GUIDELINE FOR MANAGEMENT OF UNSTABLE EATING DISORDER OF PATIENTS ADMITTED TO THE MEDICAL WARD

PURPOSE
This document outlines the management of children with eating disorders who require an admission to the medical ward for medical stabilization. It provides rationale for the pre-printed order set and guidance for health care providers in patient management.

This document cannot replace careful clinical observation and judgment in treating this potentially very serious condition.

KEY DEFINITIONS (DSM-5)

Anorexia Nervosa (AN)
Restriction of energy intake leading to significantly low body weight in the context of what is minimally expected for age, sex, developmental trajectory, and physical health. With either an intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain although at a significantly low weight. With a disturbance in the perception of one's body weight and shape, undue influence of weight and shape on self-worth or lack of recognition of the seriousness of the current low body weight.

Bulimia Nervosa (BN)
Recurrent episodes of binge eating (eating an unusually large amount of food in a discrete period of time, ex. two hours + feelings of lack of control over eating) and recurrent inappropriate compensatory mechanisms to prevent weight gain such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise. Both occurred at least once a week for 3 months. The patient’s self evaluation is also unduly influenced by body shape and weight.

Binge eating disorder (BED)
Is a newly recognized disorder characterized by recurrent episodes of binge eating in a discrete period of time (e.g., 2 hours) and associated with a sense of lack of control. To make this diagnosis binge eating must occur at least once weekly over the past 3 months.

Avoidant/Restrictive Food Intake Disorder (ARFID)
An eating or feeding disturbance (e.g. apparent lack of interest in eating or food; avoidance based on the sensory characteristics of food; concern about aversive consequences of eating) as manifested by persistent failure to meet appropriate nutritional and/or energy needs. It is associated with one or more of:
   a) Significant weight loss (or failure to thrive in a growing child)
   b) Significant nutritional deficiency
   c) Dependence on enteral feeding or oral nutritional supplements
   d) Marked interference with psychosocial functioning

ARFID is NOT explained by food insecurity or cultural beliefs (e.g. fasting), it does NOT occur exclusively during AN or BN, there is NO disturbance in perception of body weight or shape and the eating disturbance is not better attributable to a medical condition or another mental disorder (e.g. Fear of ingesting food with germs leading to food avoidance in Obsessive Compulsive Disorder)

Please Note: Any of the above diagnoses can lead to significant medical instability requiring hospital admission.
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REASONS FOR ADMISSION

- New patient with suspected eating disorder and presenting to the Emergency Department in medical crisis (see below criteria for medical instability).
- Diagnosis made/suspected on the ward when patient has presented with a complication of the eating disorder e.g. amenorrhea, syncope, GI symptoms for investigation, etc.
- Known eating disordered patient with acute physical crisis e.g. overdose, hypoglycaemia etc.
- If the patient presents in acute psychiatric crisis (suicidal ideation, overdose/any attempts at significant self-harm, exacerbation of psychiatric co-morbid symptoms that require acute intervention), then psychiatric assessment is required.

Medical instability is defined as:

Comment: There are multiple published criteria for medical instability. BC Children’ uses the following:

- Glucose <3.0 mmol/L
- Potassium <3.0 mmol/L
- Phosphate <0.8 mmol/L
- Magnesium <0.7 mmol/L
- Any ECG abnormalities, including QTc >0.46s
- Orthostatic drop in BP >20mmHg
- Temperature (oral) <36 degrees Celsius
- Resting supine heart rate < 45/min

Patients presenting with any of the above features should be admitted to a medical ward for stabilization and treatment as well as monitoring of electrolytes and cardiac rhythm as the above are markers of risk for refeeding syndrome.

