Eating disorders in children and young people

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What you need to know

• Prompt referral of patients with suspected eating disorders to specialist services is important as early treatment substantially improves prognosis.
• Eating disorders have relatively high mortality and associated morbidity (resulting from physical health, psychological consequences, and suicide).
• Indications for urgent referral to specialist mental health services for children and young people include rapid weight loss, body mass index <75% of expected body weight, and binge eating and purging several times a day.

Sources and selection criteria

Search date: Sept-Oct 2016; repeated August 2017. We consulted the Cochrane Collaboration database and the BMJ Clinical Evidence website using the search terms “eating disorder”, “anorexia nervosa”, “bulimia nervosa”, “OFSED”, “EDNOS”. We supplemented these searches with our personal archives of references and expert input from our reviewers.

Eating disorders are a group of conditions in which negative beliefs about eating, body shape, and weight accompany behaviours including restricting eating, binge eating, excessive exercise, vomiting, and laxative use. Eating disorders are particularly common among adolescent girls, although they can also occur in boys and men. Eating disorders are associated with high mortality and morbidity but international evidence shows that many patients either do not access or do not receive treatment. Recent Guidelines[1][2] highlight the importance of early intervention. This update presents a structured approach to diagnosis and management of children and young people with eating disorders (with a focus on anorexia nervosa and bulimia nervosa), including risk assessment and when to refer, incorporating recent recommendations from the May 2017 updated NICE guideline[2].

How are eating disorders classified?

In anorexia nervosa, weight is “less than minimally expected,” dietary intake is restricted, and there are disturbances in the way weight and shape are experienced. Bulimia nervosa comprises binge eating with compensatory behaviours aimed at reducing weight, such as vomiting or excessive exercise, while binge eating disorder includes binge eating but without compensatory behaviours. In the Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5)[5], a new category “other specified feeding or eating disorder” (OSFED) replaces “Eating disorder not otherwise specified” for an eating disorder that causes distress and impairment, but which does not meet the full criteria for other diagnoses. Binge eating disorder is included in DSM-5 and it is anticipated that ICD-11 criteria will be broad and consistent with DSM changes[6].

How common are eating disorders?

Eating disorders are relatively common among adolescent girls: a recent Dutch community study using new (broader) DSM-5 criteria found a lifetime prevalence among 19 year old women of 5.7% compared with 1.2% in men, with binge eating disorder the most common[7]. Incidence rates of eating disorders in UK primary care increased from 32.3 per 100 000 in 2000 to 37.2 in 2009[8]. There are few prevalence studies in low and middle income countries, but the Global Burden of Disease Study notes that eating disorders do occur across the world[9].

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How are eating disorders diagnosed?

Diagnoses are made on clinical history corresponding to ICD-10/DSM-5 criteria.1 Clinicians should consider a possible eating disorder and ask further pertinent questions (see associated Practice Pointer) in patients presenting with a change in weight (increase, decrease, or failure to keep in line with growth), erratic eating (skipping meals or binge eating), preoccupation with shape or weight, vomiting, low mood, or withdrawal from friends and family, periods stopping, or if complaining of feeling cold.

Differential diagnoses and comorbidities

In the case of weight loss, the differentials include diabetes, hyperthyroidism, coeliac disease, and malignancies, and the primary care physician should screen for these on history, examination, and investigations as detailed below. Eating disorders are associated with increased rates of other mental disorders, including depression,10 11 anxiety,11 12 obsessive compulsive disorder,11 14 and alcohol misuse/dependence.11 15 A large Finnish patient cohort found that diabetes was associated with higher subsequent rates of anorexia nervosa, bulimia nervosa, and binge eating disorder, and that Crohn’s disease was associated with higher subsequent rates of anorexia nervosa compared with controls.16

What are the psychological and physical complications?

Eating disorders are associated with high mortality: a meta-analysis found that, in patients with anorexia nervosa, rates of death are 5.9 times higher than would be expected in an age and sex matched population, and, in patients with bulimia nervosa and other eating disorders, rates are 1.9 times higher.17 Psychological—Low weight can cause substantial psychological consequences, such as low mood, suicidal ideation and behaviour, low self esteem, irritability, increased anxiety, social withdrawal, and rigidity of thinking,18 all of which can contribute to further weight loss. These symptoms can affect relationships with others. In all eating disorders, a young person’s value system and identity can become altered, with their focus shifting to weight, body shape, and what is eaten, rather than to other aspects of life. This, alongside problems with concentration and decision making, can impair capacity to consent to treatment. Physical—Chronic undernourishment can lead to disruption of all major organ systems.19 Rapid weight loss can be particularly damaging, as the body has less time to adapt.20 Purging, overhydration, and the misuse of laxatives and diuretics can also be damaging. The cardiovascular system responds to a low basal metabolic rate in underweight patients with a decreased heart rate and blood pressure,20 autonomic dysregulation, postural hypotension, postural tachycardia,21 and increased risk of syncope.22 Hypokalaemia as a result of vomiting, or diuretic or laxative misuse, and low weight in the absence of hypokalaemia, can lead to prolonged QTc, which can in turn lead to ventricular arrhythmias and sudden death.23 Hypocalcaemia and hypomagnesaemia are less common but can lead to hyponatraemia, with associated risk of seizures.24

