# Eating Disorders Requiring Hospital Admission

## Definition and Epidemiology

Eating disorders (EDs) are severe psychiatric conditions characterized by abnormal eating behaviors, distorted body image, and significant physical and psychological complications. This document focuses on anorexia nervosa (AN), bulimia nervosa (BN), avoidant/restrictive food intake disorder (ARFID), and binge-eating disorder (BED) requiring hospital admission due to medical instability or psychiatric risk. AN involves restrictive eating and severe weight loss; BN includes bingeing and purging; ARFID features restrictive intake without body image concerns; BED involves recurrent bingeing without compensatory behaviors.

- Prevalence AN affects ~0.5-1% of women, 0.1-0.3% of men; BN ~1-2% of women, 0.1-0.5% of men; ARFID ~0.5-2% in children/adolescents; BED ~2-3% of adults. Hospitalization occurs in ~20-30% of AN cases, 10-15% of BN, and 5-10% of ARFID/BED due to complications.
- Risk Factors Female sex, adolescence, perfectionism, family history of EDs, trauma, anxiety disorders.
- Rare Demographics Male AN/BN (10% of cases), geriatric EDs, ARFID in autism spectrum disorder, BED in bariatric surgery patients.

## Pathophysiology

- Mechanisms EDs result from complex interplay of genetic, neurobiological, and psychosocial factors. AN involves serotonin (5-HT1A) and dopamine dysregulation, reducing appetite and reward. BN features serotonin and CCK imbalances, driving binge-purge cycles. ARFID may stem from sensory aversions or trauma, with reduced hypothalamic appetite signaling. BED involves opioid and dopamine reward pathway hyperactivity, promoting bingeing.
- Effects Malnutrition in AN/ARFID causes catabolism, hormonal suppression (e.g., hypogonadism), and organ dysfunction. BN's purging leads to electrolyte imbalances and GI damage. BED causes obesity-related comorbidities. All increase risk of refeeding syndrome during treatment.

- **Molecular Pathways AN:** Low leptin, high cortisol suppress GnRH, causing amenorrhea. BN: Hypokalemia from vomiting disrupts Na+/K+-ATPase, risking arrhythmias. BED: D2 receptor overstimulation in nucleus accumbens. ARFID: Amygdala hyperactivity to food cues.
- Key Pathway Neurotransmitter/reward dysregulation → Abnormal eating behaviors → Malnutrition or metabolic imbalance → Organ damage and psychiatric decompensation.

## Causes

| Category | Common Triggers | Rare Triggers | Notes |
|---|---|---|---|
| Anorexia Nervosa | Perfectionism, dieting, trauma | Postpartum AN, cancer cachexia mimic | Restrictive (70%) or binge-purge (30%) |
| Bulimia Nervosa | Body dysmorphia, stress | Post-bariatric surgery, Cushing's | Binge-purge cycles, normal BMI |
| ARFID | Sensory aversion, anxiety | Autism, Ehlers-Danlos syndrome | No body image distortion |
| BED | Emotional distress, obesity | Hypothalamic tumors, Prader-Willi | Bingeing without purging |
| Psychiatric | Depression, OCD, PTSD | Schizophrenia, BPD | 80% have comorbid psych disorders |
| Medical | None | Hyperthyroidism, Addison's | Mimic ED symptoms (weight loss, bingeing) |

## Clinical Presentation

### Symptoms

- AN Weight loss, fatigue, amenorrhea, cold intolerance
- BN Bingeing, vomiting, sore throat, dental erosion
- ARFID Food refusal, failure to thrive, anxiety
- BED Recurrent bingeing, guilt, obesity
- Rare Syncope (AN, BN), seizures (electrolyte imbalance), suicidal ideation (all)

### Exam

- AN Cachexia, lanugo, bradycardia (HR <50)
- BN Russell's sign (knuckle calluses), parotid swelling
- ARFID Growth stunting, normal/low BMI
- BED Obesity, acanthosis nigricans
- Rare Hypothermia (AN), esophageal tears (BN), choking (ARFID)
- Red Flags

