

Eating Disorders

DSM 5 Criteria[1]:

Anorexia Nervosa[1]

- A. 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.
Significantly low weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.
- B. Intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.
- C. 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 persistent lack of recognition of the seriousness of the current low body weight.

ICD-10 codes:

(F50.01) Restricting type: During the last 3 months, the individual has not engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas). This subtype describes presentations in which weight loss is accomplished primarily through dieting, fasting, and/or excessive exercise.

(F50.02) Binge-eating/purging type: During the last 3 months, the individual has engaged in recurrent episodes of binge eating or purging behavior (i.e. self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Specify if:

In partial remission: After full criteria for anorexia nervosa were previously met, Criterion A (low body weight) has not been met for a sustained period, but either B or C is still being met.

In full remission: After full criteria for anorexia nervosa were previously met, none of the criteria have been met for a sustained period of time.

Specify current severity: In adults:

Mild: BMI ≥ 17 kg/m²

Moderate: BMI 16-16.99 kg/m²

Severe: BMI 15-15.99 kg/m²

Extreme: BMI <15 kg/m²

In adolescents use % of median BMI (mBMI) see p 8

Atypical Anorexia Nervosa[1]

New to DSM-5. Shares all the criteria of Anorexia nervosa above except that the person is **at or above a normal weight** at the time of presentation despite significant weight loss[1]. 1.6-2.6 % lifetime prevalence[2, 3]. It should be noted that both citation 2 and 3 were written before DSM-5 and, therefore, may not give a completely accurate number.

Bulimia Nervosa[1]

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
 - 1. Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than what most individuals would eat in a similar period of time under similar circumstances.
 - 2. A sense of lack of control over eating during the episodes (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
- B. Recurrent inappropriate compensatory behaviors in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; or excessive exercise (if excessive exercise without purging it is diagnosed as BN, non-purging subtype).
- C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least once a week for 3 months.
- D. Self-evaluation is unduly influenced by body shape and weight.
- E. The disturbance does not occur exclusively during episodes of anorexia nervosa.

ICD-10 code: F50.2

Specify if:

In partial remission: After full criteria for bulimia nervosa were previously met, some, but not all, of the criteria have been met for a sustained period of time.

In full remission: After full criteria for bulimia nervosa were previously met, none of the criteria have been met for a sustained period of time.

Specify current severity:

Mild: An average of 1-3 episodes of inappropriate compensatory behaviors per week.

Moderate: An average of 4-7 episodes of inappropriate compensatory behaviors per week.

Severe: An average of 8-13 episodes of inappropriate compensatory behaviors per week.

Extreme: An average of 14 or more episodes of inappropriate compensatory behaviors per week.

Avoidant/Restrictive Food Intake Disorder[1]

- A. 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 associated with one (or more) of the following:
 1. Significant weight loss (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.
- B. The disturbance is not better explained by lack of available food or by an associated culturally sanctioned practice.
- C. The eating disturbance does not occur exclusively during the course of anorexia nervosa or bulimia nervosa, and there is no evidence of a disturbance in the way in which one's body weight or shape is experienced.
- D. The eating disturbance is not attributable to a concurrent medical condition or not better explained by another mental disorder. When the eating disturbance occurs in the context of another condition or disorder, the severity of the eating disturbance exceeds that routinely associated with the condition or disorder and warrants additional clinical attention.

ICD-10 code: F50.8

Specify if:

In remission: After full criteria for avoidant/restrictive food intake disorder were previously met, the criteria have not been met for a sustained period of time.

*New to DSM-5. ARFID replaced the "Feeding Disorder of Infancy or Early Childhood" in DSM-IV, which was almost never used. People with ARFID have difficulty taking in enough food to maintain normal growth or to maintain a normal weight. They may need to take liquid supplements to maintain or gain weight, and their weight can get as dangerously low as people with AN. However, their feeding issues are not related to body image distortion, wish to lose weight. They may be related to food aversions, sensory issues, lack of recognition of hunger cues. Many realize they are too thin but cannot get themselves to eat adequate amounts of food [1, 4].

