# Unseen Dangers: The Physical Complications of Eating Disorders Among Individuals Without Low Body Weight

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## Disclosures -

- I have nothing to disclose.

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# Objectives

1. Identify risk for refeeding syndrome and pseudo-Bartter syndrome in patients without low body weights.
2. Recognize cardiac and GI symptoms among eating disorder patients without low body weight.
3. Identify physical risks related to eating disorder behaviors after bariatric surgery.

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# Mortality Rates in E.D.

- Anorexia nervosa: 10-20% mortality
  - Hypoglycemia
  - Cardiac arrest from other causes
  - * Suicide 18x more likely than peers
- Bulimia nervosa: double the expected mortality
  - Electrolyte imbalances, especially hypokalemia
  - * Suicide 7x more likely than peers

* Smith, A. R., Zuromski, K. L., & Dodd, D. R. (2018). Eating disorders and suicidality: What we know, what we don't know, and suggestions for future research. *Curr Opin Psychol* 22:63-67. https://doi.org/10.1016/j.copsyc.2017.08.023

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## Causes of Abdominal Pain in E.D.

- Gastroparesis
- Constipation
- Pancreatitis
- Cholecystitis
- IBS
- Ischemic bowel (stimulant laxative abuse)
- Gastritis
- Chronic diarrhea (laxatives)
- Food Intolerances
- UTIs

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## Causes of Chest Pain in E.D.

- Atrophy of heart muscle
- Heart failure
- Mitral Valve Prolapse
- Arrhythmias
- Costochondritis
- Pericardial Effusions
  - wasting of left ventricle
  - possible inflammation
  - possible hypothyroid
- Anxiety
- Heartburn

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## Causes of Chest Pain (GI) in E.D.

- Heartburn
- Esophagitis
- Esophageal Ulcers
- Esophageal varices and Mallory-Weiss tears

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## Causes of Headaches in E.D.

- Dehydration (restricting, laxatives, diuretics, vomiting)
- Migraine
- TMJ
- Anxiety (chronic neck pain and headaches)
- Low Glucose
- Concussions

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## Other Eating Disorder-Related Pain and Complications

- Anxiety and Depression
- Body Dysmorphia
- Relationship Difficulties
- Isolation
- Fractures
- Osteoporosis
- Chronic Joint Pain
- Chronic Muscle Pain
- Inflammation
- Nerve Pain

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## Case Study 1: Alexis

- 28 year old
- Recently moved to the area
- A mathematics PhD student at the local university
- Looking for new treatment team and primary care provider (PCP)
- Symptoms: Body aches, abdominal discomfort after meals
- History of binge eating disorder (BED)

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# At PCP office:

- Height: 5'8"
- Weight: 230 lbs (BMI 35)
- Vital signs stable
- Reviewed history of BED, reflux, eczema
- Prescriptions renewed, labs drawn
- Verified plans for dietitian
- "You're looking great."

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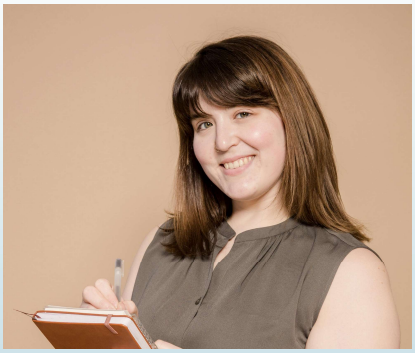
# At Therapist Visit

- Discussed anxiety related to school
- Reviewed history of depression (a little less lately)
- Discussed body dysmorphia, distress related to body shape and size
- Made plan for care
- Given links for screenings