MEDICAL COMPLICATIONS OF EATING DISORDERS

Refeeding syndrome:(please see below)

Growth & Energy Expenditure:
- Cachexia and low body mass index
- Failure to thrive
- Hypothermia

Cardiac:
- Myocardial atrophy
- Mitral valve prolapse
- Pericardial effusion
- Bradycardia
- Arrhythmia (causing sudden death) and ECG changes
- Hypotension

Endocrine:
- Hypogonadotrophic Hypogonadism (Amenorrhea, delayed puberty)
- Infertility
- Osteoporosis and pathologic fractures
- Hypoglycemia
- Hematologic:
- Marrow aplasia: anemia, leukopenia, thrombocytopenia
- Gastrointestinal:
- Constipation
- Reduced gastric motility
- Gastroesophageal reflux
- Hepatitis
- Superior mesenteric artery syndrome
- Renal:
- Dehydration
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Electrolyte imbalances (hypomagnesemia, hypophosphatemia, hypokalemia)  
Urinary incontinence  
Impaired concentration of urine  
Respiratory:  
Spontaneous pneumothorax and pneumomediastinum  
Neurologic:  
Cerebral atrophy and enlarged ventricles  
Cognitive impairment and peripheral neuropathy  
Seizures

RELEVANT FEATURES ON HISTORY

- **Weight**  
  Date of and pre-morbid weight; date of and minimum weight reached; current weight; duration, onset of weight loss.

- **Diet**  
  Recent pattern of 24 hour dietary intake; estimate calories taken per day (if possible) and note if calorie counting; fluid intake (for dehydration); idiosyncratic nutritional issues e.g. food phobias and avoidance of specific food groups.

- **Activity/Exercise**  
  Time spent doing sport/training; secretive exercise in room e.g. sit-ups, push-ups.

- **Binge/Purging Behaviours**  
  Purging frequency, Ipecac use, laxative use, diuretics, diet pills, other medications  
  Binge eating - quantity, frequency, type of food, sense of loss of control around eating.

- **Menstrual History**  
  Menarche, menses history, usual cycle, timing of amenorrhea in relationship to weight loss.

- **Eating Disorder Behaviours (brief)**  
  Body image distortion, pursuit of thinness, fear of fatness or fear of weight gain.

- **Treatment**  
  Previous admission(s) to hospital, any psychiatric/psychological treatment including outpatient treatment, medications used, treating team(s) involved in current care.

- **Physical Symptoms and Medical Complications**  
  Syncope (arrhythmia, dehydration), palpitations (arrhythmia), chest pain and/or respiratory symptoms (CHF), constipation (ileus), feeling cold (malnutrition), hair loss (malnutrition), easy bruising (cytopenia), cognitive changes (malnutrition).

- **Psychological**  
  Screen for suicide risk, depression and self harm.

- **Relevant past medical history** (must exclude)  
  - Hyperthyroidism  
  - Celiac disease  
  - Inflammatory bowel disease  
  - Diabetes
RELEVANT FEATURES ON PHYSICAL EXAMINATION

- Weight of patient in underwear and a gown (if possible)
- Plot Height and Weight on growth chart with any previous measurements
- General examination with a focus on:
  - Vital signs – temperature, orthostatic heart rate (HR) and blood pressure (BP). Also note regularity/irregularity of heart rate.
  - Hydration status – capillary refill, mottling, perfusion, urine output, peripheral edema.
  - Muscular weakness (SUSS test) – assesses difficulty in standing from squatting position or sitting up from lying position.
  - Mental State - Confusion, slurred speech, poor attention and concentration.
  - Neurologic: Cranial Nerves, Strength, Optic Discs.
  - Other - lanugo hair, skin integrity (e.g. ulcers/skin breakdown), bruising (can be petechiae or ecchymoses), muscle wasting, dentition, swollen salivary glands, Russell Sign (marks on knuckles indicative of purging), signs of self-harm.
- Mental health status – if basic screen for suicide and self harm is positive, contact Psychiatry on-call.

RATIONALE FOR ADMISSION ORDER SET

1. DIET

There is a strong focus on diet in the order set and accompanying documents due to the concept that “food is medicine” for medically unstable patients with Anorexia Nervosa. After medical stabilization of life threatening complications (e.g. hypoglycemia, dehydration, cardiac arrhythmias), nutritional rehabilitation is the next priority. Without a concerted refeeding effort, no meaningful psychotherapy can take place, due to starvation-induced cognitive deficits.

