

Eating Disorders Clinical Guideline
Physical Health Management

Short Title:	Physical Health Management in Eating Disorders
Full Title:	Guideline for the physical health management of eating disorders in children and young people
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Explicit definition of patient group to which it applies:	This guideline applies to all children and young people under the age of 18 years.
Main Resources Used for this Guideline:	Junior MARSIPAN: Management of Really Sick Patients under 18 with Anorexia Nervosa. NICE Guidelines on Eating disorders: recognition and treatment (NG69) 2017 Maudsley Service Manual for Child and Adolescent Eating Disorders (permission granted by Dr M. Simic) Nottingham University Hospitals NHS Trust's Guidelines for the recognition, assessment and management of children and young people presenting with eating disorders. (permission granted by Dr D. Wood)
(see 'References' for full list of sources)	
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Please note: Clinical guidelines are 'guidelines' only. The interpretation and application of clinical

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guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

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1.0 Summary

- Duration of untreated illness may be negatively related to treatment outcome (Schoemaker, 1997). Early intervention in eating disorder is related to a better prognosis (Le Grange & Loeb, 2006; Brown et al., 2016).
- Young people are not mini-adults and are still in their growth/development phase. It is important to take this into consideration when undertaking their physical examination. Use of gender and age-appropriate growth charts or similar e-versions will be helpful in assessment of this age-group of patients.
- Refeeding and underfeeding syndromes are both important aspects of physical health care.
- Purging is associated with electrolyte abnormalities that can resurface despite blood tests indicating that they are stable (what is known as false stabilisation). As such it is prudent to monitor electrolytes for any changes for up to 48 hours after stabilisation.
- A multi-disciplinary team approach and collaborative working (with the young person, families, community teams and paediatricians) are important aspects of eating disorder care.

2.0 Introduction

Anorexia has the highest mortality rate of any psychiatric disorder. This is both from medical complications as well as suicide (BEAT, 2017). The mortality rate for anorexia is 4%, whilst that for bulimia follows closely after at 3.9% (Crow et al., 2009).

3.0 Assessment

Assessment is directed at three main areas:

1. Nutritional Assessment
2. Physical Assessment
3. Psychiatric/Psychological Assessment

3.1 Nutritional Assessment

A detailed dietary history including a food diary over the last 5 days, any changes in food patterns over time (e.g. change from eating a full diet to vegetarianism or veganism); food behaviours (e.g. eating certain foods in a specific order; cutting food into very small pieces; separating food or smearing); fluid intake and family eating pattern.

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3.2 Physical Assessment

History

The ‘Eating Disorders in Children and Young People: Early Recognition, Assessment and Initial Management’ Guidelines (Nottingham University Hospitals NHS Trust, 2007) provides some helpful questions to explore when taking the patient’s history (see Table 1).

Table 1: Examples of questions relating weight, diet and purging behaviours

Weight	Diet	Purging
<p>How do you feel about your current weight?</p> <p>Do you ever weigh yourself? If so, how frequently?</p> <p>What’s the most you can remember weighing? And the least?</p> <p>Do you have a weight that you aspire to reach?</p> <p>When did you start to lose weight? Tell me more about that time. How did that make you feel?</p>	<p><u>Restriction</u></p> <p>Can you talk me through what you eat during a typical day? Do you have breakfast? What does that consist of? What about lunch? ...</p> <p>Do you tend to snack between meals?</p> <p>Are there any types of food that you have stopped eating?</p> <p>What about drinking? Do you find yourself drinking fizzy drinks during meals?</p> <p><u>Bingeing</u></p> <p>Have you ever experienced a “binge”? Different people have different meaning for the word “binge” – can you talk me through what you would eat in a typical “binge”?</p> <p>How do you feel in the moment? Do you ever feel as though you cannot control the amount you are eating at the time?</p> <p>What about afterwards – how do you feel? Do you ever feel guilty and disgusted at yourself?</p> <p>I was wondering how often this happens?</p> <p>You mentioned that you felt ... after a binge - how do you cope with those feelings?</p>	<p>How have you ever used exercise/water-tablets/laxatives/weight-loss pills to help you control your weight?</p> <p>Have you ever felt the need to do activity with the intention of losing weight?</p> <p>How often do you exercise each week? How long is that for? What type of exercise do you? (note: risk of falls)</p>

Menstrual History

- Age at menarche

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- Regularity of cycles
- Length of cycle
- Last normal monthly period
- Age of maternal menarche

Other Symptoms to Enquire About

- Dizziness, blackouts, fainting episodes
- Weakness/fatigue/lethargy
- Headaches
- Pallor
- Easy bruising/bleeding
- Cold intolerance/cold hands and feet
- Hair loss/dry skin
- Vomiting, diarrhoea, constipation
- Fullness, bloating, abdominal pain, epigastric burning
- Muscle cramps, joint pains, palpitations, chest pain
- Symptoms of hyperthyroidism, diabetes, malignancy, infection, inflammatory bowel disease
- Irritability
- Symptoms of depression, anxiety, OCD, phobias (especially regarding food)

3.3 Physical Examination

- A full clinical examination should include lying/standing blood pressure, SUSS test, height and weight. See [Appendix 1](#) for an example of a physical health assessment template that is used in the East London Community Eating Disorder Service for Children and Young People.
- Weighing is a particularly anxiety-provoking time for these young people. As such, clinicians must help the young person feel at ease and work with the young person through their anxiety (e.g. respecting the young person's wishes if they do not want to be told their weight, and then exploring the pros/cons of that during the session, and working towards them eventually knowing this). Weights should ideally be taken in clothing of similar texture/number of layers. If weight manipulation is suspected, these should be explored with the young person during the session, through the aid of the weight chart. Weighing in underwear is strictly not recommended practice and is considered invasive practice.
- The height should be measured at initial assessment and then at least 3 monthly thereafter. A growth and pubertal assessment should be strongly considered particularly in boys with eating disorders¹

¹ The peak incidence of anorexia nervosa in boys coincides with most boys' growth spurts. Pubertal staging can help to determine if puberty has been delayed due to the eating disorder and low weight.

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- All young people with eating disorders need their growth measuring and plotting on standard centile charts. In addition, they should have their percentage weight-for-height calculated. CEDS owns a copy of the weight-for-height software which can calculate these automatically.
- <http://www.marsipan.org.uk/calculator> provides a useful tool that allows clinicians (with an NHS Mail email) to calculate weight-for-height and blood pressure percentiles depending on age and gender.
- The SUSS test assesses muscle strength. Each test is to be scored separately, as follows:
 - 0 - unable to perform
 - 1 - only able using hands to help
 - 2 - only able with noticeable difficulty
 - 3 - able with no difficulty

Important highlights around physical features in young people with eating difficulties include the following and the Junior MARSIPAN (2015) aids clinicians rate these into red (high), amber (alert to concern), green (moderate) or blue (low) risk:

- On Inspection (Nicholls et al., 2010)
 - Lanugo hair
 - Angular stomatitis
 - Parotidomegaly (puffy face)
 - Carotinaemia (yellowing of the palms)
 - Cutting/signs of self-harm
- Cardiovascular
 - Bradycardia is very common in anorexia – and is present in up to 95% of patients (Yahalom et al., 2013). The Junior MARSIPAN (2012) indicates that a bradycardia of <40bpm (when patient is awake) is RED risk. This increases the risk of arrhythmias. If HR is less than 40 bpm please discuss with a Consultant Paediatrician regarding the need for admission for cardiac monitoring. It is true that HR will improve with refeeding but this does not take away from the danger that this poses.
 - Another aspect that is indicative of RED risk is an orthostatic change in heart rate of >30bpm (Junior MARSIPAN, 2012).
 - If an anorexic patient is tachycardic one must be suspicious of an underlying cause, such as infection or inflammation.
 - Postural hypotension: We are particularly concerned if there are marked orthostatic changes in systolic BP of >20mmHg also indicates a RED risk on Junior MARSIPAN (2012).
 - An ECG is performed to look at 2 main aspects: the corrected QTc interval (RED risk: >460ms in girls or 450ms in boys) and whether there is any evidence of a heart block. Irregular heart rhythm (not a sinus arrhythmia) is also a RED risk (Junior MARSIPAN, 2012).

