



The Psychopharmacology of Eating Disorders

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No Disclosures

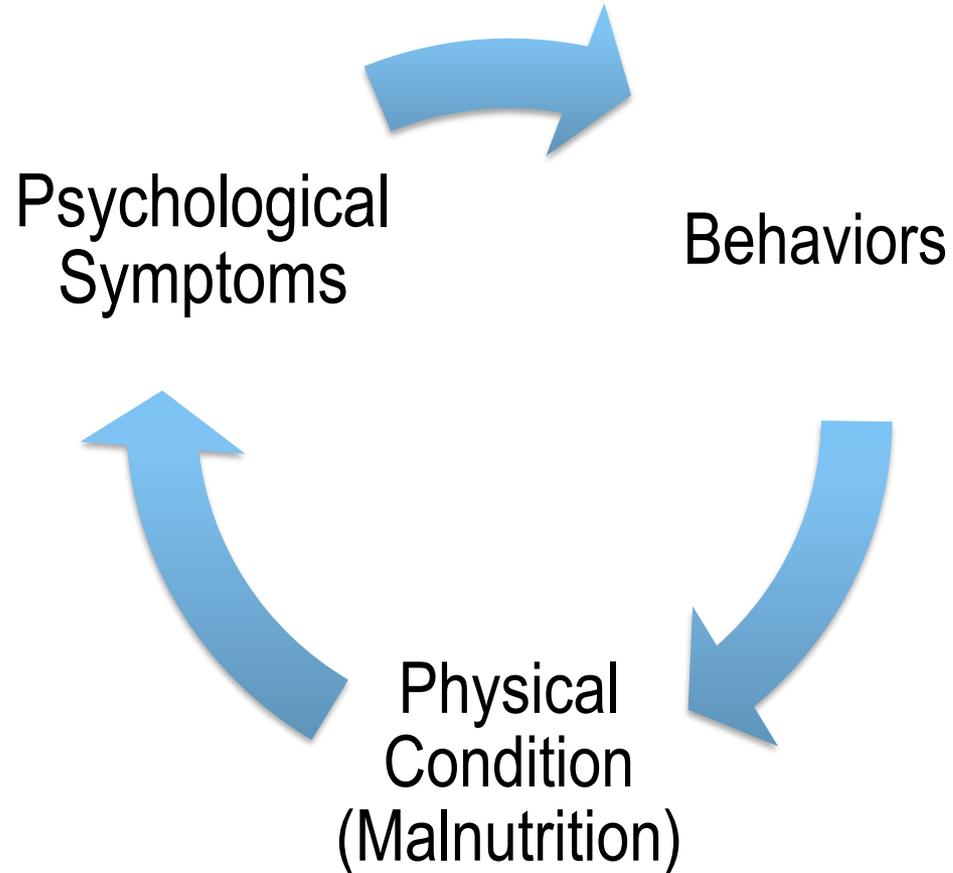
Learning Objectives

- How to understand, assess, and treat the illnesses anorexia nervosa, ARFID, bulimia nervosa, and binge eating disorder

Anorexia Nervosa – DSM V

- **Restriction** of energy intake relative to requirements leading to **significantly low body weight**
- **Fear** of weight gain or **behaviors** to avoid weight gain
- **Body image disturbance**, denial of seriousness of illness, undue influence of body weight/shape on self-evaluation

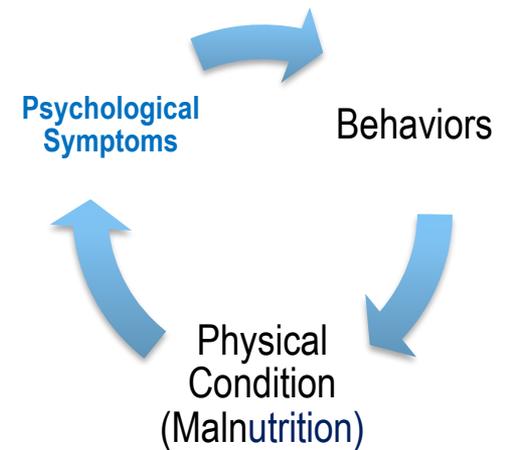
Anorexia Nervosa – the vicious cycle



Anorexia Nervosa – Psychological Symptoms

Body Image Disturbance Fear/Anxiety

Cognitive rigidity
Obsessionality
Social anxiety
Altered reward
Altered threat
Habit



Anorexia Nervosa – Behavioral Symptoms

Restricting/Fasting

Exercising

Binge eating

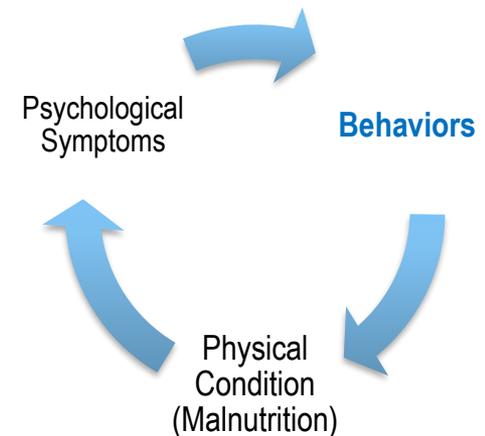
Vomiting

Laxative abuse

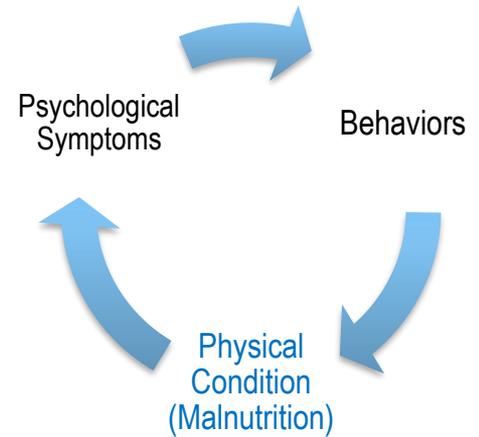
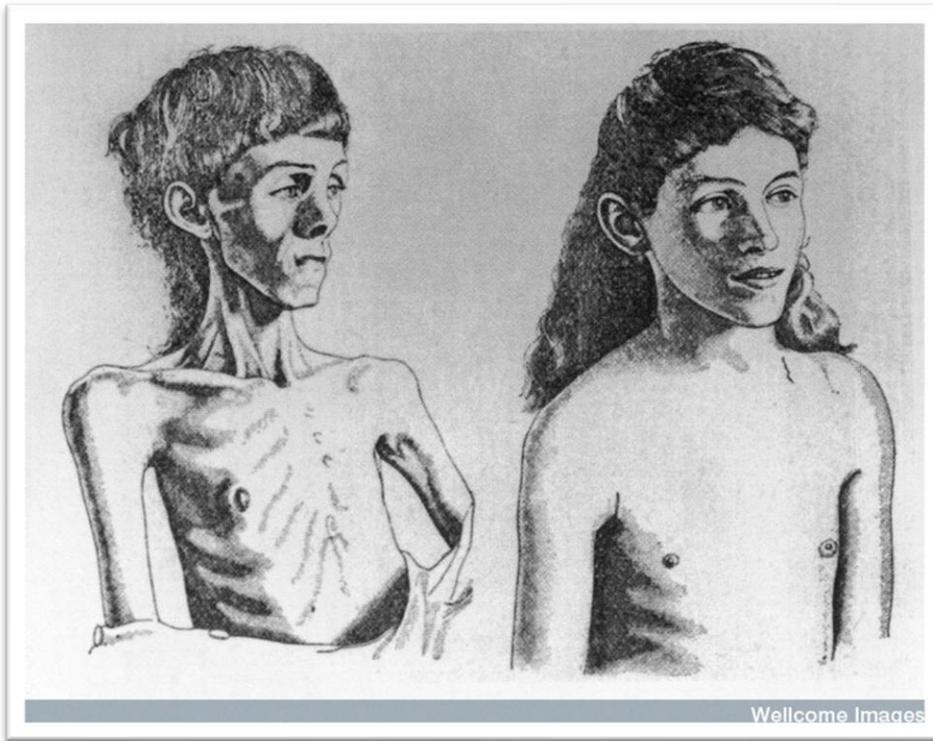
Taking diet pills or appetite suppressants

Avoiding “risk” foods or entire food groups

Calorie counting...