Meal Plans
Each meal plan is created to provide a set amount of caloric intake per day and to be nutritionally balanced. The meal plans range in caloric content from 1000-3000 kilocalories per day. Please see below for the caloric content of each meal plan:

| Meal plan A | 1000 kcal |
| Meal plan B | 1300 kcal |
| Meal plan C | 1700 kcal |
| Meal plan D | 2000 kcal |
| Meal plan E | 2300 kcal |
| Meal plan F | 2700 kcal |
| Meal plan G | 3000 kcal |

The diet office & kitchen will provide the eating disorders meal plan as ordered on admission order set.

While on the medical ward, food substitutions are not permitted based on patient preference. An additional order needs to be written should the patient have religious or cultural dietary restrictions. These may include orders for: no red meat, no pork, no poultry,
and no seafood. We cannot accommodate vegan diets. If the child or adolescent is has a long history of a religious or cultural dietary restriction that predates the eating disorder, then this should be accommodated. Otherwise, dietary restrictions are often a symptom of the eating disorder.

Considerations in Initial Meal Plan Choice
During the admission history, it is critical to take a complete dietary intake history to help determine approximately how many calories the patient has been taking in during the 2 weeks preceding admission. For some patients, you may be able to ask “Do you count calories, if so how many calories have you been having per day for the last 2 weeks.”

If you are unable to estimate caloric intake or if caloric intake has been less than 1000 cal in the two weeks prior to admission, then it is recommended to initiate refeeding with ‘Meal Plan C’. If you are unclear which meal plan to order, or if the patient is very young (e.g. <12 years of age) you can contact the adolescent medicine physician on call to ask for their advice.

In the current eating disorder literature, the concept of using hypocaloric diets with a “start low, go slow” approach to avoid refeeding syndrome is no longer considered the gold standard approach to nutritional rehabilitation. Recent case series have shown that starting nutritional rehabilitation at 1200 calories/day leads to further weight loss in the first week in the majority of adolescents, without weight gain until after the first week of hospitalization. Starting low and advancing slow results can thus result in prolonged hospitalization and delayed nutritional repletion. Routine supplementation with phosphate minimizes the risk of refeeding syndrome.

Considerations for Meal Plan Advancement
If the patient is completing all meals and snacks as ordered then advance the meal plan to the next meal plan (i.e. C → D) every 2 days.

Daily Intake Log
The ‘Daily Intake Log’ is a clinical tool to record daily dietary intake as it corresponds to the Eating Disorders Meal Plans (A-G). Each log lists the categories of food (Ex. breads & cereals), and provides a blank space to indicate the specific food item consumed. The logs also include a tick box indicating whether the meal has been completed (100%) or not.

Nursing will provide the Daily Intake Log to the parent/caregiver daily at 08:00 to complete throughout the day. Nursing will collect it after evening snack and ensure that it is added to the patient’s chart. It is the responsibility of parents/caregivers to fill in the Daily Intake Log. In their absence nursing staff should complete the log.

Outside food and drink recommendations:
The order set specifies: “No food substitutions” and “No outside food or drink, chewing gum, caffeine or artificial sweeteners”. In the treatment of eating disorders, food should be considered the main medication. Food substitutions during initial medical stabilization can lead to insufficient caloric intake, further weight loss, fluid management challenges and adverse patient outcomes. The process of negotiations with a patient with an eating disorder
can reinforce the eating disorder and delay nutritional rehabilitation. Do not negotiate with the eating disorder. If parents are asking for substitutions, the message should be given that refeeding and monitoring of nutrition needs to be done under a completely controlled protocol in the acute medical stabilization phase (provide parent handout).

The consumption of caffeine, chewing gum and artificial sweeteners all have negative effects in the management of eating disorders thus their use should be prohibited in acute management settings. Specifically, caffeine has physiological effects including increased metabolism, increased muscle work output for endurance activities, delayed onset of fatigue and diuretic properties. Artificially sweetened foods are energy sparse products that facilitate weight loss and prevent weight gain. Gum use causes jaw pain, gastrointestinal side effects such as bloating, abdominal pain, and diarrhea as well as appetite dysregulation.

