**15. Eating Disorders**

**Background**

Relatively common – 0.5-0.7% adolescent females have anorexia nervosa, 5-10% of eating disorders occur in males.

Anorexia nervosa associated with significant morbidity and 5% mortality.

Incidence increasing in younger children, where there is less predominance of female cases

Early recognition and management generally result in better outcomes.

Children may be referred to the Assessment Unit by colleagues in the Child and Family Psychological Health Service for a physical health assessment, or they may be referred by the GP, or during assessment of other issues it may become apparent the child or young person has a potential eating disorder.

Diagnostic criteria used in adults, particularly for anorexia, are not fully applicable to children and adolescents whose weight may not fall to 85% ideal weight, and who may be pre-pubertal and therefore not attained menarche.

**NB. Adolescents can present with eating disorders at ‘normal’ body weights/ BMI, especially if there is a history of preceding obesity.**

**History**

Weight – ask about duration and degree of weight loss, and whether trying to reach any target weight. Is anyone else (friends, teachers, parents) concerned about their weight?

Diet – 24 hour diet history, whether avoiding any food groups, calorie counting, and history of bingeing or vomiting after meals. Include history of fluid intake.

Pubertal development – age at menarche, regularity of periods, LMP

Exercise – how frequent, what intensity?

Systems review – dizziness, syncope, cold intolerance, hair loss, easy bruising, constipation, abdominal pain, palpitations, poor concentration, tiredness

Family history – obesity, eating disorder, psychiatric illness

Other – any thoughts or history of self harm, substance misuse. Consider using HEADSSS assessment.

**Examination**

Accurate weight and height, plotted on growth chart

Plot BMI on growth chart (see instructions on new 2012 growth charts for doing this).

If plotting on 2nd centile or less, calculate percentage median BMI.

Percentage BMI = actual BMI (weight/height2) x 100

 Median BMI (50th percentile) for age & gender

**General physical examination**, paying particular attention to;

* Temperature, hydration status, skin & hair
* Cardiovascular system – bradycardia, cool peripheries, blood pressure, postural hypotension, arrhythmias
* Signs of recurrent vomiting - gingivitis, dental caries, swollen parotid glands, callouses on hands, loss of tooth enamel
* Pubertal development – prepubertal, entering puberty or completing puberty (see 2012 growth charts for definitions)
* Signs to suggest alternative diagnosis – lymphadenopathy, mouth ulceration, abdominal tenderness or mass, hepatosplenomegaly

**Please fill in the following check lists and attach to notes (page 244/245)**

**Paediatric Checklist for Patients Admitted for Refeeding in Anorexia Nervosa**

**Please place in notes at time of admission**

Calculate BMI \_\_\_\_\_\_\_kg/m2

Baseline bloods taken

(FBC, U&E, LFT, TFT, bone profile, magnesium, glucose, vitamin D)

ECG performed

Prescribe Forceval 1 capsule daily

Prescribe Phosphate Sandoz 1 tablet twice daily

(If phosphate level low initially this may need to be increased)

Inform dietician

Daily bloods - (U&E, bone profile, magnesium)

Day 1

 Day 2

 Day 3

 Day 4

 Day 5

 Day 10-12 (if still an inpatient)

Lying/standing blood pressure, at least daily

(In addition to routine observations)

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**The Junior MARSIPAN report provides a framework for the medical assessment of risk;**