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- New heart murmur (particularly a mid-to-late systolic click or murmur at the apex as mitral valve prolapse can occur).
- Weak Peripheral pulses and reduced capillary refill time (Nicholls et al., 2010)
- Hydration Status
 - Fluid refusal and severe dehydration (10%) are considered RED risk (Junior MARSIPAN, 2012). Decreased skin turgor, sunken eyes, dry mouth fast respiratory rate, tachycardia and a decreased urine output are all indicators of dehydration (Junior MARSIPAN, 2012).
- Temperature
 - Hypothermia: we are particularly concerned if tympanic temperature is <35.5°C or axillary temperature is <35.0°C. This makes these patients at RED risk on Junior MARSIPAN (2012).
 - Arrhythmias - look out for bradyarrhythmias or tachyarrhythmias (excluding sinus bradycardia and sinus arrhythmia), ECG evidence of biochemical abnormalities. QTc intervals of >460ms are of high concern. In boys >15 years old the cut-off is usually >450ms (Junior MARSIPAN, 2012).
- SUSS Test
 - Inability to get up at all from squatting (score=0) or inability to sit up at all from lying flat (also score=0) is indicative of RED risk (Junior MARSIPAN, 2012).
- Signs of Recurrent Vomiting
 - Dental erosion, callouses on fingers/hand (Russell's sign) (Nicholls et al., 2010), swollen salivary glands (parotid/submandibular) are indicative of regular vomiting.
- Other Signs to Elicit (Nicholls et al., 2010)
 - Pitting oedema
 - Cold extremities
 - Acrocyanosis
- Signs to suggest alternative diagnosis
 - Lymphadenopathy, mouth ulceration, thyroid enlargement, hand tremor, abdominal tenderness or mass, hepatosplenomegaly should alert one to consider alternative diagnoses. Medication can affect appetite so it would be prudent to also check what medication the young person is on.

3.4 Psychiatric/Psychological Assessment

A mental state examination with focus on over-valued ideas around body-weight, shape, food and eating. Eating attitudes (e.g. fat phobia) and eating behaviours (e.g. food separation, slow eating) are to be explored. Co-morbidities including anxiety, depression and

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neurodevelopmental disorders are to be sought out (consider drawing up a timeline of the onset of these symptoms). Self-esteem and perfectionistic traits are other areas to consider exploring.

4.0 Diagnosis

4.1 DSM-V Diagnosis

Table 2 illustrates a summary of the DSM-V criteria for eating disorders (DSM-V, 2014).

Table 2: Summary of DSM-V criteria for eating disorders

Anorexia Nervosa	Bulimia Nervosa
<p>Restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health.</p> <p>Intense fear of gaining weight or becoming fat, even though underweight. (This may be exhibited through behaviour or verbalised).</p> <p>Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or denial of the seriousness of the current low body weight.</p>	<p>Recurrent episodes of binge eating characterized by BOTH:</p> <ul style="list-style-type: none"> • Eating in a discrete amount of time (within a 2-hour period) large amounts of food. • Sense of lack of control over eating during an episode. Recurrent inappropriate compensatory behaviour to prevent weight gain (purging). <p>The binge eating and compensatory behaviours both occur, on average, at least once a week for three months.</p> <p>Self-evaluation is unduly influenced by body shape and weight.</p> <p>The disturbance does not occur exclusively during episodes of anorexia nervosa.</p>
Atypical Anorexia Nervosa	Avoidant Restrictive Food Intake Disorder
<p>Some of the criteria for anorexia nervosa are met. Despite significant weight loss, the individual's weight could be within or above the normal.</p>	<p>An Eating or Feeding disturbance as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one (or more) of the following:</p> <ol style="list-style-type: none"> 1. Significant loss of weight (or failure to achieve expected weight gain or faltering growth in children). 2. Significant nutritional deficiency 3. Dependence on enteral feeding or oral nutritional supplements 4. Marked interference with psychosocial functioning <p>The behaviour is not better explained by lack of available food or by an associated culturally sanctioned practice.</p> <p>The behaviour does not occur exclusively during the course of anorexia nervosa or bulimia nervosa, and there is no evidence of a</p>

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	<p>disturbance in the way one's body weight or shape is experienced.</p> <p>The eating disturbance is not attributed to a medical condition, or better explained by another mental health disorder. When it does occur in the presence of another condition/disorder, the behaviour exceeds what is usually associated, and warrants additional clinical attention.</p>
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4.2 Differential Diagnosis

This should have already been done by the community team, as the diagnosis of an eating disorder should be established prior to admission to an inpatient Eating Disorder Unit. As the Junior MARSIPAN (2012) guideline succinctly illustrates the main differentials that need to be considered include:

- Gastroenterological causes: e.g. coeliac disease, inflammatory bowel disease (including Crohn's and Ulcerative Colitis), peptic ulcer, malabsorption.
- Endocrine causes: e.g. diabetes mellitus, hyperthyroidism, hypopituitarism, Addison's disease
- Chronic infection: e.g. TB, HIV, viral
- Oncological: e.g. lymphoma, leukaemia, intracerebral tumour
- Psychiatric: e.g. depression, autism spectrum disorder, OCD. [Note: it is not uncommon for there to be co-morbidities, so it is important to elucidate what the primary diagnosis is.]

The Junior MARSIPAN (2012) cautions that despite the above "eating disorders is one of the most common causes" (p. 35).

4.2.1 Coeliac Disease²

- May present without the typical gastrointestinal symptoms and many clinicians have a low threshold for serological testing. Those that are symptomatic often present at various times after introduction of food containing gluten.

4.2.2 Crohn's Disease³

² Symptoms: chronic diarrhoea OR constipation, reduced appetite, abdominal distension/bloating and pain, faltering growth or weight loss +/- delayed puberty, vomiting, dermatitis herpetiformis (more commonly in adolescents and adults), mouth ulcers (but not-specific to coeliac disease), dental enamel hypoplasia, iron deficiency (not responding to oral iron supplements) +/- anaemia

Investigations: FBC + ESR, looking for anaemia and screening for inflammatory bowel disease (Crohn's/Ulcerative Colitis); U&Es and LFTs, chronic diarrhoea may cause electrolyte abnormalities and transaminases may be elevated; Iron studies: (iron deficiency is common); B12/Folate (deficiency can also be seen); Serology: Coeliac screen - anti Tissue Transglutaminase antibodies (TTG) or anti-endomysial antibodies; IgA should also be tested as a false negative can occur with low IgA levels

³ Symptoms: Abdominal pain, Nausea and Vomiting, Weight loss, Diarrhoea (can be bloody/mucousy with frequency and urgency), Mouth ulcers, Constitutional symptoms including fever, malaise, anorexia, nausea, vomiting, Anaemia, Erythema nodosum, 15% asymptomatic, Poor correlation between symptom severity & disease activity

Investigations: FBC: Anaemia, ↑ platelet count + ESR, Biochemistry: ↑ C-reactive protein, ↓ serum albumin; +/- abnormal LFTs, Haematinics: Fe/ B12 deficiency, Stool cultures, Faecal calprotectin (surrogate marker of inflammatory activity; Neutrophil-derived cytosolic protein resistant to bacterial degradation)

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- Clinical presentation variable and depends on site and the predominant pathology at that site.