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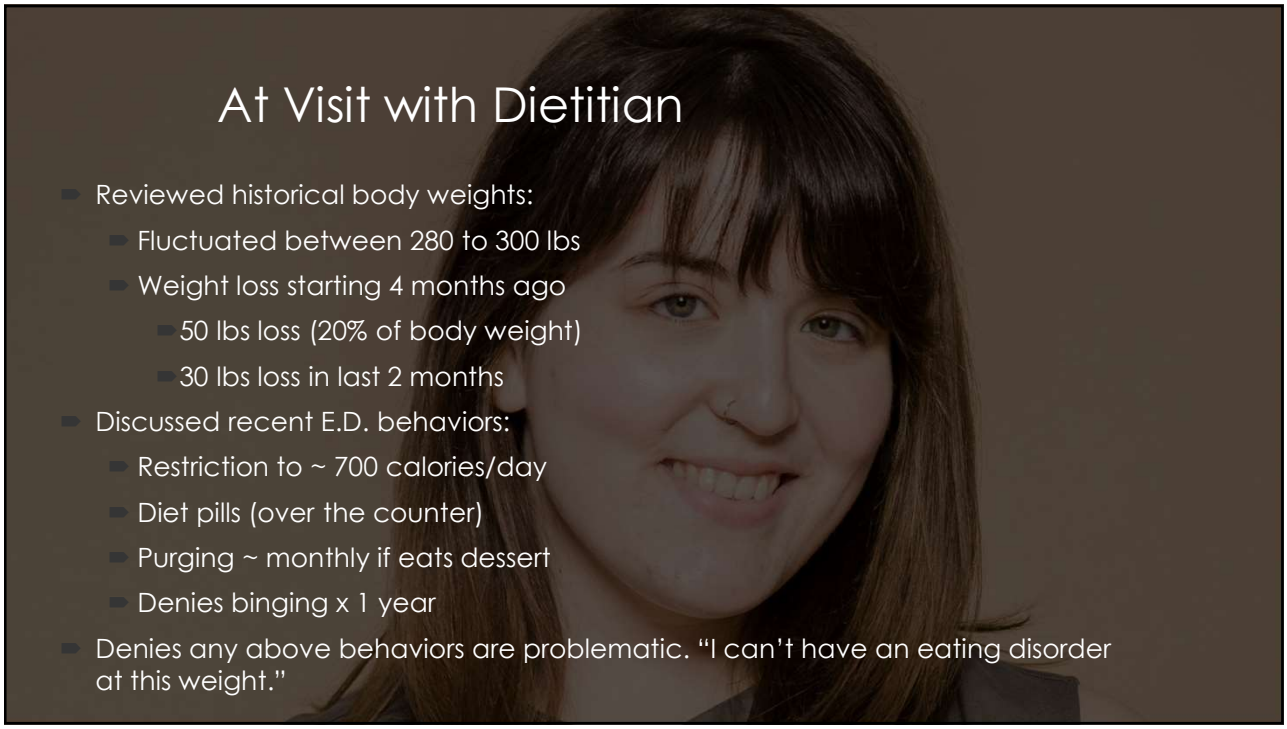
At Visit with Dietitian
Reviewed historical body weights:
Fluctuated between 280 to 300 lbs
Weight loss starting 4 months ago
50 lbs loss (20% of body weight)
30 lbs loss in last 2 months
Discussed recent E.D. behaviors:
Restriction to ~ 700 calories/day
Diet pills (over the counter)
Purging ~ monthly if eats dessert
Denies binging x 1 year
Denies any above behaviors are problematic. "I can't have an eating disorder at this weight."

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Conference call with PCP, LCSW, RD
Change from BED to Atypical Anorexia
PCP reports findings of anemia, low white blood cells (WBC), and high cholesterol (no history of the same) on labs
Therapist found on screenings that Alexis experiences: isolation, poor concentration, difficulty in relationships
Decision to move to PHP (all insurance allows).

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## Alexis in PHP

- Labs drawn every other day x 3
- On day 5: low phosphorus, low magnesium, slightly low potassium
- On day 5:
  - heartrate increased from 70s to 100s.
  - Body aches increased
  - Significant headache

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## Risk for Refeeding Syndrome

- Weight loss of > 10-15% in 3-6 months, regardless of current weight
- Chronic low body weight
- BMI < 15 kg/m2
- Little or no nutrition > 10 days
- Abnormal electrolytes before weight restoration begins
- Significant alcohol use
- Insulin, laxative, or diuretic misuse

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# Refeeding Syndrome

- "The clinical and metabolic derangements that can occur during refeeding…of a malnourished patient."
- Possibly fatal
- Possible at any age, size, or weight

- * Academy for Eating Disorders. (2021). *Eating disorders: A guide to medical care*. Reston, VA. Academy for Eating Disorders Medical Care Standards Committee. https://www.aedweb.org/resources/publications/medical-care-standards

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# Symptoms of Refeeding Syndrome

- Shortness of breath
- Tachycardia (relative)
- Chest pain
- Palpitations
- Edema
- Hypothermia
- Headache
- Numbness/weakness
- Tremors/seizures
- Confusion/delirium
- Muscle cramps
- GI discomfort
- Rhabdomyolysis