Risk assessment framework for young people with eating disorders

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Red | Amber | Green | Blue |
| BMI & weight | Percentage medianBMI<70% (approx. below 0.4th BMI centile)Recent loss of weight of 1 kg or more/week for 2 consecutive weeks | Percentagemedian BMI 70–80% (approx. between 2nd and0.4th BMI centile)Recent loss of weight of 500– 999 g/week for 2 consecutive weeks | Percentage median BMI 80–85% (approx.9th–2nd BMI centile)Recent weight loss of up to500 g/week for 2 consecutive weeks | Percentage median BMI>85% (approx. above 9th BMI centile)No weight loss over past 2 weeks |
| Cardiovascular health | Heart rate (awake)<40bpmaHistory ofrecurrent syncope; marked orthostatic changes (fall in systolic blood pressure of20 mmHg or more, or below 0.4th– 2nd centiles for age, or increasein heart rate of >30 bpm)Irregular heart rhythm (doesnot include sinus arrhythmia) | Heart rate (awake) 40–50 bpmSitting blood pressure: systolic <0.4th centile (84–98 mmHg dependingon age and genderb); diastolic<0.4th centile (35–40 mmHg depending on age and genderOccasional syncope; moderate orthostatic cardiovascular changes (fall in systolic blood pressure of15 mmHg or more, or diastolic blood pressure fall of 10 mmHg or more within3 min standing, or increase inheart rate of up to 30bpm | Heart rate (awake) 50– 60 bpmSitting blood pressure: systolic <2nd centile (98–105 mmHg dependingon age and genderb); diastolic<2nd centile (40–45 mmHg depending on age and genderPre-syncopal symptoms but normal orthostatic cardiovascular changesCool peripheries; prolonged pe- ripheral capillaryrefll time (normal central capillaryrefll time) | Heart rate (awake) >60bpmNormal sitting blood pressure for age and gender with reference to centile chartsNormal orthostatic cardiovascular changesNormal heart rhythm |
| Temperature | Tympanic<35.5°C, axillary <35.0°C | <36°C |  |  |
| Hydration status | Fluid refusalSevere dehydration (10%): reducedurine output, dry mouth, decreased skin turgor, sunken eyes, tachypnoea,tachycardiac | Severe fluid restrictionModerate dehy- dration (5–10%): reduced urine out- put, dry mouth, normal skin turgor, some tachypnoea, some tachycardiac, peripheral oedema | Fluid restriction Mild dehydration(<5%): may have dry mouth or not clinically dehy- drated but with concerns about risk of dehydrationwith negative fuid balance | Not clinically dehydrated |
| ECG abnormalities | QTc>460 ms (girls) or 400 ms (boys) with evidence of bradyarrhythmiaor tachyarrhythmia (excludes sinus bradycardia and sinus arrhythmia); ECG evidenceof biochemical abnormality | QTc>460 ms (girls) or 400 ms (boys) | QTc<460 ms (girls) or 400 ms (boys) and taking medicationknown to prolong QTc interval, family history of prolonged QTcor sensorineural deafness | QTc<460 ms (girls) or 400 ms (boys) |
| Disordered eating behaviours | Acute food refusal or estimated calorie intake 400–600 kcal per day | Severe restriction (less than 50% of required intake), vomiting, purging with laxatives | Moderate restriction, bingeing |  |
| Activity and exercise | High levels of uncontrolled exercise in the context of malnutrition(>2 h/day) | Moderate levels of uncontrolled exercise in the context of malnutrition(>1 h/day) | Mild levels of uncontrolled exercise in the context of malnutrition(<1 h/day) | No uncontrolled exercise |
| Biochemical abnormalities | Hypophosphataemia <0.5mmol/l, hypokalaemia <2.5mmol/l, hypoalbuminaemia, hypoglycaemia <2.5mmol/l, hyponatraemia <130mmol/l, hypocalcaemia | Hypophosphataemia, hypokalaemia, hyponatraemia, hypocalcaemia |  |  |
| Engagement with management plan | Violent when parents try to limit behaviour or encouragefood/fuid intake, parental violencein relation to feeding (hitting, force feeding) | Poor insight into eating problems, lacks motivation to tackle eating problems, resistance to changes required to gain weight, parents unable to implement meal plan advice given by healthcare providers | Some insight into eating problems, some motivation to tackle eating problems, ambivalent towards changes required to gain weight but not actively resisting | Some insight into eating problems, motivated to tackle eating problems, ambivalence towards changes required togain weightnot apparent in behaviour |

a. Patients with inappropriately high heart rate for degree of underweight are at even higher risk (hypovolaemia). Heart rate may also be increased purposefully through the consumption of excess caffeine in coffee or other drinks.

b. Jackson et al, 2007.

c. Or inappropriate normal heart rate in an underweight young person.

**Differential diagnosis**

Diagnosis of eating disorders relies on evidence of abnormal eating behaviour plus disordered thinking and beliefs about weight and body shape. If these abnormal beliefs and behaviours are not present then alternative diagnoses should be considered including;

* Gastrointestinal – inflammatory bowel disease, malabsorption, coeliac disease
* Malignancy – leukaemia, lymphoma, intracerebral tumour
* Endocrine – diabetes, hyperthyroidism, hypopituitarism, Addison’s disease
* Chronic infection – TB, HIV
* CNS disease
* Other psychiatric disorders: depression, OCD

**Investigations**

* FBC (anaemia, leucopoenia & thrombocytopenia can all occur in anorexia)
* U&E (low creatinine can occur due to low muscle mass & high urea due to catabolic state, rather than dehydration, but high creatinine can be seen if muscle breakdown. So results must be interpreted in light of clinical assessment)
* LFT (mildly raised bilirubin & liver enzymes are not uncommon)
* Bone profile, Magnesium, Glucose
* Vitamin D level
* TFT
* ECG
* Urinalysis – consider pregnancy test if amennorhoeic (with patient’s consent)

**Management**

Refer to shared care protocol for further information and referral form to CAMHS

<http://howis.wales.nhs.uk/sitesplus/866/page/48555>

The need for admission to the paediatric ward should be based on history, examination and use of the Junior MARSIPAN risk assessment framework. No one factor predicts risk better than others. Admission should be considered for any young person with ‘red’ alerts on the assessment framework, but may also be needed for those with lower levels of risk depending on the circumstances.

**Do not discharge home any young person with ‘red’ alerts on the assessment framework without discussing the patient beforehand with a senior paediatrician (specialty trainee ST4 or above, or a consultant).**

At RGH, please inform Dr Morgan’s secretary on extension 8811 if a child or young person is admitted with an eating disorder or potential eating disorder.