Binge Eating Disorder[1]

- A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:
 - 1. Eating, in a discrete period of time (e.g. within any 2-hour period), an amount of food that is definitely larger than what most people would eat in a similar period of time under similar circumstances.
 - 2. A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).
- B. The binge-eating episodes are associated with three (or more) of the following:
 - 1. Eating much more rapidly than normal.
 - 2. Eating until feeling uncomfortably full.
 - 3. Eating large amounts of food when not feeling physically hungry.
 - 4. Eating alone because of feeling embarrassed by how much one is eating.
 - 5. Feeling disgusted with oneself, depressed, or very guilty afterward.
- C. Marked distress regarding binge eating is present.
- D. The binge eating occurs, on average, at least once a week for 3 months.
- E. The binge eating is not associated with the recurrent use of inappropriate compensatory behavior as in bulimia nervosa and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa.

Specify if:

In partial remission: After full criteria for binge-eating disorder were previously met, binge eating occurs at an average frequency of less than one episode per week for a sustained period of time.

In full remission: After full criteria for binge-eating disorder were previously met, none of the criteria have been met for a sustained period of time.

Specify current severity:

The minimum level of severity is based on the frequency of episodes of binge eating (see below). The level of severity may be increased to reflect other symptoms and the degree of functional disability.

Mild: 1-3 binge eating episodes per week.

Moderate: 4-7 binge eating episodes per week.

Severe: 8-13 binge eating episodes per week.

Extreme: 14 or more binge eating episodes per week.

ICD-10 code: F50.8

Unspecified Feeding or Eating Disorder[1]

This category applies to presentations in which symptoms characteristic of a feeding and eating disorder that cause clinically significant distress or impairment in social, occupational, or other important areas or functioning predominate but do not meet the full criteria for any of the disorders in the feeding and eating disorder diagnostic class. The unspecified feeding and eating disorder category is used in situations in which the clinician chooses not to specify the reason that the criteria are not met for a specific feeding and eating disorder, and includes presentations in which there is insufficient information to make a more specific diagnosis (e.g. emergency room settings).

ICD-10 code: F50.9

Major Differences between DSM IV-R and DSM 5 in these disorders [5]

1. Addition of Binge Eating Disorder as a definite diagnostic entity
2. DSM-5 includes specification of the level of severity, which includes low BMI as only one clinical element.

For Anorexia Nervosa:

3. Replacement of term “refusal to maintain a minimally normal body weight...” with “restriction of energy intake” to avoid the pejorative term *refusal* in a therapeutic relationship
4. Replacement of more specificity of weight (i.e. < 85% of ideal body weight) with “significantly low weight” (Interestingly, the “85%” number was never meant to be set in stone in the old DSM’s. It was used as an example...e.g. weight less than 85% of ideal body weight, which means “for example,” not i.e., meaning “that is.” But it became, over time, a criterion that was too important.).
5. Removal of the amenorrhea criteria

For Bulimia Nervosa:

6. Reduced frequency of binge eating episodes with compensatory weight loss behaviors over a 3-month period from twice to once a week.

Using DSM-IV criteria more than half of patients fell into the Eating Disorder-Not otherwise specified category, impeding early identification and treatment. Some feared that loosening criteria would increase misdiagnoses, but this has not happened.

Incidence and Prevalence:

Anorexia Nervosa: Prevalence 0.3%-0.7% among adolescent females and 1%-2% among adult women[6]. Prevalence of sub-threshold AN 1.5% among adolescent girls [6]10:1 female: male in clinical populations (more recent articles have questioned this number, stating males higher than previously thought (13-18%), particularly in gay and bisexual males and in younger males [7-9], in whom eating disorders are up to 4 times more prevalent than in heterosexual males[10]. Transgender youth may also have a higher prevalence of eating disordered behaviors, because of their intense body dissatisfaction.

Bulimia Nervosa: 12-month prevalence 1-2% among young females. ~3% in older adolescent/young adult population. 10:1 female: male

Binge-Eating Disorder (BED): Most common eating disorder. Prevalence- 3.5% of females and 2% of males among adults and 2.3% in adolescent males and 0.8% in adolescent males[6].