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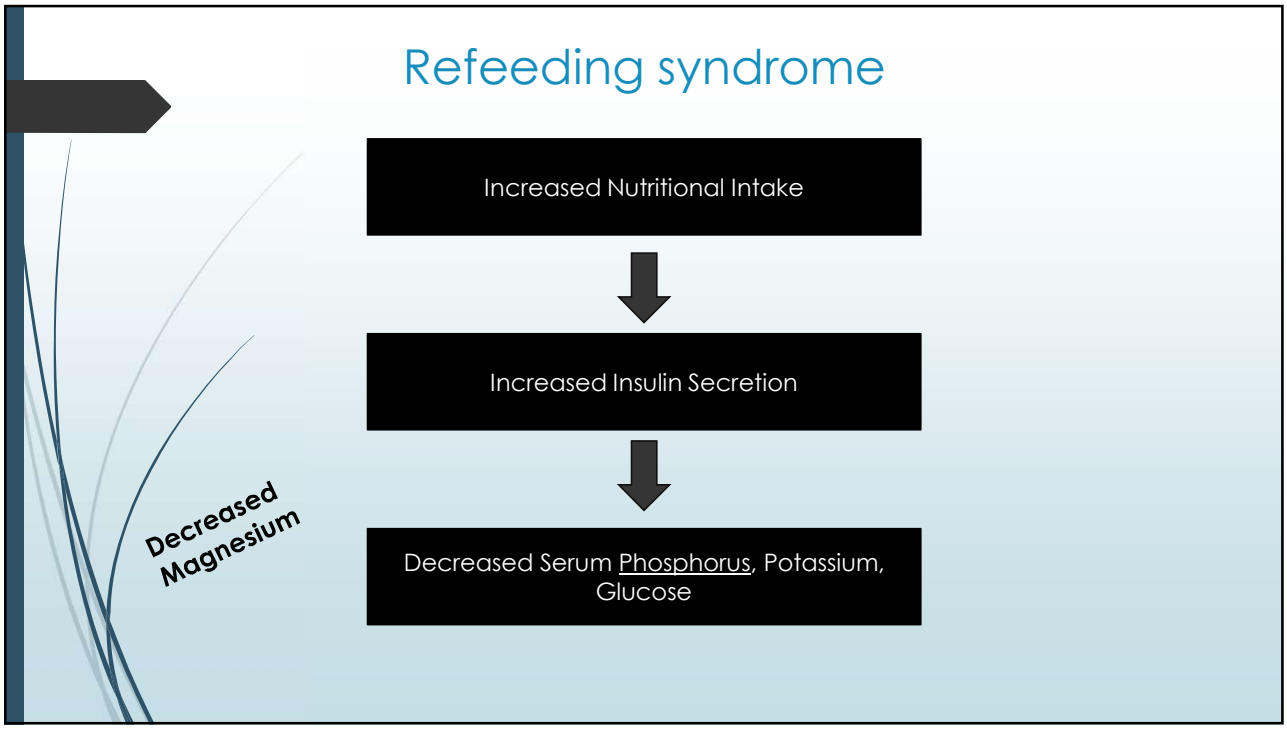
Refeeding syndrome
Increased Nutritional Intake
Increased Insulin Secretion
Decreased Serum Phosphorus, Potassium, Glucose
Decreased Magnesium

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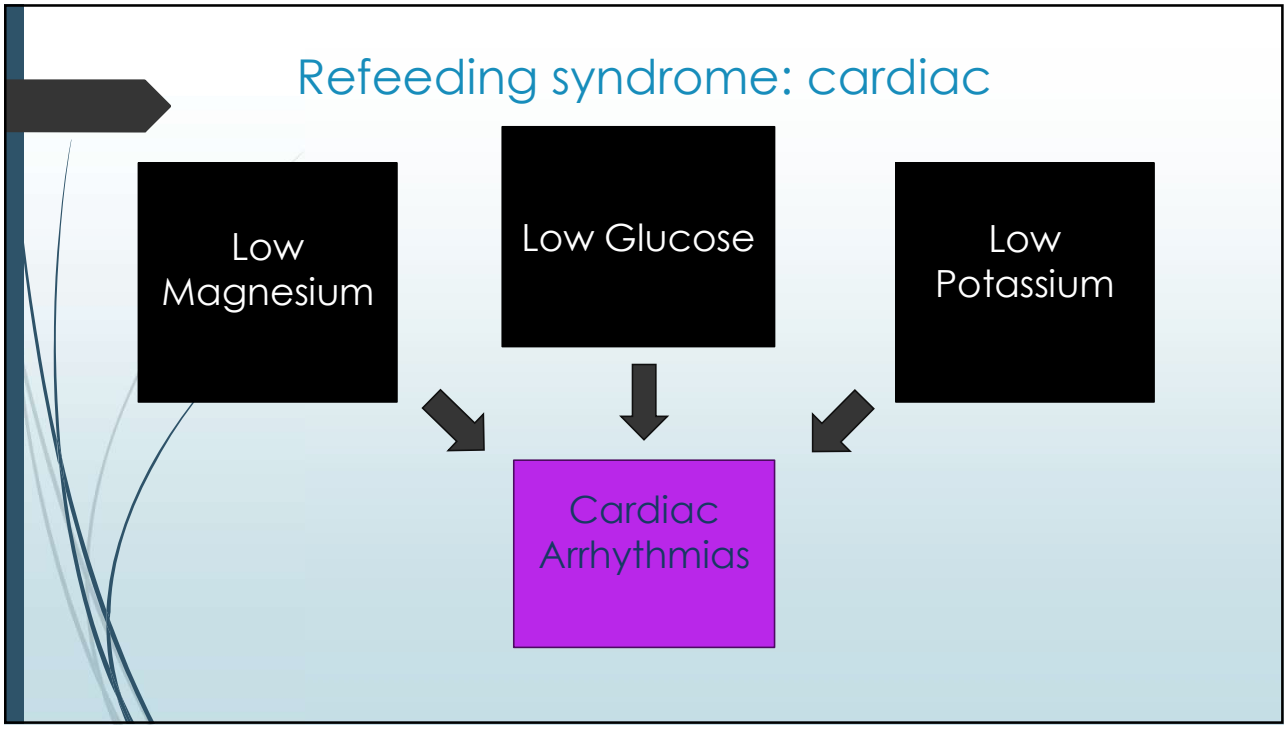
Refeeding syndrome: cardiac
Low Magnesium
Low Glucose
Low Potassium
Cardiac Arrhythmias