4.23 Addison's Disease⁴

- A rare, endocrine disorder with adrenal insufficiency, causing insufficient glucocorticoids and mineralocorticoids. Can present with symptoms that are similar to someone with an eating disorder.

5.0 Investigations

5.1 Blood Investigations

5.1.1 Initial blood investigations at assessment

- Full Blood Count
- Erythrocyte Sedimentation Rate
- Urea & Creatinine
- Electrolytes
 - to include potassium⁵ and sodium⁶
 - to include chloride if there is a h/o vomiting.
- Bone profile to include phosphate and calcium
- Magnesium
- Creatinine Kinase (if there is a h/o exercising)
- Liver Function Test (Lipid profile is to be requested if there are abnormal LFTs and/or if c/o abdominal pain)
- Amylase (if there is a h/o vomiting)
- Vitamin B12/Ferritin/Folate
- Vitamin D⁷
- Coeliac Screen and Immunoglobulins (unless already done by the GP)
- Thyroid Function Tests
 - Sick euthyroid changes are common and monitoring may be all that is needed.
- Glucose⁸

⁴ **Symptoms:** chronic fatigue/weakness, reduced appetite, nausea/vomiting, weight loss, hypotension or orthostatic changes with BP/pulse, salt craving

⁵ Laxative misuse and vomiting can cause low potassium levels. Additionally, vomiting can cause metabolic alkalosis on venous blood gas, whilst laxative misuse can cause metabolic acidosis.

⁶ Water-loading can cause hyponatraemia. Differential diagnosis should include sepsis, SIADH, diarrhoea, vomiting or iatrogenic causes.

⁷ Vitamin D deficiency/insufficiency is very common. To prevent a vitamin D deficiency, advise that all children and young people living in the UK, including those at increased risk of vitamin D deficiency (including those with eating disorders), should take a daily vitamin D supplement throughout the year, including in the winter months. Dose for prevention of Vitamin D in all ages: 400 IU (10 micrograms) daily. Vitamin D supplements and multivitamin preparations (tablets, capsules, and liquids) containing 400 IU of vitamin D can be purchased from pharmacies.

⁸ Hypoglycaemia: Hypoglycaemia is often seen in starvation, this should not be assumed to be the cause until it is investigated. These patients are rarely symptomatic as ketones produced in prolonged fasting can be used instead of glucose by the brain. A low capillary glucose (<2.6 mmol/L) should always be checked with a laboratory (oxalate) sample. If never previously investigated, blood and/or urine

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- HbA1c (if glucose is <4mmol/L)
- If amenorrhoea is present, the following blood tests should be considered (in the context of the general clinical picture and after discussion with the paediatrician): Prolactin, FSH, LH, Oestradiol, AFP, β -HCG (Eisler et al., 2016).

should be checked for the presence of ketones, and plasma sent for glucose (oxalate sample), cortisol and insulin. Other metabolic investigations (lactate, urine organic acids, ammonia, plasma amino acids, Growth hormone, C-peptide, acyl carnitines, synacthen test) should be considered based on the clinical picture" (Eisler et al., 2016, p.78).

5.1.2 Blood Investigations following assessment

If the risk of refeeding syndrome is moderate or high, electrolytes need to be monitored regularly over the first 2 weeks of refeeding as electrolyte imbalance is common and can usually be corrected by oral supplementation.

Suitable oral supplements (BNFC, 2018-2019) – always check latest BNF guidance:

- Sando K for potassium <3.5 mmol/L (each tablet contains 12 mmols of potassium) 1-2 mmol/kg/day in divided doses, adjusted according to response.
- Phosphate Sandoz for phosphate <0.83 mmol/L (each tablet contains 16.1 mmols of phosphate) 2-3 mmol/kg/day as 1-2 tablets with meals (3x/day), adjusted according to response.
- Magnesium glycerophosphate tablets for magnesium <0.7 mmol/L (each tablet contains 4 mmols of magnesium) 0.2 mmol/kg 3x a day or 1-2 tablets (4-8 mmol) 3x a day

5.1.3 Refeeding Syndrome⁹ (*Nottingham University Hospitals NHS Trust's Guidelines for the Recognition, Assessment and Management of Children and Young People Presenting with Eating Disorders by Wood D., 2016*)

Patients at highest risk

- Severe underweight - 70-80% weight-for-height
- Acute weight loss of 5-10% in past 1-2 months OR weight loss of 500g-1kg (or more) per week in 2 consecutive weeks
- Markedly reduced enteral nutrition (<50% of required intake) for 5-10 days or major stressors without food for several days. If this is in combination with vomiting or laxative misuse, it will further increase the risk.
- Abnormal electrolytes (low phosphate, potassium) prior to refeeding
- Previous history of refeeding syndrome
- Neutropenia/low WBC
- History of alcohol abuse or use of medications including insulin, chemotherapy, antacids or diuretics (NICE CG32)

Prevention of Re-feeding Syndrome

- Correction of dehydration
- Gradual introduction of nutrition: for most young people starting at 20 kcal/kg/day or higher, such as 1000 kcal per day or quarter/half portions, appears to be safe.
- In the highest risk patients, it may be necessary to use lower starting intakes (e.g. 5–10 kcal/kg/day), especially in the presence of severity indicators such as ECG abnormalities

⁹ When nutrition is re-introduced after a prolonged period of malnutrition there is a risk of refeeding syndrome which may result in cardiac failure and death. Refeeding syndrome is due to total body phosphate depletion and a shift of extracellular to intracellular phosphate when there is a switch from catabolism to anabolism. The risk is highest in the first few days after feeding is restarted but can develop up to 2 weeks after restarting nutrition.

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or evidence of cardiac failure, electrolyte abnormalities before re-feeding starts, active comorbidities (such as diabetes or infections), or very low initial weight.

- If low initial calorie levels are used (5–10 kcal/kg/day), with calories increasing in steps unless there is a contraindication, and continuing to increase until weight gain is achieved. (see [Appendix 4: Sample Refeeding Meal Plans](#))
- **Never start at a lower portion than the patient is already on – i.e. beware of underfeeding syndrome!**
- Aim to increase nutrition slowly to meet full requirements by 5-7 days
- Routine phosphate supplementation is not recommended, however in high risk patients, **Sandoz Phosphate one tablet twice daily** prophylaxis is recommended for first five days of re-introduction of nutrition.
- A multivitamin (to include zinc and vitamin D) and thiamine supplementation is recommended for the first 14 days of feeding. An example of a prescribing regime is as follows:
 - **Oral thiamine 300 mg daily;**
 - **Vitamin B co strong 2 tablets, three times a day (or full dose daily intravenous vitamin B preparation, if necessary); and**
 - **A balanced multivitamin/trace element supplement once daily e.g. Forceval capsules**

Management of Refeeding Syndrome

If a young person has clinical features of the re-feeding syndrome (oedema or confusion) they should be treated at in hospital. Their management should include (see [Appendix 2](#)):

- Decrease rate of feeding
- Ensure monitoring of
 - blood pressure, ECG and cardiac status
 - neurological observations
 - weight, fluid balance and hydration status

Blood investigations during admission for high moderate-high risk of refeeding syndrome

- Monitoring of electrolytes including Na^+ , K^+ , Ca^{2+} , PO_4^{3-} , Mg^{2+} (before, 6 hrs after restarting feeds and then daily until evidence of biochemical and cardiovascular stability - needs repeating on day 10 and 14 to pick up late signs of refeeding). See Appendix 2.