Avoidant-Restrictive Food Intake Disorder (ARFID): So far not enough data since 2013. Only data from studies prior to 2013[4].

First Described

Sir Richard Morton in 1689. He wrote *A Treatise on Consumptions*, which was best known for its description of Tuberculosis. In the treatise, however, he described one male and one female with anorexia nervosa, which he termed "Nervous Consumption" caused by "Sadness and Anxious Cares." [11]

Sir William Gull described Anorexia Nervosa, in 1873, as Apepsia Hysterica or Anorexia Hysterica

Etiology

Current theory is that Eating Disorders are about 50% genetic and 50% environmental[5]. Anorexia nervosa appears to have heritability ranging from 28-74%. Bulimia nervosa appears to have heritability from 28-83%. But most genetic studies assume genetics and environment are completely independent. How do we look at heritability in the face of epigenetics, which seem to show the environment has a major role in the expression of our genes? [12, 13]

A study just published in Nature Genetics on July 15, 2019, looked at genes of 16, 992 people with a history of AN and 55, 525 controls. Four universities involved: UNC Chapel Hill, Karolinska Institute in Stockholm, Sweden, Aarhus University in Denmark, and the Berghofer Queensland Institute for Medical Research in Christchurch, New Zealand. This was part of the Genome-Wide Association Study (GWAS). They found 8 regions of the genome significantly associated with AN:

1 (PTB2), 2(ASB3, ERLEC1), 3 (FOXP1, NSUN3), 5 (CHD10), 10(MGMT), and 11(CADM1)

These genes indicate

- The genetic basis of AN overlaps with other psychiatric disorders, such as OCD, depression, anxiety, and schizophrenia
- Genes associated with AN also influence physical activity, influencing people to be highly active
- These genes also influence metabolism, lipids, and body measurement traits.

They conclude that AN is a metabopsychiatric disorder[14]

Intriguing studies indicate that in girls there is no increased risk from heritability until puberty is reached and estrogen levels increase. In boys the approximate 50% risk is unchanged through the life span.[15]

All of the above information is important because we need to educate our patients about the complex interplay between genetics and environment in the development of eating disorders and replace the simplistic concepts that eating disorders are either entirely social (i.e. “there was so much out of control in her life she picked something she could control”) or entirely biologic. Giving families this information helps them understand why recovery can be so difficult to obtain, reduces or eliminates parental blame so they can focus on optimizing home environments (e.g. zero tolerance for negative comments about body weight, shape or size by any member of the family) and helps reduce guilt among parents who have a personal history of an eating disorder.

Please note that, in some eating disorder patients simply going on a diet can kick off the disease. There is more and more information about overlap of eating disorders and obesity[16].

Approach to a New Eating Disorder Patient:

History

Time course of weight loss, including minimum and maximum weight before and during illness. Recent history of vegetarianism [17]. Describe the thoughts they are having. Help patient and family understand link between obsession with food and starvation [18].

Perceived goal weight/healthy weight
Body image concerns

Mood changes
Amenorrhea and duration? Timing of thelarche and pubarche if premenarchal.

Dietary habits including 24-hr recall, history of restricting, binge eating, and/or purging.

Exercise history
Previous therapy
Secretive behaviors (purging behaviors, going to “pro anna or pro mia” websites)
Symptoms of systemic illnesses, such as inflammatory bowel disease, diabetes mellitus, celiac disease,

lupus, CNS tumors.

Relevant review of systems: pre-syncope, syncope, headaches, fatigue, exercise intolerance, sleep disturbance, dry skin, increased hair loss, cold intolerance, easy bruising, delayed wound healing, mood changes.

For males: history of decreased erections or nocturnal emissions

Family history

Eating disorders, obesity, depression, anxiety, alcoholism or drug abuse, bipolar affective disorder, schizophrenia Pubertal/menstrual history

Social history

Recent stressors in family, school, friends ?

Was there teasing about patient's weight at anytime before illness began?

Tobacco, alcohol, illicit drug use (unusual in AN patients. More common in BN patients).

History of physical or sexual abuse

Use of pro-eating disorder Web sites

LGBTQ?

