Educational Objectives

• What are eating disorders? What are their core features? Why are they serious?
• Where do eating disorders come from?
• How can we effectively treat eating disorders?
“In the beginning of this disease the state of the body appears oedematous and bloated, and as if it were stufft with dispirited chyle, the face is pale and squalid, the stomach loathes everything but liquids, the strength of the patient declines at the rate before the fleshy parts of the body are evidently consum’d, she is render’d plainly feeble and almost always confin’d to her bed. The causes which dispose the patient to the disease I have for the most part observed to be violent passions of the mind, the intemperate drinking of spiritous liquors, and an unwholsom air by which it is no wonder if the tone of the nerves and the temper of the spirits are destroy’d.”

Richard Morton, Phthisiologia, 1689
Anorexia Nervosa: History

- **Gull and Leségue** (late 19th century): Independently described what is now recognized as modern anorexia nervosa.
- **Freud** (early 20th century): Recognized relationship to melancholia, proposed analytic understanding.
- **Simmonds, Sheehan, Berkman** (1930’s, 40’s) - Physiological illnesses with psychologic symptoms.
- **Hilda Bruch, Salvatore Minuchin** (1960’s 70’s)- Individual and Family hypotheses.

Anorexia Nervosa (DSM-IV)

- Refusal to maintain body weight at or above a minimally normal weight for age and height.
- Intense fear of weight gain or becoming fat, even though underweight.
- 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 denial of the seriousness of the current low body weight.
- In postmenarcheal females, amenorrhea.
Anorexia Nervosa: Subtyping

Anorexia Nervosa - Epidemiology

- Prevalence is estimated at 0.5 - 2% of populations at highest risk (adolescent females).
- Female: male ratio 10:1
- Significantly higher rates if subthreshold cases are included.
- Childhood anorexia (<age 10) is less prevalent, but may be increasing.
Anorexia Nervosa - Physical Consequences

- Energy conservation - diminished pulse, blood pressure, and temperature.
- Dehydration, electrolyte disturbance, cardiac changes, arrhythmia.
- Gastric disturbances, constipation.
- Growth retardation, osteoporosis

Anorexia Nervosa - Social Consequences

- Profound impact on interpersonal relationships and family. Decreased rates of marriage and fertility.
- Diminished achievement in school and occupation relative to potential.
- High dependence on health care system at extremely high cost (second only to schizophrenia).
Anorexia Nervosa - Outcome

• About 50% develop bulimic symptoms.
• Short-term outcome is worse in persons with laxative abuse, bingeing, and family psychiatric illness.
• Long term outcome has few reliable predictors.
• Death rate is approximately 5% per decade of illness; Highest of any psychiatric illness.
• Suicide accounts for about 1/2 mortality.

Bulimia Nervosa - History

• Description of bulimic symptoms in literature since 1873.
• Case of Ellen West (1944): first well documented account.
• Gerald Russell (1979): Landmark description of bulimia nervosa.
Bulimia Nervosa (DSM-IV)

- Recurrent episodes of binge eating.
- Regular compensatory measures to prevent weight gain.
- Occurrence at least twice per week for three months.
- Attitude about body shape predominantly influences self-evaluation.
- No evidence of anorexia nervosa.

Bulimia Nervosa: Subtyping

Purging

Non-purging
Bulimia Nervosa - Epidemiology

- Age of onset between mid-adolescence and late 20’s.
- Diversity in socioeconomic class background.
- Rare in first decade of life.
- Lifetime prevalence estimates: 3-8%
- Prevalence in adolescent and young women: 1-2%

Bulimia Nervosa - Physical Consequences

- Electrolyte disturbances - hypokalemia
- Orthostatic hypotension
- Esophageal tear (Mallory-Weiss)
- Gastritis, gastric dilation, rupture
- Cardiac arrhythmias
- Menstrual irregularities
- Osteopenia
- Sudden death
Bulimia Nervosa - Outcome

- Treatment response is highly variable.
- One long-term follow up study suggest that the number of women who continue to meet full criteria for BN declines as the duration of follow-up increases.
- Longer duration of the disorder at presentation and history of substance use disorder predicted worse outcome.

