Junior MARSIPAN (Management of Really Sick Patients with Anorexia Nervosa)

Dilshad Marikar,[1] Sarah Reynolds,[2] Omer S Moghraby[3,4]

[1]Department of Paediatrics, Bedford Hospital, Bedford, UK
[2]Department of Paediatrics, Stoke Mandeville Hospital, Buckinghamshire, Aylesbury, UK
[3]Child and Adolescent Mental Health Services (CAMHS), Kaleidoscope Lewisham CAMHS, London, UK
[4]Child and Adolescent Mental Health Services (CAMHS), South London and the Maudsley NHS Foundation Trust, London, UK

Correspondence to
Dr Dilshad Marikar, Department of Paediatrics, Bedford Hospital, Bedford, UK;
dilshad.marikar@nhs.net

Received 25 May 2015
Revised 3 September 2015
Accepted 5 September 2015

To cite: Marikar D, Reynolds S, Moghraby OS. *Arch Dis Child Educ Pract Ed* Published Online First: [*please include* Day Month Year] doi:10.1136/archdischild-2015-308679

ABSTRACT

We present a review of the Junior MARSIPAN (Management of Really Sick Patients with Anorexia Nervosa) guideline, which provides paediatricians with a framework for managing Anorexia Nervosa in the inpatient setting.

ABOUT THE GUIDELINE

Anorexia nervosa is a commonly encountered cause of severe underweight in paediatric settings that can cause potentially life-threatening physical and psychological complications.[1] There is evidence to suggest that paediatricians lack knowledge and confidence in managing this condition; a survey of middle-grade doctors showed a low level of knowledge of several life-threatening features.[2] It is, therefore, important that paediatricians are familiar with the key recommendations in this guideline on the assessment and management of sick patients under 18 with anorexia nervosa.

This guideline was published in January 2012 by the Junior MARSIPAN (Management of Really Sick Patients with Anorexia Nervosa) working group of the Royal College of Psychiatrists,[3] and is endorsed by the Young People's Health Special Interest Group of the Royal College of Paediatrics and Child Health. It is intended to complement the Adult MARSIPAN guideline.[4] The difference in (1) definition of anorexia nervosa in young people and (2) presentations of serious underweight necessitated a separate guideline. In addition, there are differences in clinical risk assessment (eg, age-specific weight/height/blood pressure centiles), legal frameworks (particularly regarding consent and capacity) and services involved in the care of young people.

This guideline aims to advise on the assessment and management of children and young people in a range of settings, including primary care, outpatients and inpatients. It addresses both medical and psychological causes for concern, and stresses the need for a multidisciplinary approach. The guidance targeted at paediatricians is summarised here.

KEY ISSUES ADDRESSED BY JUNIOR MARSIPAN GUIDELINES

Risk assessment

A multifactorial 'traffic light' risk assessment system is used to assess patients from high risk (red), alert (amber), moderate risk (green) and low risk (blue). Key assessment parameters are listed in table 1.

BMI alone is not a useful tool in assessing malnutrition in children due to age-related variation; therefore, percentage median BMI should be used (box 1). This involves comparing a patient's BMI against a 'model' individual of the same age and sex whose BMI is on the 50th (median) centile, derived from a BMI centile chart (see resources box). A percentage median BMI <70% is a marker for severe underweight, aligning with WHO child recommendations.[5]

Blood pressure measurements should be compared with normal ranges specific for age and gender based on data from healthy UK children and young people.[6]

Location of care

Junior MARSIPAN discusses available options to manage patients:

1. General paediatric ward
2. Generic Child and Adolescent Mental Health Services (CAMHS) bed/CAMHS unit with expertise in managing eating disorders
3. Specialist paediatric eating disorders unit (SEDU)

Table 1 Summary of MARSIPAN risk assessment framework

What to assess	What to look for	When to be concerned (red/amber in risk-assessment framework)
BMI	Percentage median BMI	<70% median BMI or BMI centile <0.4th
Cardiovascular system	Bradycardia Postural tachycardia Syncope ECG Blood pressure	HR<50 Symptomatic postural tachycardia Recurrent or occasional syncope Prolonged QTc interval Arrhythmia associated with electrolyte abnormality, for example, hypokalaemia BP <0.4th centile for age and gender Postural drop >15 mm Hg
Hypothermia	Temperature	Temperature <35° (axillary) or <35.5° (tympanic)
Dehydration and hypovolaemia	Clinical assessment of hydration status; tachycardia; poor peripheral perfusion	Significant clinical dehydration/hypovolaemia
Oedema	Ankle or sacral oedema	Bilateral pitting oedema
Musculoskeletal weakness	Get patient to (1) sit up from lying and (2) stand from a squatting position (SUSS test)	Complete inability to sit up or stand without using arms—indicative of prolonged malnutrition
Metabolic/electrolyte imbalance		
Hypokalaemia	Consider purging as possible cause (assess for physical signs)	Admit if <3 mmol/L, consider paediatric intensive care for central replacement if <2–2.5 mmol/L
Hyponatraemia or hypernatraemia	Consider water loading/dehydration	Admit if Na <130 mmol/L, consider paediatric intensive care if Na <125 mmol/L
Other electrolytes	Check phosphate and magnesium	Presence of hypophosphataemia indicates high risk for refeeding syndrome
Hypoglycaemia	Check blood sugar	Hypoglycaemia—admit for refeeding—suggests poor compensation
Mental health/behaviour	Assess for purging, deliberate self-harm, aggression, suicidal ideation, overexercise	Suicide attempts Violent reaction to attempted refeeding on part of patient or parent
Safeguarding issues	Follow local safeguarding protocol	

BMI, body mass index; BP, blood pressure; HR, heart rate; MARSIPAN, Management of Really Sick Patients with Anorexia Nervosa.