Time with friends

Engagement in fun activities

Recent stressors, family, school, friends

I personally also spend time educating the patient and her family about the effects of starvation, Ancel Keys' studies on starvation[18]. We discuss the effects of her eating disorder on her metabolism, and I usually attempt to let the patient know I understand the feelings she has, the thoughts that are continuously hammering at her self-esteem, etc.

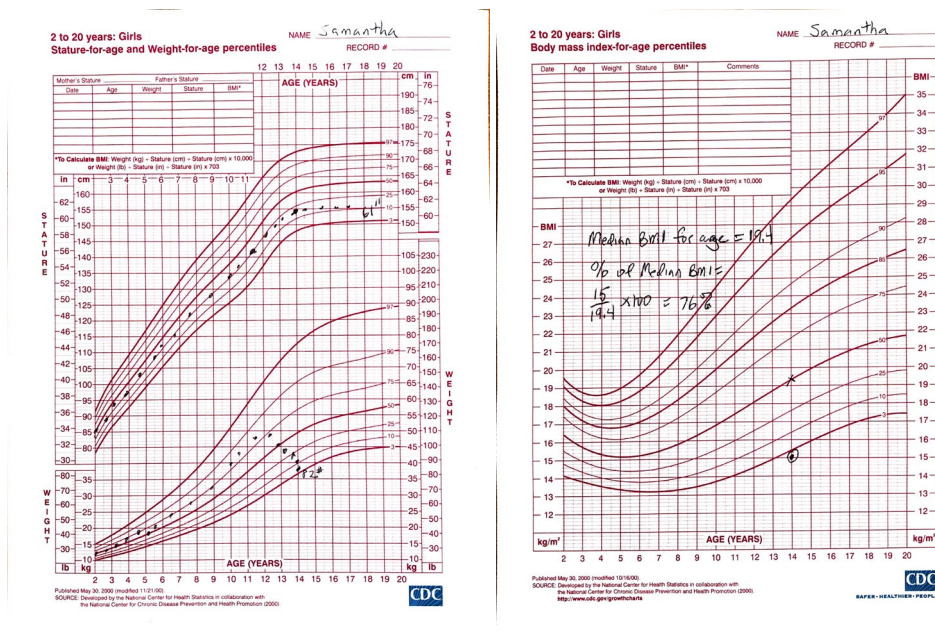
Physical Examination Findings and EKG findings

Anorexia nervosa and other restrictive disorders:

Growth rate deceleration?

Evaluate weight and % of median BMI (median BMI is 50th %ile BMI for age and sex)

% of Median BMI = current BMI/mBMI x 100 [19] Currently preferred method!



Ideal Body Weight method:

For post pubertal girls: 100 # for 5 feet + 5 pounds per inch above 5 feet + /- 10% [20]

(therefore, a girl who is 5' 4" should weigh 120# +/- 10%)

For post-pubertal boys: 106 pounds for 5 feet + 6 pounds per inch above 5 feet +/- 10% [20]

(therefore, a boy who is 5'10" should weigh 166 pounds +/- 10%)

Sinus bradycardia (by far most common). Rarely Cardiac arrhythmias including QT prolongation

Orthostatic changes in pulse >20 or blood pressure >20

Hypotension

Hypothermia

Dry, pale skin

Orange discoloration of skin Lanugo

Bruising/abrasions over spine

Acrocyanosis Thinning scalp hair

Facial wasting Cachexia

Atrophic breasts Scaphoid abdomen Dependent edema

Flat or anxious affect

Chewing gum or bubble gum in mouth

Red, chapped hands

Bulimia Nervosa and other purging disorders:

Sinus bradycardia or cardiac arrhythmias including QT prolongation

Callouses or abrasions over knuckles due to self- induced vomiting (Russell's sign)

Parotid enlargement

Dental enamel erosions (on lingual side of teeth), caries, oral ulcerations, very prominent fillings

Mood lability

Scleral hemorrhage

Palatal petechiae

Loss of gag reflex

From Campbell and Peebles [21]

Treatment

- Medication does NOTHING for Anorexia Nervosa
- Fluoxetine and SSRI's or SNRI's have been shown to be helpful in Bulimia Nervosa, along with Cognitive Behavioral Therapy.
- Lisdexamfetamine dimesylate (Vyvanse[®]) approved by FDA for Binge Eating Disorder in adults
- Recommend bone densitometry scan as baseline and annually for patients with anorexia nervosa, ARFID, and atypical AN (if amenorrheic).