Contrasting Features

<table>
<thead>
<tr>
<th>Anorexia Nervosa</th>
<th>Restrictor</th>
<th>Binge/Purge</th>
<th>Bulimia Nervosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>obsessive</td>
<td>impulsive</td>
<td>impulsive</td>
</tr>
<tr>
<td>Weight</td>
<td>low</td>
<td>low</td>
<td>normal/above</td>
</tr>
<tr>
<td>Bingeing</td>
<td>absent</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Purging</td>
<td>absent</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Menses</td>
<td>absent</td>
<td>absent</td>
<td>present</td>
</tr>
<tr>
<td>Morbidity</td>
<td>++++</td>
<td>++++++</td>
<td>+++</td>
</tr>
</tbody>
</table>
Common Dx Confusion

- Bulimic symptoms and low weight
  - Anorexia Nervosa, binge-purge type
  - Bulimia nervosa, purging type
  - AN symptoms, low wt., not bingeing but purging.
  - ED NOS

Eating Disorder Comorbidity

- Mood Disorders
- Anxiety Disorders
- Personality Disorders
- Substance Use Disorders
- Obesity
Medical Comorbidity

- Medical Complications
  - Often unstable, life-threatening.
  - Affect virtually every organ system.
  - Psychiatrist and non-physicians must be aware of dangers and when to refer.
  - Generates anxiety in caregivers which can interfere with therapeutic effectiveness.

Laboratory Findings

<table>
<thead>
<tr>
<th>BLOOD TEST FINDING</th>
<th>LIKELY CAUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukopenia</td>
<td>Starvation, chronic stress</td>
</tr>
<tr>
<td>Anemia</td>
<td>Starvation</td>
</tr>
<tr>
<td>Hypokalemia</td>
<td>Vomiting, diuretics</td>
</tr>
<tr>
<td>Hypochloremia</td>
<td>Vomiting</td>
</tr>
<tr>
<td>Low blood glucose</td>
<td>Glycogen depletion</td>
</tr>
<tr>
<td>Hypophosphatemia</td>
<td>Starvation, refeeding</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>Starvation</td>
</tr>
<tr>
<td>Low estrogen, T3</td>
<td>Starvation</td>
</tr>
<tr>
<td>hypercortisolemia</td>
<td>Starvation, stress</td>
</tr>
</tbody>
</table>
### Dual Photon Scan Findings

<table>
<thead>
<tr>
<th>Finding</th>
<th>Likely Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced estrogen</td>
<td>Hypercortisolemia</td>
</tr>
<tr>
<td>Calcium deficiency</td>
<td></td>
</tr>
<tr>
<td>Osteopenia or Osteoporosis</td>
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</tbody>
</table>

### EKG Findings

<table>
<thead>
<tr>
<th>Finding</th>
<th>Likely Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>QT interval changes</td>
<td>Electrolyte disturbances, meds</td>
</tr>
<tr>
<td>T wave changes</td>
<td>Electrolyte disturbances</td>
</tr>
<tr>
<td>Malignant arrhythmias,</td>
<td>Starvation, sudden fluid shifts</td>
</tr>
<tr>
<td>Junctional rhythms</td>
<td>affecting electrolytes</td>
</tr>
<tr>
<td>ST-T changes</td>
<td></td>
</tr>
</tbody>
</table>
Binge-Eating Disorder
DSM-IV Research Criteria

- Recurrent episodes of **binge-eating**.
- Marked distress regarding binge-eating.
- Occurrence at least two days per week for six months.
- Not associated with the regular use of inappropriate compensatory measures.

Summary of Eating Disorder Classification
You can never be too rich or too thin.

What Causes Eating Disorders?