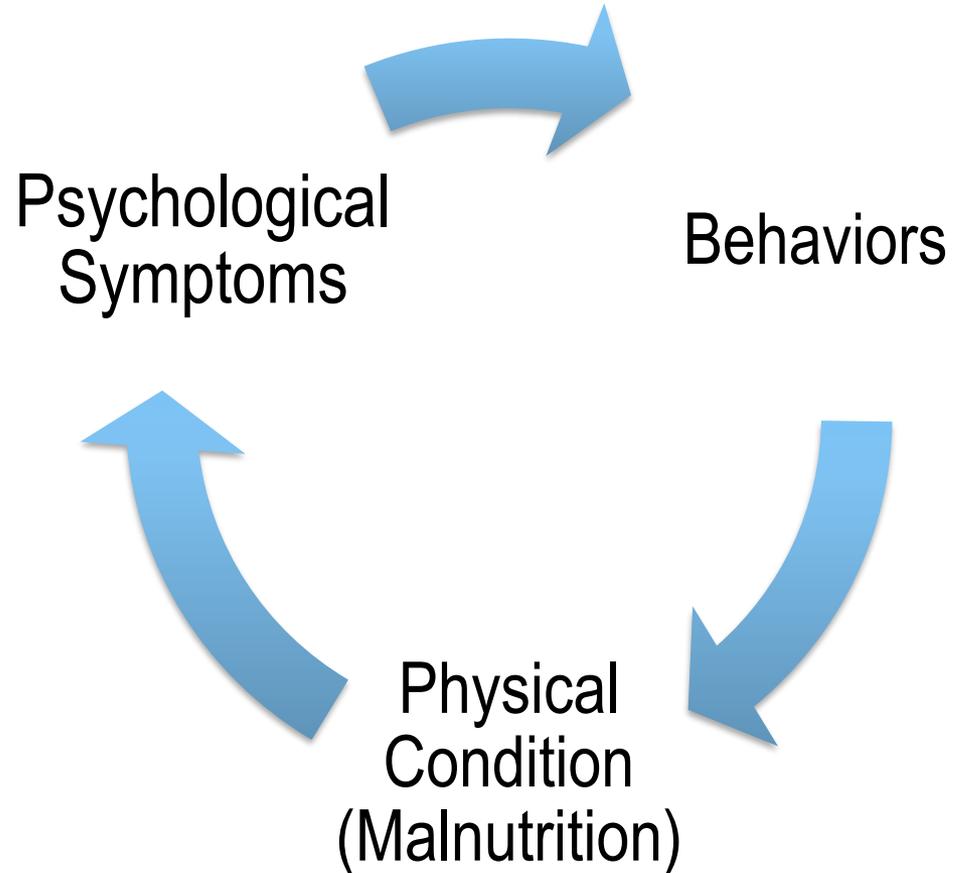


Anorexia Nervosa – Physical Symptoms



John Ryle “Anorexia Nervosa”, *Lancet*, October 17, 1936

Anorexia Nervosa – the vicious cycle



Avoidant/Restrictive Food Intake Disorder

Eating or feeding disturbance

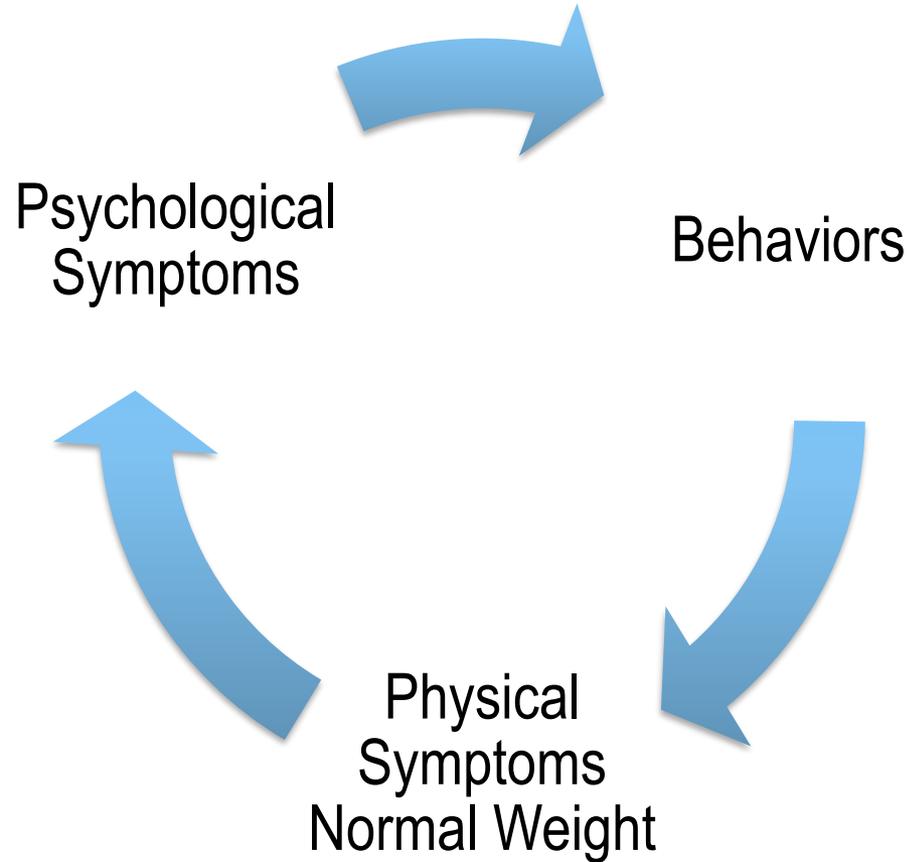
- lack of interest in eating or food
- avoidance based on sensory characteristics of food
- concern about aversive consequences of eating

One of: significant weight loss, or significant nutritional deficiency, or dependence on supplements or enteral feeding, and marked interference with functioning

Bulimia Nervosa

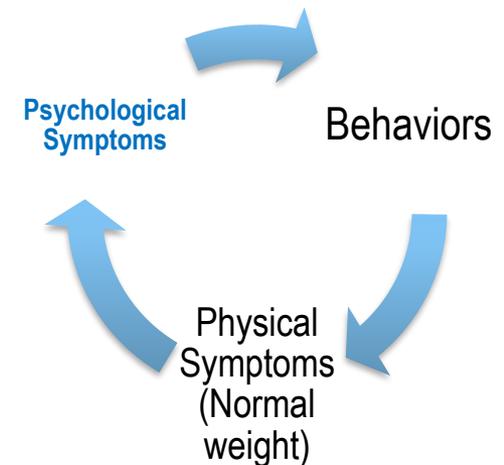
- **Recurrent binge eating**
- Recurrent **compensatory behaviors** to prevent weight gain
- On average **once** a week for three months
- **Self evaluation** unduly influenced by body shape and weight
- Does not occur exclusively during episodes of anorexia nervosa

Bulimia Nervosa – the vicious cycle



Bulimia Nervosa – Psychological Symptoms

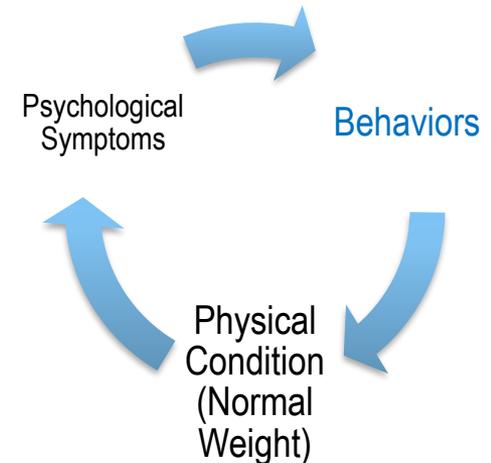
- Body Image Disturbance
- Fear/Anxiety
- Preoccupations
- Stress induced bingeing
- More shame
- Better insight



