Your Adolescent Patient has an Eating Disorder....

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Presenter Disclosures

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Relationships with commercial interests:
  Grants/Research Support: None
  Speakers Bureau/Honoraria: None
  Consulting Fees: None
  Other: None
Mitigating Potential Bias

• No mitigation required
Disclosure of Commercial Support

• This program has received no financial support
• This program has received no in-kind support
• Potential of conflicts of interest: None
Learning Objectives

At the end of this presentation you should be able to

• Describe the features of eating disorders presenting in adolescence in the context of set point theory

• Develop a therapeutic approach to managing eating disorders in family practice settings

• Recognize the red flags that may require hospitalization or specialist intervention
Eating disorder prevalence

• How many of you have a personal connection with someone who has an eating disorder?
• Introduce yourself to the person next to you and share what you find most challenging about working with eating disorders.
Eating disorders are not about food or slimness.

They are about self-worth and a sense of power or personal effectiveness.
Adolescent Identity

- Self-esteem
- Body Image
- Sexuality
- Autonomy
- Control

Definitions

• Anorexia Nervosa: addiction to weight loss
  – Intense fear of weight gain
  – Restrictive eating / compensatory behaviors

• Bulimia Nervosa: compulsive disorder
  – Binge eating / compensatory behaviors

• Binge-eating Disorder: 20% of the obese

• Drunkorexics: skip meals to binge drink
  – Associated early cirrhosis

‘Drunkorexia’ on the rise at university campuses, including Canadian schools.
Global News October 14 2016
"Drunkorexia” a disturbing trend on college campuses
Dipali Rinker. University of Houston, Texas July 2016
The Canadian Context

80% of people with eating disorders started with dieting

25% of Canadian women of normal weight think they are obese

56% of women are on a diet.

1.5% adolescents have Anorexia Nervosa

4.5% have Bulimia Nervosa

Stats Canada 2015-11-27
Anorexia Nervosa Morbidity

• **27%** of girls 12-18 years old were reported to be engaged in severely problematic food and weight behavior.

• **6%** of adolescents suffer from either anorexia nervosa or bulimia nervosa: making it the **third** most common chronic health condition after Obesity (11.7%) and Asthma (8.1%) in teens.

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*Canadian Health Measures survey 2014*  
Fotios C. Papadopoulos, Anders Ekbom, Lena Brandt and Lisa Ekselius
Anorexia Nervosa Mortality

• The death rate associated with anorexia nervosa alone is more than 12 times higher than the overall death rate among young women in the general population

• The crude rate of all cause mortality in Anorexia Nervosa is 6%

Canadian Health Measures survey 2014
Fotios C. Papadopoulos, Anders Ekbom, Lena Brandt and Lisa Ekselius
Diabetic girls skip insulin to lose weight: Toronto Star Jan 22, 2008

- One in four of the diabetic girls had an eating disorder, compared with 10 per cent in the group without diabetes,
  - 356 girls with diabetes and 1,098 without
- The study showed 35 per cent of girls ages 16 to 22 admit to purposefully stopping their insulin for weight loss.
- 20 yr old became blind

Dr. Denis Daneman HSC 2001
Set Point Theory

Set Point Theory

- The body is biologically programmed to weigh a certain amount, within normal limits.
- The body defends a certain weight that is unique to each individual usually within the BMI 18-25 range in adults.
- BMI for age tables for teens.

The Biology of Human Starvation

US Army wanted to establish protocols for re-feeding starving POW from WW2 -1944-45

• 100 men volunteered: normal BMI
• 24 week period of Dietary Restriction
• Goal to lose 25% of body weight
• Recovery phase: different diets tried to prevent Refeeding Syndrome

Refeeding Syndrome

• Defined as the potentially fatal shifts in fluids and electrolytes that may occur in malnourished patients receiving refeeding

• The hallmark biochemical feature of refeeding syndrome is hypophosphataemia.

• May also feature abnormal sodium and fluid balance; changes in glucose, protein, and fat metabolism; thiamine deficiency; hypokalaemia; and hypomagnesemia.

*Refeeding syndrome: what it is, and how to prevent and treat it*  
Hisham M Mehanna  
BMJ 2006
Effect on Fluid Balance

• The introduction of carbohydrate to a diet leads to a rapid decrease in renal excretion of sodium and water.

• If fluid repletion is then instituted to maintain a normal urine output, patients may rapidly develop fluid overload. This can lead to congestive cardiac failure, pulmonary oedema, and cardiac arrhythmia.
Ancel Keys Study

Starvation phase (24 weeks)

– Decreased Basal Metabolic Rate
– Decreased temperature: fingertips
– Bradycardia: < 40/min
– Hypotension: < 80 mmHg/postural drop 20 mmHg
– Lethargy
– Headaches

Psychological Effects

Starvation Phase:

– Depressed
– Increased Irritability
– Impaired concentration/judgment
– Reduced libido
– Nail-biting
– Preoccupation with food
– Increased use of coffee, cigarettes, spices, gum
– Sleep disturbance: hyperarousal

Physiological effects

Starvation Phase:

– Cold intolerance
– Stomach Shrinks
– Slowed Gastric emptying: 4-5 hrs
– Constipation
– Sodium retention
– Fluid Retention: starvation edema

Physiological signs

Starvation Phase:

– Lanugo
– Hypercarotenemia: deficiency Vit. A
– Increased Adrenalin levels
– Dehydration
– PO4/ K /Mg decreased

Re-feeding phase

• Consumption of large amounts of food without feeling satisfied
• Mimics the physiology of bulimia
• Returned to their original weight
• If too emaciated: cardiovascular collapse from fluid overload and reduced heart muscle

Patient Education Conclusion

• Symptoms of Starvation are those of eating disorders
• The body is not reprogrammed at a lower set point once weight loss is achieved
• The body has a strong biological drive to defend its target weight
• To maintain a lower BMI than normal starvation must continue

Case History

Sam is a 14 year old who has come to your office for his annual physical.