- Sociocultural
- Psychodynamic
- Family
- Genetic
- Biologic
Common Psychodynamic Themes

- Separation-Individuation
- Retreat from puberty
- Phobic avoidance disorder
- Control issues
- Low self-esteem

Common Family Themes

- Limited tolerance of angry affect and conflict
- Excessive performance expectations.
- Problems with role adaptability.
- Emphasis on propriety and rule-mindedness.
- Parental over-direction of child with subtle discouragement of autonomy.
- Poor skills in conflict resolution.
Genetics of Eating Disorders

- Monozygotic twin studies - high concordance.
- First-degree relatives of patients with eating disorders have high rates of eating disorders, mood disorders and alcoholism.
- Genetic studies suggest heritability, but what is heritable is less clear (e.g., temperament, neurotransmitter abnormality, propensity for dieting, abnormal eating).

Price Foundation and NIMH Collaborations
Genetics of AN and BN
(www.anbn.org; www.angenetics.org)

- Clinical Collection
  - U Pittsburgh: W Kaye (core center)
  - Cornell: K Halmi
  - U Munich: M Fichter
  - Toronto Hospital: A Kaplan, B Woodside
  - UCLA: M Strober
  - CED, Baltimore: H Brandt, S Crawford
  - U London: J Treasure, D Collier
  - U Pisa: A Rotondo, M Mauri, Cassano
  - N Dakota: J Mitchell
  - U Minnesota: S Crow
  - Harvard: P Keel
  - Laureate, Tulsa: C Johnson

- Genetics
  - W Berrettini: U Pennsylvania
  - D Grice: U Pennsylvania
  - A Bergen: NIH

- Statistics, phenotypes
  - B Devlin: U Pittsburgh
  - C Bulik: U N Carolina
  - K Klump: Michigan State U
  - L Lilenfeld: Georgia State U
  - L Thornton: U Pittsburgh
  - S-A Bacanu: U Pittsburgh

- Core staff (U Pittsburgh)
  - K Potnicov
  - E Gerard
  - K Lancaster (U ND)
  - C Pollice
Genetics of AN
NIMH collaborative R01

- Years: 2002 – 2007
- 10 clinical sites N America, Europe
- 400 families with 2+ members with AN
- Comprehensive behavioral assessment
- NIH repository: cell lines, behavior

Chromosome 1
Dotted line: All AN ARPs (192 families)
Dashed line: AN-AN Pairs (127 families)
Solid line: RAN-RAN Pairs (37 families)
Grice et al, 2002
1950’s: Minnesota Starvation Studies (Keys et al)

- 36 young, healthy, psychologically stable men were restricted to 50% of their normal intake leading to 25% weight loss.

“As starvation progressed, the number of men who toyed with their food increased. They made what under normal conditions would be weird and distasteful concoctions. Cookbooks, menus, and information on food production became intensely interesting to many of the men who previously had little or no interest in dietetics.”
Regulation of Eating Behavior In Animals

<table>
<thead>
<tr>
<th>Neurotransmitters</th>
<th>Neuropeptides</th>
<th>Hormones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norepinephrine</td>
<td>Cholecystokinin</td>
<td>Insulin</td>
</tr>
<tr>
<td>Serotonin</td>
<td>Neuropeptide Y</td>
<td>Cortisol</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Ghrelin</td>
<td></td>
</tr>
<tr>
<td>Acetylcholine</td>
<td>Peptide YY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Opioids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CRH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leptin</td>
<td></td>
</tr>
</tbody>
</table>

Eating Disorders are Multidetermined

- Biology/Genetics
- Temperament
- Psychology
- Family
- Society

Symptom Blockade
- Excessive Weight Focus
- Extreme Dieting Behavior
- Starvation
- Compulsive Exercise
- Binge/Purge
Eating Disorders Treatment

- Only one-third of people with AN in the community receive mental health care
- Only 6% of people with BN receive mental health care
- 80% of individuals with severe eating disorders do not receive intensity or duration of care warranted by their symptoms

Treatment of Eating Disorders

- Intensive Stepped-Care Approaches
  - Inpatient hospitalization
    - Treat life-threatening medical complications
    - Interrupt entrenched symptoms and patterns
    - Begin nutritional rehabilitation
  - Partial hospitalization (day treatment)
    - Maintain structure while encouraging autonomy
    - Gradual tapering of imposed external limits
  - Intensive Outpatient Programs
    - Focused nutritional counseling, cognitive behavioral treatments, peer support
    - Allows engagement in "outside world" (e.g., school, work).
Indication for Hospitalization

