled treatment trials of adolescents with BN. NICE (2003) concludes that subject to adaptation for age and level of development, adolescents with BN should receive the same type of treatment as adults with the disorder, though consideration should be given to involvement of the family.

### Cognitive behaviour therapy (CBT)

In anorexia nervosa, a handful of studies have examined the efficacy of CBT (Channon, de Silva,



Hemsley, & Perkins 1989; Serfaty et al., 2002; Pike, Walsh, Vitousek, Wilson, & Bauer, in press). These studies suggest that individual CBT may be moderately effective in this condition, but possibly no more so than other focal therapies. It may be more effective, however, at the symptomatic level, for example in reducing body image disturbance (Norris, 1984).

In bulimia nervosa, by contrast, there have been more than 30 RCTs exploring the efficacy of CBT, which have led to the conclusion that a specific form of CBT that focuses on modifying abnormal eating behaviours and weight- and shape-related cognitions is currently the most effective treatment (Fairburn & Harrison, 2003). The optimum treatment protocol involves about 20 weekly treatment sessions, with most studies achieving complete remission in about 40% of cases (Wilson & Fairburn, 2002).

Recent studies and four systematic reviews (Jacobi et al., 1997; Whittal et al., 1999; Hay & Bacaltchuk, 2001, 2002) have demonstrated the advantages of CBT over placebo or waiting list control in terms of numbers of patients achieving *abstinence* from bingeing (Griffiths, 1994) and purging (Agras, 1989), and clinically significant *reductions* in bingeing (NICE, 2003; Griffiths, Hadzi-Pavlovic, & Channon-Little 1994; Treasure et al., 1994) and purging (NICE, 2003; Griffiths et al., 1994; Agras, Schneider, Arnow, Raeburn, & Telch 1989; Freeman, 1988). As well as having an effect on bulimia, CBT also causes a significant reduction in depression scores (Agras, 1989). A systematic review of 10 RCTs (Hay & Bacaltchuk, 2001) also demonstrated no difference in weight change between those receiving CBT and controls. In comparison with Interpersonal Therapy (IPT), CBT has been found to be effective more quickly, achieving remission by end of treatment more often, though by 8-month follow-up there appears to be no difference between treatments (Agras, 2000). There have been no RCTs on child or adolescent series.

### *Interpersonal psychotherapy (IPT)*

This is a specific form of focal psychotherapy which aims to help patients identify and address interpersonal difficulties associated with the onset or maintenance of the eating disorder. Originally developed as a treatment for major depression (Klerman, Weissman, Rounsaville, & Chevron, 1984), it has been successfully developed for BN and Binge Eating Disorder.

Although CBT produces more rapid remission and reduction in symptoms in BN, several studies (Agras et al., 2000; Fairburn et al., 1991, 1995) have consistently shown that IPT is of equal efficacy in the longer term (with follow-up at 8–12 months). The Agras et al. (Agras, Walsh, Fairburn, Wilson, & Kramer, 2000) study suggested that BN patients found IPT more theoretically ‘appropriate’ for their difficulties than CBT and expected more success with it.

In anorexia nervosa, one adult trial is under way (McIntosh, Bulik, McKenzie, Luty, & Jordan, 2000) comparing CBT, IPT and Focal Supportive Psychotherapy.

### *Behaviour therapy and exposure with response prevention (ERP)*

Agras (1989) found that ERP with a supportive programme of behaviour therapy was effective in achieving abstinence from purging (10/22 compared with 1/19 controls,  $p = .006$ ) in bulimia nervosa, but researchers have described the behavioural component (requiring binge eating with prevention of vomiting) as an unpleasant, aversive treatment to administer (NICE, 2003). Bulik, Sullivan, Joyce, Carter, and McIntosh (1998) concluded that ERP adds nothing to the benefits of CBT administered alone.

### *Psychodynamic psychotherapy*

Although the earliest models of psychological therapy for anorexia nervosa utilised psychodynamic ideas, these have not generally been studied systematically. Herzog and Hartmann (1997) have provided a review. Dare et al. (2001) compared focal psychoanalytic psychotherapy ( $n = 21$ ) with family therapy ( $n = 22$ ), cognitive analytic therapy (CAT) ( $n = 22$ ) and ‘routine treatment’ ( $n = 19$ ) in an RCT for adults with anorexia nervosa not so ill as to require urgent admission. Focal psychoanalytic therapy was significantly better than routine treatment in producing weight gain ( $f = 5.4$ ,  $p = .02$ ) and in terms of overall progress at one year (recovered and significantly improved vs. improved and poor outcome,  $RR = .70$ , 95% CI .51–.97), but there was little to distinguish between the different specific therapies. There may also have been a ‘dose effect’ in that the routine treatment often involved fewer sessions and, in addition, those providing the specific therapies were more senior and experienced.