Meal Support
Nursing staff are not expected to provide meal support or supervision to medical ward patients with eating disorders. Parents/caregivers are expected to take on this role. All meals and snacks should be supervised and parents should be cautioned that some youth with eating disorders secretly hide food. The parent handout has a reference to the meal support video for instructions and should also direct them to the website: keltyeatingdisorders.ca. The parent or caregiver should check that the food that arrives on the patient’s meal tray is in line with menu plan, which arrives circled on the tray. If there are any discrepancies the family should alert the bedside nurse so that they may bring it to the attention of the attending team of physicians. The parent/caregiver should be instructed to remove the food 30 minutes after the beginning of a meal and 20 minutes after the beginning of a snack. If, due to extenuating circumstances, a parent or caregiver is not available to provide meal support, nursing staff should check that the contents of the tray are in line with the menu plan and should remove the tray after 30 minutes for meals and 20 minutes for snacks.

2. FLUIDS & WEIGHTS

Fluid Status Assessment
The assessment of fluid and electrolyte disturbances in patients presenting with an eating disorder are both important as well as inherently difficult due to challenges with volume status assessment by history, physical examination, and laboratory investigation.

Patients with AN often have impaired osmoregulation and difficulty concentrating urine when dehydrated. They can also have impairments in secretion of antidiuretic hormone and renal concentrating ability. This is relevant to interpretation of urine output on history as well as interpretation of urine specific gravity. For example, a patient who appears dehydrated based on other indices may have a reasonable urine output on history and urine specific gravity that is not concentrated.

On physical examination an assessment of capillary refill, mottling, perfusion, urine output, and peripheral edema is indicated. In patients with AN, confounding factors can lead to inaccurate volume assessment. For example, diminished skin turgor and sunken facies can be compatible with extracellular volume depletion but may also be a sign of extreme weight
loss. Additionally, patients are often bradycardic at baseline, thus resting heart rate is not a good indicator of intravascular volume status.

Laboratory indices of hemoconcentration can be difficult to interpret before the patient is rehydrated appropriately. For example, serum hemoglobin and total protein concentration may appear within normal range on day one of admission, however, on reassessment several days later they are often low secondary to chronic malnutrition. Interpretation of serum sodium at admission is generally a poor indicator of hydration status. Water intoxication with severe hyponatremia is very rare. In the context of an acute presentation, it is more common to have normal serum sodium despite dehydration.

Clinical Use of Oral Fluids
Pedialyte provides appropriate fluid and electrolyte rehydration. Pedialyte (200ml) should be provided with each meal and snack (six times per day or 1200ml total/day). Free water is limited to 1litre per day to avoid early satiety.

IV Fluid Recommendations
Oral rehydration is the preferred route of fluid resuscitation. IV fluid resuscitation should be considered if:
- Signs of severe dehydration or hemodynamic instability
- Electrolyte imbalance requiring acute correction
- Hypoglycemia, if oral correction is refused
- Refusing oral foods and NG tube not yet placed

Given the frequency of cardiac dysfunction, it is recommended that volume resuscitation is gradual (normal saline boluses of 10 mL/kg) rather than aggressive.

The recommended maintenance fluid for hospitalized patients requiring intravenous therapy is N/Saline. Please see section entitled “Flowchart of Medical Management” to determine whether the patient requires a normal saline fluid bolus.

If hypoglycemia is present, patient should be offered oral options first to correct hypoglycemia. If refused, then an NGT should be placed and Pedialyte run at maintenance plus any deficits or to achieve normoglycemia.

Patient Weighing
Patients should be weighed in a gown and underwear only on Monday, Wednesday & Friday mornings after their first void and before eating breakfast. Patients should be given the option to know their weight or to be weighed blind (facing away from the scale). Please use the same scale if possible.

3. Activity
Patients with medically unstable eating disorders have severely depleted their energy stores. During the initial process of nutritional rehabilitation, activity is counterproductive to the goal of weight gain and can put the patient at medical risk of eating disorder complications, such as falls secondary to fainting.
The order set specifies that the patients are to be on strict bedrest. Any out of room activity needs to be specifically ordered by the attending physician team. If a physician has written an order for the patient to attend a test off of the unit, a porter, family member or nurse should push their wheelchair to attend the tests. Please inform staff if the patient is exercising in the room.