What investigations should you do to aid diagnosis and management?

(And infographic) outline examination and investigation of children and young people presenting with features of an eating disorder. The purpose of the investigations is to assess for physical complications so that they can be managed appropriately and to exclude other possible causes of weight loss or gain.

Risk assessment of children and young people with an eating disorder

Risk assessment helps inform immediate and long term treatment decisions. Features of high physical risk that might indicate a need for inpatient medical admission25 are detailed in 11 17. Readers are encouraged to refer to the Junior MARSIPAN guidelines20 for detailed guidance on managing patients who are very ill with anorexia nervosa.

Full psychiatric assessment, including of suicidal thoughts and plans, is important as people with anorexia are at higher risk of suicide than the general population.17 Psychiatric comorbidities in eating disorders are common and associated with higher mortality.17 31 and worse treatment outcomes.17

What treatments are available?

Population studies consistently find that many people meeting diagnostic criteria do not receive any kind of treatment (around 56% in the Netherlands26; 28% in the US3); those with anorexia nervosa are more likely to receive treatment. Intervention early is associated with better treatment outcomes.14 Outcomes in anorexia nervosa are poor if the patient does not receive effective treatment within the first three years.14 A holistic approach should be taken, potentially including several modes of treatment. It is important to keep the primary care team informed about progress in secondary care, and to invite the primary care team to attend key reviews, especially towards the end of treatment to ensure a safe transition back to primary care. Principles of managing eating disorders that families might find helpful include strengthening family relationships away from the pressures of food, and focusing on enjoyable activities together; conceptualising eating problems as separate from the young person, so that parent and child can “team up” against the disorder; eating regular, balanced meals as a family where possible; avoiding regular weighing and other forms of body
checking as these can increase concerns about weight and shape. Specific types of treatment include:

**Psychological treatments**

### Anorexia nervosa

Family based treatment, or “anorexia nervosa focused family therapy”28 is recommended by the National Institute for Health and Care Excellence (NICE) as the first line treatment for anorexia nervosa in children and young people.7 The effectiveness of family based treatment is based on evidence from 12 individual randomised controlled trials (1060 participants), one of which was rated by NICE, using the GRADE system, as Moderate, the rest as Low or Very Low. It is regarded as the core treatment for anorexia nervosa in children and young people.31,32 Family treatment emphasises the importance of parents initially taking responsibility for refeeding, before gradually handing back responsibility to the young person. This is best done in an atmosphere of collaboration and minimisation of blame, for which support from the clinical team is often required.

Evidence for adolescent focused treatment, and enhanced cognitive behavioural therapy (an enhanced, transdiagnostic version of the original cognitive behavioural therapy developed for bulimia nervosa) comes from randomised controlled trials rated as Low or Very Low GRADE in the NICE guidance.33 NICE guidance recommends cognitive behavioural therapy for eating disorders if family therapy as described above is contraindicated, unacceptable, or ineffective.

### Bulimia nervosa

A review29 concluded that there have been fewer randomised controlled trials investigating the efficacy of treatments for bulimia nervosa in children and young people,34 but

- In adolescents, one randomised controlled trial found family therapy for bulimia nervosa to be more effective than supportive individual therapy,35 and this is what the NICE guideline recommends, although NICE rated the evidence GRADE as Low

- Randomised controlled trials finding enhanced cognitive behavioural therapy to be effective for bulimia nervosa have included high proportions of young adults,36 so it might be reasonable to generalise from these.37 NICE suggests cognitive behavioural therapy for eating disorders be used when family therapy is ineffective, contraindicated, or unacceptable

- One randomised controlled trial suggests that cognitive behavioural therapy guided self help might be more effective than family based treatment (adapted for this study for use in bulimia nervosa),38 as well as being more cost efficient and acceptable to patients.