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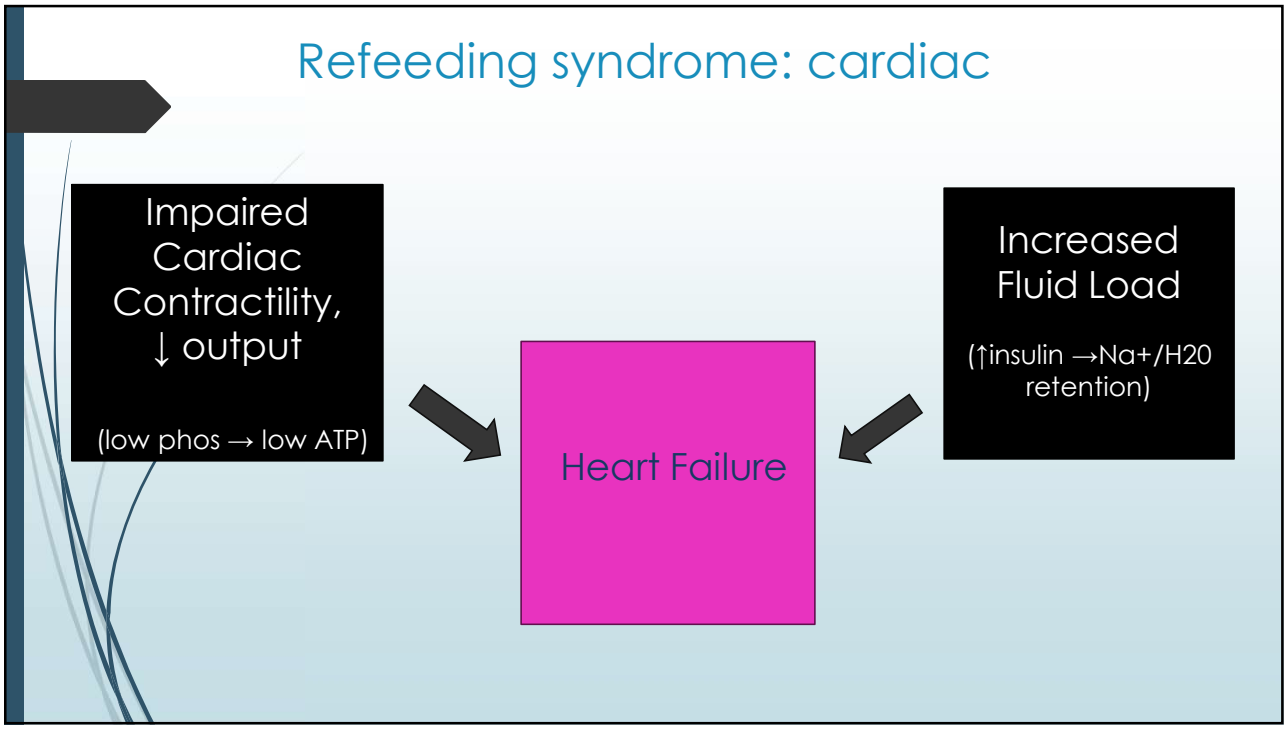
Refeeding syndrome: cardiac
Impaired Cardiac Contractility, ↓ output
(low phos → low ATP)
Heart Failure
Increased Fluid Load
(↑insulin →Na+/H20 retention)