Blood investigations for low-moderate risk of refeeding syndrome

- Bloods to monitor for refeeding syndrome should be repeated 3x/week for the first week of commencing refeeding and then 2x/week for the following week, and can then be discontinued if the results are all normal¹⁰.

5.1.4 Blood investigations in patients who are vomiting

¹⁰ The highest risk of refeeding is in the first 14 days of reinstating a full meal plan.
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- Bloods should be carried out if there is an increase in frequency in vomiting and repeated weekly for 3 weeks, and if they remain stable and normal, can then be discontinued.
- If any of the electrolytes are abnormal, an ECG¹¹ should be considered.

5.1.5 Blood investigations in young people on enteral feeds (Nasogastric tube feeds)

- Rarely, a young person may require nasogastric tube feeds if they are unable/unwilling to tolerate sufficient food/nutritional intake (Refer to [section 6.5](#))
- Young people on enteral (nasogastric tube) feeds should have closer monitoring of their bloods initially. (Refer to [Appendix 3](#) & [Appendix 4](#))

5.2 ECG

- ECG should be carried out as part of the assessment in the significantly underweight or significant weight loss (particularly if bradycardic or hypotensive).
- When a young person is bradycardic, especially when this is significant, look out for heart block as well as manually checking the QTc¹².

5.3 DEXA Bone scan

- DEXA bone density scan should be considered if a young person is pre-menarchal and has been underweight for 6-12 months, or if they have had secondary amenorrhoea for 12 months.
 - Ensure that the DEXA scan is corrected for size. National recommendations are that for children one should be using BMAD (Bone Mineral Apparent Density) and not just z-score BMD.
 - DEXA scan should also be considered if a young person has bone pain or recurrent fractures (NICE, 2017).
 - Repeat testing should be done on a yearly basis if indicated (i.e., the patient remains amenorrhoeic) unless they develop bone pain or recurrent fractures. (Couturier et al., 2013; NICE, 2017).

5.4 Pelvic ultrasound

- Should be done in those with primary amenorrhoea >16 years to exclude any medical causes for the primary amenorrhoea.
 - If >95% weight-for-height for 3-6 months and no resumption of menstruation. This can then be used to guide about further weight gain and to reinforce that 'target weights' cannot be set.
 - Could also be used if menstruation is reported at a low weight-for-height and dysfunctional bleeding is suspected.

¹¹ Electrolyte imbalances can cause arrhythmias and other ECG changes.

¹² Under 15 years of age (males and females) a borderline QTc is 440-460 mm, and abnormalities when >460mm. Over 15 years of age a borderline QTc in males is 430-450 mm and abnormal >450mm, in females borderline is 450-460mm

6.0 Guidance for inpatient admissions

6.1 Guidance for when to Refer to a General Paediatric Unit

A constellation of the following signs/symptoms should prompt referral to a paediatric unit:

- High risk of refeeding syndrome
- Severe bradycardia (i.e. an awake heart rate of <40bpm)
- Hypotension BP <80/50mmHg
- Cardiac dysrhythmia (particularly prolonged QTc or new heart block)
- Electrolyte disturbances with associated ECG changes
- Low electrolytes: K^+ <3.0mmol/L, Na^+ <130mmol/L, PO_4^{3-} <0.5mmol/L
- BMs <2.5mmol/L
- Hypothermia: Temperature <35.5°C tympanic, <35.0°C axillary
- Dehydration needing IV fluids
- Syncope
- New heart murmur
- Seizures
- Cardiac failure
- Pancreatitis

6.1.1 Guidance for when to Recommend Bed Rest

The following signs/symptoms should prompt bed rest:

- Rise in HR >30 bpm
- Postural drop in systolic BP of >20 mmHg or diastolic of >10mmHg
- Unable to get up without using arms as leverage

6.1.2 General nursing support (See [appendix 3](#))

- Monitor fluid balance.
- Supervise bathroom trips (toilet, showers) to monitor for compensatory behaviours.
- Leave from the medical ward should be discouraged but can only be enforced if the patient is detained under the Mental Health Act.
- Physical observations should be carried out at least 4 times daily and can be reduced in frequency over time based on clinical need.

6.1.3 Transfer and discharge from the medical ward

Longer term plans about future transfer or discharge from the medical ward should be provisionally agreed and clearly documented in the patient's case notes as early as possible, ideally prior to admission, with input from all stakeholders and the MARSIPAN expert working group.

6.2 Support from mental health services

All MARSIPAN patients should be offered eyesight nursing observations by a registered mental health nurse (RMN) if they:

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- Require nasogastric (NG) feeding. Eyesight nursing observations should commence as soon as NG feeding has started. Eyesight nursing observations can be reduced to 15 minute observations when the NG feed is not running and can be stepped down further in time dependant on individual care needs.
- Are resistant to medical treatment (e.g. IV K+, bed rest boundaries).
- Present with deliberate self-harm, extreme distress, aggression/agitation or excessive exercise (including covert behaviour and 'micro exercising').

All RMN staff supporting MARSIPAN patients should have completed the MARSIPAN training.

6.2.1 Physical restraint and the use of psychotropic medication

For MARSIPAN patients who present as agitated or resistive to urgent medical treatment consider the following:

- Increase the provision of RMN nursing observations
- The use of physical restraint can be considered in extreme cases and if required should only be done by staff with sufficient training in physical restraint and should be in line with local policy.
- Please refer to local rapid tranquilisation policies if this is required.

6.3 Links with CEDS

It is recommended that any hospital which admits MARSIPAN patients should have:

- one identified junior MARSIPAN paediatrics ward (Rainbow ward at Newham University Hospital, Starlight ward at Homerton University Hospital and Ward 7E at Royal London Hospital)
- 6 monthly multi-agency MARSIPAN meetings are organised by CEDS
- annual MARSIPAN training programmes for hospital staff facilitated by the MARSIPAN expert working group.

6.4 Reasons for Admission to Psychiatric Inpatient Services

Most young people with eating disorders will be managed on an outpatient basis. However, on occasion inpatient facilities may be necessary. The criteria for this fall into three categories:

1. Need of the MHA to facilitate management
2. Ongoing weight loss despite outpatient support
3. Systemic issues necessitating admission

6.5 Management of the young person who is refusing oral intake

If the young person is refusing all food intake then a suitable oral nutritional supplement (e.g. Fortisip or Ensure) can be safely used as meal replacement. Their fluid intake must also be monitored carefully for signs of dehydration. If for some reason (e.g. acute refusal) this is not possible, then consider nasogastric tube feeding. This can be done informally if the young patient is agreeing to treatment, but use of the mental health act should be considered if the

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young person is not competent/have capacity or is refusing treatment. In the case of a life-saving procedure this can be done under the mental capacity act and a mental health act assessment can be called at a later stage. There is various literature around NGT feeding, but the general consensus is that young people should always be offered food in the first instance and encourage to eat this. If this is unsuccessful, only then should the nutritional supplement be offered. Again, only if this is unsuccessful should NGT feeding be considered. A similar process should be followed for each meal.