- Severe malnutrition (wt less than or equal to 75% IBW)
- Dehydration
- Electrolyte disturbances
- Cardiac dysrhythmias

Indication for Hospitalization

- Physiologic instability
  - Bradycardia (heart rate < 50)
  - Hypotension (BP < 80/50)
  - Hypothermia (body temperature < 96)
  - Orthostatic changes in pulse or blood pressure
- Acute complications of purging
  - Hemeatemesis
Indication for Hospitalization

- Acute psychiatric emergencies
  - Suicidal ideation
  - psychosis
- Co-morbidity interfering with treatment of eating disorder
  - Depression
  - Obsessive-compulsive disorder
  - Severe family dysfunction

Medical Management

- Collaboration between psychiatrist, non-physicians and primary care physicians
- Regular consistent weigh-ins
- Ongoing laboratory/vital signs monitoring
- Annual bone densities
- Regular dental exams
Treatment of Eating Disorders

- Cognitive behavioral therapy
  - Most studied
  - Effectiveness well established in Bulimia Nervosa
  - Preliminary studies suggest effectiveness in anorexia nervosa, but more work needed.

- Interpersonal psychotherapy
  - Effectiveness established in BN. Similar to CBT
  - Not studied in AN, but clinical wisdom suggests refeeding is important first step.

- Psychodynamic therapy
  - Commonly utilized but no controlled studies

- Feminist therapies
  - Focus on role conflicts, identity confusion, cultural attitudes, and sexual abuse in etiology and perpetuation of eating disorders. No controlled studies.

- Family therapy
  - Controlled-studies suggest critical importance of family therapy for adolescents living at home.
  - New behavioral family treatments showing great promise.
Behavioral Family Therapy

- Phase I: Weight restoration
- Phase II: Return control over eating back to the adolescent
- Phase III: Establishing healthy adolescent identity

Treatment of Eating Disorders - Pharmacotherapy of AN

- No medications clearly effective in AN.
- Refeeding is most efficacious treatment.
- SSRI’s may prove helpful after refeeding, but not before.
- Atypicals may be useful but need placebo-controlled confirmation.
- Comorbid conditions require creative pharmacotherapy.
Treatment of Eating Disorders
Pharmacotherapy of BN

• Antidepressants reduce symptoms
• Fluoxetine is only SSRI studied (& published)
  - well tolerated at 60 mg/day
• CBT also clearly effective
  - combine treatments?
  - sequence treatments?
• Experimental
  - ondansetron, topiramate

Some Treatment Conclusions

• AN and BN are morbid illnesses requiring early identification and specialized treatment.
• Family treatment should be recommended for virtually all adolescents with AN.
• CBT or IPT should be recommended for virtually all patients with BN.
• Meds should be used as an adjunct, but there are no clearly efficacious agents.
• Treatment of comorbid conditions and medical complications is absolutely essential.
Center for Eating Disorders - History

- **1980’s - NIH Unit on Eating Disorders**
  - Government funded research unit
  - 3-6 month length of stay
- **1990-1996 - Mercy Center for Eating Disorders**
  - 40 day length of stay (1990) to 14 day (1996)
  - Initial development of alternatives to inpatient care including day hospital
- **1996-2004 - CED at St. Joseph Medical Center**
  - State-of-the-art clinical unit
  - Further development of continuum of care; intensive coordinated outpatient care, research and teaching program
- **2005 - The Center for Eating Disorders at Sheppard Pratt**

Center for Eating Disorders at Sheppard Pratt

- **Diagnostic Evaluation Program**
- **Inpatient and Day Treatment Unit**
- **Intensive Outpatient Program**
- **Outpatient Center**
  - CBT, IPT, DBT, Med Mgmt, Nutr., Fam. Ther., CBT Groups, Support Groups, MET
- **Community Outreach**
- **Postgraduate Training Program**
- **Research**