For GP referrals or new presentations referral to CAMHS should be made using relevant referral form (available on shared care protocol)

Inform paediatric dieticians of admission

Commence multivitamin supplement egg. Forceval 1 tablet daily

All young people admitted for re-feeding should be commenced on oral phosphate supplements, even if baseline phosphate level is normal. Please prescribe Phosphate Sandoz (each tablet contains 16.1mmol of phosphate) 1 tablet twice daily for first 5 days.

**NB. This dose may need to be increased if baseline phosphate low or phosphate level drops on re-feeding.**

Daily bloods for at least first 5 days of re-feeding, to include U&E, bone profile, magnesium

**Management of other electrolyte abnormalities**

1. Hypokalaemia – If K <3.5mmol/l give Sando K (each tablet contains 12mmols of potassium) 2-4 tablets daily

- If K < 3.0mmol/l consider need for intravenous KCl added to intravenous fluids (DO NOT EXCEED 0.4mmol/kg/hour). Admit to HDU, ECG monitoring

2. Hypomagnesaemia (serum Mg <0.6mmol/L) Correct with 0.2ml/kg 50% Magnesium sulphate (max 10ml) in 250ml 0.9% saline over 4 hours. Admit to HDU. Must monitor ECG & blood pressure.

3. Hypoglycaemia (glucose <2.5mmol/L). Encourage sugary drink or consider use of hypostop. Give 2mls/kg 10% glucose intravenously over at least over 5 minutes (Guys and St Thomas Paediatric Formulary) if altered conscious level or seizures, followed by glucose infusion of 0.1ml/kg/minute. Measure glucose concentration by Dextrostix after 4-5 minutes and adjust glucose infusion to maintain the blood glucose at 5-8 mmol/L and no higher.

 4. Hypophosphataemia (phosphate <0.32mmol/L). Admit to HDU. ECG & blood pressure monitoring. Use intravenous potassium dihydrogen phosphate (0.08 - 0.16 mmol/kg diluted appropriately over 6 hours). For peripheral intravenous administration the concentration of potassium should not exceed 40mmol/L (BNFC 2013/14).

**Refeeding Syndrome**

Re-introduction of nutrition to severely malnourished individuals can precipitate refeeding syndrome which may result in cardiac failure and death. The key biochemical abnormality is hypophosphataemia, due to total body phosphate depletion and a shift of extracellar to intracellular phosphate when the body changes from a catabolic state to anabolic. The risk is greatest in the initial stages of refeeding (first week). The incidence increases with decreasing BMI and if weight loss is rapid.

Features of the syndrome include:

* Delirium with visual and auditory hallucinations
* Respiratory compromise (dyspnoea, tachypnoea)
* Generalised weakness and fatigue
* Paraesthesia
* Signs of fluid overload e.g. peripheral oedema, cardiac failure
* Diarrhoea
* Seizures and reduced conscious level
* Electrolyte imbalances

Preventing refeeding syndrome

* Reintroduce nutrition gradually, as advised by dietician
* Correct dehydration – usually over 48 hours as too rapid correction can result in cardiac decompensation
* Daily electrolyte monitoring
* Prophylactic phosphate supplementation, as above
* Start any multivitamins and mineral supplementations before feeding begins (NICE CG9)

If signs of refeeding syndrome

* Seek advice from senior paediatrician
* Ensure regular monitoring of blood pressure, ECG, cardiac status, neurological observations, weight, fluid balance and hydration status
* Urgent correction of any electrolyte abnormalities
* Inform dietician – nutrition plan will need to be reviewed and may include reducing or stopping enteral feeds for a time.

**Discharge/ Outpatient Management**

Timing of discharge from the paediatric ward will be agreed at a multidisciplinary meeting between paediatrics and CAMHS. This will include whether ongoing paediatric follow up is required for monitoring of growth, pubertal development, bone health etc.

**References**

* Junior MARSIPAN: Management of Really Sick Patients under 18 with Anorexia Nervosa. Royal College of Psychiatrists CR 168. January 2012
* Medical management of acute severe anorexia nervosa. Norrington A, Stanley R, Tremlett M, Birrell G. Education and Practice, Archives of Disease in Childhood 2012;97(2):48-54
* Identification and Management of Eating Disorders in Children and Adolescents. Rosen DS. Pediatrics 2010;126:1240-1253
* Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders NICE clinical guideline 9. January 2004

# Eating Disorders in Children and Young People: Early Recognition, Assessment and Initial Management. Nottingham University Hospitals NHS Trust Paediatric Clinical Guideline January 2007 Damian Wood. Downloaded from; http://nottinghamchildhealth.org.uk/Guidelines/Adolescent/12.2%20Eating%20Disorders.doc

**Doses, dilutions and rates of administration checked in BNFC/Medusa IV guide/Guys and St Thomas Paediatric Formulary/UCL IV Handbook.**

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