**Psychotropic medication**

Psychotropic drugs are not recommended for the treatment of anorexia nervosa in primary care. A meta-analysis found no difference between placebo and either antidepressant or anti-psychotic medication on weight gain in anorexia nervosa,40 and no differences in anorexia nervosa symptomatology between anti-psychotics and placebo.31 This might be because the randomised controlled trials were underpowered, but in view of drug safety considerations around the use of antidepressants in adolescents, and the risk of prolonged QT interval in both low weight individuals and for those taking anti-psychotics,41 they should be used cautiously if needed for treatment of comorbid mental illness, and only by eating disorders specialists with regular monitoring.

There is very little evidence for pharmacotherapy in young people with bulimia nervosa, but there is some evidence to suggest that high dose antidepressants might improve outcomes in adults with bulimia nervosa42,43 so fluoxetine might be considered by specialist services if other treatments are not working.

**Weight restoration in underweight patients**

For underweight individuals, re-establishing a healthy weight is considered by experts to be a key part of treatment,39 although psychological treatment is crucial to ensuring a full recovery.35 Regular monitoring of electrolytes, phosphate, and magnesium is advised because of the risk of refeeding syndrome44,45 when there has been rapid weight loss and a period of minimal food intake. Monitoring should be undertaken in specialist care; according to local protocols this might be by the specialist eating disorder team or the paediatricians. Recommended rates of weight regain range from 500 g to 1400 g per week,36 depending on the setting. A recent randomised controlled trial in young people found commencing refeeding with 1200 kcal/day × 500 kcal/day did not increase the rate of refeeding syndrome.46 Expert advice suggests offering paediatric supplement feeds (high calorie drinks) if young people struggle to complete meals.28 In hospital settings, feeding through a nasogastric tube can be considered in cases where weight is very low and if meals cannot be completed.28

**Vitamin/mineral supplements**

Experts are divided as to whether refeeding in high risk underweight patients should include routine supplementation with thiamine and phosphate.30-32 A multivitamin and mineral supplement is usually recommended in underweight patients.31

**Oestrogen replacement therapy in underweight patients**

Transdermal oestrogen application is partially effective in increasing bone density, although it should be initiated only by an appropriate specialist.7 Oral oestrogen can be considered for use by specialists in 13-17 year olds with long-term low weight and low bone mineral density.33 The most effective way to improve bone density is for the patient to regain a healthy weight and re-establish menstruation.34

**Legal framework**

Most jurisdictions acknowledge that serious or life threatening eating disorders can be treated compulsorily with refeeding, under the relevant legal framework, when the patient is not able to consent to treatment. Some younger adolescents might respond to a firm approach from parents regarding participating in treatment, but if they are resistant and the illness is sufficiently serious then the use of a formal legal framework helps to safeguard their rights and wellbeing.

**When to consider admission?**

Experts advise that all young people with a probable eating disorder be referred to local specialist mental health services for children and young people, with results of tests (outlined in []). Guidance in England recommends that all under 18s start evidence based treatment within four weeks.35 Practice guidelines31,47 advise that most patients with eating disorders can be treated as outpatients: outcomes in anorexia nervosa are
equivalent for brief inpatient treatment followed by outpatient care compared with prolonged inpatient care. Specialist local services are associated with lower rates of admission and more consistent care,\(^2,3\) and are also more cost efficient.\(^3\) Inpatient or day patient services might be needed in more severe cases or if the patient does not improve with outpatient care.\(^1\) Inpatient treatment in a medical or paediatric ward is necessary where there is high medical risk (\(\downarrow\)).\(^1\) Indications for urgent referral to specialist mental health services for children and young people include rapid weight loss, body mass index <75% of expected body weight, and binge eating and purging multiple times a day. Indications for referral for emergency paediatric assessment include pulse <50 beats/min, arrhythmia, or postural tachycardia >20 beats/min; blood pressure <80/50 mm Hg or postural drop >20 mm Hg; temperature <35.5°C; QTc >450 ms; significant hypokalaemia; significant neutropaenia.\(^1\) In such cases, simultaneous referral to both paediatrics and mental health services is recommended.\(^2\)

Transitions are particularly important in patients with eating disorders as there needs to be careful multidisciplinary planning between primary care, paediatric, medical, and psychiatric settings, between in and outpatient treatment, and between child and adolescent and adult services to ensure continuity of care and minimisation of risk.\(^3,5,10\)

### Can eating disorders be prevented?

A systematic review\(^6\) found that both universal and targeted prevention programmes, most of which focus on psychoeducation, produce moderate effects on knowledge but have little effect on reducing eating disorders. A randomised controlled trial found a statistically significant reduction in concerns about weight and shape 12 months after a universal school based intervention in 13 year olds.\(^6\)