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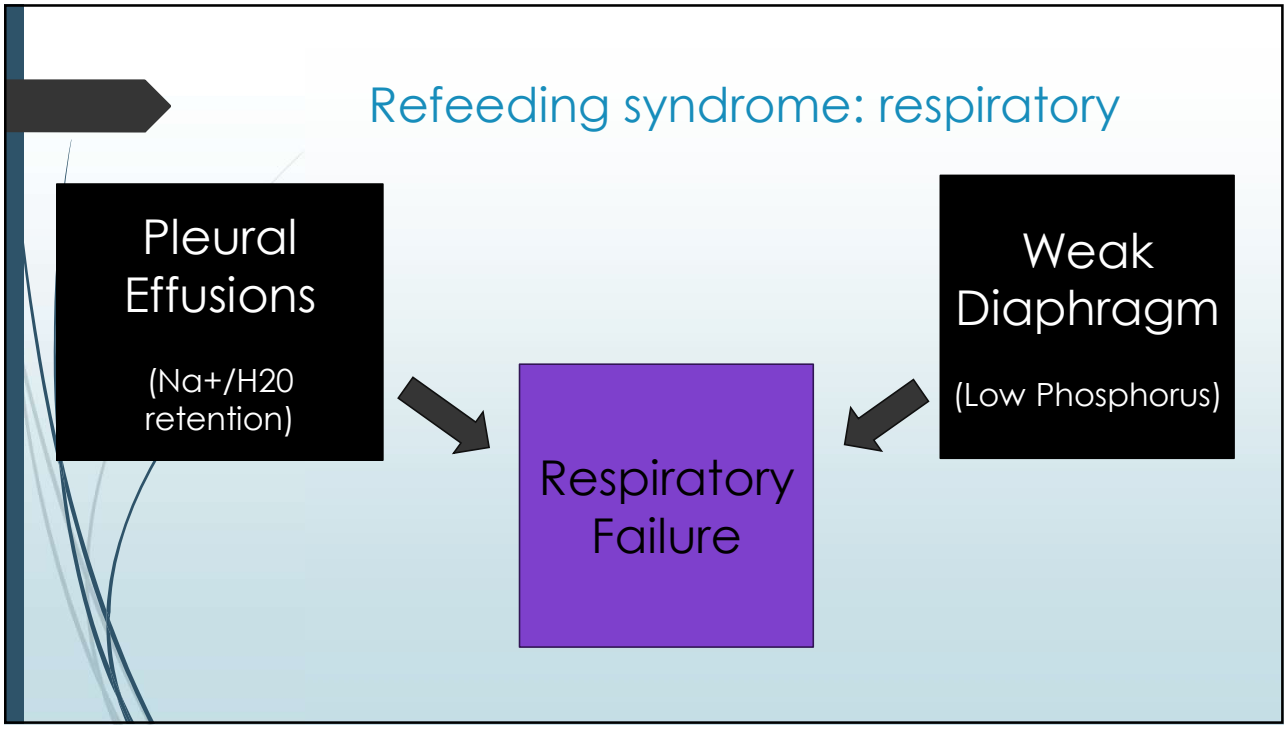
Refeeding syndrome: respiratory
Pleural Effusions
(Na+/H20 retention)
Respiratory Failure
Weak Diaphragm
(Low Phosphorus)

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## Refeeding prevention & treatment

- If risk, refer to higher level of care
- Monitor labs!
  - Usually no symptoms or concerning labs x 1st 3-5 days
  - CMP, magnesium, phosphorus daily to every other day
  - Higher risk → more frequent labs
  - Monitor until stable
- Supplement where deficiencies (usually oral)
- Daily multivitamin

**Remember:**
**- Low Phos**
**- Low Mag**
**- Low Potassium**

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## Refeeding prevention & treatment

- If alcohol use, supplement with thiamine and folate
- Monitor intake and output
- Monitor edema, vital signs, weight changes
- Frequent checks with provider and dietitian
- Dietary interventions
  - Balanced meals
  - If weight restoring: Per AED: start 1600-2400 cal/day and increase from there in inpt setting

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## Alexis During Treatment

- Stepped up to inpt level x 1 week
  - Oral supplements
  - Urgent labs stabilized
  - Headaches improved
  - Immediate 5 lbs weight loss (fluid loading)
  - Constipation
  - Severe fullness (with nausea, vomiting, worse reflux)
- To RTC x 4 weeks
  - Anemia improved
  - Weight stabilized
  - Fullness continued (treated)
  - Constipation (treated)
  - Gradual independence with self plating appropriately