Bulimia Nervosa – Behavioral Symptoms

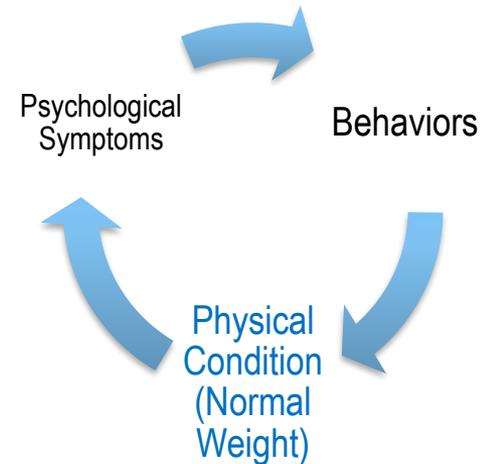
- **Binge eating**
- **Restricting/Fasting**

- Exercising
- **Vomiting**
- **Laxative abuse**
- Taking diet pills or appetite suppressants
- Avoiding “risk” foods or entire food groups
- Calorie counting...

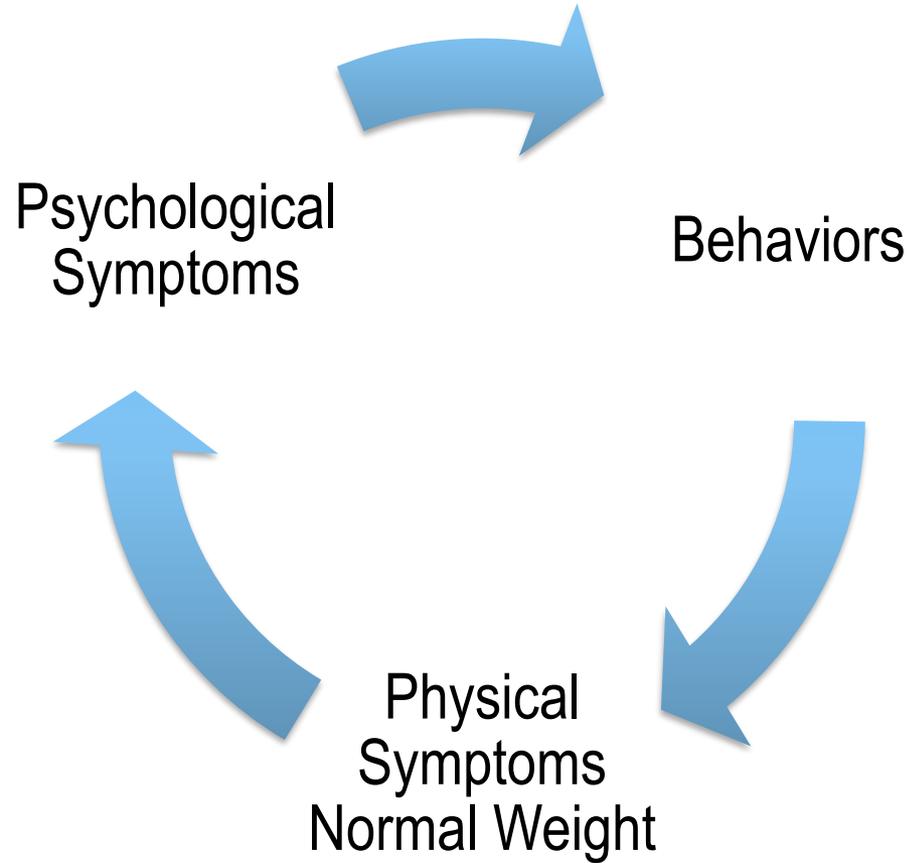


Bulimia Nervosa – Physical Symptoms

- Weight cycles
- Complications of binge eating and purging



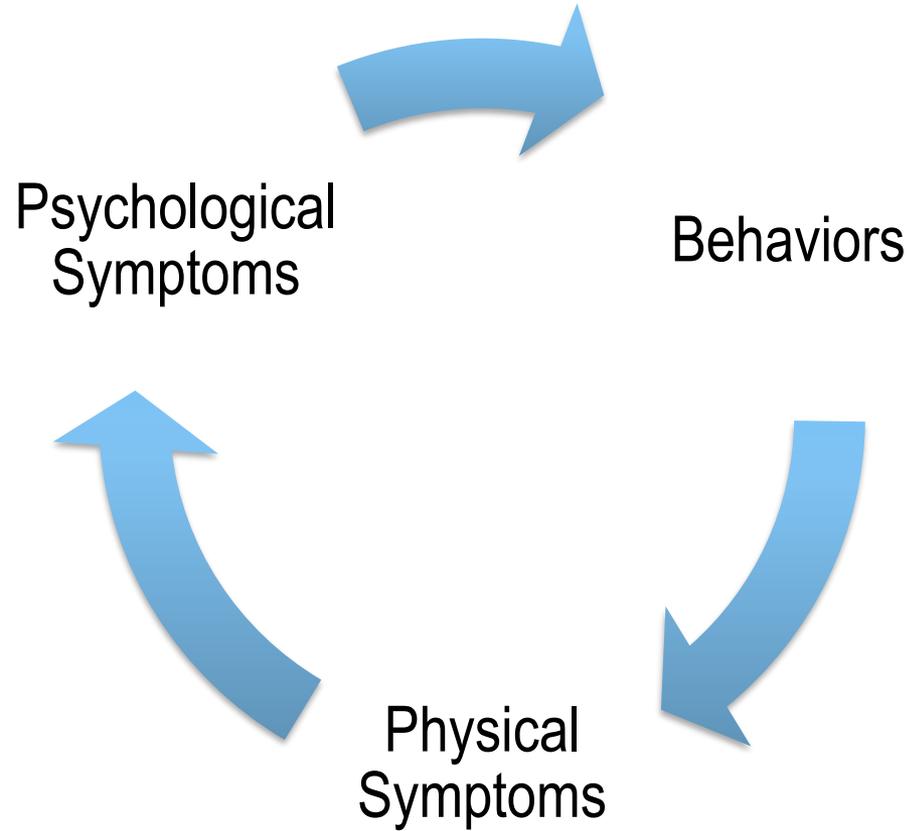
Bulimia Nervosa – the vicious cycle



Binge Eating Disorder

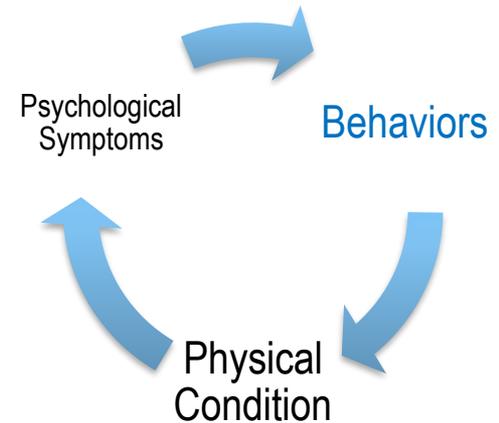
- **Recurrent binge eating**
- **No compensatory behaviors**
- On average **once** a week for three months
- Rapid eating, eating without hunger, eating when uncomfortably full, eating alone due to embarrassment, feelings of disgust
- Does not occur exclusively during episodes of anorexia nervosa or bulimia nervosa