Showering, an activity of daily living, also requires significant energy expenditure. The orders specify that the patient should be assisted by a nurse to shower, should use a shower chair and that length of shower should be limited to maximum 10 minutes. Shower supervision limits the possibility of the shower providing an opportunity for eating disordered behaviors such as purging or exercising. The shower chair reduces energy expenditure as well as fall risk, increasing patient safety. The time limit helps to avoid sequelae of excessive energy expenditure such as a decrease in resting heart rate.

4. Vitals

In Anorexia Nervosa, cardiac complications are common (can be present in up to 80% of patients). They can include alterations in cardiac electrical activity, structure and hemodynamics which can lead to morbidity and mortality. Therefore continuous cardiac monitoring (telemetry) is required to look for bradycardia and arrhythmias. Corrected QTc should be calculated by hand from a 12 lead ECG.

Orthostatic vitals are done twice daily as part of this monitoring. When completing orthostatic vitals please have the patient lie supine for 5 minutes and stand for 2 minutes before measurement.

During the refeeding process, postprandial insulin will surge, resulting in a drop in blood glucose. This occurs most commonly in the first 2-3 days of refeeding, therefore, bedside blood glucose is done 30 minutes post meals.

5. Investigations

**Serum Electrolytes**

The close monitoring of serum electrolytes, particularly potassium, phosphate and magnesium, is critically important in the management of unstable eating disorders patients as these patients are at risk for refeeding syndrome. This syndrome describes a potentially fatal shift of fluid and electrolytes that can occur when refeeding (orally, enterally, or parenterally) a malnourished patient. Clinical symptoms of this syndrome can be quite non-specific, thus laboratory monitoring is vital to early identification and management.

Patients particularly at risk of refeeding syndrome include:

- Age less than 12
- Poor fluid intake prior to admission
- Caloric intake less than 500 calories per day prior to admission
- SUSS test positive – stand from squat or sit up from lying with difficulty i.e. needing to use upper limbs for support
• History of rapid weight loss – for example no intake for the past week leading up to presentation, previously overweight and now <50%ile BMI within 1 month

**General principles of managing re-feeding**

• In general, **recommend starting at Meal plan C (1700cal)** and starting Phosphate 500mg PO BID.

• Increase intake by 200-300cal every day i.e. increase meal plan daily for example from A to B. On morning rounds please consider ordering meal plan increases for the following day. Meal plans can be increased on Fridays for Saturday morning, however, typically, meal plans should remain constant from Saturday to Sunday.

• After rehydration, ensure that as the IV is weaned off, the oral fluid intake increases correspondingly. It would be best to use oral/NG Pedialyte to rehydrate and remove the IV as soon as possible.

• Total maintenance fluids should be around 1500-2000 mL per day e.g. 200ml Pedialyte with each meal and snack (x6 per day, total of 1200ml) and the rest will be fulfilled within the meal plan.

• If solid food as per meal plans A-G is refused, substitute with Ensure Plus. Please see Food Refusal Guidelines later in this document for further details.

• For patients at high risk of refeeding syndrome or with known refeeding syndrome, close monitoring (telemetry and daily to twice daily labs) must be performed during the risk period of refeeding, which is the first five to ten days of refeeding.

**Electrolyte derangements**

**Hypophosphatemia**
This may result in cardiac arrhythmias, especially when in combination with other electrolyte derangements. Hypophosphatemia indicates refeeding syndrome, and generally occurs within the first 5-7 days of refeeding and possibly with each increase in daily caloric intake. This is managed with cautious titration of nutrition, supplemental oral phosphate and close monitoring (labs and telemetry).

**Hypomagnesaemia**
This generally occurs within the first 5-7 days. Magnesium can be replaced either orally or by IV. Oral Magnesium can be given at 420 mg twice daily or IV magnesium sulphate infusion at 25-50 mg/kg/dose at a maximum infusion rate of 125mg/kg/hr.

**Hypokalemia**
This is most likely to be secondary to vomiting or laxative abuse. It can also occur with refeeding. Oral replacement should be used initially, however, a potassium value below 2.5 mmol/L requires intensive cardiac monitoring and intravenous replacement.