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## Gastroparesis pearls

- Delayed gastric emptying due to sluggish gastric motility
- Very common with rapid weight loss, even 10 lbs
- Upper abdominal bloating and fullness
- Often accompanied by nausea and reflux
- Diagnosis
  - Gastric Emptying Study (GES)
  - Usually treat empirically

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## Gastroparesis Pearls Continued

- Treatment Options
  - Decrease fiber & legumes
  - Small, frequent meals (calorie dense)
  - Consider metoclopramide or erythromycin if doing weight restoration
  - Avoid E.D. behaviors over time
- Expected Outcomes
  - Improvement in several weeks to months (or longer)
  - If weight restoring, expect significant improvement once to maintenance meal plan

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## Alexis in Treatment

- Eventually to outpatient
  - Cholesterol returned to normal
  - Weight remaining stable
  - Continued body image concerns
- Able to return to PhD program
- Continue treatment and monitoring over time with PCP, RD, LCSW
- No longer isolating
- Reflux well managed
- Fullness pain managed with dietary interventions

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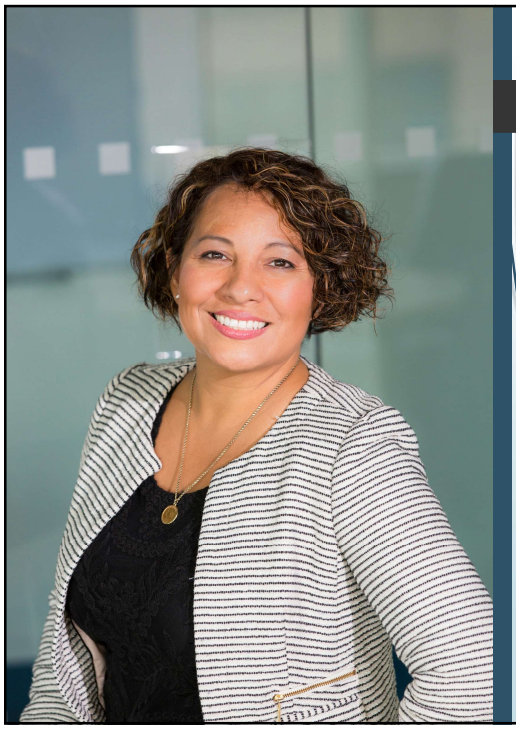

## Case Study 2: Jane

- 35 year old
- CFO of moderate-sized company
- History of Sleeve Gastrectomy 3 years ago
- Presents to PCP for abdominal pain and chest pain

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## Jane's Visit With PCP

- Vital signs stable
- Reports chest pain x 3 months
  - Intermittent tight, aching, central/right chest pain, worse with pressure and cough
  - Constant central burning chest pain, radiating throughout chest, worse in evenings
- Not taking post-bariatric surgery vitamins (too busy to remember)
- Constipation, bloating, cramping x 2-3 months
- When asked specifically, reports low fluid intake (fullness at meals)
  - Set plan for fluid intake
  - Goal 64 oz/day, mostly outside of meals
- Reports 10 lbs weight gain over the last year

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## Jane's Workup With PCP

- Labs stable except low Vitamins D and B12
- Echocardiogram (heart ultrasound) normal
- EKG normal
- Follow up Visit
  - Constipation, bloating, cramping – a little better with stool softener and osmotic laxative.
  - Significant edema with distress related to weight gain
  - A little shortness of breath at rest
  - Repeat labs show low potassium!

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## Follow up with PCP

- Discussed fluids and possible eating disorder behaviors:
  - Purging accelerating x 1year
  - Purging x 10 years before surgery, had stopped after
  - Fluid restriction (triggered by weight gain)
  - Weekly laxatives (excessive) on weekends
    - Constipation
    - Weight loss
- Discussed pseudo-Bartter syndrome
- Education on dangers laxative abuse