SEDU provision is limited, and admission may result in geographical separation of a child from his/her family. When choosing between a CAMHS unit and a paediatric ward, a decision should be made as to whether the most pressing need is for medical care or psychiatric care. Whichever unit is decided upon, there should be discussion and collaboration between teams—particularly at the time of transfer between services.

Box 1 Calculating percentage median body mass index (BMI)

Percentage median BMI=actual BMI÷median BMI (50th percentile) for age and gender×100

Example

A girl aged 12 years has a height of 1.5 m and weighs 25 kg
Her BMI=$25/(1.5)^2$=11.1 kg/m^2

Using the Royal College of Paediatrics and Child Health BMI chart (see resource box)—the 50th BMI centile for a 12-year-old girl is 18 kg/m^2
Therefore, percentage median BMI=11.1/18×100=61.7%

Compulsory admission and treatment

Ideally, treatment decisions should be made in conjunction with the child and his/her family. However, this is not always possible, and compulsory treatment may be required (see box 2 for relevant legislation).

Feeding plans—refeeding and 'underfeeding' syndrome

No evidence-based guidelines exist for initiating refeeding in children with anorexia. It is important to monitor for refeeding syndrome (box 3), but Junior MARSIPAN also warns against an overly cautious approach to refeeding, which can result in further weight loss ('underfeeding syndrome'):

- Involve a paediatric dietician for specialist advice.
- Refeeding should ideally mimic normal eating, that is, solid food for meals and snacks.
- If the patient cannot comply with a meal plan then nasogastric (NG) feeding should be considered as early as 24 h into the admission.

Box 2 Relevant legislation

- Children under 16 should be assessed for Gillick competency—that is, their capacity to consent; however, they can be treated against their will if someone with parental responsibility consents.
- Mental Capacity Act—patients over 16 years of age are presumed to have the capacity to consent to treatment unless proven otherwise; at 16–18 years, patients are assumed to have the capacity to consent to, but not refuse treatment
- Children Act 1989—where parent and child are refusing treatment, a Care Order (section 37) can be applied to allow for compulsory treatment
- Mental Health Act—allows for compulsory restraint and refeeding as a treatment for anorexia for children of any age

- For NG feeding, use a daytime bolus regimen to mimic physiological eating and give the patient options to eat.
- Starting intake should not be lower than preadmission amounts; consider starting at 20 kcal/kg/day.
- Aim for 0.5–1 kg/week weight gain.
- An appropriate rate of increase is important to prevent underfeeding—aim to increase by 200 kcal/day until full nutritional requirements for weight gain are achieved (this should be within 5–7 days).
- If hypophosphataemia develops, maintain rather than reduce calorie intake; consider supplementation.
- Refeeding bloods (urea and electrolytes, liver function tests, phosphate, magnesium) should be performed daily during the 'at-risk' period of days 2–5 initially, and at 7–10 days (to identify late refeeding syndrome). Biochemical monitoring should continue for at least a fortnight, or until electrolytes become stable.
- Restrict carbohydrate intake and increase dietary phosphate (eg, using milk).
- If NG feeding, avoid high calorie concentration feeds (with high carbohydrate content, as this increases the risk of refeeding syndrome).
- Prescribe multivitamin and mineral supplements; consider thiamine in older children based on clinical judgement.
- Only individuals most at risk of refeeding syndrome (box 4) may need a more cautious approach (5–10 kcal/kg/day starting regimen) with twice daily bloods.

Box 3 What is refeeding syndrome?

A potential fatal shift in fluid and electrolytes occurring as a result of hormonal and metabolic changes during refeeding. Hypophosphataemia is a diagnostic sign.

MANAGING ANOREXIC BEHAVIOUR

Anorexic behaviour can be challenging to manage in a ward environment. Common anorexic behaviours include:

- compulsive exercising—consider total/partial bed rest and supervised washing/toileting
- wearing insufficient clothes for temperature
- resisting feeds/hiding food—if weight gain less than expected (<0.5–1 kg/week), assume weight-losing behaviours. With excessive weight gain (eg, >2 kg within a few days), assume water loading and other fluid manipulations
- purging—limit access to toilet for 1 h after a meal or snack. Limit access to syringes to prevent aspiration NG tubes
- binging—monitor for food hoarding
- self-harm
- falsifying weight gain—for example, by water loading or hiding weights in clothes
- violent/disturbed behaviour—local policy should be followed

WHAT SHOULD I START DOING?