**Hyponatraemia**
This is less common and may be due to excessive water intake, underlying sepsis (causing SIADH), or excessive sodium loss due to diarrhea/vomiting. Low urinary sodium suggests total body sodium depletion. Hyponatraemia in the context of dehydration exacerbates hypokalemia.
6. Medications

Rationale for phosphate (related to refeeding above)
Hypophosphatemia is a common but preventable complication of refeeding syndrome. Thus, the order set recommends providing sodium phosphate supplementation 500mg PO BID.

Rationale for PEG 3350
Constipation is a common complication of Anorexia Nervosa secondary to decreased gastrointestinal motility.

Rationale for magnesium
Replace Mg if Mg <0.5mmol/l via oral Mg (suggest 420 mg = 252 mg elemental magnesium orally 3-4 times daily). Be aware that this may induce diarrhea.

Rationale for potassium
Replace potassium chloride if K+ <3.0. Start with oral potassium but if K+ <2.5, IV potassium replacement is recommended.

7. Alert MD on Call if:

The following vital sign parameters should prompt a call to the physician on call for consideration within the clinical context:

- Systolic BP drops by >40mmHg from lying to standing
- HR at or <30bpm
- Blood glucose <3.5 (It is important to know when glucose is at this level before it becomes clinically low enough to result in seizures. This is particularly important in this population as glycogen stores are usually very depleted)
- Refusal of eating 1 consecutive meal and snack e.g. lunch and PM snack

SUGGESTED ACTION IN THE EVENT OF FOOD REFUSAL

In the instance that a patient refuses food for 1 consecutive meal and snack, the following are suggestions for clinical management:

The first option to discuss with the patient is whether they would be willing to drink a liquid meal replacement instead of eating their meals and snacks. If they agree to this option then please use the following guidelines to convert their current meal plan to a liquid meal replacement of equivalent caloric value. Ensure Plus is the preferred liquid meal replacement. One bottle of Ensure Plus is 235 milliliters.
Equivalent Amounts of Ensure Plus* to Eating Disorder Meal Plans

<table>
<thead>
<tr>
<th>Meal Plan</th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Dinner</th>
<th>Snacks (3 per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>120 mL</td>
<td>1 Bottle</td>
<td>1 Bottle</td>
<td>50 mL</td>
</tr>
<tr>
<td>B</td>
<td>150 mL</td>
<td>1 Bottle + 125 mL</td>
<td>1 Bottle</td>
<td>50 mL</td>
</tr>
<tr>
<td>C</td>
<td>150 mL</td>
<td>1 Bottle + 125 mL</td>
<td>1 Bottle + 125 mL</td>
<td>75 mL</td>
</tr>
<tr>
<td>D</td>
<td>150 mL</td>
<td>2 Bottles</td>
<td>2 Bottles</td>
<td>125 mL</td>
</tr>
<tr>
<td>E</td>
<td>1 Bottle</td>
<td>2 Bottles</td>
<td>2 Bottles</td>
<td>150 mL</td>
</tr>
<tr>
<td>F</td>
<td>1 Bottle</td>
<td>2 Bottles</td>
<td>2 Bottles</td>
<td>1 Bottle</td>
</tr>
<tr>
<td>G</td>
<td>1 Bottle</td>
<td>2 Bottles</td>
<td>2 Bottles</td>
<td>1 Bottle + 50 mL</td>
</tr>
</tbody>
</table>

*This can be substituted with Boost Plus. One bottle of Boost Plus is 237 milliliters (equivalent calories).

If there is a consistent pattern of missed meals or snacks e.g. 1 missed snack per day, then this warrants a clear discussion with the young person and their family re the importance of keeping up with the meal plan requirements to allow medical stabilization to occur. If this persists, and they continue to be medically unstable, a consult involving Adolescent Medicine should occur to discuss the possibility of using NG feeds.

If the patient is <30kg or <11 years old, please consult Adolescent medicine for advice on the appropriate formula.

If the patient refuses liquid meal replacements, then NG feeding should be considered.

Parenteral nutrition is rarely needed, except in the most challenging of cases. This should only be considered in consultation with an Eating Disorder Specialist.

REFERENCES


Royal College of Psychiatrists and Royal College of Physicians London. Report from Junior MARSIPAN: Management of Really Sick Patients under 18 with Anorexia Nervosa; Jan 2011