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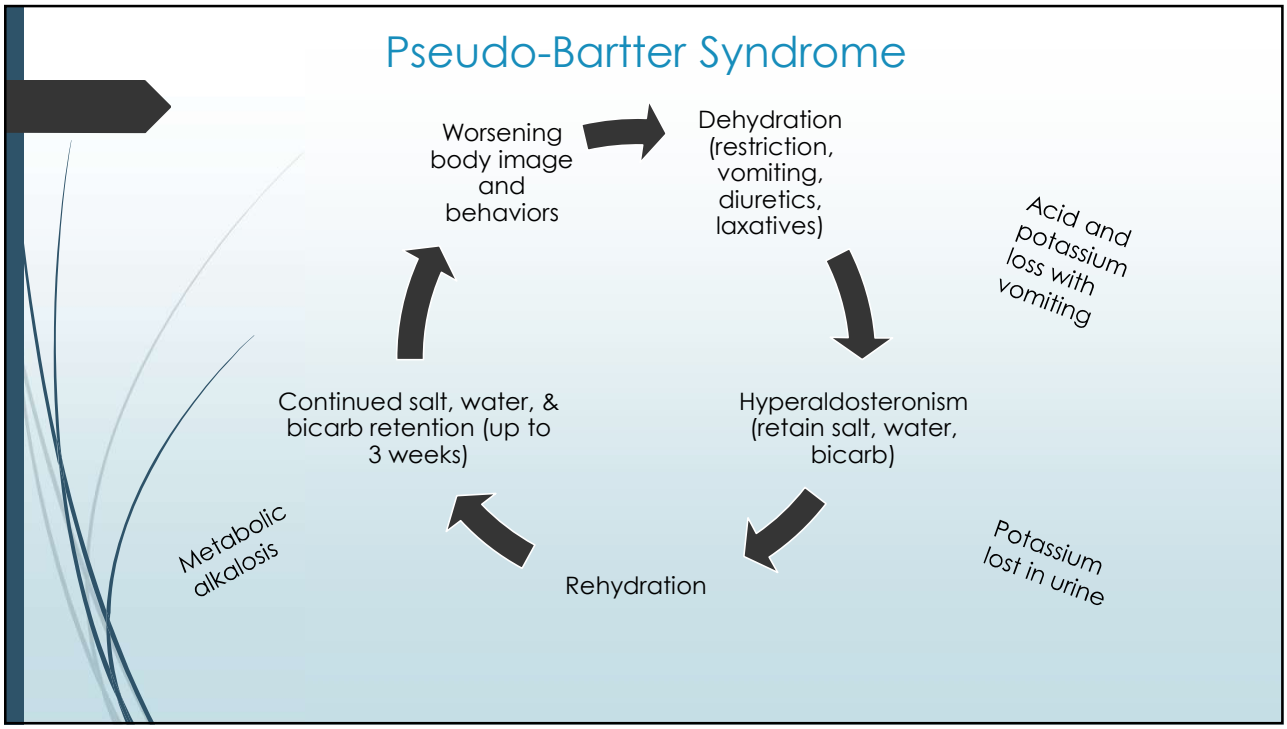
## Pseudo-Bartter Syndrome

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## Pseudo-Bartter's During Rehydration

- Persistent hypokalemia despite cessation purging
- Metabolic alkalosis (high CO2)
- Edema
- Shortness of breath
- Respiratory failure
- Irregular heartbeat
- Palpitations
- Malaise
- Cramps
- Weakness and fatigue
- Other symptoms
- Can be lethal

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## Treating pseudo-Bartter Syndrome

- Stop behaviors
- Rehydrate carefully (PO or slow saline infusion)
- Monitor edema and lung sounds
- Treat edema/volume overload (avoid spironolactone in cisgender males)
- Monitor for pleural and pericardial effusions
- Aggressive therapy
- Monitor CMP, magnesium, phosphorus

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## Jane During Treatment

- Potassium supplement given
- Insurance will only cover short term stabilization in RTC
- Labs, edema checks, lung sounds all daily until normal
- Restarts appropriate vitamin supplements
- With continued hydration, edema resolves
- Constipation managed with daily polyethylene glycol (Miralax)and abdominal pain resolves.

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## Jane During Treatment

- Central chest pain improves drastically with omeprazole (antacid)
- Hypoglycemia found on labs
  - Frequent fingerstick checks show low glucose intermittent
  - Starts continuous glucose monitoring (CGM)
  - CGM shows post-prandial (after meals) hypoglycemia
  - Aggressive medical and dietary management
- Other labs remain stable without fluid restriction

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## Jane in Outpatient Treatment

- Establishes care with outpatient dietitian and therapist
- With adequate hydration, able to decrease polyethylene glycol to ½ dose daily
- Referred to GI for upper endoscopy
  - Severe esophagitis
  - Esophageal ulcers
  - No Barrett's esophagus
- Abdominal pain and central chest pain resolve
- Central/left chest pain (presumed costochondritis) resolves without treatment
- Is referred to Endocrinology for workup for hyperinsulinemic hypoglycemia

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## Complications Related to Bariatric Surgery

- Hypoglycemia
- Danger to surgical site with purging
- Dumping Syndrome
- Iron Deficiency Anemia
- Thiamine (B1), B12, Vitamin D deficiencies
- Fullness (small stomach volume)
  - Uncomfortable to get adequate intake
  - Difficult to weight restore when needed
  - Dehydration