Family-based Therapy (FBT) superior to others[19, 22-24]. Arose in the 1980's in the Maudsley Hospital in London. Initially called the "Maudsley approach." Initially used for younger patients. Goes counter to the beliefs of time that environment, over-controlling or non-connected parents involved[25]

1. Take an agnostic view of illness. DO NOT SEND TO COUNSELING TO TRY TO FIND OUT WHAT CAUSED THE ILLNESS AT FIRST
2. Work on nutritional rehabilitation FIRST
 - a. I don't even refer them to an Eating Disorder Counselor until nutrition somewhat improved (unless the counselor can help with FBT)! It is a waste of time.
3. Give parents control of the child's meals. They should be cooking, plating the food, and making certain their child eats the food (see handouts for parents accompanying this handout).
 - a. This may need to include going to school to eat lunch with their child.
 - i. Takes A LOT of time!

- ii. Parents need to know that “we don’t negotiate with terrorists!”
4. At this stage if you need a nutritionist have the parents see her/him, not the patient
 5. As pediatrician you follow up with weight checks, nutrition checks, and support
 6. When weight is recovered start giving control of diet back to the child.
 7. Do more intensive interpersonal counseling about issues after weight is improved enough patient can think (I usually wait for at least 2-4 weeks, depending on how they do eating).

Guidelines for Hospitalization of Eating Disordered Patients [19]

<75% of mBMI for height (many still use <75% of IBW)

Heart rate <50 beats/min daytime; < 45 beats/min nighttime

Cardiac arrhythmias including prolonged QTc or cardiac failure

Orthostatic changes in pulse (> 20 beats/min) or blood pressure (> 20 mm Hg systolic or >10 mm Hg diastolic)

Systolic blood pressure < 90 mm Hg

Temperature < 96 °F (35.6 °C)

Refusal to eat

Uncontrollable bingeing and purging

Failure to respond to outpatient treatment

Syncope

Pancreatitis

Serum electrolyte disturbance

Esophageal tears

Suicide risk

Intractable vomiting

Hematemesis

Failure to respond to outpatient therapy

Comorbid psychiatric or medical conditions that prohibit or limit appropriate outpatient treatment (severe depression, suicidal ideation, obsessive compulsive disorder, type 1 diabetes mellitus).

If you admit a child with an eating disorder to a medical unit the primary diagnosis must be medical. Do not make the primary diagnosis AN or BN, as you may not get paid unless you are on a psychiatric unit. Use severe malnutrition, bradycardia, disturbance of electrolytes, etc.

Refeeding Syndrome [19, 26, 27]

1. Metabolic changes that take place when the body shifts from a severe catabolic state to an anabolic state
2. Patient is severely glycogen depleted and total body phosphorous and Mg and K depleted
3. He/she is surviving on metabolism of fat and muscle
4. If they take a load of sugar in food

- a. Insulin levels increase
 - b. Glucose and phosphorous shift intracellularly
 - i. Production of ATP and 2,3-diphosphoglycerate
 - c. Extracellular phosphorous levels crash because total body Ph is low
 - d. Body cannot produce ATP.....leads to dysfunction
 - e. Low phosphorous levels cause Na/K pump to work poorly, contributes to electrolyte and fluid disturbances
5. Refeeding syndrome NOT thought to be related to rapidity of refeeding. Rather, related to severity of malnutrition, length of time without nutrition
- a. Has been reported in people who go as little as two weeks without nutrition
6. Ongoing studies being done to help us decide a reasonable starting level, but most experts now say it is ok to start at about 1400-2000 calories per day and to increase by 100-200 calories per day to achieve up to 2 kg/week weight gain [28, 29], but **NOT YET in severely malnourished patients (<70% mBMI) (not enough studies).**