- BMI <15 kg/m$^2$, K+ <2.5 mEq/L, HR <40, active SI, refeeding edema

## Labs and Studies

### Labs

- CMP Hypokalemia (BN, <3 mEq/L), hypophosphatemia (AN, <2.5 mg/dL), hypoalbuminemia (<3 g/dL)
- CBC Anemia (AN, Hgb <10 g/dL), leukopenia (<4K, immune suppression)
- Electrolytes Hypomagnesemia (<1.8 mg/dL), metabolic alkalosis (BN, vomiting)
- Advanced Leptin (<2 ng/mL, AN), cortisol (HPA axis, depression), amylase (BN, purging)

### Imaging

- DEXA Osteoporosis (AN, T-score <-2.5)
- CXR Cardiomegaly (refeeding edema), pneumomediastinum (BN, vomiting)
- ECG Bradycardia, QT prolongation (AN, BN, electrolyte issues)
- Advanced Brain MRI (AN, gray matter loss), esophageal manometry (BN, motility)

### Other

- Nutritional Assessment MUST score, Eating Disorder Inventory (EDI-3)
- Hormones FSH/LH suppression (AN), TSH (rule out thyroid mimic)
- Advanced Indirect calorimetry (AN, REE), gastric emptying study (ARFID)

## Diagnosis

### Criteria

- **AN DSM-5:** BMI <18.5 kg/m$^2$, fear of weight gain, body image distortion
- **BN DSM-5:** Binge-purge ≥1/week for 3 months, self-worth tied to body
- **ARFID DSM-5:** Restrictive intake, no body image issues, nutritional deficiency
- **BED DSM-5:** Bingeing ≥1/week for 3 months, distress, no purging
- Hospital Admission BMI <15, HR <40, K+ <2.5, SI, refeeding risk
- Differential
    - Cachexia (cancer), hyperthyroidism, Addison's, IBD, celiac disease.

### Flowsheet

- Step 1 History/Exam Weight loss, binge-purge, food refusal; assess SI, vitals
- Step 2 Labs CMP, CBC, electrolytes; rule out medical mimics (TSH, cortisol)
- Step 3 Nutritional Assessment BMI, MUST, EDI-3; confirm DSM-5 criteria
- Step 4 Studies ECG (arrhythmias), DEXA (bone density), CXR (complications)
- Step 5 Admission Criteria Medical instability (HR, K+), SI, or refeeding risk

## Treatment

General Principles Stabilize medically, prevent refeeding syndrome, and initiate psychiatric care with interdisciplinary teams (MD, dietitian, therapist, psychiatrist).

### Supportive Care

- Safety 1:1 sitter for SI, fall precautions (AN, weakness)
- Thiamine 100 mg IV daily x 3 days before refeeding
- Monitoring Vitals q4h, daily weight, ESAS for symptoms

### Specific Therapies

- Refeeding (AN, ARFID) Start 10-15 kcal/kg/day (500-1000 kcal), advance 200 kcal/day; NG tube if oral refusal
- Electrolyte Replacement K+ 20-40 mEq IV, PO4- 20 mmol IV, Mg2+ 1-2 g IV
- Psychiatric SSRI (fluoxetine 20 mg PO daily, BN/BED), CBT referral
- BN Haloperidol 0.5 mg PO q6h (purging urge), PPI (esomeprazole 40 mg PO daily)
- Advanced Olanzapine 2.5-5 mg PO qHS (AN, weight gain), topiramate 100 mg PO BID (BED)
- Rare Causes ARFID (sensory, cyproheptadine 4 mg PO TID), BED (liraglutide 3 mg SC daily)

### Complications

- Refeeding Syndrome Phosphate 20 mmol IV, monitor q12h x 5 days
- Arrhythmias Amiodarone 200 mg IV (if VT), magnesium 2 g IV
- SI Ketamine 0.5 mg/kg IV, (acute), inpatient psych consult, ECT