### *Family therapy*

The psychosomatic conceptual model of Minuchin and colleagues (1975) stimulated considerable interest in the use of family interventions in anorexia nervosa, particularly in adolescents. Initially the rationale was based on the notion of the ‘anorexogenic family’, but empirical study has failed to support the aetiological role of family dysfunction and the model fuels concern about blaming parents. Family interventions have thus developed as treatments which mobilise family resources, whether delivered as ‘conjoint’ family therapy, separated FT (in which parents and the child or adolescent patient are seen separately) or ‘parental counselling’. There have been a number of RCTs. Russell et al. (1987), in a trial of adolescents and adults whose weight had been restored in a specialist inpatient service prior to

randomisation, found that for a small group ( $n = 21$ ) of adolescents with short duration of illness, family therapy was superior to individual therapy. The findings in relation to those who had been ill for more than three years were inconclusive and the outcomes were generally poor. At five-year follow-up (Eisler et al., 1997), the adolescent short duration subgroup continued to do well, with 90% of those who had received FT having a good outcome, compared with 36% receiving individual therapy.

Four studies have compared different forms of family intervention in adolescent AN. Geist, Heine-man, Stephens, Davis, and Katzman (2000) compared family therapy with family group psycho-education ( $n = 25$ , mean age 15). There was no difference in weight gain between the two interventions, or significant difference in self-reported psychological outcomes. All patients were concurrently hospitalised.

Robin et al. (1999) compared the effect of Behavioural Family Systems Therapy (BFST) with Ego-Oriented Individual therapy (EOIT) in 37 adolescents with AN. Parents in the EOIT group received separate parental counselling. There was no significant difference on end-point weight, or on psychological measures; however, the BFST group had a greater change in BMI over time ( $F = 12.6$ ,  $p < .001$ ), reflecting different baseline values. By 1-year follow-up 94% of the BFST group had resumed menstruation compared with 64% of the EOIT group ( $p < .03$ ). Forty-three per cent of this sample had been hospitalised when their weight fell below 75%.

Le Grange, Eisler, Dare, and Russell (1992) and Eisler et al. (2000) compared conjoint family therapy with separated family therapy (SFT) in which patients were seen on their own and parents seen separately by the same therapist. Both treatments were delivered as outpatients, though 4/40 in the Eisler study required hospitalisation during treatment. The overall results were similar in the two trials. The Le Grange trial ( $n = 18$ , mean age 15) found a non-significant trend for the separated FT group to do slightly better in terms of weight gain and on the composite Morgan–Russell Outcome Measure than the Conjoint FT group, though there were baseline trends in this direction. The Eisler et al. study ( $n = 40$ , mean age 16), found a trend favouring SFT in terms of Morgan–Russell Outcomes at one year based on comparison between good vs. intermediate and poor outcomes ( $n = 40$ ,  $RR = 1.41$ , 95% CI .86–2.29). A small subgroup with high maternal expressed emotion did markedly better with SFT.

Studies of FT in bulimia nervosa have been more limited and there is only one published RCT, though two are under way. Russell et al.'s (1987) series included a subgroup of 23 adults with bulimia (some at low weight), randomly allocated to individual therapy or FT. At one year the outcomes were generally poor, with no significant difference between the groups; 19 were followed up at 5 years (Eisler et al., 1997), at which point only 16% were

asymptomatic, a poor outcome reflecting a high number with binge-purging AN, rather than BN. There were no differences between the groups. Dodge, Hodes, Eisler, and Dare (1995) reported a small series of 8 who received outpatient FT and had significant improvements in bulimic behaviours. Good or intermediate outcomes were achieved by six (using the composite Morgan–Russell scale).

