What the Specialists Want Us to Know: Screening, Evaluation, and Treatment of Eating Disorders
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Agenda
• What are EDs?
• Fact or Fiction?
• DSM V diagnoses
• Statistics
• Etiology
• Health consequences
• Screening and evaluation
• Monitoring
• Levels of care
• Treatment modalities
• Pharmacology
• Research
• Resources

True or False?
Eating disorders are really just diets gone wrong. False! Eating disorders are serious, biologically influenced illnesses that require immediate intervention and specialized care. It is true, however, that dieting is both a risk factor for the development of an eating disorder and is common among people who have eating disorders.

True or False?
Anorexia nervosa has the highest mortality rate among all psychiatric disorders. True. • Mortality rate is estimated to be between 5 - 10 percent. • 5-10% of people with anorexia will die within 10 years after disease onset and 18-20% will be dead after 20 years. • One in 5 will die by suicide.

True or False?
Only people who are really thin (or obese) have eating disorders? False. Many individuals who meet criteria for an eating disorders are at a normal weight and BMI. Obesity is not an eating disorder. When screening for an ED it’s important to ask about cognitions and behaviors.

True or False
Men are diagnosed with eating disorders. True! One in three people diagnosed with an eating disorder is male. Due to cultural bias they are less likely to seek treatment, but once in treatment respond similarly to women.
True or False
All ages and genders are at similar risk for developing an eating disorder.
False!
Due to multiple factors, adolescent girls are at greatest risk for development of an ED.
Adolescence is a time of significant change in:
Physical appearance
Hormones and brain development
Environment and social groups
Culbert, Karter, & Klump, 2015

True or False
There are several FDA approved medication options used in the treatment of eating disorders.
False!
There are only two FDA approved options to treat eating disorders.
Prozac for bulimia nervosa
Vyvanse for binge eating disorder
There are no FDA approved treatment options for anorexia

True or False
It may be helpful to focus on eating disorder as a process toward recovery rather than an end goal.
True!
Eating disorders have exceptionally high relapse rates.
30-50% of patients relapse within 2 years after an inpatient stay
Evidence shows the sooner treatment is started, the shorter the recovery process can be.
Early and targeted care will increase the likelihood of positive outcomes.
Levinson, 2018

True or False
Nurse practitioners play an important role in the recognition, evaluation, and treatment of eating disorders.
True!
No matter your specialty or practice setting, understanding your role will help to make sure your patients get timely and effective treatment for their eating disorder.

Nurse Practitioner Roles
• Relationship and patient engagement
• Collaborate and consult
  • Eg. psychologists, physicians, nutritionists, dentists, social workers, school personnel, teachers
• Screen and evaluate: Recognize signs and symptoms of an eating disorder
• Diagnose
• Assess and monitor medical status
• Assess and monitor psychiatric status
• Involve family as appropriate
• Educate: patient, family, and other clinicians
• Establish treatment goals and plan of care
• Know when to refer
Southard, Bauer, & Kummerow, 2015

What is disordered eating?
• Chaotic or disturbed eating patterns, behaviors, and cognitions
  • Excessive concerns about weight, appearance, and eating
  • Unhealthy weight control behaviors
  • Chronic/extreme dietary restraint
  • Binge eating
  • Loss of control over eating
Levinson, 2018
Disordered Eating Terms

- Fasting – skipping two or more meals in a row or not eating for more than 8 hours
- Dietary Restriction – Limiting caloric intake
- Dietary Restraint – Cognitively attempting to limit dietary intake whether or not successful
- Laxative use – use of laxatives or diuretics to influence weight/shape
- Purging/self-induced vomiting – vomiting after eating to influence weight/shape usually after binge eating episode but not always
- Excessive (aka compensatory/compulsive/driven) exercise—exercise to influence weight/shape, usually feel compelled to engage in exercise, negative emotions when unable to exercise, exercise when injured or sick, interferes with responsibilities or social relationships

What are eating disorders?

- DSM-V diagnoses
  - Anorexia nervosa
  - Bulimia nervosa
  - Binge eating disorder
  - Avoidant/restrictive food intake disorder (ARFID)
  - Other specified feeding or eating disorders

Anorexia Nervosa

1. Restriction of energy intake relative to requirements leading to 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.
   - Adults
     - Mild: BMI > 17
     - Moderate: BMI 16-16.99
     - Severe: BMI 15-15.99
     - Extreme: BMI < 15
   - Children: percentiles and growth charts

2. Intense fear of gaining weight or becoming fat, or persistent behavior that interferes with weight gain, even though at significantly low weight

3. 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.