Symptoms of Refeeding Syndrome

- | | |
|------------------------------------|---|
| • <u>Cardiac arrhythmias</u> | • <u>Diaphragmatic muscle dysfunction</u> |
| • <u>Cardiac failure or arrest</u> | • <u>dysphagia</u> |
| • <u>Muscle weakness</u> | • <u>Ileus</u> |
| • <u>Hemolytic anemia</u> | • <u>Rhabdomyolysis</u> |
| • <u>Delirium</u> | • <u>ophthalmoplegia</u> |
| • <u>Renal Failure</u> | |

Feeding/ Medications

1. Give Thiamine supplementation 100 mg daily x several days to prevent Wernicke Encephalopathy.
2. Check phosphorous, magnesium, K+ levels daily for about a week then as needed (after feeding starts)

If phosphorous falls below 3.0 mg/dL start NaK Phosphate 250 mg/packet (8 mmol Ph and 7.1 mEqK) 1-2 packets tid p.o.

Magnesium can also be supplemented. Use Magnesium amino acid chelate (133 mg of elemental Mg) 1-2 tabs three times daily or Magnesium Chloride. These are better absorbed than magnesium oxide or magnesium citrate.

*Note, I have been known to start the above meds prophylactically in people who come into the hospital at very low weights.....<75% of mBMI.

Feeding Possibilities

1. Oral feeds (see protocol below). Probably most common.

2. Nasogastric or naso-jejunal tube feeds. Thomas Silber, M.D., at Children's National Medical Center believes it is best to "medicalize" the illness so as to not give parents and the patient the idea it is not serious. If you feed them by tube during the day you also help decrease hyperactivity.
3. Mixture of the two. In my experience patients do not like to swallow much food when they have a tube in their nose. But amount of tube feeding can be turned up or down based on how much patient is able to eat.
4. I don't recommend TPN, intralipids except in a critical situation in which patient cannot absorb enterally. Seems higher risk of refeeding syndrome
5. I usually start a saline lock, at least, for access in case needed till out of refeeding period (1-2 weeks usually).

Hospital Protocol

1. Weigh patient daily in gown, after she arises and empties her bladder.
2. Do not allow her to see her weight.
3. Give patient notice of meals coming. Meals should be delivered to the nursing station, not to the patient. That allows the nurse to make certain she is getting what she is supposed to get
4. Patient needs to go to bathroom BEFORE food arrives
5. She has 30 minutes to eat her food, with a nurse or aid in attendance watching her eat (not their phone).
6. If she cannot finish meal in 30 minutes, she is offered the calories she was not able to eat as a liquid supplement, like Ensure, Boost, etc.
7. If she cannot or will not take the liquid supplement consideration given to tube feeds to "take the pressure off of her."
8. Given emphasis on Family-Based Therapies it makes sense to allow the parents to sit with her and work with her in the hospital after everyone gets "feet wet."
9. Patient needs to stay in her bed for at least 1 hour after a meal and 30 minutes after a snack.
10. If she needs to go to the restroom in that time (and is a purger) she must sing or talk the entire time she is in the bathroom so people know she is not purging. Same for showers.
11. Try to give her some sort of schedule with child life therapy and school work.
12. When she is medically stable she can be discharged for FBT. In past we used 85% of IBW, whenever possible, but in this day you probably need to d/c at a lower mBMI and medically stable....ONLY IF family looks to be capable of doing FBT. If not consider residential treatment

From Garber, et al[29]:

- 1) In moderately malnourished patients with AN, higher calorie feeding is feasible
- 2) Meal-only approaches or combined nasogastric plus meal-feeding approaches can deliver higher calorie feeds in hospital

- 3) In severely malnourished patients with AN, there is insufficient evidence to support any change to current standards of care for refeeding hospitalized patients
- 4) Higher calorie approaches to refeeding appear safe under close medical supervision and with correction of electrolyte abnormalities
- 5) The impact of differing approaches to refeeding on long-term outcomes is unknown
- 6) TPN is not recommended unless no other form of refeeding is possible; and 7) Meals and liquid formulas with nutrient compositions within recommended ranges are appropriate for refeeding.

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