Binge Eating Disorder – the vicious cycle



BED – Behavioral Symptoms

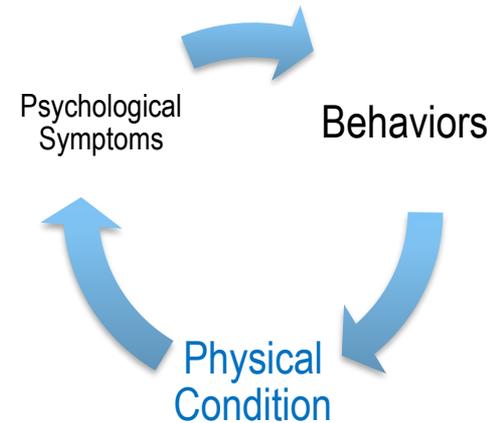
- **Binge eating**
- **When not binge eating: overeating or regular eating or restricting**
- Rapid eating, eating without hunger, eating when uncomfortably full, eating alone due to embarrassment



Binge Eating Disorder – Physical Symptoms

Overweight and weight gain

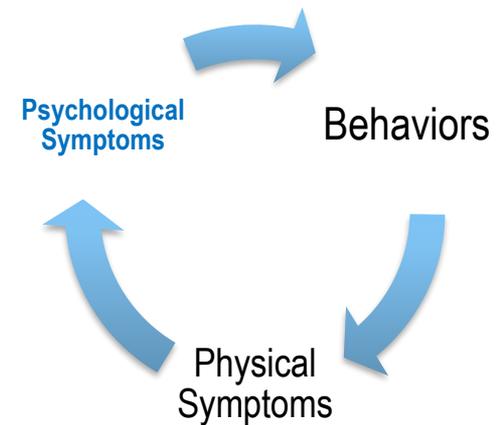
Increased risk of metabolic syndrome



Binge Eating Disorder – Psychological Symptoms

Feelings of embarrassment
and disgust

Altered appetitive
homeostatic and hedonic
processing



Assessment

Assessment

- First make the diagnosis
- Often undisclosed by patients, underdiagnosed and undertreated (especially non-white, higher weight, men)
- Look for clues and ask questions

Clues to eating disorders

- Weight loss (AN), weight cycles (BN), or weight gain (BED)
- Dieting, calorie counting, taboo foods
- Excessive exercise
- Trips to bathroom after meals, evidence of vomit, laxatives
- Focus on body image/appearance
- Russell's sign (knuckle abrasion), parotid/salivary gland swelling, loss of dental enamel, abnormal labs (low K, elevated HCO₃), low blood pressure or heart rate

SCOFF (2 indicates clinically significant AN or BN)

S – Do you make yourself **S**ick because of you feel uncomfortably full?

C – Do you worry that you have lost **C**ontrol over how much you eat?

O- Have you recently lost more than **O**ne stone (14 lb) in a 3-month period?

F- Do you believe yourself to be **F**at when others say you are too thin?

F- Would you say **F**ood dominates your life?

Assessment – EDE-Q (last 28 days of symptoms)

- ▶ Restricting
- ▶ Fasting
- ▶ Food avoidance
- ▶ Food rules
- ▶ Desire for an empty stomach
- ▶ Desire for a totally flat stomach
- ▶ Food/eating/calorie obsessions
- ▶ Shape/weight obsessions
- ▶ Fear of losing control
- ▶ Fear of weight gain
- ▶ Feeling fat
- ▶ Desire to lose weight
- ▶ Dissatisfaction with weight/shape
- ▶ Episodes of eating an unusually large amount of food
- ▶ And felt a loss of control
- ▶ Days of bingeing
- ▶ Episodes of vomiting
- ▶ Episodes of taking laxatives
- ▶ Episodes of driven exercise
- ▶ Eating in secret
- ▶ Felt guilty after eating
- ▶ Concerned others seeing you eat
- ▶ Weight/shape influenced self evaluation
- ▶ Upset if weighing self less
- ▶ Uncomfortable seeing self or others seeing you

Assessment continued

- Medical workup
- Weight history
- Comorbid conditions
- and the iceberg...

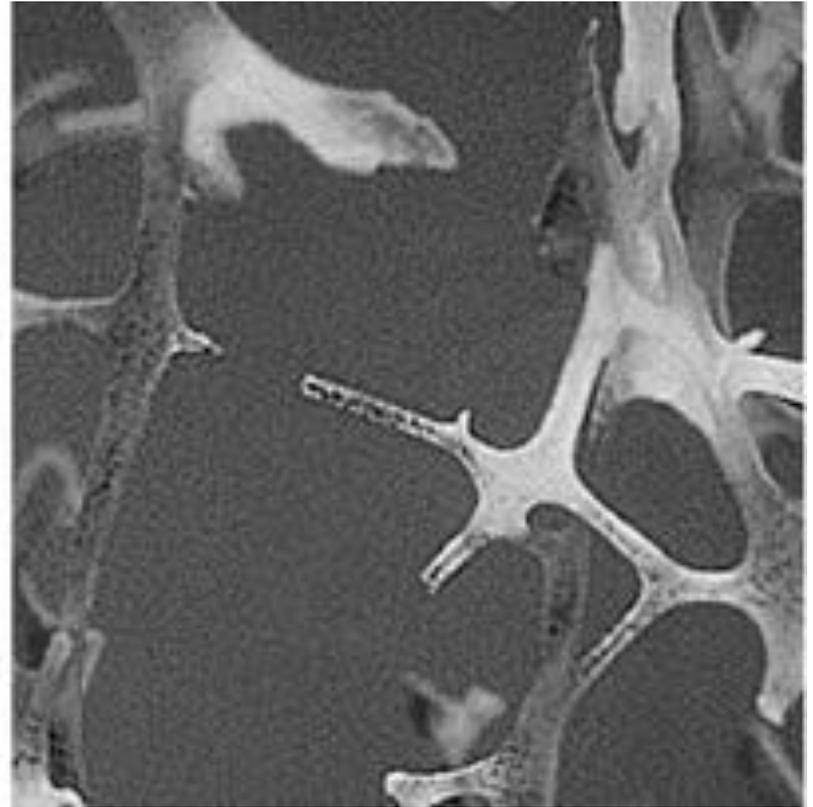
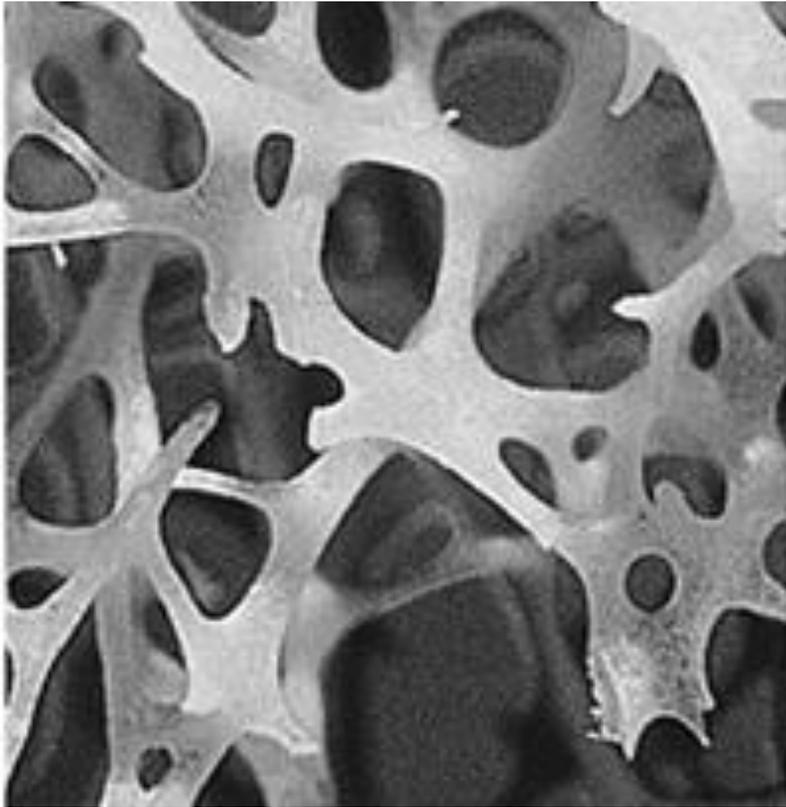
Medical Assessment