### *Multiple family group therapy*

The apparent effectiveness of family interventions with children and adolescents with AN and the need to develop more intensive family-based interventions for those who require it led to the development of this treatment approach. The therapy aims to help family members learn by identifying with members of other families with the same condition, by analogy (Asen, in press). It is generally delivered within a day hospital programme, in which up to 10 families with an adolescent with AN attend a mixture of whole family group discussions, parallel meetings of parents and adolescents and creative activities. Preparation of lunch and communal eating is a central part of the programme. There is generally a four/five-day block of therapy followed by a limited number of day attendances at approximately monthly intervals (Scholz & Asen, 2001; Dare & Eisler, 2000). This treatment is at an early stage of evaluation but preliminary findings suggest a high degree of acceptability and promising outcomes, particularly in terms of a reduced need for hospitalisation (Scholz & Asen, 2001).

### *Nutritional counselling*

There is insufficient evidence to determine the efficacy of nutritional counselling given alone, though many services offer it as an adjunct to other specific therapies. In one remarkable RCT (Serfaty, 1999), 35 patients with AN (mean age 21, youngest = 16) were randomly allocated to CBT ( $n = 25$ ) or nutritional counselling ( $n = 10$ ). All patients receiving nutritional counselling had dropped out by 3 months, resulting in a lack of follow-up data for this group. At follow-up, 16 /23 of the CBT group no longer met criteria for AN.

### *Dialectical behaviour therapy (DBT)*

This is a type of behaviour therapy that views emotional dysregulation as the core problem in BN, with bingeing and purging viewed as attempts to control painful emotional states. DBT was found to be more effective than a waiting list control in achieving abstinence from bingeing and purging (4/16 compared with 0/15) in one small adult study (Safer, Telch, & Agras, 2001). A further small uncontrolled trial (Palmer et al., 2003) of seven adult patients with an eating disorder and comorbid borderline

personality disorder (BPD) found all patients stayed in therapy and were improved (though not in remission) at 18 months.

### *Cognitive analytic therapy (CAT)*

This therapy is rooted in attempts to combine cognitive elements into psychoanalytic methods, delivered in a brief focal therapy. There are only two small adult studies of CAT in the eating disorders literature. In a small pilot study of those with AN (Treasure et al., 1995), CAT was compared with educational behaviour therapy (EBT). CAT resulted in greater subjective improvement at one year and in objective outcomes on the composite Morgan–Russell scales, though these were not statistically significant in view of the very small sample size. The Dare et al. (2001) study of 4 therapies, including CAT (see above), found no benefit of any one specific therapy over any others.

### *Motivational therapy and therapeutic engagement*

Recently there has been considerable interest in the importance of motivational interventions in the engagement and treatment of people with AN (Geller, Cockell, & Drab, 2001; Treasure & Ward, 1997; Vitousek, Watson, & Wilson, 1998), based on the trans-theoretical model of change of DiClemente and Prochaska (1998). Motivational interviewing is a potentially useful technique which aims to move a person to a position where they are more prepared to contemplate change. Motivational enhancement therapy (MET) compared with CBT (4 sessions each) was found in one small study of BN to lead to no differences in short-term outcome (Treasure et al., 1999). More comprehensive RCTs in this area are as yet lacking.

### *Comparisons between psychological therapies and drug therapy*

Five trials have compared antidepressants with CBT in BN. In meta-analysis ( $n = 270$ ) they provided limited evidence that CBT is superior in terms of remission from bingeing and purging by end of treatment, but little evidence is available about differences in *frequencies* of these behaviours or at follow-up (NICE, 2003).

There is insufficient evidence to conclude on the relative efficacy of antidepressants and other psychological therapies (NICE, 2003).

### *Areas for further research*

Evaluation of interventions to improve motivation and adherence to treatment are particularly required in the younger population, as many children and adolescents are brought to treatment by others rather than actively seek treatment themselves.

Given that most young people with AN are treated without admission to hospital (Gowers, Weetman, Shore, Hossain, & Elvins, 2000), further evaluation of the efficacy of psychological therapies designed to be delivered on an outpatient basis is required. This should explore content and who the therapies are delivered to.

Further research is needed to identify what the most effective intervention is to challenge the primary cognitive distortion, in which the young person over-evaluates themselves in terms of their weight and shape.

We also need to understand further how behavioural management can best be effected on an outpatient basis.

Given the importance of parental involvement in managing young people with AN, further studies are needed to investigate the relative merits of individual, family or combination treatments. The relative benefits of separated vs. conjoint family therapy approaches for young person, parents and siblings require further study, as do the range of outcomes by which the success of such therapies is measured.