Anorexia Nervosa – Subtypes

1. Restricting type:
   - Use of obsessive, rigid rules to restrict the amount and type of food consumed.
   - I can only eat food that is green
   - Bread for breakfast = no bread for lunch
   - It’s only safe to eat between 9-12 and 3-6
   - I’ll only eat organic foods
   - Omit or restrict amount of food eaten from specific food groups
   - Only fruits and vegetables are safe
   - Carbs are always bad and must be avoided
   - Calorie counting
   - Skipping meals

2. Binge/Purge type:
   - Place severe restriction on amount of food consumed with periods of binging
   - Purging/inappropriate compensatory behaviors
     - Laxative use
     - Excessive exercise
     - Carrying around heavy objects (e.g., backpacks)
     - Diuretics
     - Caffeine pills
     - Enemas
     - Fasting
     - Self-induced vomiting
Bulimia Nervosa
1. Recurrent binge eating – characterized by both of the following:
   a. Eating, in a discrete period of time, an amount of food larger than what most people would eat during a similar period of time and under similar circumstances (e.g., consuming 6,000 calories in 2 hours)
   b. Lack of control over eating during the episode (e.g., a feeling that one cannot control what or how much they are eating)
2. Recurrent inappropriate compensatory behavior to prevent weight gain
3. Both behaviors occur, on average, at least once a week for 3 months
4. Self-evaluation disproportionately influenced by body shape and weight
5. Binge/purge does not occur exclusively during episodes of behavior that would be common in anorexia

Binge Eating Disorder
1. Recurrent episodes of binge eating
2. Binge eating episodes associated with 3 or more of the following:
   a. Eating much more rapidly than normal
   b. Eating until feeling uncomfortably full
   c. Eating large amounts of food when not feeling physically hungry
   d. Eating alone because of feeling embarrassed by quantity
   e. Feeling disgusted with oneself, depressed, or guilty afterwards
3. Marked distress regarding binge eating
4. Occurs, on average, at least once weekly for 3 months
5. Binge eating not associated with inappropriate compensatory behaviors

Avoidant/Restrictive Food Intake Disorder
1. An eating/feeding disturbance as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one (or more) of the following:
   a. Significant weight loss (faltering growth in children)
   b. Significant nutritional deficiency
   c. Dependence on enteral feeding or oral nutritional supplements
   d. Marked interference with social functioning
2. Disturbance not better explained by lack of available food or cultural practice
3. Eating disturbance not better explained by AN or BN and there is no body image disturbance
4. Eating disturbance not better explained by other medical or mental condition. If it does—eating disturbance exceeds what is routinely associated with said condition.

Other Specified Feed or Eating Disorders
• Feeding or eating disturbance that causes clinically significant distress and impairment, but does not meet full criteria for any of the other disorders.
   1. Atypical AN
   2. BED of low frequency and/or limited duration
   3. BN of low frequency and/or limited duration
   4. Purging disorder
   5. Night eating syndrome

Comorbidities and Rule Outs
• Mood disorders
  • Unipolar depression
  • Bipolar depression
  • Mania
• Suicidal ideation
• Generalized anxiety
• Social anxiety
• Obsessive compulsive disorder
• Substance abuse
• Self-injurious behaviors
• Trauma/PTSD
• Personality Disorders

Epidemiology – Adults
• Prevalence – 10%
  ➢ Binge eating d/o: 3%
    • females x2 higher
    • 38.9% reported severe impairment
  ➢ Bulimia Nervosa: 0.3-1.5%
    • females 5x higher
    • 43.9% reported severe impairment
  ➢ Anorexia: 0.6-0.9%
    • females 3x higher
Epidemiology – Adolescent females

- Prevalence
  - Anorexia
    - Teenage girls 0.3%
  - Bulimia
    - Teenage girls 0.9%
  - Binge Eating Disorder
    - Teenage girls 1.6%

Biopsychosocial Etiology – Risk factors

- Mid-to-late adolescence
  - Approximately 13% of youth will experience at least one ED by 20
  - 15%-47% youth endorse significant disordered eating cognitions and behaviors
- Sociocultural idealization of thinness
  - Media
    - Pressures for thinness
    - Sports, modeling, dance
  - Thin ideal internalization
    - Prevention and intervention—The Body Project
      - Reduction in disordered eating symptoms and onset of disease
      - Alter responsiveness to thin ideal media images and advertisements
    - Thinness expectancies
- Personality variables
  - Negative emotionality/neuroticism
  - Perfectionism
  - Negative urgency and Impulsivity