- Vitals (lying and standing)
- Labs: complete blood count, comprehensive metabolic, **magnesium**, **phosphorus**, **urine pH**, thyroid panel, drug screen, lipid panel, HgA1C
- EKG
- Screen for medical complications of malnutrition or purging or obesity

Malnutrition: Cardiac

- Low heart rate,
low blood
pressure
- Cardiac
arrhythmias
- Congestive heart
failure, mitral
valve prolapse





Malnutrition:
Osteoporosis and
Osteopenia

Malnutrition and other organ systems

- **Brain** (low neurotransmitters, altered neural pathways)
- Endocrine (estrogen deficiency, androgen deficiency, growth hormone resistance, **hypercortisolemia**, sick euthyroid syndrome, low oxytocin, suppressed leptin, elevated ghrelin)
- Dermatology (lanugo, dry skin, edema)
- Gastrointestinal (constipation, motility)
- Laboratory (pancytopenia, **low potassium, low phosphorus**)

Purging: cardiac complications

- Low heart rate,
low blood
pressure
- **Cardiac
arrhythmias**



Purging: more physical complications

- Electrolyte abnormalities (e.g. **low potassium**)
- Gastrointestinal (tears, gastritis/GERD, dysmotility)
- Dental (enamel loss and caries)
- Parotid and salivary gland swelling

Objective Binge Eating

BN: 3,000 to 4,000 Kcal

BED: 1,515 to 2,963 Kcal

Often energy dense, highly palatable food

Rapid consumption

→ Increased oxidative and inflammatory stress

Metabolic Syndrome

Glucose intolerance/insulin resistance (type 2 diabetes, impaired glucose tolerance, or impaired fasting glycemia)

Central obesity

Dyslipidemia (low HDL, elevated triglycerides)

Hypertension

A Weight History

Anorexia nervosa: 22 yo woman who is 5'6" with a present weight of 104# (**BMI 16.8**), high weight of 115# (**BMI of 18.6**), a low weight of 80# (**BMI of 12.9**), and a desired weight of 99# (**BMI of 16**)

ARFID: 10 yo picky eater who has been in the second percentile for BMI his whole life

Bulimia nervosa: 28 yo woman who is 5'7" with weight that varies from 130# to 155# who desires to be 125#

Binge Eating: 30 yo man 6' gained 33# in last year

BMI (Body Mass Index)

- Underweight: < 20
- Normal: 20-25
- Overweight: 25 to <30
- Obesity: 30+

Calculator.net

Weight (kg)/(Height (m))squared

Anorexia Nervosa: How thin is thin?

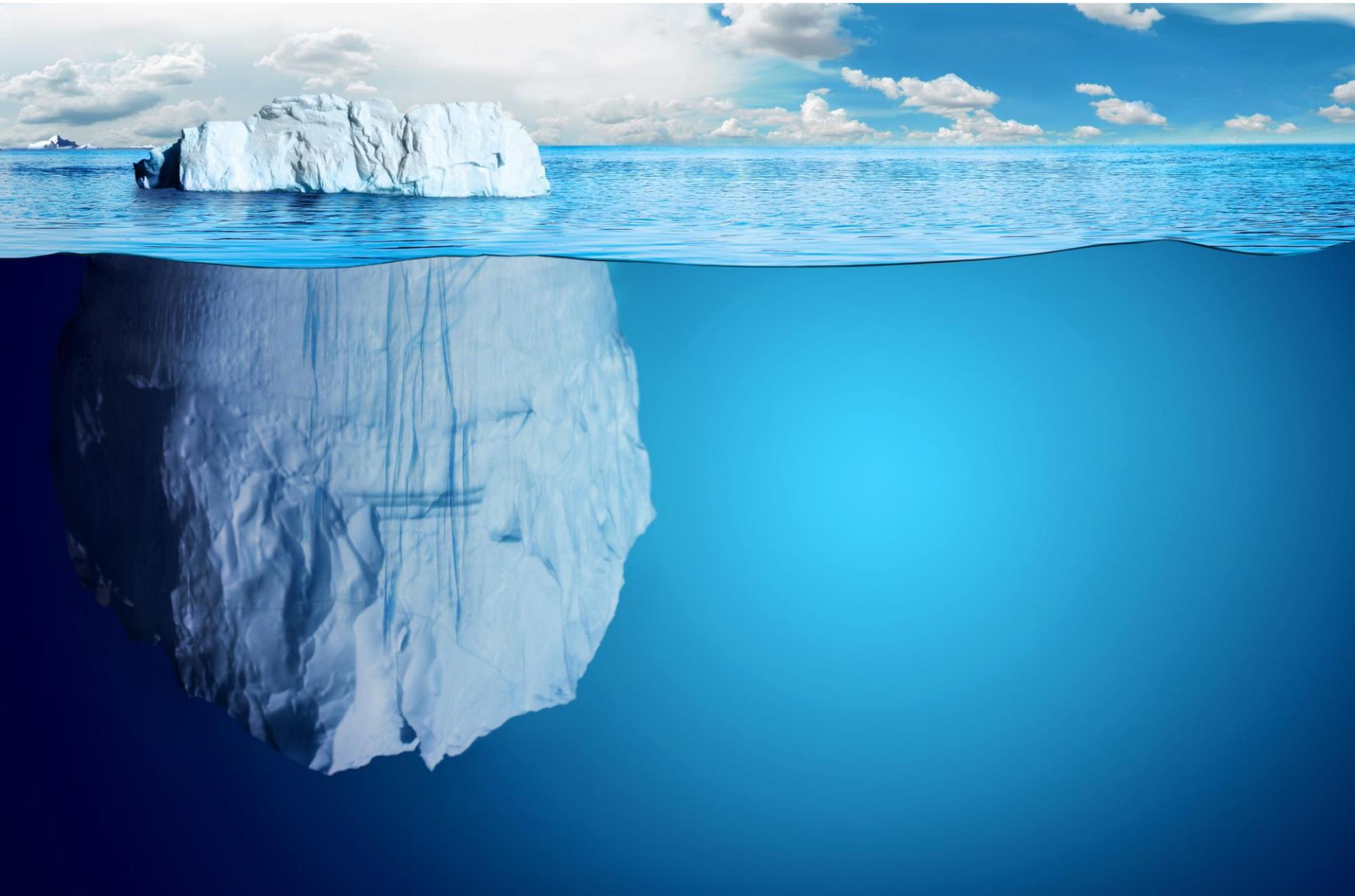
- **Extreme:** BMI < 15
- **Severe:** BMI < 16
- **Moderate:** BMI < 17
- **Mild:** BMI < 18
- **Normal:** BMI 20 to 25

National Comorbidity Survey Replication (percentages with at least one comorbid condition)

- AN: 56.2%
- BN: 94.5%
- BED: 78.9%

National Epidemiological Studies on Alcohol and Related Conditions (prevalence of lifetime suicide attempts)

- AN: 24.9%
- BN: 31.4%
- BED: 22.9%



What is under the iceberg?