Despite there being good evidence-based treatments for bulimia nervosa in adults (particularly CBT and IPT), these have been insufficiently explored in terms of application to adolescent-onset BN. Developmentally appropriate modifications, including a degree of parental involvement and age-related motivational issues, require further study. As with adults, it is unlikely that CBT will be successful and/or acceptable as the primary treatment for all adolescents with BN, suggesting a need for further development and evaluation of a range of other outpatient therapies.

### **Service issues**

Most young people with anorexia nervosa, bulimia nervosa and related eating disorders can be managed on an outpatient basis, with inpatient care usually only being required for a minority with anorexia nervosa, where there are serious complications related to comorbid diagnoses, or where there is high physical and/or psychiatric risk (Nicholls & Bryant-Waugh, 2003). When admission is deemed necessary this may be to a paediatric ward, a general child or adolescent psychiatric unit, or a specialist eating disorder service. In UK practice, the latter includes specialist adult units, and both independent and public sector services. There are relatively few dedicated NHS beds for the management of children and adolescents with eating disorders, and existing services have been unevenly distributed. A survey by the Royal College of Psychiatrists carried out in 1997/1998 found that 4 regions, representing 25% of the UK population, had no specialist provision for young people with eating disorders, and that 69% of clinics who identified

themselves as providing treatment for children and younger adolescents with eating disorders were in the South East of England (Royal College of Psychiatrists, 2000). This situation is slowly being rectified, with increased activity in the development and commissioning of eating disorder services for young people throughout the UK over the past few years (Great Ormond Street National Map Project – personal communication).

Perhaps related to the fact that there are so few dedicated inpatient beds is the finding that children and adolescents with eating disorders occupy a significant percentage of all available generic inpatient beds. A recent one-day census of bed occupancy by diagnosis in child and adolescent units in the UK revealed that more beds were occupied by young people with eating disorders than any other diagnostic group (Jaffa, 2001).

A summary of current research in the area of service provision is set out below. This covers studies over the past ten years that have attempted to investigate the relative merits of inpatient, day-patient and outpatient treatment delivery, and the relative effectiveness of treatment by a specialised eating disorder service vs. a more general setting.

### *Anorexia nervosa*

Research in the area of service provision is limited. There is one systematic review summarising what is known about the issue of the relative effectiveness of inpatient and outpatient care in the management of anorexia nervosa (Meads, Gold, & Burls, 2001). However, the review is based on only one small RCT with a five-year follow-up, often referred to as the St Georges study (Crisp, Norton, Gowers, 1991; Gowers, Norton, Halek, & Crisp, 1994) plus a number of very varied case series making meaningful conclusions difficult. The main conclusions of the systematic review are that outpatient treatment for AN at a specialist tertiary referral eating disorder service was as effective as inpatient treatment in those not so severely ill as to warrant emergency intervention, and that outpatient care is in general cheaper than inpatient care.

Gowers et al. (2000) carried out a non-randomised, naturalistic comparison of outcome (at 2–7 years) in adolescents with anorexia nervosa treated as inpatients and outpatients. They found those treated as inpatients did less well, with admission status being the main predictive variable. Their findings suggest caution in assessing the benefits of inpatient treatment, but care should be taken about conclusions drawn from this study in the absence of a randomised design.

Whilst the St Georges study lacked power and had other difficulties, it did clearly demonstrate that many older adolescent and adult patients with AN were able to make progress with fairly modest outpatient treatment (Gowers, Norton, Halek, & Crisp,

1994). The majority of people with AN are treated on an outpatient basis (Palmer, Gatward, Black, & Park, 2000), although such treatment tends to be poorly described and documented and presumably varies considerably between services.

Specialised day-patient treatment for AN has been described in the UK and abroad (Gerlinghof, Backmund, & Franzen, 1998; Birchall, Palmer, Waive, Gadsby, & Gatward, 2002; Zipfel et al., 2002; Robinson, 2003). These studies report short-term positive outcomes in older adolescents and adults. However, there are no RCTs and it is not always clear whether, in the absence of the day care offered, the patients included in the study would have been treated as inpatients or outpatients. Although the addition of a day programme to a comprehensive service has been found to reduce the use of inpatient beds in an adult service (Birchall et al., 2002) it seems unlikely that inpatient treatment will cease to be needed. The relative effectiveness and cost-effectiveness of the two forms of more intensive treatment have yet to be adequately studied.