7.0 Management of other aspects of eating disorders

7.1 Vitamin D

Young people with eating disorders are at increased risk of vitamin D deficiency.

7.1.1 Prevention of Vitamin D deficiency

Give information and lifestyle advice on:

- Safe sun exposure.
- Dietary intake of vitamin D
- Dietary intake of calcium.
- Adherence to long-term supplementation.

7.1.2 Vitamin D insufficiency

If serum 25(OH)D levels are in the range of 25-50 nmol/L:

- Advise on measures to prevent vitamin D deficiency as above, including a daily vitamin D supplement throughout the year [National Osteoporosis Society, 2015].
- Retesting is not normally required if the child or young person is asymptomatic and compliant with preventative measures.

7.1.3 Vitamin D deficiency

Children and young people with serum 25-hydroxyvitamin D (25[OH]D) levels < 25 nmol/L should be considered for the need for referral for specialist advice if they:

- Have features of rickets
- Are also hypocalcaemic
- Have a fragility fracture or osteopenia/osteoporosis
- Have raised parathyroid hormone levels
- Have a malabsorption disorder (example Crohn's disease) or other condition known to cause vitamin D deficiency
- Have a co-existing condition associated with increased sensitivity to Vitamin D (sarcoidosis, tuberculosis, lymphoma or primary hyperparathyroidism)
- Are taking a drug that can increase the risk of vitamin D deficiency or the risk of vitamin D toxicity

If they do not require specialist referral or advice, they can be commenced on a treatment dose of Vitamin D (usually colecalciferol) for 12 weeks:

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- Age 6 months to 12 years: 6,000 IU daily
- Age 12 to 18 years: 10,000 IU daily

At the end of treatment:

- Check bone profile (check more regularly, 1-2 weekly in the first month, if also receiving calcium supplements)
- Check serum 25-hydroxyvitamin D (25[OH]D) levels 3-6 months after starting treatment.
If 25[OH]D level is:
 - o > 50 nmol/L: Continue a daily prevention dose of vitamin D indefinitely
 - o < 50 nmol/L: Consider possible causes including poor compliance and refer to secondary care to investigate other causes of failure to respond.

Daily calcium requirements should also be met.

The recommended daily intake of calcium is:

Age 7-10 years: 550 mg

Age 11-18 years (boys): 1000 mg

Age 11-18 years (girls): 800 mg

If they are unable or unwilling to increase their dietary calcium, calcium supplementation should be considered. There are several calcium preparations listed in the British National Formulary (BNF) for Children.

Examples include [BNF for Children, 2017]:

Adcal® fruit flavoured tablets (containing calcium carbonate 1.5 g [calcium 600 mg or 15 mmol]).

Cacit® effervescent tablets (containing calcium carbonate 1.25 g, providing calcium citrate when dispersed in water [calcium 500 mg or 12.5 mmol]).

Sandocal® 1000 effervescent tablets (containing calcium lactate gluconate 2.263 g and calcium carbonate 1.75 g, [calcium 1 g or 25 mmol]).

Multivitamin preparations (tablets, capsules, and liquids) containing calcium are also available to buy from pharmacies.

Combined calcium and vitamin D preparations with supplemental doses of vitamin D (such as Calcichew D3®) are available on prescription. However, many are not licensed for use in young children. Over-the-counter multivitamins provide an adequate amount of calcium and vitamin D and may be more palatable.

7.2 Oestrogen Treatment (NICE 2017)

- Do not routinely offer oral or transdermal oestrogen therapy to treat low bone mineral density in children or young people with anorexia nervosa.
- Seek specialist paediatric or endocrinological advice before starting any hormonal treatment for low bone mineral density. Coordinate any treatment with the eating disorders team.

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- Consider transdermal 17- β -estradiol (with cyclic progesterone) for young women (13–17 years) with anorexia nervosa who have long-term low body weight and low bone mineral density with a bone age over 15.
- Consider incremental physiological doses of oestrogen in young women (13–17 years) with anorexia nervosa who have delayed puberty, long-term low body weight and low bone mineral density with a bone age under 15.

7.3 Dental Care

Young people with eating disorders who are vomiting should see their dentist and should be given advice on dental hygiene including avoiding brushing after vomiting and rinsing with a non-acidic mouthwash.

7.4 Monitoring of Growth

As children and adolescents are in their growth and development phase, it is important to have a longitudinal log of their height and weight to ensure that they are growing.

7.5 Immunisations

It is important to ensure that children and young people are in line with the recommended immunizations.

8.0 On Reaching a Healthy Weight

A healthy weight is a question that is constantly under debate. It is important to note that different ethnicities may have different nomograms. Pelvic ultrasound scans are useful aids to help when this dilemma arises or when patients reach a previous weight-for-height at which that had menstruated but are still experiencing amenorrhoea. A healthy scan should show mature pelvic organs, follicular proliferation with a dominant follicle/corpus luteum and an appropriately endometrial thickness.

9.0 Anti-Psychotic Medication Monitoring

The NICE Guidelines on Psychosis and Schizophrenia in Children and Young People: Recognition and Management (NICE, 2013 - r2016) recommends that prior to starting antipsychotic medication, the following baseline investigations should be undertaken and recorded:

- Weight and height (plotted on appropriate growth chart)
- Waist and hip circumference – this is usually not appropriate in eating disorders
- Pulse and blood pressure (plotted on appropriate centile chart)
- Fasting blood glucose, glycosylated haemoglobin (HbA1c), blood lipid profile and prolactin levels
- Assessment for any movement disorders
- Assessment of nutritional status, diet and level of physical activity – this would have already been completed as part of an eating disorder assessment
- Side effects that the child/young person is most and least likely to tolerate
- ECG

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For the first 6 weeks, NICE (2013 – r2016) recommends that weekly weighing is recorded and at 12 weeks the following investigations should be repeated:

- Weight and height (plotted on appropriate growth chart)
- Waist and hip circumference – this is usually not appropriate in eating disorders
- Pulse and blood pressure (plotted on appropriate centile chart)
- Fasting blood glucose, glycosylated haemoglobin (HbA1c), blood lipid profile and prolactin levels

Thereafter, these should be monitored every 6 months.

Finally, movement disorders, nutritional status, efficacy, side-effects and adherence should be monitored and recorded regularly throughout treatment with antipsychotic medication particularly especially during titration (NICE, 2013 – r2016).

Mental health review

MARSIPAN patients should be reviewed minimum weekly by the Eating Disorders team, who can be contacted on 0207 426 2556.

General advice and consultation should also be available during working hours from the MARSIPAN expert working group.

Use of the Mental Health Act

Medical re-feeding is recognised as a legal treatment for anorexia nervosa under the provisions of the Mental Health Act and can be given against the will of the patient as a life-saving measure. Although a last resort, the decision to use the Mental Health Act should be considered from the outset, for example, in a patient refusing treatment in an accident and emergency unit. If medical staff suspect that this course of action may be necessary, then mental health services should be contacted immediately.