Trauma, abuse, neglect

Teasing (about weight), bullying, exclusion

Teenage drama

School failure, school stress

Learning difficulties

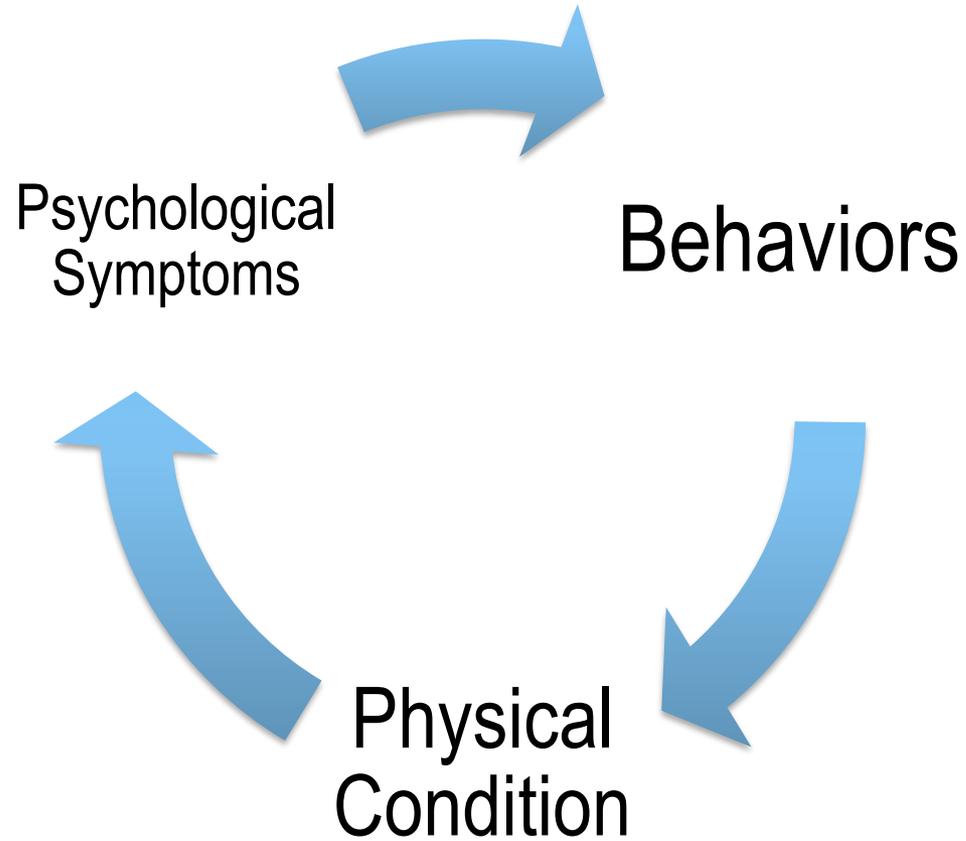
Family discord, divorce, moves, financial stress

Illness (personal and family)

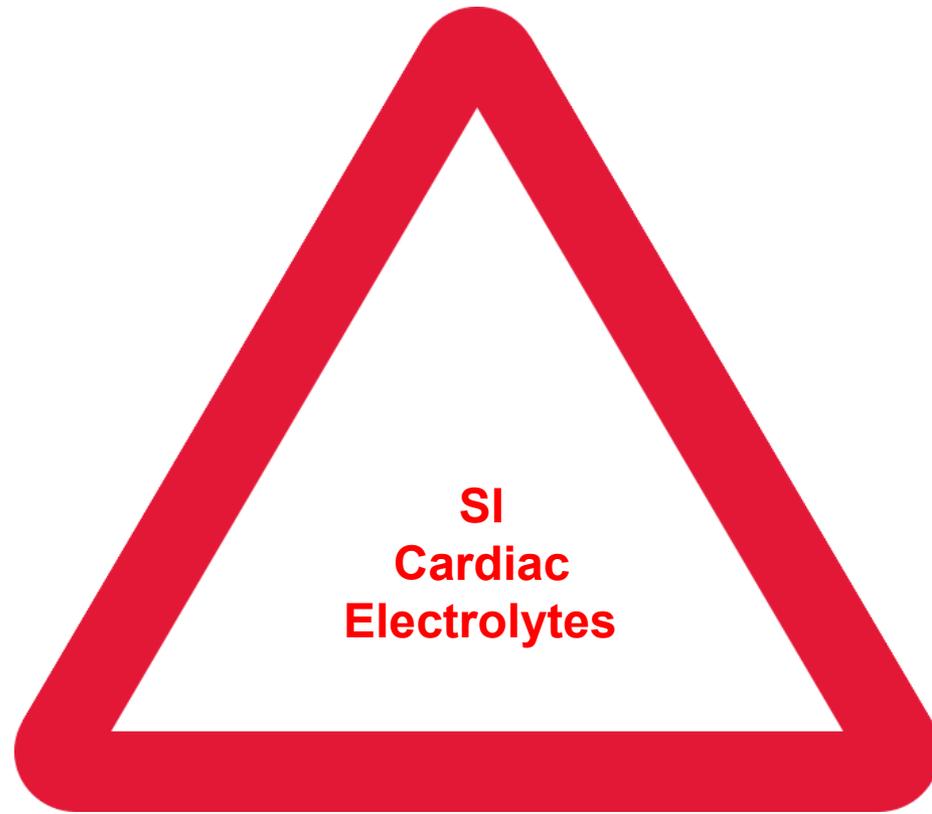
Food insecurity

Anxiety, depression, substance abuse

Treatment



Treating the Vicious Cycle



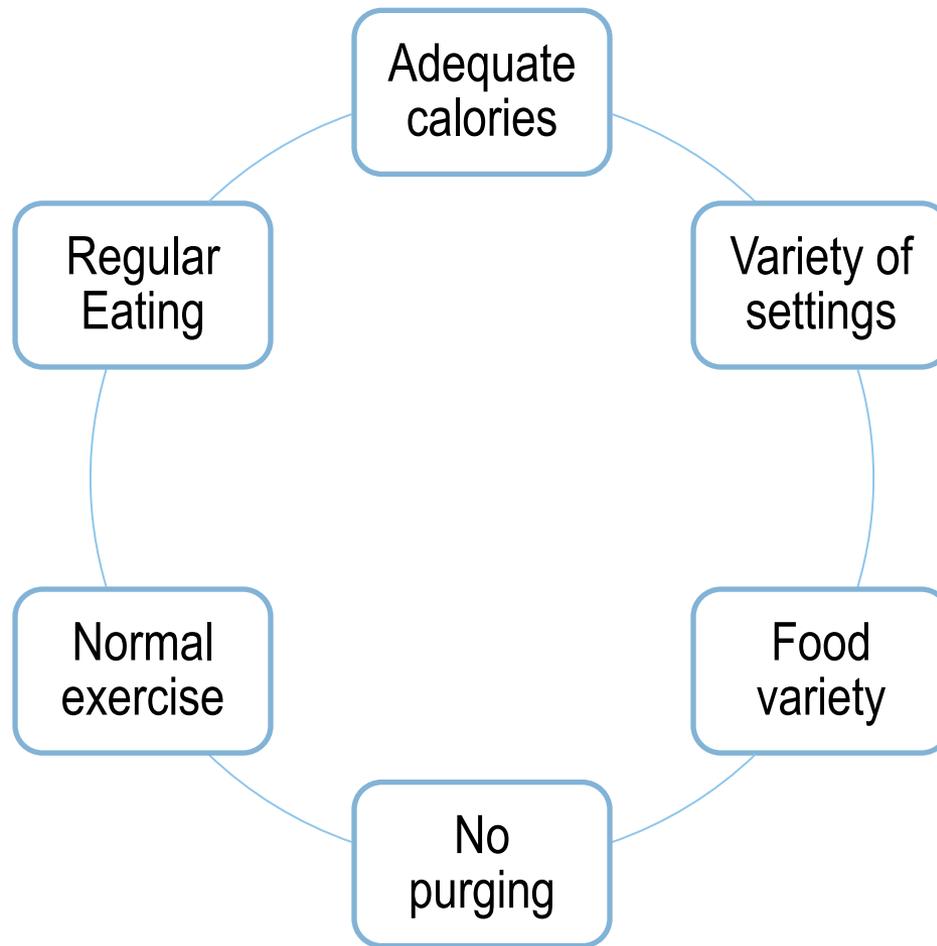
Triage for the Danger Zone

Treatment of Anorexia Nervosa

- Regular eating
- Improve food variety and settings
- Stop compensatory behaviors (exercise and purging)