It is widely believed that there may be benefits in the treatment of severe AN within a specialised tertiary eating disorders service compared with less specialised secondary services. Both competence and confidence tend to develop in settings where such treatment is a regular and ongoing activity. This is regarded as a particular problem in the case of very young onset AN, which is relatively rare. However, there is a lack of studies that might provide evidence to support these views.

### *Bulimia nervosa*

In the UK, very few people with BN are treated on an inpatient basis. Admission tends to occur only in those with severe physical complications or with comorbid presentations. It is generally recommended that the great majority of adolescents and adults with BN should be treated on an outpatient basis (NICE, 2003). The idea of ‘stepped care’ has been put forward in the context of managing BN (Fairburn & Peveler, 1990; Dalle Grave, Ricca, & Todesco, 2001), with patients being offered simpler and less expensive interventions first with more complex and expensive interventions reserved for those who have not benefited.

A range of different types of intervention for BN has been studied (see above) but there are no systematic comparisons of outcome with different service levels. All of the current evidence-based therapies for BN are designed to be delivered in an outpatient setting. The place of inpatient treatment for BN is not clearly supported by research evidence. Special inpatient and day-patient treatment regimes have been described (Zipfel et al., 2002), in relation to extreme severity, comorbidity or suicidal risk. There are some reports on special treatment programmes for severe BN complicated by self-harm, substance abuse and

similar behaviours in patients who often fulfil criteria for borderline personality disorder (Lacey & Evans, 1986). There are no specific studies investigating these issues in adolescents.

### *Existing service-related recommendations*

Given the very limited amount of research indicating which service configurations are most effective in the management of young people, current provision tends to be guided by recommendations found in national and professional guidelines. The recommendations below are representative of current international thinking about services for children and adolescents with eating disorders, and have been drawn from a number of published guidelines (Eating Disorders Association, 1994; Kreipe et al., 1995; Royal College of Psychiatrists, 2000; NICE, 2003):

- Services for children and adolescents should be set up and run in a way that involves parents or primary carers, plus other significant family members. Clear expectations around communication between all individuals and agencies involved should be established and implemented. This would normally include the child, the parents, the general practitioner, the child's school, and the treating team in relation to the eating disorder. Other individuals or agencies, such as social services, other medical practitioners including paediatricians, etc. may be also involved. Care needs to be taken to respect the young person's right to confidentiality, and to adhere to existing local and professional guidelines around this.
- Services should be delivered in an age-appropriate manner and setting, taking account of developmental, social and educational needs. Wherever possible, children and adolescents should be treated locally. Assessment and ongoing management should be multidisciplinary, and provided by healthcare providers who have experience in the management of young people with eating disorders and who have knowledge about normal physical and psychological development.
- When inpatient care is required, young people should by preference always be admitted to units with regular and continuing experience in the management of eating disorders in their age group, making a distinction between children and adolescents. Arrangements for older adolescents should be flexible depending on their level of maturity and locally available services. Adolescents should be admitted to the most suitable service with experience of eating disorders. Written guidelines should be drawn up for monitoring the physical progress of all young people treated for eating disorders.
- Services involved in the management of young people with eating disorders will need to ensure that all staff members are familiar with guidance

and recommendations around consent to treatment, the assessment of the young person's capacity to make treatment-related decisions, and the legal framework within which young people may be treated against their stated wishes in those cases where treated is deemed essential. A number of helpful documents and papers can be recommended in this respect (e.g., Manley, Smye, & Srikameswaran, 2001; Honig & Bentovim, 1996).

- In the case of older adolescents with ongoing treatment needs, transition to adult services from child and adolescent services should be planned and actively facilitated.

### *Satisfaction with services*

There is only a limited amount of information on the experience and views of young people with eating disorders and their families about the treatment they receive. Information of this type can be considered an important variable in the assessment of the relative merits of different service configurations. Newton (2001) reports that although various surveys have identified strengths and weaknesses in existing service provision, this information seems to have had little impact on service planning. Assessment of user and carer satisfaction specifically in relation to service setting is rarely carried out. Similarly, patient adherence and drop-out, specifically in relation to service setting, is not usually investigated (Mahon, 2000).