Governance and the MARSIPAN expert working group

The governance of local adult and junior MARSIPAN care pathways should be overseen by a local MARSIPAN expert working group which meets regularly to discuss clinical issues, training, care pathways, transitions, policies and probity. The terms of reference for the MARSIPAN expert working group are outlined in Appendix 4.

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Appendix 1: Physical Health Assessment Template

Symptoms Review and Physical Health Examination Form (CEDS-CYP)

Name:

Age/D.O.B:

Rio Number:

Chaperone:

Name of clinician:

Date:

History

- Fatigue
- Cold intolerance
- Change to skin
- Change to hair
- Change to nails
- Menstrual History:
 - Age at onset of menses
 - Age at onset of amenorrhea
 - Current cycle
- Change in bowel habit
- Dizzy spells / faint

Lifestyle Questions

ITEM	COMMENTS	ANY ACTION NECESSARY? If yes please state who will take responsibility to ensure this is done
Tobacco use Have you ever smoked?	If yes – how many per day	
Alcohol use Have you ever used alcohol?	If yes- how many units per week	
Have you ever used recreational drugs	If yes- name of drug, whether currently using, quantity and mode of use e.g. smoke, inject	

Consent to physical examination: Yes No

ITEM	COMMENTS	ANY ACTION NECESSARY? If yes please state who will take responsibility to ensure this is done
Cardiovascular System	Blood Pressure <ul style="list-style-type: none"> • Sitting • Standing 	

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	<p>Perfusion</p> <ul style="list-style-type: none"> • Peripheral Pulses • Cold/Colour 	
Weight for Height	<p>Weight: Height: % of weight for height:</p>	
Dehydration		
Pallor		
Condition of Teeth		
<p>Muscle Strength Sit Up Squat Stand (SUSS) Test</p> <p>Scoring: 0: Unable 1: Able only using hands to help 2: Able with noticeable difficulty 3: Able with no difficulty <i>(Robinson, 2006)</i></p>	<p>Patient lies down flat on the floor and sits up without, if possible, using his/her hands.</p> <p>Score:</p> <p>Patient squats down and rises without, if possible, using his/her hands.</p> <p>Score:</p> <p>Comments:</p>	
<p>Any other abnormalities or examination findings (e.g. lanugo hair, abdominal distension, parotid gland enlargement)</p>		

Signature of clinician completing assessment:

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Appendix 2: 'Refeeding guidelines for children and young people with feeding and eating disorders admitted to the Mildred Creak Unit at Great Ormond Street Hospital' (Hudson et al., 2014)

On Admission

- Check Urea, Sodium, Creatinine, Potassium, Phosphate and Magnesium ASAP
- Perform ECG- look for QTc and arrhythmia ASAP
- Discuss **any** electrolyte abnormalities with consultant
- Do not prescribe prophylactic phosphate routinely (see section 2.5)
- Do not prescribe prophylactic thiamine routinely (see section 2.6)
- Do not check glucose routinely unless symptomatic
- Check Vitamin D and prescribe 800IU Vitamin D prophylaxis (Treat deficiency when results back)



Low Phosphate

- **Do not increase feed regime until the phosphate is corrected and normal**
- Check Vit D & PTH if baseline Phosphate is low
- Always discuss an abnormal phosphate with the on-call consultant
- **Treatment depends on the phosphate level:**
 - 0.5-1.1 mmol/L:
 - Correct orally with a STAT dose: 2 x Sandoz Phosphate tablets (1.936g of sodium acid phosphate anhydrous per tablet)
 - Commence three times per day regular Sandoz Phosphate 1 tablet
 - Check phosphate level 12 hours after oral stat dose
 - <0.5 mmol/L:
 - Consider need for IV treatment and discuss with consultant
 - Make Clinical Site Practitioners aware
 - Repeat ECG if low phosphate developed when re-feeding
 - <0.3 mmol/L:
 - Significant risk for feeding safety
 - Will need medical environment, including potentially High dependency

Normal Phosphate (>1.1 mmol:L)

- Commence feeding as per dietetic plan
- Daily Urea, creatinine, Sodium, Potassium, Phosphate and Magnesium for 5 days
- Discuss **any** electrolyte abnormalities with consultant
- Check clinically each day for signs of Refeeding syndrome (confusion and oedema) as routine, but be aware that can develop at any time
- Check daily for biochemical evidence of Refeeding syndrome- especially a low phosphate
- Complete Refeeding front sheet daily
- If Phosphate remains normal then cease any phosphate supplements after 2 weeks



Develops re-feeding syndrome at any time

1. No clinical signs but low phosphate
- OR
2. Clinical signs (oedema, confusion)



Clinical Signs of the re-feeding syndrome

- Should be transferred (when stable) for ongoing management on a medical ward (or HDU/PICU)
- Discuss and inform all patients with consultant on-call, medical registrar on call and CSPs
- Reduce calories to starting dosage (calories on admission)-but discuss with consultant and dietician
- Immediately check: FBC, U&E (including Magnesium, phosphate, calcium), LFT; check blood gas for measurement of acid-base and more immediate measurement of sodium and potassium
- Check blood sugar and treat hypoglycaemia
- Patient should be put on cardiac monitor, especially those with cardiac arrhythmia and electrolyte abnormalities
- Patients with an arrhythmia should be discussed with the duty cardiology registrar ASAP
- Replace electrolyte disturbances - this should generally be done intravenously in a medical setting
- Oedema will usually complicate fluid management, albumin of often low - senior support and advice is required
- Initiate neuro-observations

Appendix 3: Guidance for supporting a young person through a refeeding admission

GENERAL

- ❖ It is essential that all the immediate staff (usually a nurse or health care assistant) supporting a young person to eat and drink have a good understanding of the meal plan, when and how to use oral nutritional supplements and how to document intake
- ❖ Continuity of staff, particularly for those who will be supporting the young person with the feeding plan, enables a trusting relationship to be established and provides a more therapeutic atmosphere for eating and drinking. There is also less likely to be any confusion with regards to how to follow the meal plan and document intake
- ❖ If this is not possible then there needs to be a clear plan of how the meal plan is handed over between staff. Allocating a person responsible for each day of admission for speaking to the newly allocated staff member first thing in the morning to provide a detailed handover is the most effective way of achieving this.

BEFORE MEALS

- ❖ It is important to stick to set times for meals and snacks. If a meal or snack is delayed it can impact on the next meal or snack. Although a young person may be feeling tired due to malnutrition and/or reduced energy intake, it is important to wake them up in time for breakfast, usually around 30 minutes before so they have time to prepare.
- ❖ The young person may be allowed to choose from the menu with the support of an adult (parent or staff member) to ensure meals contain a balance of carbohydrates, protein and vegetables, and snacks and puddings are appropriate as according to the meal plan. If the young person struggling to make a choice, then an adult should make the decision for them
- ❖ If the young person says they do not like a food, then it is importance to check with the parents if they previously ate this food at home. If they previously ate this food then they are expected to eat it in hospital.
- ❖ Staff should plate up the appropriate amount of food (as per the meal plan) before presenting the meal to the young person. Use a normal size plate even if the young person is on reduced portions so the young person can see that they are not yet eating full portion sizes to make the transition to normal portions easier.