Biopsychosocial Etiology – Correlates

- Neurocognitive processes
  - Cognitive flexibility
  - Inhibitory control
- Molecular genetics: no specific genes yet
  - Twin & adoptions studies
  - Candidate gene association studies of genes in neurobiological systems
    - Serotonin
    - Dopamine
    - BDNF

Biopsychosocial Etiology – Nature + Nurture

- Gene-environment interplay
  - Serotonin and Gene x Environment (G x E) interactions predict AN, bulimic symptoms and drive for thinness
    - Environment-parental factors (pressure, criticism, low contact); abuse/neglect
    - The short allele of 5-HTTLPR (alleles for 5HT transporter) – alterations in 5HT system
      - Reduced AN & BN had
        a. Increased CSF levels of S-HTAA (5HT metabolite) may reflect increased 5HT neuronal activity
        b. Images showed altered 5HT receptor activity (increased 5HT1A and reduced 5HT2A binding potential)
      - Recovered BN had
        a. Reduced 5HT reuptake
- Neurocognitive processes
  - Cognitive flexibility
  - Inhibitory control
- Molecular genetics: no specific genes yet
  - Twin & adoptions studies
  - Candidate gene association studies of genes in neurobiological systems
    - Serotonin
    - Dopamine
    - BDNF

Biopsychosocial Etiology – Nature + Nurture

- Gene-environment interplay
  - Dopamine and epigenetic effects
    - Women with AN and/or BN: alterations in D2 receptor gene in – more robust with abuse hx or personality disorder
    - Women recovered from AN: lower CSF levels of D metabolites which may reflect decreased neuronal dopamine function
    - Women recovered from AN and BN: increased binding of D2 and D3 receptors
    - Women recovered from AN: increased dopamine release following amphetamine release – associated with increased anxiety

Biopsychosocial Etiology – Nature + Nurture

- Gene-environment interplay
  - Age/Puberty and Gene x Environment (G x E) – the degree of genetic influences on disordered eating in females varies by age and pubertal status
    - Genetic effects contribute to ED during mid-to-late adolescence and mid-to-late puberty but not during pre-adolescence
    - Ovarian hormones rise during puberty and regulate gene transcription in key systems (SHT, D)
    - Changes in estradiol and progesterone predict changes in emotional eating/binge eating in normal sample and in BE and BN
What happens when we starve?

- The Minnesota Study (Keys et al., 1950) – “The Starvation Study”
  - 36 out of 100 young, healthy psychological normal men volunteered as alternative to military service
  - First 3 months ate normally while behavior, personality and eating patterns documented
  - Next 6 months restricted to half of normal intake
  - Lost, on average, 20% of their former weight

- Attitude and behavior changes
  - Dramatic increases in food preoccupations
  - Decreased concentration
  - Decreased interest in previously enjoyed activities
  - Hoarding behaviors
  - Loss of control and binge eating (daily intake 8,000-10,000 calories) followed by feeling “self-deprecating”

- Personality changes
  - Depression
  - Mood swings
  - Irritability and anxiety (e.g., a subject intentionally let a car down on his hand and then cut off 3 fingers)
  - Changes on MMPI elevations on depression, hysteria, and hypochondriasis scales

- Cognitive and Physical Changes
  - Impaired concentration, alertness, comprehension and judgment (no signs of diminished intellectual abilities)
  - GI discomfort
  - Decreased need for sleep
  - Headaches
  - Reduced strength
  - Edema
  - Hair loss
  - Decreased tolerance for cold
  - Decreases in body temp, heart rate, and respiration
  - Decreased basal metabolic rate (dropped about 40%)
Physical Signs of Eating Disorders: General

- Rapid/severe weight loss or frequent weight change: unable to maintain normal body weight
- Dehydration (severe and prolonged can lead to kidney failure)
- Fainting or dizziness (poor circulation)
- Cold intolerance (poor circulation)
- Bluish tinge to fingers (poor circulation)
- Low energy, feeling tired, not sleeping well (extreme hunger or fullness; sleep apnea)
- Facial changes (gaunt, sunken eyes)

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Health Consequences & Physical Signs of ED

Oral/Dental

- Oral trauma/lacerations (purging)
- Enlarged salivary gland
- Perimyelosis

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Dermatologic

- Lanugo (conserve warmth during starvation)
- Dry, brittle hair and nails (low calorie and fat consumption)
- Alopecia (low calorie and fat consumption)
- Carotenodermia (excessive intake of carotenoids)
- Russell’s sign (purging)
- Poor wound healing (malnutrition)