The major focus of existing studies has been on improving the acceptability of services, which may have benefits in terms of improved attendance rates, but also increased involvement with, and effectiveness of, programmes and treatments prescribed (Matoff & Matoff, 2001; Swain-Campbell, Surgenor, & Snell, 2001). Taking account of user and carer perceptions when designing and delivering services may also facilitate help seeking over a prolonged period in people with recurrent mental health problems (Buston, 2002). This in turn may contribute to reduced morbidity.

Individuals with eating disorders, and AN in particular, are often described as being ambivalent about seeking treatment. Unlike most other psychiatric conditions, core features of eating disorders can be highly valued by the patient. In addition, the hospital environment can contribute to a sense of passivity and vulnerability, which can be linked to an increased sense of loss of control, one of the central characteristics of an eating disorder (Eivors, Button, Warner, & Turner, 2003). The acceptability of inpatient treatment for AN in adolescence has been rated as low. They often report feeling pressured and watched, with authoritarian and restricting aspects of treatment causing anger and ambivalence (Brinch, Isager, & Tolstrup, 1988). Such factors can contribute to a degree of reluctance to engage fully in interventions, resulting in relatively

high levels of treatment refusal and premature drop-out, with related implications for long-term recovery and healthcare costs (Kahn & Pike, 2001; Swain-Campbell et al., 2001). People receiving inpatient treatment for AN have been found to be twice as likely to drop out of treatment compared to general psychiatric inpatients (Kahn & Pike, 2001). Reasons for drop-out are likely to be varied and complex. Such findings suggested a complicated relationship between service setting, clinical outcome and patient experience that is difficult to tease out.

It is common to find that individuals remain ambivalent about treatment received, particularly those with AN (Carnell, 1998), even when followed up after many years. Those who have AN in adolescence appear most likely to recall their treatment (whether inpatient or outpatient) in negative terms. This attitude tends to persist and does not appear to be related to treatment duration or intensity (Buston, 2002).

Parents of adolescents have identified a lack of, and need for, support, involvement and education about eating disorders for themselves (Kopeck-Schrader, Maren, Rey, Touyz, & Beaumont, 1993). Such parents have also reported feeling blamed for their child's eating disorder by clinicians providing treatment (Sharkey-Orgero, 1999). Lengthy waiting times for outpatient treatment have been identified as a major reason for being dissatisfied with health care, leading to unacceptable stress and anxiety (Buston, 2002).

### *Areas for further research*

A significant minority of young people with AN are currently treated on an inpatient basis; however, the benefits and risks of different service settings remain poorly understood. Further research is needed on the advantages and disadvantages of different treatment settings (including inpatient, outpatient and day-patient) on all aspects of functioning, including physical, psychological and social functioning. Long-term comparisons of outcome in relation to these different treatment settings are required, but also treatment delivered in 'specialist' eating disorder units vs. more generic units. Patient and parent perspectives on treatment experience and satisfaction should be sought in an attempt to contribute towards improved service delivery.

### **Prognostic factors**

The aetiology of eating disorders, in common with most other psychiatric disorders, is generally considered to be multifactorial (Cooper & Steere, 1995). Following the establishment of an eating disorder, a similar combination of risk and protective factors is thought to maintain the condition, determine whether a young person recovers, or predict response to a particular treatment.

Much of the research on prognostic factors suffers from methodological limitation. Firstly, much of it has been based on clinical samples attending specialist clinics, which may result in selection biases. The general outcomes of patients with AN, in particular, treated in specialist services seems poor (e.g., Russell et al., 1987), probably reflecting the severity of disorder being treated there, though it is often better in younger cases.

As with the treatment research in general, wide variations in outcome measures and timing have been reported. Prognostic factors studied have comprised a mixture of pre-treatment variables, variables relating to adherence and response to treatment and end of treatment predictors of outcome. There is little in the literature matching prognostic features to a particular treatment (NICE, 2003). Different factors may influence speed of response to treatment, outcome at end of treatment or follow-up, relapse or chronicity.

Although a number of potential predictors of outcome have been measured, these are chiefly ones which are easily measured at presentation. Some factors, however, which are assessed more rarely, such as motivation for change or over concern with body weight and shape, may be at least as crucial in determining outcome. Indeed most studies have found that the contribution of any risk or maintenance factor to outcome is small, implying either that multivariate models are necessary to predict outcome or that the most important factors have not been measured. Finally, few studies have included the person with an eating disorder's own perspective.