### Questions for future research

“Which factors influence the duration of recovery and the possibility of complete recovery?” was the top question from the recent James Lind Alliance priority setting process involving patients, carers, and clinicians\(^8\)

Medication—Experts suggest more research into antipsychotic use in anorexia nervosa.\(^1\) Tumour necrosis factor, dronabinol, and ghrelin agonists and antagonists are also being investigated\(^7\)

Psychotherapy—studies of enhanced cognitive behavioural therapy in young people with anorexia nervosa are ongoing; feasibility and open studies of multi-family therapy for anorexia nervosa are promising

### What general practitioners need to know—a patient’s perspective

Advising patients that, even if they look and feel well and are of normal weight, they can still be very unwell

Female patients might find it easier to talk to a female doctor about body image problems; offering patients a choice of whom to see is helpful

It’s important to speak to the patient on their own, without their parents

Children should be given the same respect as adults, and have their problems taken seriously

Social media can often be a massive factor in their illness

Even though patients may find it distressing, hard facts about the physical risks are essential. The patient might respect the information given by a doctor more than that from their parents or families

### Additional educational resources for healthcare providers

All the websites listed are free; none requires registration.

- The Royal College of Psychiatrists website includes readable, user-friendly, evidence-based information. http://www.rcpsych.ac.uk/healthadviceproblemsdisorders/anorexiaandbulimia.aspx
- Junior Management of Really Sick Patients under 18 with Anorexia Nervosa (MARSIPAN). Guidelines for identifying and managing high risk patients with anorexia nervosa. http://www.rcpsych.ac.uk/usefulresources/publications/collegereports/cr/cr168.aspx
- NICE Guidelines for eating disorders. https://www.nice.org.uk/guidance/cg69
- B-EAT: A UK charity supporting anyone affected by eating disorders has a section for professionals. https://www.b-eat.co.uk/for-professionals
- The Royal Australian and New Zealand College of Psychiatrists has recently updated practice guidelines. https://www.ranzcp.org/Files/Resources/Publications/CPG/Clinician/Eating-Disorders-CPG.aspx

### Information resources for patients

All the websites listed are free; none requires registration.

- B-EAT: A UK charity supporting anyone affected by eating disorders offers information, helplines, and online and peer support groups for patients with eating disorders, their families, and friends. https://www.b-eat.co.uk
- Maudsley Parents. A website for parents of children with eating disorders. www.maudsleyparents.org
- FEAST. An international organisation of and for parents and caregivers to help loved ones recover from eating disorders by providing information and mutual support. http://www.feast-ed.org
- Anorexia and Bulimia Care. A UK eating disorders organisation with more than 25 years of experience. http://www.anorexiabuliaicare.org.uk
- www.healthtalk.org. A useful resource on many disorders, this site has information on young people’s experiences of eating disorders and the range of interventions. http://www.healthtalk.org/young-peoples-experiences/eating-disorders/topics

### Education into practice

How might you incorporate a focused history and examination for signs of eating disorder into a brief consultation with a young person?

Are you aware of the specialist services in your local area for people with suspected eating disorders? Would you feel able to contact them for support or advice about a patient?

What advice might you give to parents who are concerned their child is at risk of developing an eating disorder?

How patients were involved in the creation of this article

A recovered patient, her mother, and another parent of a young person with an eating disorder who wished to remain anonymous, read drafts of the article and made valuable suggestions, including how we worded specific ideas, which we have incorporated here.
Competing interest statement: We have read and understood the BMJ Group policy on declaration of interests and declare the following interests: none.

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## Tables

### Table 1 | Lifetime prevalence of eating disorders in 19-20 year olds

| Eating disorder                          | Lifetime prevalence (%) (with 95% confidence intervals) in 19-20 year olds |
|------------------------------------------|--------------------------------------------------------------------------|
|                                          | Women                       | Men                        |
| Anorexia nervosa                         | 1.7 (1.0 to 2.9)            | 0.1 (0.0 to 0.8)           |
| Bulimia nervosa                          | 0.8 (0.3 to 1.7)            | 0.1 (0.0 to 0.8)           |
| Binge eating disorder                    | 2.3 (1.4 to 3.6)            | 0.7 (0.2 to 1.6)           |
| Other specified feeding or eating disorder| 0.6 (0.2 to 1.3)            | 0.3 (0.0 to 1.0)           |
| Unspecified feeding or eating disorder   | 0.2 (0.0 to 0.8)            | 0.0 (0)                    |
| Any eating disorder                      | 5.7 (4.2 to 7.5)            | 1.2 (0.6 to 2.3)           |