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Cardiopulmonary

- Dyspnea (anemia, HF)
- Chest pain (mitral valve prolapse—sharp pain beneath sternum, heart failure)
- Palpitations
- Heart failure (weakened heart muscle, hypokalemia)
- Bradydysrhythmia (parasympathetic NS overactivity to conserve energy)
- Tachycardia (HF)
- Orthostatic changes (dehydration, weakened heart muscle)
- Mitral valve prolapse (loss of cardiac muscle mass)
- Cardiomyopathy (hypokalemia, stress, shock, alcohol, Mg deficiency deficiencies)
- Prolonged QT
- Prolonged QT Dispersion
- V fib (quick/severe weight loss; hypokalemia or hypophosphatemia)
- Edema (HF)
- Sudden cardiac death

*Main cause of sudden death in ED related to cardiovascular complications*

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Gastrointestinal

- Gastroparesis (food restriction/purging disrupts normal stomach emptying)
- Abdominal bloating
- Gastric discomfort
- Fullness
- N/V

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Endocrine

- Amenorrhea or oligomenorrhea (inhibitory secretion of gonadotropin-releasing hormone)
- Reduced sex drive
- Infertility
- Stress fractures (osteopenia and osteoporosis, lack of Ca and Vit D)
- Low bone density
- Osteomalacia
- Hypothyroidism
- Type 1 diabetes or DM (under dose insulin)
- Type 2 diabetes (large eating leading to insulin resistance)
- Reduced resting metabolic rate (conservation of energy)
- Abnormal thyroid size (hyperthyroidism, hypothyroidism)
- Metabolic syndrome (inadequate fat intake)

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Neurological

- Seizures (severe dehydration and electrolyte imbalances)
- Memory loss
- Poor concentration (poor nutrition)
- Numbness/tingling (inadequate fat intake)

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008
Psychological Signs of Eating Disorders

- All-or-nothing, black-or-white thinking about food. E.g. “All carbs are bad.” “I should NEVER eat a cookie.”
- Preoccupation with weight, shape, eating and food
- Distorted body image—Seeing oneself as “fat” when actually thin
- Sensitive to comments about weight, food, exercise
- Low self-esteem, poor self-image
- Depression
- Perfectionism
- Anxiety—especially related to issues of food, eating

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Behavioral Signs of Eating Disorder

- Restricting food
- Skipping meals
- Compulsions related to food prep, recipes, and nutrition
- Won’t look at scale when weighed
- Looking at self in mirror often
- Lying about how much food eaten
- Hiding body with baggy clothes
- Avoiding situations involving eating in front of others (e.g. eating out)
- Avoiding situation where body is revealed (e.g. pool or beach)

Academy for Eating Disorders, 2016; Higgins & Cahn, 2017; Lock & LaVia, 2015; Williams, Goodie, & Motsinger, 2008

Screening Tools

SCOFF

1. Do you make yourself sick (bulge/worm) because you feel uncomfortably full?
2. Do you worry that you have lost Control over how much you eat?
3. Have you recently lost more than one stone (14 lbs. [6.4 kg]) in a three-month period?
4. Do you think you are too fat, even though others say you are too thin?
5. Would you say that Food dominates your life?

One point for every yes answer; a score of 2 indicates a likely case of AN or BN (sensitivity 100%; specificity 87.5%)

Morgan, Reid, & Lacey, 1999

Screening Tools

Screen for Disordered Eating (SDE): Primary Care Screener

1. Do you often feel the desire to eat when you are emotionally upset or stressed?
2. Do you often feel you can’t control what or how much you eat?
3. Do you sometimes make yourself throw up (vomit) to control your weight?
4. Do you believe yourself to be fat when others say you are too thin?

Scores range from 0-5, cutoff of 2, sensitivity 90.5% specificity 57.5%

Maguen et al., 2018
What do I do with a positive screen?

- Comprehensive assessment
  - Ask very specific questions
- Physical examination
  - Labs
  - EKG
  - DEXA Scan
  - Monitor weight
- Diagnostic evaluation
  - Establish appropriate level of care
- Refer
  - Dentist
  - Nutritionist
  - Psychologist

Comprehensive Assessment

**General eating patterns**
- Over the last 28 days, how many times have you eaten?
- Give me an example of what you'd have in a typical meal for...
- Accepted foods vs avoided foods
- Typical portions

**Dieting, restricting**
- How old were you when you first started dieting?
- Over the last 28 days, how many times have you tried to restrict your food because of weight concerns?
- How have you done this? (skipped meals, avoided certain foods, etc.)