Two recent systematic reviews of prospective and experimental studies have considered the evidence for maintaining and prognostic factors (Stice, 2002; NICE, 2003), while Steinhausen (2002), in a more inclusive review of outcome predictors from 119 studies, has also included publications based on expert clinical opinion.

An important question facing those treating patients with eating disorders is how to predict which young people will respond to treatment. This knowledge might enable more intensive treatments to be given to those likely to be more resistant. Intensive treatments for AN, such as inpatient management, are expensive, less popular and scarce and therefore should be targeted.

### *Anorexia nervosa*

*Service issues.* There is no good evidence on the outcomes of those who do not access formal medical care (Treasure & Schmidt, 2002), though Crisp et al.'s (1991) RCT (adults and older adolescents combined) found a significant advantage of specialised inpatient and outpatient therapies over assessment only, at one-year follow-up. In adolescents, one cohort study found that only 3/21 of those treated as inpatients had a good outcome at 4 years compared

to 31/51 of those who had never been admitted (Gowers et al., 2000). This paper raises the controversial issue of the potential adverse consequences of admission, which, given the inevitably more severely ill nature of those selected for it, is difficult to address without an RCT design. The TOuCAN trial of inpatient vs. outpatient management (Gowers et al., in preparation) may help to rectify this. A similar difficulty bedevils the evaluation of compulsory treatment and treatment predictors of mortality. Those compulsorily treated have a poorer outcome (Ramsay, Ward, Treasure, & Russell, 1999), but most treatment guidelines (e.g., NICE, 2003) conclude that there are considerable benefits, including saving life, in its judicious use.

Dropout from treatment is often cited as a poor prognostic indicator (NICE, 2003), though those with other unfavourable features may disengage more readily.

*Predictors of mortality.* Neilsen et al. (1998) reviewed the mortality rate in AN, based on published outcome studies across the age range. They concluded that the Standard Mortality Ratio (SMR) in anorexia nervosa was raised in those with a lower presenting BMI and those presenting in adulthood (aged 20–29), that is to say the adolescent-onset condition conferred a better prognosis in terms of lethal outcome. Andersen (1992) has concluded, on the basis of a review of a number of large series, that the outcome is no better or worse for males than females.

*Comorbidity.* A number of papers have reviewed the impact of comorbid conditions in adolescence. Pre-treatment depression was found not to influence outcome at 1 year (North & Gowers, 1999), while obsessive-compulsive disorder was associated with a poorer outcome (Higgs et al., 1989). Residual OCD symptoms at end of treatment are also a negative indicator (NICE, 2003).

*Age of onset.* An early age of onset has been consistently reported as conferring a good prognosis (Treasure & Schmidt, 2002), along with a short duration of illness before treatment, which may be a confounding variable. Gowers, Crisp, Joughin, and Bhat (1991) suggested, however, that there may be a sub-set of very early onset (pre-menarcheal) cases, with especially poor physical, social and personality development, who might have a poor outcome. (Bryant-Waugh, Knibbs, Fosson, Kaminski, and Lask (1988) found a poor outcome in those developing AN under the age of 11 and Rome et al. (2003) suggest that asociality in childhood predicts poor outcome.

*Life events.* In a prospective adolescent series, North, Gowers, and Byram (1997) found that those with a severe negative life event precipitant (i.e., acute onset) had a good prognosis, probably reflecting the healthier premorbid adjustment of this subgroup.

*Physical features.* Vomiting, bulimia and profound weight loss are associated with a poor outcome (Treasure & Schmidt, 2002). BMI centile alone may therefore not be that helpful in predicting outcome given that binge-purgers do not generally achieve the very low weights seen in restricting AN and indeed Rome et al. (2002) conclude that in young patients it is the restricters rather than purgers who have the worse outcome.

High serum creatinine levels (>1.5mg/100ml) are associated with poor outcome in children (Rome et al., 2002).

### *Bulimia nervosa*

Keel and Mitchell (1997), in a narrative review of predictors of outcome for bulimia nervosa based on 60 studies, and Hay and Bacaltchuk (2002), in their systematic review, concluded that there were few consistent predictors of outcome. NICE (2003) reviewed 60 studies of sample size >50 and follow-up of greater than 1 year and concluded that meta-analysis was not possible owing to the variety of methods employed. NICE (2003) give no prognostic indicators specifically for adolescents.