DURING MEALS

- ❖ The young person should have an adult (parent or staff member) sitting with them to support them throughout the meal
- ❖ Meals and snacks should have clear time boundaries and there should be a clear message of when the young person is expected to complete the meal/snack. The young person should be reminded of the time boundaries at the start of each meal/snack and if necessary at intervals though the meal.
 - Breakfast 30 minutes
 - Snacks 30 minutes
 - Lunch and dinner 45minutes (30mins main course, 15 mins dessert)

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- ❖ What is served is what is to be eaten – avoid swaps and any negotiations. The young person may try to negotiate the portion size, say they do not like the food etc. Avoid any discussion and simply advise the young person that the food provided is according to the plan specified by the dietitian and that they are required to eat what is provided. Swapping food, reducing portions or trying to be ‘kind’ in other ways will make future meals more difficult and will not aid the young person’s recovery.
- ❖ Be supportive and firm at mealtimes. Acknowledge how hard it is but remain firm and calm in encouraging them to complete the meal or snack.
- ❖ Be cautious about offering praise – some young people perceive eating as failure and praise can exacerbate their sense of shame and guilt at their perceived failure.
- ❖ The staff supporting a young person to eat and drink will usually learn the most effective approach that works with the individual. If unsure, ask the young person what they would find helpful. In some cases distraction may be helpful – e.g. chatting about neutral (i.e. non food/weight/shape related) topics, but in other cases the young person may prefer to eat quietly focusing on the task at hand.
- ❖ Challenge any disordered eating behaviours such as pushing food around the plate, cutting food into tiny pieces, eating one pea at a time etc.
- ❖ Be alert for attempts to hide or dispose of food. Napkins should only be given once a meal is complete as they may be used to hide food if provided during a meal. Sometimes a young person may hide food in clothes, drop it on the floor or smear it out of sight. Point out that you have observed this and explain the lost or spoiled food will be replaced. Replace any lost food where possible. If this is not possible add the equivalent amount to the oral nutritional supplement.

AFTER MEALS

- ❖ Patients may have an overwhelming sense of guilt after eating the meal and parents and staff should be available to offer emotional support to manage these feelings. Often distraction – talking about something else, doing some colouring, playing a game, watching a film or reading is an effective way of redirecting their thoughts.
- ❖ Young people who have had a poor oral intake for a period of time often experience unpleasant gastro-intestinal symptoms once they start to eat again. They may feel full very quickly, bloated, nauseous and may suffer constipation. These sensations can be distressing, particularly as they may be interpreted as evidence of over-eating by the young person. The young person should be reassured that although these symptoms are uncomfortable, they are to be expected and will improve over time. Explain that the best way of improving these symptoms is to continue increasing their food intake as this will enable their gut to adapt. Eating less simply perpetuates the problem.
- ❖ Keep an accurate food and fluid chart so that oral intake can be correctly calculated to meet nutritional and fluid requirements.

USE OF ORAL NUTRITIONAL SUPPLEMENTS

- ❖ Food should always be offered as first line and the young person should be given every opportunity and support to eat. However, if after 20 minutes from the meal or snack being served, the young person has not even started eating then the appropriate amount of nutritional supplement (as per the meal plan) should be provided.

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- ❖ It is useful to have a measuring cup to measure out the correct volume of oral nutritional supplement and then give to the young person in a drinking cup
- ❖ If, after the set time boundary, the young person has not managed to complete the meal or snack then the remaining amount needs to be provided by an appropriate amount of nutritional supplement (as per the meal plan). Should for example, half the recommended portion be completed, then half the recommended amount of supplement should be provided.

IF THERE ARE COMPENSATORY BEHAVIOURS

Offer the young person the opportunity to use the toilet prior to meals and snacks. The toilet should not be used during the post-meal supervision period (1 hour after main meals, 30 minutes after snacks). If it becomes imperative for the young person to use the toilet they must be under eyesight observation as these are very high risk periods for over-exercising or vomiting.

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Appendix 4: Sample refeeding plans

Day 1:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Small portion cereal + 100ml milk + orange juice cup	150	100ml
Morning Snack	100ml semi skimmed milk	50	33ml
Lunch	Quarter meal (1 tbsp each of carbs, protein, veg)	100	66ml
Afternoon snack	100ml semi skimmed milk	50	33ml
Supper	Quarter meal (1 tbsp each of carbs, protein, veg)	100	66ml
Evening Snack	100ml semi skimmed milk	50	33ml
Total:		500kcal	

Day 2:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Small portion cereal + 100ml milk + orange juice cup	150	100ml
Morning Snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Lunch	Quarter meal (1 tbsp each of carbs, protein, veg)	100	66ml
Afternoon snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Supper	Quarter meal (1 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	200	132ml
Evening Snack	Hot chocolate made with 150ml semi-skimmed milk OR 2 biscuits	100	66ml
Total:		750kcal	

Day 3:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Standard portion cereal + 200ml milk + orange juice	200	132ml
Morning Snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Lunch	Half meal (2 tbsp each of carbs, protein, veg)	200	132ml
Afternoon snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Supper	Half meal (2 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	300	200ml
Evening Snack	Hot chocolate made with 150ml semi-skimmed milk OR 2 biscuits	100	66ml
Total:		1000kcal	

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Day 4:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Standard portion cereal + 200ml milk + orange juice	200	132ml
Morning Snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Lunch	Half meal (2 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	300	200ml
Afternoon snack	SMALL snack (e.g. 2 biscuits/cereal bar/crisps)	100	66ml
Supper	$\frac{3}{4}$ meal (3 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	400	264ml
Evening Snack	Hot chocolate made with 200ml semi-skimmed milk + 1 biscuit OR cheese on 3 crackers OR flapjack	200	132ml
Total:		1300kcal	

Day 5:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Standard portion cereal + 200ml milk + orange juice	200	132ml
Morning Snack	MEDIUM snack (e.g. yoghurt +1 biscuit OR cheese on 3 crackers OR flapjack)	200	132ml
Lunch	$\frac{3}{4}$ meal (3 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	400	264ml
Afternoon snack	MEDIUM snack (e.g. yoghurt +1 biscuit OR cheese on 3 crackers OR flapjack)	200	132ml
Supper	$\frac{3}{4}$ meal (3 tbsp each of carbs, protein, veg) + yoghurt/custard/rice pudding/ice cream pot	400	264ml
Evening Snack	Hot chocolate made with 200ml semi-skimmed milk + 1 biscuit OR cheese on 3 crackers OR flapjack	200	132ml
Total:		1600kcal	

Day 6:

Meal	Food	Kcals	Equivalent amount of 1.5kcal/ml feed
Breakfast	Standard portion cereal + 200ml milk + 1 slice of toast with butter and jam/Nutella/peanut butter + orange juice cup	350	233ml
Morning Snack	MEDIUM snack (e.g. yoghurt +1 biscuit OR cheese on 3 crackers OR flapjack)	200	132ml
Lunch	Full meal (2 fists carbs, 1 fist each of protein + veg) + yoghurt/custard/rice pudding/ice cream pot	500	300ml

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Afternoon snack	MEDIUM snack (e.g. yoghurt +1 biscuit OR cheese on 3 crackers OR flapjack	200	132ml
Supper	Full meal (2 fists carbs, 1 fist each of protein + veg) + yoghurt/custard/rice pudding/ice cream pot	500	300ml
Evening Snack	Hot chocolate made with 200ml semi-skimmed milk OR 1 slice of toast with butter and jam/Nutella/peanut butter AND 2 biscuits	250	150ml
Total:		2000kcal	