**Food rules**
- Do you have food rules?
- What happens when you break a rule?

**Binge eating**
- Have there been times when you felt that your eating was out of control?
- During these times have you eaten large amounts of food? (Be sure to give examples for people because AN patients believe they are binging but not necessarily true binging.)
- What's an example when you've felt out of control and eaten a large amount of food?
- At what age did you first binge eat? What age did you begin to binge eat regularly?
- How frequently have you binge eaten in the past three months?

**Compensatory Bx**
- Are you using? How much? How often?
  - Laxatives, Enemas, Caffeine, Diuretics, Emetics, Diet pills
- How much and how often?

**Exercise**
- How much and how often?

**Menstrual history**
- Have you started your period? When was your last period? Are you regular?
- How heavy is your period?
- Do you use oral contraceptives?

**Current medication**
- Are you taking any medications?
- Any supplements or alternative meds? CBD oil?

**Family history**
- Is there a family history of EDs, obesity, mood or anxiety disorders, or SUDs?

**Psychiatric history**
- Are you or have you been treated for depression, anxiety, etc.?

**Trauma history**
- Has anyone ever hurt you physically, sexually or emotionally?

**Growth history**
- Obtain past growth charts whenever possible.
Treatment Goals

- Medical Stabilization
  - Treat medical complications
- Nutritional Rehab
  - Restore and maintain healthy weight
- Normalization of eating behavior
  - Minimize food restrictions
  - Reduce binge/purge
  - Identification of healthy weight range
- Psychosocial Stabilization
  - Treat psychiatric conditions
  - Enhance motivation
  - Address themes and maladaptive thoughts and attitudes
  - Family therapy
  - Prevent Relapse

Level-of-care determination

- Outpatient
- Intensive Outpatient
- Partial Hospitalization
- Residential
- Hospitalization – Acute Care

Outpatient Care

- Medically stable
- Low suicide risk
- Greater than 85% of healthy body weight
- Fair-to-good motivation to recover
- Self-sufficient eating
- Managing compulsive exercising with self-control
- Can significantly reduce purging in unstructured setting
- No significant medical complications (e.g. EKG changes) needing acute care
- Has adequate social and emotional support at home
- Programming available

Intensive Outpatient Care

- Medically stable
- Low suicide risk
- Greater than 80% of healthy body weight
- Motivation to recover
- Needs some structure to gain/maintain healthy weight
- Needs some structure to prevent compulsive exercising
- Can significantly reduce purging in unstructured setting
- No significant medical complications (e.g. EKG changes) needing acute care
- Has adequate social and emotional support at home
- Programming available

Partial Hospitalization

- Medically stable
- Low suicide risk
- Greater than 80% of healthy body weight
- Partial motivation; preoccupied with intrusive thoughts > 3 hrs./day
- Needs some structure to gain/maintain healthy weight
- Needs some structure to prevent compulsive exercising
- Can significantly reduce purging in unstructured setting
- No significant medical complications (e.g. EKG changes) needing acute care
- Has adequate social and emotional support at home
- Programming available

Residential

- IV fluids, NG feedings, daily labs not needed
- Low suicide risk
- Less than 85% of healthy body weight
- Poor-to-fair motivation; preoccupied with intrusive thoughts 4-6 hrs./day
- Cooperative with highly structured treatment
- Requires supervision at all meals or will restrict eating
- Needs some structure to prevent compulsive exercising
- Can ask for and use support from others; use cognitive & behavioral skills to inhibit purging
- Conflict or inadequate support at home
- Local programming not available
Acute Inpatient Hospitalization

**Medical Status – Adults**
- < 85% of individually estimated healthy body weight
- HR < 40 bpm
- BP < 90/60 mmHg
- Glucose < 60 mg/dl
- K+ < 3 mEq/L
- Other electrolyte imbalance
- Temp < 97.0°F
- Dehydration
- Hepatic/renal/cardiovascular organ compromise
- Poorly controlled diabetes

**Medical Status – Children and Adolescents**
- Weight < 85% of individually estimated healthy body weight
- HR near 40 bpm
- Orthostatic vital sign change
  - > 20 bpm increase in HR
  - >10 mmHg – 20 mmHg drop in BP
- BP < 80/50 mmHg
- Hypokalemia
- Hypophosphatemia
- Hypomagnesemia

**Specific plan for suicide with intent=high SI risk**
- Other significant mental illness interfering with ED treatment
- < 85% acute weight decline—with food refusal even if not < 85% of healthy body weight
- Very poor to poor motivation; intrusive, repetitive thoughts
- Uncooperative or only cooperative in highly structured environment
- Requires supervision during and after all meals or NG/special feeding
- Requires supervision during and after all meals and in bathrooms
  - Unable to control purging despite trying outpatient care
  - Regardless of presence/absence of metabolic shifts on labs
- Conflict or inadequate support at home
- Local programming not available