Good prognosis has been associated with the following pre-treatment variables: shorter duration of illness, higher social class, younger onset and family history of alcoholism (Collings & King, 1994). Bell (2002), meanwhile, concluded that low self-esteem was associated with poor outcome.

*Body mass.* In bulimia nervosa higher body mass does not appear to act as a maintenance factor for bulimic symptoms (Stice & Agras, 1998; Fairburn, Cooper, Doll, Norman, & O'Connor, 2000).

*Perceived pressure to be thin.* In an adolescent sample, perceived pressure to be thin was found to predict maintenance of bulimic symptoms in an adolescent sample followed up for 9 months (Stice & Agras, 1998). The same study also found that maintenance of bulimic symptoms was also related to higher rates of presenting body dissatisfaction.

*Dieting.* The dietary restraint model argues that calorie restriction contributes to the maintenance of binge eating. This proposal was supported in the adolescent study of Stice and Agras (1998), but not in adults (Fairburn et al., in press).

*Negative affect.* This has been found to be a non-significant predictor of bulimic symptom maintenance in general (NICE, 2003) and in adolescents (Stice & Agras, 1998). Leon, Fulkerson, Perry, Keel, Klump (1999), meanwhile, found that it predicted an increase in general eating pathology in a large sample of adolescents followed up for three years.

*Perfectionism.* Santonastaso, Friederici, and Favaro (1999) followed up 72 adolescents and found that

high initial perfectionism predicted maintenance of eating pathology at 12 months.

*Severity.* Higher rates of bingeing and vomiting are associated with poor outcome (NICE, 2003).

*Comorbidity.* Substance misuse confers a poor prognosis (Keel, Mitchell, Miller, Davis, & Crow, 1999; NICE, 2003). Premorbid obesity in childhood has also been cited (Fairburn et al., 1995; Bulik, Sullivan, Joyce, Carter, & McIntosh, 1998; NICE, 2003). Personality disorder or disturbance is consistently associated with poor outcome, particularly Cluster B (Rossiter, Agras, Telch, & Schneider, 1993; NICE, 2003) and impulsivity (Keel et al., 1999).

### *Service and treatment issues*

Those with poor motivation for change do poorly (NICE, 2003). Continuing bulimic behaviours at the end of treatment are associated with poor outcome, thus treatment should aim for complete abstinence rather than reduction in these behaviours (NICE, 2003). The association of continuing abnormal attitudes, body dissatisfaction, drive for thinness and low mood, at end of treatment with poor outcome (NICE, 2003), indicates that both cognitive and behavioural change are vital to long-term recovery.

## Discussion

Despite the very long history of treating eating disorders, good quality research is lacking. For a condition which commonly arises in adolescence, the number of adolescent treatment trials is very small. We must conclude that the barriers to research are considerable. The need for intensive medical management, often delivered on an inpatient basis, makes research into AN problematical; many studies list severe physical compromise as an exclusion criterion. Furthermore, attention to necessary physical management may draw attention away from psychological aspects of the disorders. Problems with engagement and obtaining informed consent are ubiquitous clinical issues and make for additional difficulty in recruitment into treatment trials. A number of aspects of management may not lend themselves to RCT design; nevertheless, well-conducted pragmatic trials of adequate power may well elucidate the more effective and acceptable treatments. Although clinical guidelines have identified consensus good clinical practice, research is needed to confirm or challenge unsubstantiated belief.

The gaps in the knowledge base regarding effective treatments in child and adolescent eating disorders suggest that almost any adequately powered well-conducted trials would add to knowledge. There are some areas, however, which should be considered priorities and these have been highlighted in the

relevant sections above. Finally, further clarification is required to guide treatments for those with 'atypical' or 'not otherwise specified' eating disorders. Currently these terms are used to include a heterogeneous mix of clinical presentations, for whom there are no evidence-based treatments. In those not quite meeting criteria for AN and BN, studies are required to investigate the acceptability and efficacy of treatments for AN and BN. Predictors of outcome within this group also need further study, as part of a process of improving the ability to match interventions to individual presentations.

## Acknowledgement

Grateful thanks are due to the members of the NICE Eating Disorders Guideline Development Group who contributed many of the clinical questions referred to in this review and to the searches and analysis.

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