Weight restoration for Anorexia Nervosa

- Eat and gain weight to healthy weight range
- 0.5 to 4 pounds a week
- Watch for refeeding syndrome



Psychopharmacology of Anorexia Nervosa

- Therapies have evidence (e.g. CBT, FBT, IPT)
- Medications have limited efficacy for *pure AN* symptoms (body image distortion, fears of weight gain)

Psychopharmacology of Anorexia Nervosa

Caution with medications that cause:

- Constipation
- Prolonged QTC
- Hypotension
- Weight gain
- Weight loss
- Death in overdose
- Seizures (bupropion)

Olanzapine (Bissada et al, 2008) 10 week RCT → olanzapine group had decreased obsessional symptoms and increased rate of weight gain

Risperidone (Hagman et al, 2011) 9 week RCT → increased prolactin on risperidone, short term improvement in drive for thinness not sustained, no change in weight gain or other scales

Fluoxetine (Walsh et al, 2006) one year RCT of weight recovered patients treated with fluoxetine vs placebo plus manualized CBT → no difference in time to relapse

Zinc (Birmingham et al, 1994) supplementation increased rate of BMI increase

Psychopharmacology of Anorexia Nervosa

- Food as medicine
- Treat comorbid conditions
- Olanzapine has the most evidence for weight gain, but watch the downsides and the long game

Levels of Care – Anorexia Nervosa

- Inpatient medical (unstable medical)
- Inpatient psychiatry (SI or need NGT)
- Residential
- Partial
- Intensive outpatient
- Outpatient

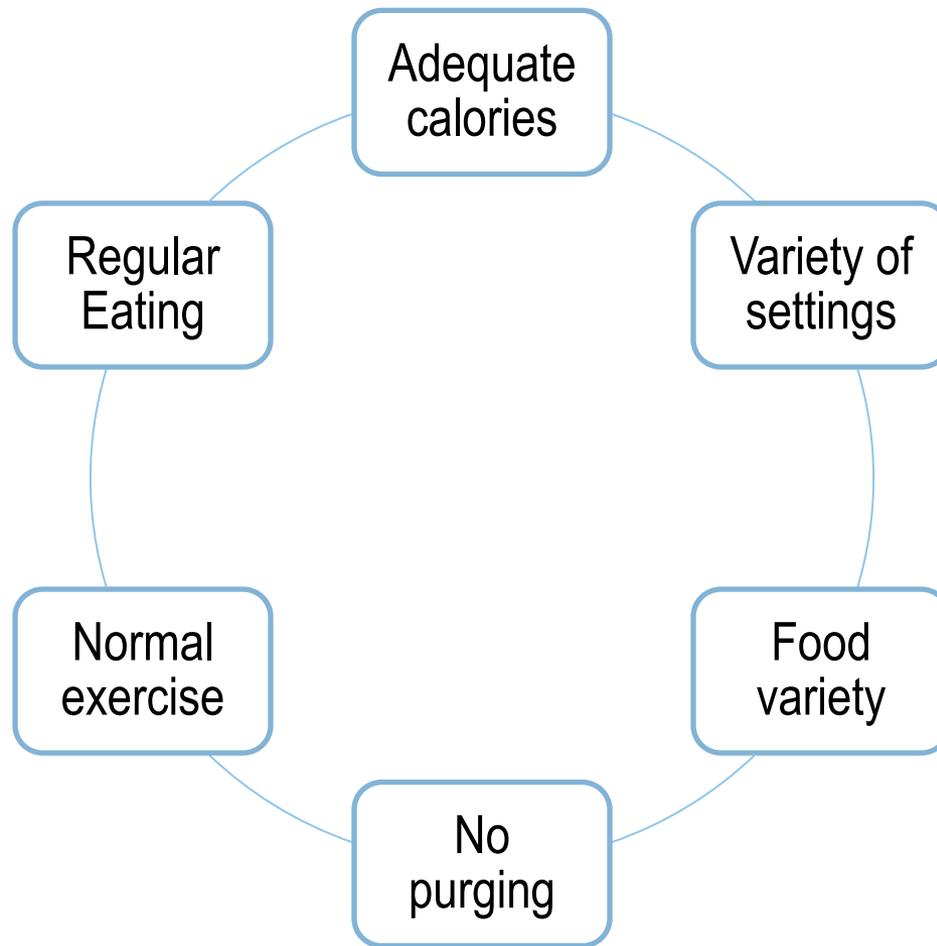
Psychopharmacology of ARFID

- CBT for ARFID
- Case studies with mirtazapine
- Cyproheptadine (Periactin) may help with weight gain
- Hydroxyzine may help with appetite and anxiety

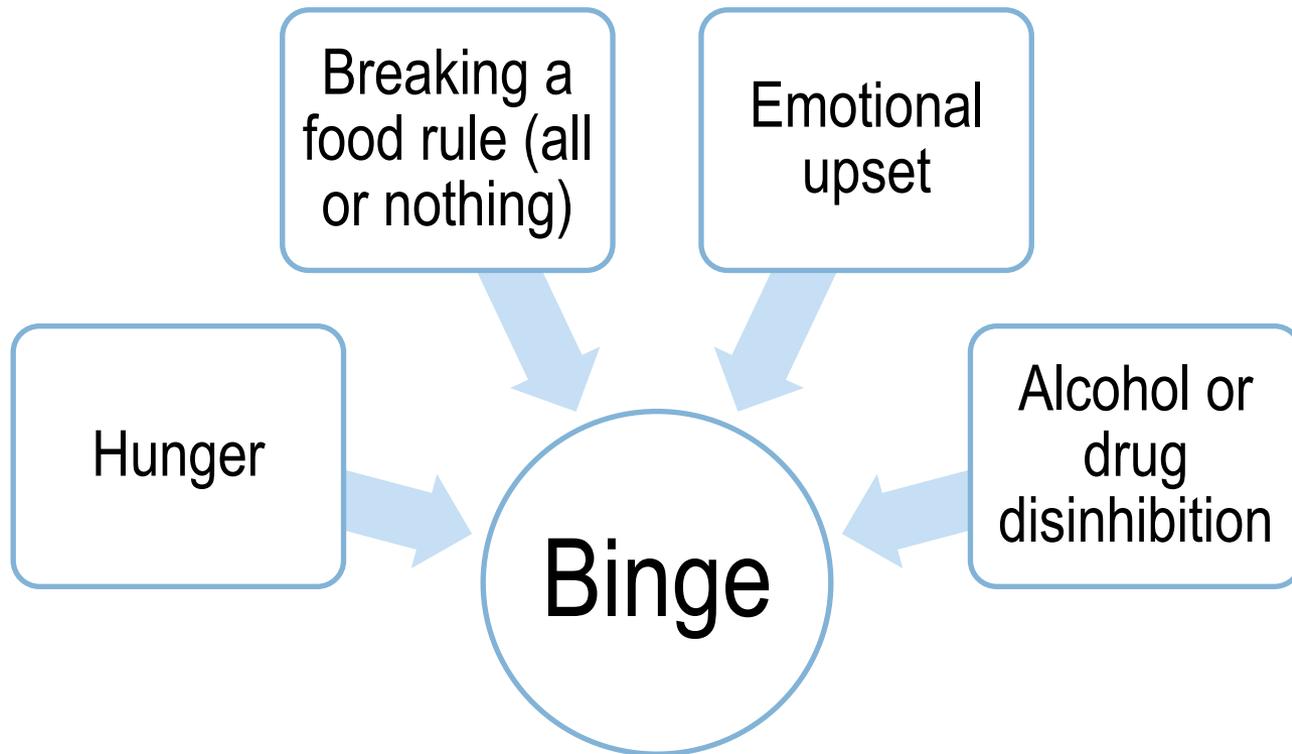
Treatment of Bulimia Nervosa

- Regular eating
- Stabilize weight (***stop trying to lose weight***)