**Acute Medical Treatment**

- Balance of evidence-based medical and psychiatric care
- Ideally admit to hospital with access to or onsite ED specialist support
- Nearly all medical complications of EDs can resolve with nutritional, fluid, and weight restoration
  - Old mantra "Start low and go slow."
  - New evidence to support more aggressive approach can be safe
    - 1400-1800 calories daily
    - Advance by around 300 calories every 2-3 days
- Know who’s at risk for Refeeding Syndrome
- Close cardiac and electrolyte monitoring
- Aggressive replacement of electrolytes as needed
- Prophylactic oral phosphate supplementation (1.0 + .2 mmol/kg/day) appears safe
- Prophylactic oral thiamine supplementation

**What is Refeeding Syndrome?**

- Abnormally deadly shifts in fluids and electrolytes that can occur in malnourished/starved patients during refeeding: enteral or parenteral
- Glucagon leads to increased insulin and decreased glucagon
- Insulin stimulates glycogen, fat and protein synthesis using phosphate, magnesium, and thiamine and triggers aborption of potassium, glucose, magnesium, and phosphate into the cells
- Decreases serum phosphate, potassium, and magnesium

**Complications of Refeeding Syndrome**

- Malnutrition
- Infection
- Metabolic crisis
- Cardiac compromise
- Renal compromise
- Liver compromise
- Gastrointestinal compromise
- Respiratory compromise
- Brain compromise
Treatment Considerations:
Guidelines of National Institute for Health and Clinical Excellence

Outpatient Primary Care
- Establish therapeutic, trusting relationship
- Accurate diagnosis
- Assess medical complications
- Treat as necessary
- Monitor weight and nutrition
- Patient education
- Refer
  - Dietitian, psychiatry, psychotherapy
  - Higher level of care if necessary

Psychotherapy - Adults
- CBT-E
  - Examines maintaining behaviors—not initial etiology
  - Stabilize eating behaviors and reduce symptoms
  - Reduce cognitive distortions related to:
    - Over evaluation of weight and body
    - Rigid diet and food rules
    - Being underweight or drive for thinness
    - Event or mood triggered change in eating
  - Self-monitoring, changing behaviors, change self-talk, ABC logs

Psychotherapy – Children and Adolescents
- Family-based therapy
  - Parents in charge of refeeding child
  - Choosing food, portioning, and supervision
  - Return autonomy to child when ready
  - Maintenance of regular, healthy eating

Other treatment modalities
- DBT: distress tolerance skills, mood regulation, interpersonal effectiveness
  - Non-judgement skills
  - Radical acceptance
- Perfectionism-CBT
- Self-esteem-CBT (positive affirmations)
- Body image-CBT
- Exposure Response Prevention (feared foods, eating out and in front of others, grocery shopping)
**Psychopharmacology of Eating Disorders**

- Medications to be used in conjunction with psychosocial interventions
  - Amoxapine and BUP: substantial evidence base
  - BED: limited evidence, but typically used in clinical practice
- Timing
  - AN: possible wait until weight restored
  - BN and BED: when starting psychosocial modalities
- Know and manage side effects and black box warnings
  - Weight issues, benefits
  - Antidepressants and increased risk for SI
  - MAOIs: depression, depressed patients more prone to SE
- Consider a multidisciplinary approach
- Large research gap – ED is a large public health problem, however, lack of psychopharmacological research and options
  - Only two FDA-approved medications to treat ED
  1. Fluoxetine (Prozac) 60 mg for BN
  2. Lisdexamphetamine (Vyvanse) 30, 50, or 70 mg for BED