- Assess nutritional status based on percentage median BMI, and not BMI alone.
- Baseline clinical assessment of risk using the Junior MARSIPAN framework—this includes baseline ECG and SUSS test for musculoskeletal weakness.
- Have a low threshold for starting NG feeding and avoid an overcautious approach to refeeding (consider starting at 20 kcal/kg/day and increasing by 200 kcal/day until nutrition is sufficient for weight gain).
- Always consider refeeding syndrome—monitor patient's electrolytes (especially phosphate) before and during refeeding, and assess the risk of refeeding syndrome prior to starting feeding.
- Prescribe a general vitamin and mineral supplement in younger children, and consider thiamine supplements in older children.

WHAT SHOULD I STOP DOING?

- Taking an overcautious approach to refeeding (may result in underfeeding syndrome)—patients should be receiving sufficient nutrition for weight gain within 5–7 days of refeeding.
- For patients receiving supplemental or NG feeds, avoid calorie dense feeds, which may be too high in carbohydrates and increase the risk of refeeding syndrome.

Box 4 Identifying high-risk individuals

- Very low percentage median body mass index
- Minimal or no nutritional intake for the past 3–4 days
- Weight loss >15% in the past 3 months
- Abnormal electrolytes prior to starting refeeding

Clinical bottom line

- Anorexia is a serious potentially fatal disease—while refeeding syndrome can be fatal, the risk from malnutrition and 'underfeeding' is much greater.
- Do not 'refer and wait'—recovery from anorexia requires nutritional rehabilitation.
- Risk from refeeding syndrome can be reduced by careful monitoring and paediatric dietician input into choice of feed composition.
- All patients should be carefully assessed to establish their risk according to Junior MARSIPAN guidelines.

- Offer consistent support with joint medical and mental health team input—do not 'refer to CAMHS and wait'. Recovery from anorexia requires early nutritional rehabilitation and maintaining collaborative links to specialist services.

Resources

Junior MARSIPAN guidelines:
http://www.rcpsych.ac.uk/files/pdfversion/CR168nov14.pdf

Adult MARSIPAN checklist for assessment, refeeding and management:
https://www.rcpsych.ac.uk/pdf/CR189checklistXX.pdf

Adult MARSIPAN guideline:
http://rcpsych.ac.uk/usefulresources/publications/collegereports/cr/cr189.aspx

NICE guideline—Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders
http://www.nice.org.uk/guidance/cg009

UK-WHO growth charts (0–18 years)
http://www.rcpch.ac.uk/improving-child-health/public-health/uk-who-growth-charts/uk-who-growth-charts-0-18-years

RCPCH body mass index (BMI) chart
http://www.rcpch.ac.uk/system/files/protected/page/GIRLS%20and%20BOYS%20BMI%20CHART.pdf

Blood pressure centiles for Great Britain
http://adc.bmj.com/content/92/4/298

AREAS OF CONTROVERSY

- The definition of seriously underweight in children and adolescents—there is little evidence base for what constitutes 'high risk'.
- Where the balance should lie between avoiding refeeding syndrome, and an overcautious approach leading to 'underfeeding syndrome'? Randomised controlled trials to assess the safety of higher rates of feeding are not yet available, but some international groups use higher starting rates of feeding (eg, 1200 calories) than specified in this guidance.[7]
- The role of thiamine supplementation—thiamine supplementation has long been a staple of nutritional rehabilitation in adults, but there is little evidence on its use in children.

Twitter Follow Omer Moghraby at @moghraby

Contributors DM and SR produced the first draft; DM and OSM provided revisions to the second draft. DM made revisions to the final draft.

Competing interests None declared.

Provenance and peer review Commissioned; externally peer reviewed.

REFERENCES

1 Nicholls D, Hudson L, Mahomed F. Managing anorexia nervosa. *Arch Dis Child* 2011;96:977–82.
2 Hudson LD, Cumby C, Klaber RE, *et al*. Low levels of knowledge on the assessment of underweight in children and adolescents among middle-grade doctors in England and Wales. *Arch Dis Child* 2013;98:309–11.
3 Royal College of Psychiatrists. *Junior MARSIPAN: Management of Really Sick Patients under 18 with Anorexia Nervosa* (College Report CR168). London: Royal College of Psychiatrists, 2012. http://ww.rcpsych.ac.uk/files/pdfversion/CR168.pdf (accessed April 2015).
4 Royal College of Psychiatrists. *MARSIPAN: Management of Really Sick Patients with Anorexia Nervosa*. 2nd edn. (College Report CR189). London: Royal College of Psychiatrists, 2014. http://rcpsych.ac.uk/usefulresources/publications/collegereports/cr/cr189.aspx (accessed April 2015).
5 *WHO child growth standards and the identification of severe acute malnutrition in infants and children: a Joint Statement*. World Health Organisation, 2009. http://www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/ (accessed April 2015).
6 Jackson LV, Thalange NKS, Cole TJ. Blood pressure centiles for Great Britain. *Arch Dis Child* 2007;92:298–303.
7 Great Ormond Street Hospital refeeding guidelines. http://www.gosh.nhs.uk/health-professionals/clinical-guidelines/re-feeding (accessed April 2015)