Appendix 5: Food, Supplement and NG Chart

Time	Food Offered e.g. 1 piece toast	Food eaten e.g. ½ piece toast	Amount of Supplement required as per meal plan (ml)	Amount of Supplement taken orally (ml)	Amount of supplement given via NG (ml)	Amount of other fluid taken orally (ml)	Amount of extra fluid via NG (ml)	Total fluid (oral and NG) – include flushes, drinks & supplements	Running total of fluids:	Signature

Name of Patient:
 Date:

Food, Supplement and NG Chart

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Appendix 6: guidance for nasogastric feeding for MARSIPAN patients

- MARSIPAN patients who require urgent medical re-feeding due to severe emaciation (e.g. BMI<13 (adults), 70% median BMI for age (children)) should be admitted to a gastroenterology or paediatrics ward for nasogastric (NG) feeding which should commence immediately on arrival to the ward.
- NG feeding should start at a rate of 5-10 kcal/kg/day and then increased to 20kcal/kg/day by day 2.
- Electrolytes should be monitored twice daily for the first 7 days.
- Minor or even moderate abnormalities of liver function (e.g. alanine transaminase up to four times the upper limit of the normal range) should not delay planned increases in the rate of NG feeding.
- NG feeding should continue for a minimum of 7 days.

Appendix 7: Blood Investigations whilst on Enteral Feeding

[Reference: NICE Enteral tube feeding 2017]

Parameter	Frequency	Rationale	Interpretation
Sodium, potassium, urea, creatinine	Baseline, daily until stable Then 1 or 2 times a week as needed until consistently stable Monitoring of electrolytes including Na, K, Ca, PO4, Mg (before, 6 hrs after restarting feeds and then daily until evidence of biochemical and cardiovascular stability - needs repeating on day 10 and 14 to pick up late signs of refeeding)	Assessment of renal function, fluid status, and Na and K status	Interpret with knowledge of fluid balance and medication
Glucose	Baseline, 1 or 2 times a day (or more if needed) until Stable, then weekly as needed until consistently stable	Glucose intolerance is common	Good glycaemic control is necessary
Magnesium, phosphate	Baseline, daily until stable if risk of refeeding syndrome Three times a week until stable, then weekly as needed until consistently stable (See above for details)	Depletion is common and under-recognised	Low concentrations indicate poor status

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Liver function tests including International Normalised Ratio (INR)	Baseline, twice weekly until stable, then weekly as needed until consistently stable	Abnormalities common during parenteral nutrition	Complex. May be due to sepsis, other disease or nutritional intake
Calcium, albumin	Baseline, then weekly as needed until consistently stable (see above for details)	Hypocalcaemia or hypercalcaemia may occur	Correct measured serum calcium concentration for Albumin Hypocalcaemia may be secondary to Mg deficiency. Low albumin reflects disease not protein status and allows for accurate interpretation of electrolytes.
C-reactive protein	Baseline, then 2 or 3 times a week until stable	Assists interpretation of protein, trace element and vitamin results	To assess the presence of an acute phase reaction (APR). The trend of results is important
Zinc, copper	Baseline, then every 2–4 weeks, depending on results	Deficiency common, especially when increased losses	People most at risk when anabolic APR causes Zn decrease and Cu increase
Full blood count and MCV	Baseline, 1 or 2 times a week until stable, then weekly as needed until consistently stable	Anaemia due to iron or folate deficiency is common	Effects of sepsis may be important. Low white cell count is normal.
Iron, ferritin	Baseline, then every 3–6 months	Iron deficiency common	Iron status difficult if APR (Fe decrease, ferritin increase)
Folate, B12	Baseline, then every 2–4 weeks until stable, then every 3-6 months	Iron deficiency is common	Serum folate/B12 sufficient, with full blood count
Vitamin D	Baseline, then every 6 months	Vitamin D deficiency is common	Requires normal kidney function for effect

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Appendix 8: guidance for stabilisation of physical risk in MARSIPAN patients

Parameter	Setting	Recommended treatment
Hypokalaemia (K+ <3.0mmol/l)	Gastroenterology or medical ward (adults) Paediatrics ward (children)	IV K+ for a minimum of 12 hours as per local policy
Hyponatraemia (Na+ <130mmol/l)	Gastroenterology or medical ward (adults) Paediatrics ward (children)	Fluid restriction until Na+ levels within normal range
Neutrophils <1.0 x 10 ⁹ /L	Gastroenterology or medical ward (adults) Paediatrics ward (children)	Barrier nursing as per local policy NG feeding if BMI<13 or 70% median BMI for age
Heart rate (HR) <40bpm	Gastroenterology or medical ward (adults) Paediatrics ward (children) Cardiology ward if severe	Bed rest Cardiac telemetry NG feeding if BMI<13 or 70% median BMI for age
Prolonged QTc interval (>450ms)	Gastroenterology or medical ward (adults) Paediatrics ward (children) Cardiology ward if severe	Bed rest Cardiac telemetry NG feeding if BMI<13 or 70% median BMI for age

Appendix 9: MARSIPAN expert working group terms of reference template

Name

The MARSIPAN expert working group

Purpose

To ensure that MARSIPAN care pathways standards outlined in the adult and junior MARSIPAN reports are achieved and maintained.

To meet regularly to discuss clinical issues, potential upcoming MARSIPAN admissions, transitions, policies and probity such that a proactive approach is taken to MARSIPAN care.

Membership

Member	Description
Eating disorders nutrition paediatrician	Interest in managing children (<18) with eating disorders Expertise in clinical nutrition and nutrition support Access to in-patient paediatric beds Training in the clinical problems (medical and psychiatric) of patients with severe eating disorders and their management.
Paediatric dietician	Interest in managing children with eating disorders Expertise in clinical nutrition and nutrition support Training in the clinical problems (medical and psychiatric) of patients with severe eating disorders and their management.
CAMHS eating disorders psychiatrist	Specialist training in the management of children (<18) with eating disorders Access to specialist CAMHS eating disorders beds <i>Note: If a local CAMHS eating disorders psychiatrist is not available then one should be identified from the regional adult specialist eating disorders unit to provide advice and consultation to the MARSIPAN expert working group</i>
Liaison psychiatrist	Interest in managing adults with eating disorders <i>Note: if a Liaison Psychiatry consultant is not available then another senior Liaison Psychiatry representative should be included in the membership of the MARSIPAN expert working group.</i>
Senior paediatrics nurse	Interest in managing adults with eating disorders Interest in staff development and training including enteral feeding
GP representative	Interest in managing children with eating disorders
Senior management representative	Senior manager from the acute trust with access to funding (e.g. RMN nursing observations)
Local and regional commissioners	Local and regional commissioners who have access to SEDU beds or funding for external MARSIPAN support where needed (e.g. if no Eating Disorders psychiatrist available in the area)

Working methods

Meetings

The MARSIPAN expert working group should work collaboratively taking a multi-disciplinary approach ensuring that the needs of both junior and adult MARSIPAN patients are considered.

Meetings should be held quarterly and should be chaired by a nominated member of the group. Meetings should be minuted with admin support and minutes circulated to the group within 2 weeks of the meeting.

Policies

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The group should ensure that local policies are in place to support the MARSIPAN care pathway.

Training

The group should facilitate an annual MARSIPAN training programme for all frontline MARSIPAN staff (medical and nursing).

Review and evaluation

The group should regularly assess the performance of the local MARSIPAN care pathway and the MARSIPAN expert working group through the process of clinical audit and evaluation.

The terms of reference should be reviewed on a bi-annual basis.