**Fluoxetine – Drug Profile**

- **Pharmacokinetics**
  - **DOSAGE:**
    - **Capsules: 60 mg**
    - **Sustained-release tablets: 60 mg**
- **Pro-drug of dextroamphetamine:**
  - **Inactive before absorbed in GI tract and then converted to active dextroamphetamine and L-lysine**
- **Pharmacodynamics**
  - **CNS Stimulant:**
    - Facilitates DA and NE neurotransmission by:
      1. Increasing the release of these monoamines into the extraneuronal space
    - **Eliminated through kidney**
  - **Half-life:**
    - 9-11 hours
  - **Blood levels:**
    - Acidity of urine (critical)
- **Drug Interactions:**
  - **Interactions with 2D6 substrates and inhibitors:**
    - Initiate at lower dose (e.g., paroxetine, fluoxetine)
- **MAOI inhibitors:**
  - Do not use with or within 14 days of administration due to risk of hypertensive crisis
- **Alkalining agents (sodium bicarbonate) increase blood levels**
- **Acidifying agents (ascorbic acid) decrease blood levels**
  - More acidic urine decreases blood levels
  - **Drug-drug interactions with 2D6 substrates and inhibitors:**
  - **SERT inhibition, NET inhibition, 5HT2C antagonism**
- **Interval between doses:**
  - 24 hours
- **Clinical studies**
  - **BN and BED:**
    - Limited evidence, but typically used in clinical practice
  - **Anorexia and BED:**
    - Substantial evidence base
  - **Fluoxetine and BED:**
    - Largest RCT, placebo-controlled pharmacotherapy trial in BN (adults) to date
    - **Primary endpoint—number of binge days/week:**
      - Significantly decreased in 50-70 mg
      - Significant reductions in binge episodes and % change in weight from baseline
      - Positive effect on Sheehan Disability Scale scores
  - **DA and NE systems important in regulating eating behavior and reward processing**
- **Criticisms of LDX in BED**
  - **Risk of Abuse and Dependence:**
    - Drug liking, drug high, stimulation, happy and well being similarly rated
  - **Studies did not include patients with comorbid psychiatric or cardiovascular conditions**
  - **Low enrollment of men**
  - **Risk of Abuse and Dependence:**
    - "Pharmacokinetics and Pharmacodynamics similar to d-amphetamine" (Goldberg et al., 2017)
  - **Drug liking, drug high, stimulation, happy and well being similarly rated**
  - **Not indicated for weight loss in obesity**

- **Fluoxetine – Drug profile**

- **Lisdexamphetamine – Drug Profile**

- **Fluoxetine**
  - **Approved to treat moderate – severe BED 2015**
  - **Other FDA indications**
    - ADHD in children 2007
    - ADHD in adults 2008
    - Maintenance treatment 2012
    - RCT of maintenance (4-6-months) LDX of 418 adults found:
      - Two-thirds of patients who responded to then discontinued remained improved
    - **Three RCTs acute adult BED**
    - **Primary endpoint—number of binge days/week:**
      - Significantly decreased in 50-70 mg
  - **Fluoxetine – Drug profile**

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  - **Three RCTs acute adult BED**
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  - **Fluoxetine – Drug profile**
Risks of LDX in BED

• Stimulants associated with weight loss and slowing of growth rate in pediatric patients
• Serious Cardiovascular Reactions – sudden death, stroke, MI have been reported
  • Avoid use if known structural cardiac abnormalities, cardiomyopathy, serious arrhythmia, coronary artery disease or other cardiac problems
  • Monitor BP and pulse – can cause elevations
• Peripheral Vasculopathy (Raynaud’s Phenomenon)
  • S/S improve/resolve with reduction or discontinuation
• Serotonin Syndrome
  • Risk if used in conjunction with SSRIs, SNRIs, MAOIs, buspirone, St. Johns Wort, etc.

Psychopharmacology of Bedtime Dextroamphetamine (LDX) in BED

• No FDA approved medication
• Every class has been tried, however, results of RCTs have been disappointing
  • Lack of effects on weight gain and recovery
• Large proportion of individuals with AN are treated with psychotropics
• No targeted pharmacological interventions
• Limited knowledge of disorder-specific pathophysiology
• Try what we have
• Focus on acute phase – not relapse prevention and recovery
• Treat comorbid conditions
• Targets for future drug developments
  • Learning and fear extinction
  • Reward system responsiveness
  • Social cognition

Brownley, et al., 2016; Dolder et al., 2017; Fornaro et al., 2016; Shire 2017

Psychopharmacology of Anorexia Nervosa

• No FDA approved medication
• Every class has been tried, however, results of RCTs have been disappointing
  • Lack of effects on weight gain and recovery
• Large proportion of individuals with AN are treated with psychotropics

Psychopharmacology – Children and Adolescents with Anorexia

*The use of medications, including CAM, should be reserved for comorbid conditions and refractory cases*

• Antidepressants – SSRI for comorbid anxiety and depression
• Second-generation antipsychotics: not usually recommended
  • risperdal – pilot RCT of using adjunct found few benefits, but well tolerated
  • olanzapine – small case series decrease in body image concerns, agitation, anxiety regarding eating, small controlled trial found no benefit
  • quetiapine – small randomized study some improvements in weight and eating-related thinking, but not statistically different