1.2%.
| Examination                          | Possible features                                                                 | High risk features (consider medical admission) |
|-------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------|
| General observations                | Might appear totally well                                                        | **Pulse <50 beats/min**                           |
|                                     | Possible muscle wasting                                                           | Low blood pressure (<0.4th centile)              |
|                                     | Lanugo hair                                                                      | Postural hypotension (drop ≥15mm Hg)             |
|                                     | Russell’s sign (callous on back of hand) suggests self induced vomiting           | Postural tachycardia (increase >20                |
|                                     | Tooth decay and parotid gland swelling (in vomiting)                              | beats/min)                                       |
|                                     | Submandibular gland swelling                                                      | Delayed capillary refill                         |
|                                     | Indicators of another cause of underweight: pallor, thyroid signs, organomegaly   | Temperature <35.5°C                              |
|                                     | Dehydration can be difficult to detect                                            |                                                 |
| Pulse, temperature, and blood pressure | Decreased basal metabolic rate in starvation leads to decreased core temperature, slowed pulse, low blood pressure (<2nd centile) | **• Weight <75% of expected (although note** |
|                                     |                                                                                    | **that weight for height is a poor proxy for medical** |
|                                     |                                                                                    | **• Rapid weight loss (0.5-1kg/week)**            |
| Height and weight: body mass index (BMI) | Percentage BMI should be calculated as (actual BMI×100)/median BMI (50th centile) for age and sex | **Spinal compression or osteoporotic fractures** |
|                                     | Normal/Increased BMI (bulimia nervosa/ORSED)                                      |                                                 |
|                                     | Weight “less than minimally expected” for height in anorexia nervosa              |                                                 |
| Musculoskeletal system               | Muscle weakness is common in underweight patients                                 |                                                 |
| including the “sit up” and “squat stand” tests (†) | Patient might be unable to sit up from lying or to rise from a squat position |                                                 |
|                                     | Back or bone pain from spinal compression or osteoporotic fractures                |                                                 |
| Abdomen                             | Tenderness/bloating due to gastritis (most often if vomiting)                      | **Gastric dilatation**                           |
|                                     | Constipation or ileus                                                             |                                                 |

OFSED: Other specified feeding or eating disorder
### Table 3: Investigations in children and young people presenting with possible features of an eating disorder. (Note that these are often normal, even in acutely unwell patients)

| Investigation                  | Possible features                                                                 | Features suggestive of high medical risk (consider medical admission) |
|--------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Full Blood Count               | Anaemia (rar; possible causes: gastrointestinal bleeding/malnutrition); neutropaenia (which is associated with increased risk of refeeding syndrome); thrombocytopaenia | Significant neutropaenia                                               |
| Urea and electrolytes          | Electrolyte disturbance (vomiting/laxative or diuretic abuse/overhydration).     | Hyponatraemia                                                        |
|                                | Dehydration (vomiting, diuretics, starvation)                                    | Hypokalaemia                                                          |
| Calcium, magnesium, and phosphate | Low (malnourished)                                                              | Hypophosphataemia (this can also occur in the context of refeeding)  |
| Erythrocyte sedimentation rate | If raised could indicate organic cause for weight loss or an intercurrent bacterial infection |                                                                       |
| Blood glucose                  | Low (acute starvation)                                                          | Hypoglycaemia                                                        |
| Thyroid function tests         | To rule out hyperthyroidism as a cause of weight loss                           |                                                                       |
| Vitamin B and D levels         | Vitamins B and D might be low                                                   |                                                                       |
| Electrocardiogram              | Features of electrolyte disturbance                                              | Cardiac arrhythmia                                                    |
|                                | Prolonged QTc                                                                   | QTc >450 ms                                                          |
|                                | Sinus bradycardia                                                              |                                                                       |

Tables are adapted from 27–30
Figures

Risk factors for eating disorders

- **History of dieting/eating disorders**
- **History of depression/anxiety/alcohol dependence**
- **History of obesity**

**INDIVIDUAL**
- Female gender
- Genetics
- Premature birth
- Low self esteem
- Perfectionism
- Previous depression/anxiety
- Previous obesity
- Early puberty
- Diabetes
- Crohn's disease

**POSSIBLE TRIGGERS AND MAINTAINING FACTORS**
- Puberty
- Socio-cultural pressures, e.g. thin ideal portrayed in the media and social media
- Family factors
- Pressure to achieve
- Behaviour of peers
- Comments about weight

**FAMILY**
The sit up-squat-stand test. People who are suspected to have an eating disorder might be unable to sit up from lying, or to rise from a squat position.