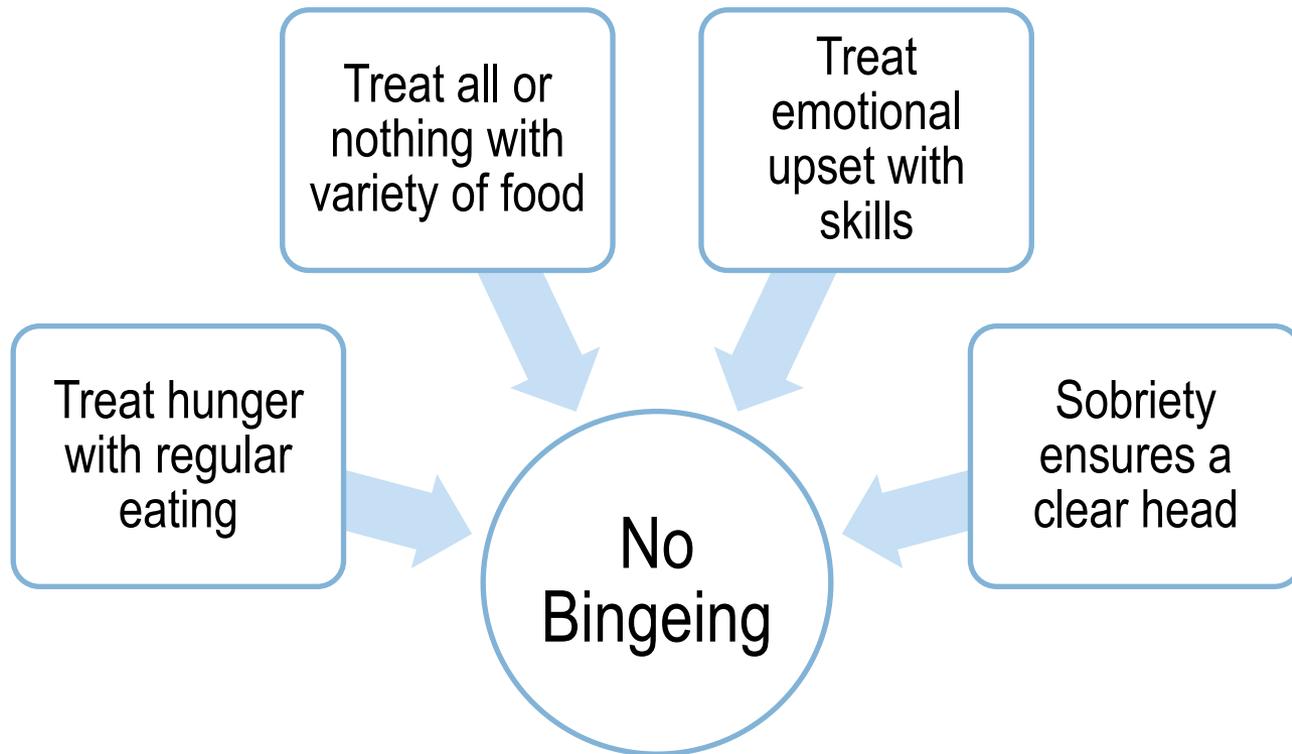
Fairburn, 2008



What causes binge eating?



To treat binge eating – treat what *causes* binge eating



Psychopharmacology of Bulimia Nervosa

- Food is medicine
- Therapies have evidence (e.g. CBT, IPT)
- Fluoxetine (FDA approved) 60 mg has evidence for reduced binge/purge frequency in 16 week trial and in 8 week trial (smaller studies sertraline, citalopram, fluvoxamine)
- Topiramate (off label) median dose 100 mg reduced BN symptoms, body weight, and anxiety

Levels of Care – Bulimia Nervosa

- Outpatient
- Intensive outpatient
- Partial
- Residential
- Inpatient psychiatry

Treatment of BED

- Outpatient
- Therapies have evidence (e.g. CBT and IPT) with 50% durable remission rates
- 78.9% have at least one co-morbid condition
- Target of medication is binge remission, weight loss, and decreased “food noise”

Treatment of BED

- Lisdexamfetamine (FDA approved)
- Topiramate
- bupropion and naltrexone
- SSRI
- GLP-1 agonists

Fluoxetine for BED – 16 week

	CBT and Placebo	Fluoxetine 60 mg daily	CBT plus Fluoxetine	Placebo
Remission of binge eating	73%	29%	55%	30%

Weight loss with remission was 7.4 lbs. vs 1.6 lbs. for no remission

PRO-OPIOMELANOCORTIN NEURONS

→ **Anorectic effects** (decreased food intake and increased energy expenditure)

Bupropion – stimulates POMC
→ anorectic effects

Endogenous opioids – inhibit POMC

Naltrexone – block inhibition of endogenous opioids

Naltrexone–Bupropion and BWL: 16 week RCT

	Behavioral Weight Loss and Placebo	Naltrexone- bupropion	BWL plus Naltrexone- bupropion	Placebo
Remission of binge eating	37.1%	31.3%	57.1%	17.7%
Greater or equal to 5% weight loss	31.4%	18.8%	37.1%	11.8%

Lisdexamfetamine 30 mg, 50 mg and 70 mg: 11 week RCT

	30 mg dose	50 mg	70 mg	Placebo
BE days per week	4.5→1.0	4.5→0.4	4.6→0.5	4.3→1.1
Weight loss in pounds	6.8	10.8	9.5	0.2

Lisdexamfetamine 50-70 mg: Two 12 week RCTs

	Trial 1 50-70 mg	Placebo	Trial 2 50-70 mg	Placebo
BE days per week (least mean squares)	-3.87	-2.51	-3.92	-2.26
Weight change in percentage	-6.3%	0.1	-5.6%	-0.2

Topiramate (target dose 200 mg) added to CBT: 21week trial

	Topiramate (average dose 206 mg)	Placebo
Weight loss in pounds	15.0	2.0
Clinically significant weight loss >10%	33.3%	11.5%
Binge day frequency	4.2→0	3.4→0.3
Binge episodes per week	4.7→0	3.8→0.3

Topiramate (flexible dose): 14 week trial

	Topiramate	Placebo
Weight loss in pounds	13.0	2.6
Binge frequency per week	5.3→0.3	6.3→3.4
Binge day frequency	4.3→0.3	4.8→2.6

Trial	Weight loss
Topiramate – 14 weeks	13 lbs.
Topiramate – 21 weeks	15 lbs.
Lisdexamfetamine – 12 weeks	-6.3%
Lisdexamfetamine – 12 weeks	-5.6%
Lisdexamfetamine – 11 weeks	10.8#
Lisdexamfetamine – 11 weeks	9.5#
Naltrexone-bupropion – 16 weeks	-2.1%
Naltrexone-bupropion – 16 weeks	-3.4%

GLP-1 Agonists and BED

Pathophysiology of type 2 diabetes is hyperglycemia (combination of insulin resistance, inadequate insulin secretion and inappropriate secretion of glucagon)

GLP-1 agonists stimulate insulin secretion and suppress glucagon production

GLP-1 agonists slow gastric emptying and affect appetite-regulating neural pathways

GLP-1 Agonists and BED

Medications help with diabetes and weight loss (most patients regain weight once medications are stopped)

Weight loss clinically significant >10%

Loss of muscle mass with weight loss

Common GI side effects and less common, more serious side effects (e.g., pancreatitis)

GLP-1 Agonists and BED

Cons: could worsen pathological dietary restriction and prevent regular eating and thus maintain or worsen the eating disorder (especially once discontinued)

Pros: could also help with obesity/MetS along with overconsumption/binge eating urges