### Monitoring

- Daily electrolytes, ECG (QTc >450 ms)
- Weekly BMI, prealbumin, psych assessment
- Psychiatry consult within 24h, dietitian daily

## Complications

### Acute

- Refeeding Syndrome Hypophosphatemia, edema, arrhythmias (10-25% risk)
- Arrhythmias Bradycardia (AN), VT (BN, K+ <2.5, 5%)
- Esophageal Rupture Boerhaave syndrome (BN, vomiting, <1%)

### Long-Term

- Osteoporosis Fractures (AN, 30-50% by age 40)
- Infertility Hypogonadism (AN, 70%), PCOS (BED)
- Rare Gastric dilatation (BED, binging), Wernicke's (AN, B1 deficiency)

## Clinical Scenarios

### Case 1 Anorexia Nervosa

- **Presentation** 18 y/o F with AN, BMI 14 kg/m$^2$, presents with syncope, fatigue. Vitals BP 90/60, HR 38, SpO2 96%, RR 14. Exam Cachexia, lanugo.
- **Labs/Studies** K+ 3.0 mEq/L, PO4- 1.8 mg/dL, ECG Bradycardia, QTc 460 ms.
- **Interpretation** Severe AN, high refeeding risk.
- **Management** Thiamine 100 mg IV x 3 days, 500 kcal/day NG, K+/PO4- replacement. Olanzapine 2.5 mg PO qHS. Psych consult. BMI 15 by week 2.

### Case 2 Bulimia Nervosa

- **Presentation** 25 y/o F with BN, vomiting 5x/day, presents with weakness, SI. Vitals BP 110/70, HR 100, SpO2 94%, RR 16. Exam Russell's sign, parotid swelling.
- **Labs/Studies** K+ 2.4 mEq/L, amylase 200 U/L, C-SSRS Moderate. ECG Normal.
- **Interpretation** BN, hypokalemia, psychiatric risk.
- **Management** K+ 40 mEq IV, fluoxetine 20 mg PO daily, esomeprazole 40 mg PO. 1:1 sitter, CBT referral. K+ normalizes by day 3, discharge to IOP.

### Case 3 ARFID (Rare)

- **Presentation** 12 y/o M with autism, ARFID, 10% weight loss, presents with failure to thrive. Vitals BP 100/60, HR 90, SpO2 98%, RR 14. Exam Stunted growth, BMI 16.
- **Labs/Studies** Prealbumin 12 mg/dL, normal electrolytes. MUST High risk.
- **Interpretation** ARFID, nutritional deficiency.

- **Management** Cyproheptadine 4 mg PO TID, 600 kcal/day oral, behavioral therapy. Dietitian daily. Weight gain 0.5 kg by week 2, outpatient follow-up.

## Expert Tips

- **Start thiamine:** 100 mg IV before refeeding; prevents Wernicke's in AN
- **Monitor K+, PO4-:** q12h x 5 days; refeeding syndrome is fatal if missed
- **Use olanzapine:** cautiously in AN; improves weight but risks QT prolongation
- **Assess SI:** daily (C-SSRS); ketamine for acute risk in severe depression
- **Suspect ARFID:** in autism or sensory issues; avoid force-feeding
- **Pitfall:** Missing esophageal rupture in BN; CXR if chest pain post-vomiting
- **Advanced:** Indirect calorimetry for precise caloric needs; leptin therapy (AN, research)

## Key Pearls

- **AN:** requires hospitalization for BMI <15, HR <40, or refeeding risk
- **BN:** needs urgent K+ correction (<2.5 mEq/L) and psychiatric care
- **ARFID:** lacks body image issues; focus on nutritional rehab
- **BED:** may require liraglutide or topiramate for binge control
- **Rare:** geriatric or autism-related EDs need tailored behavioral therapy

## References

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