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## Case study 3: Jake

- 25-year-old, treated for ARFID since age 16
- Restriction, extreme emotional discomfort with certain textures and foods, purges them
- Weight restored in inpatient and residential care with discharge to outpatient care 2 months ago
- Canceled previous scheduled appointments with RD and therapist
- Now presents to PCP with headaches, body pain, and back pain

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## Jake at PCP Visit

- Vital signs stable except heart rate 58 (mild bradycardia)
- BMI 20.5 (18.5-24.9), reports 2 pounds weight loss in last 2 months
- New headache x 2 weeks
- Reports central and low back pain x last 2 months
- General body aching x about 6 weeks

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## Jake: Headaches and Back Pain

- Tenderness to palpation of thoracic and lumbar spine
- X-rays ordered - pending
- Labs ordered
  - All normal
  - Hemoglobin and hematocrit high end normal
- Fluid log given
- Encouraged to make appointments with RD and therapist

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## Jake's Visit With Dietitian

- Reports adequate fluids
- Usually sticking to meal plan
- Reports high exercise
  - Running 4 hours/day despite dizziness
  - Strength training a few times/week
  - History high exercise in high school (sports)
  - Restarted high exercise 2 months ago
- Body image concerns ever since weight restoration

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## Jake's Follow Up

- Therapist adjusts diagnosis
- X-rays show 7 stress fractures in the thoracic and lumbar vertebrae
- A more thorough evaluation leads to concussion diagnosis (headaches)
- DEXA ordered
  - Osteoporosis
  - Referred to endocrinology

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## Jake's Follow Up

- Steps up to intensive outpatient programming
- Evaluated by orthopedics for stress fractures
- With cessation of over exercise:
  - Headaches resolve
  - Body aches (not back pain) decrease by >80%
  - Dizziness resolves

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## Causes of Abdominal Pain in E.D.

- Gastroparesis
- Constipation
- Pancreatitis
- Cholecystitis
- IBS
- Ischemic bowel (stimulant laxative abuse)
- Gastritis
- Chronic diarrhea (laxatives)
- Food Intolerances
- UTIs

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## Causes of Chest Pain in E.D.

- Atrophy of heart muscle
- Heart failure
- Mitral Valve Prolapse
- Arrhythmias
- Costochondritis
- Pericardial Effusions
  - wasting of left ventricle
  - possible inflammation
  - possible hypothyroid
- Anxiety
- Heartburn

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## Causes of Chest Pain (GI) in E.D.

- Heartburn
- Esophagitis
- Esophageal Ulcers
- Esophageal varices and Mallory-Weiss tears

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## Causes of Headaches in E.D.

- Dehydration (restricting, laxatives, diuretics, vomiting)
- Migraine
- TMJ
- Anxiety (chronic neck pain and headaches)
- Low Glucose
- Concussions

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## Other Eating Disorder-Related Pain and Complications

- Anxiety and Depression
- Body Dysmorphia
- Relationship Difficulties
- Isolation
- Nerve Pain
- Fractures
- Osteoporosis
- Chronic Joint Pain
- Chronic Muscle Pain
  - Atrophy
  - Wear and tear
- Inflammation

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## When is 24 hour care appropriate?

- Risk for refeeding syndrome or pseudo-Bartter syndrome
- Labs unstable
- Cardiac or other medical complications
- Failure to progress at a lower level of care
- Rapid weight loss
- Low body weight

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## Remember…

- Few of the many complications of eating disorders are only seen at low body weights.
- Refeeding syndrome and pseudo-Bartter syndrome can and do occur at higher weights.
- Cardiac, GI, and other complications can happen with:
  - Decreasing body weight
  - Increasing body weight
  - Stable body weight
- Communicate as a team
- If any concerns: get more labs
- Seek the appropriate level of care for your patient

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## Suggested resources


- Academy for Eating Disorders Report. (2021). Eating Disorder: Critical Points for Early Recognition and Medical Risk Management in the Care of Individuals with Eating Disorders. https://www.aedweb.org/resources/publications/medical-care-standards.
- American Psychiatric Association. (2023). *Practice Guidelines For The Treatment of Patients With Eating Disorders, Fourth Edition.*
- Mehler P. S. & Andersen A. E. (Eds.). (2022). *Eating Disorders: A guide to Medical Care and Complications* (4th Ed). Baltimore, MD: Johns Hopkins University Press.
- National Eating Disorders Associate (NEDA) website: https://www.nationaleatingdisorders.org/what-are-eating-disorders/


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## For Questions

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## For Questions

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