Psychopharmacology – Children and Adolescents with Anorexia

• Dopamine agonists –
  • aripiprazole –
    1. chart review of 106 adolescents with AN and taking med and greater increase in BMI
    2. case series suggests med could be helpful in supporting fear extinction during ED focused psychotherapy
• Zinc supplementation – 3 RCTs mixed results
• Calcium supplementation – if dietary Ca intake is inadequate for growth
• Vitamin D supplementation – poor daily sunlight exposure, but avoid excessive doses

APA, 2012; Flament, Bissada & Spettigue, 2012; Frank 2015; Frank et al., 2017; Frank & Shott, 2016; Hagman et al., 2012; Hay & Claudino, 2012

Psychopharmacology – Adults with Anorexia

• Antidepressants
  • TCAs and MAOIs – not recommended due to lethality and potential for fatal arrhythmia at low body weight
  • bupropion – avoid due to increased risks of seizures
  • SSRIs – used often, but only fluoxetine and citalopram studied in RCTs and showing no benefit over placebo
  • mirtazapine – non-SSRI sedative antidepressant increases appetite and can induce weight gain. Open trial reported weight gain in five inpatients with AN.
  • Mood stabilizers and anticonvulsants
    • Lithium – not recommended due to Na and fluid depletion; can result in Li toxicity
    • Valproic acid and others – weight gain can result in non adherence

Psychopharmacology – Adults with Anorexia

• Antipsychotics
  • First-generation – severe adverse effects (convulsions and Parkinsonism)
  • Second-generation – some trials report reduction in weight anxiety and depressive symptoms, and weight gain. Especially consider using for patients with severe resistance to weight gain, obsessional thinking, and delusional thoughts/denial.
    • olanzapine (1 – 10 mg/day)
    • quetiapine (100 – 400 mg/day)
    • aripiprazole (2 – 15 mg/day) – adjunct to antidepressant
• Prokinetic agents (e.g. metoclopramide, domperidone, etc.) – can reduce post-prandial abdominal bloating
• Cannabinoids (dronabinol) – one RCT 25 women over 18 with AN. Participants gained 0.73 kg above placebo and was well tolerated

APA, 2012; Flament, Bissada & Spettigue, 2012; Frank et al., 2017; Frank & Shott, 2016; Hay & Claudino, 2012; Marzola et al., 2015

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Psychopharmacology – Adults with Anorexia

- Opiate antagonists (e.g. naltrexone) – High dose (200 mg/day) studied in 6 patients and binge/purge frequency was reduced.
- High risk for hepatic damage at high doses
- Calcium supplementation – if dietary Ca intake is inadequate for growth
- Vitamin D supplementation – poor daily sunlight exposure, but avoid excessive doses
- Hormone replacement – sometimes given, but no good evidence to support this. Also, can reinforce denial of disease by triggering pseudomenstrual bleeding.
- Bisphosphonates – usually not indicated

Psychopharmacology of Bulimia Nervosa

- Studied almost exclusively in adults
- Antidepressants – to reduce frequency of binge/purge, comorbid condition/symptoms, and prevent relapse
  - SSRIs safest and most studied
  - Once in remission continue at least 9 months
  - If no response assess timing of medication (serum levels may be low depending on timing and frequency of purge bx)
- Treat comorbid conditions
  - Combo of CBT and SSRIs most effective

Psychopharmacology of Binge Eating Disorder

- lisdexamfetamine (FDA approved) can reduce:
  - Frequency of BE and then lead to abstinence
  - Obsessions/compulsions about shape and weight
  - Negative mood symptoms
  - Weight
- Antidepressants like SSRIs (e.g. fluoxetine, fluvoxamine) and DNRIs (e.g. bupropion, atomoxetine) can reduce:
  - Frequency of BE and then abstinence
  - Obsessions/compulsions about shape and weight
  - Negative mood symptoms
  - Not associated with weight loss
- Topiramate can reduce:
  - Frequency of BE
  - Weight in overweight or obese individuals
  - Obsessions/compulsions about shape and weight

Eating Disorder Research

- The Eating Anxiety Treatment Laboratory and Clinic: University of Louisville
- Center for Excellence for Eating Disorders: UNC Chapel Hill
- Dipeptidyl Peptidase IV: University of Colorado
- UK Health Services: outpatient
- Elyse Rochman, LCSW: outpatient
- EAT Lab: outpatient if quality for research

ED Resources

- National Eating Disorders Alliance (NEDA)
- Linus Center for Eating Disorders: outpatient and inpatient (PHS location)
- NIMH: updated/fresh quality for research
- American Psychiatric Association: updated/fresh
- Academy for Eating Disorders: updated
- Eating Disorders: A Guide to Medical Care

References