• When you checked his height and weight you noted that his BMI is 15.9

• On questioning him about his eating habits you discover that he skips breakfast, rarely has time for lunch but eats a good meal at dinner time because “Mom is a health food freak and watches me like a hawk”.
Body mass index-for-age percentiles:
Boys, 2 to 20 years

A 10-year-old boy with a BMI of 23 would be in the healthy weight category (95th percentile or greater).

A 15-year-old boy with a BMI of 23 would be in the healthy weight category (5th percentile to less than 85th percentile).

95th Percentile
85th Percentile
5th Percentile
Sam’s Measurements

• Height: 160 cm
• Weight: 50.4 kg
• BMI: 19.7 (20\textsuperscript{th} centile)

One year ago
• Height 150 cm
• Weight: 50 kg
• BMI: 22.2
Sam’s Growth chart
Next steps

• What other questions would you like to ask Sam?

• What would your assessment and plan include?
Sam’s complaints

• Fatigue
• Cold Intolerance
• Palpitations
• Dizziness when he stands up
• Constipation
• Abdominal Bloating
Screening for Eating Disorders

• **SCOFF**
  • Do you make yourself **Sick** because you feel uncomfortably full
  • Do you worry that you have lost **Control** over how much you eat
  • In 3 months have you lost **Over 15 lbs**
  • Do you think you are **Fat** when others don’t
  • Does **Food** dominate your life

*Morgan JF, Reid F, Lacey JH, The SCOFF questionnaire. BMJ 1999*
Differential Diagnosis

- Diabetes
- Hyperthyroidism
- Peptic Ulcer Disease
- Inflammatory Bowel disease
- Malignancy
- Coeliac Disease, malabsorption
- Depression
Compensatory Behaviors

- Excessive Exercise
- Vomiting
- Laxative abuse
- Diuretic abuse
- Stimulant abuse
- Thyroid replacement
- Energy drinks

“You don’t have anorexia, you just want to look like a celebrity”: perceived stigma in individuals with anorexia nervosa
Gina Dimitropoulos et al.
Journal of Mental Health
: 11 Dec 2015
Signs of Compensatory Behaviors

- Russell’s sign
- Dental enamel erosion
- Parotid Gland enlargement
- Bloodshot eyes
- Electrolyte changes?

Medical complications of Anorexia Nervosa and bulimia. AMAJ 2016
Medical signs

- Emaciation
- Muscle wasting
- Lanugo
- Hair Loss
- Starvation edema
- Carotenemia: Vit A def
- Bradycardia
- Hypothermia <35
- Postural Hypotension.
Initial Lab Investigations

- Serum electrolytes
- LFTS- AST, ALT, Alkaline phosphatase
- INR
- Serum creatinine, BUN eGFR
- Urine for ketones
- Serum total protein, albumin
- Serum magnesium and phosphate
- Tissue Transglutaminase Antibodies

Medical complications of Anorexia Nervosa and bulimia. AMAJ 2016
Other investigations

- CBC - Anemia Leukopenia Thrombocytopenia in 33% to 85%
- TSH
- Serum Glucose
- Serum Calcium, 25-hydroxyvitamin D
- Testosterone in males
- Pregnancy test in females
- ECG

Medical complications of Anorexia Nervosa and bulimia. AMAJ 2016
Therapeutic Approach
Clinical Management

• Three primary issues:
  – Restoring weight
  – Modifying distorted eating behavior
  – Addressing the psychological and family issues

• Treatment methods:
  – Nutritional rehabilitation
  – Psychotherapy
  – Medication
Nutritional Rehabilitation

• Weekly visits in beginning
• Avoid major increases in nutrition
  – Avoid refeeding syndrome
  – Increase intake by one meal or snack / week
• Weight gain targets
  – Outpatient: 1kg / month
  – Inpatient: 1kg / week
• Physical activity must be monitored as well and restricted if it interferes with weight gain
• Keep scales in home (?)
Medical Follow-up Visits

• Outline
  – Interim 24 hour food history
  – Physical activity history
  – Screen for red flags
  – Urine (dehydration, water loading)*
  – Weight (back to scale?)*
  – Orthostatic vitals*   
  *staff
Medical Follow-up Visits

- Plan
  - Increase nutrition
  - Decrease activity
  - Bloodwork (electrolytes if suspected vomiting, refeeding)
  - Follow-up – closer or spread apart
  - Liaise with tertiary pediatric centre?
  - Emergency department for possible hospitalization?
Nutrition Rehabilitation Suggestions

• Increase caloric intake slowly
  – Recommend: Start at 500 calories more than the amount required to maintain present body weight
  – Rationale: Avoid refeeding syndrome

• Help parents plan in advance
  – Rationale: Give an ED an inch and it will take a mile

• Referral
  – Experienced dietician/nutritionist
Nutrition Rehabilitation Suggestions

• May be necessary to space meals
  – Recommend: Three meals and three snacks
  – Rationale: Avoid physical and psychological discomfort in somebody who is severely underweight

• Patients are often observed after meals
  – Recommend: Usually 30 minutes
  – Rationale: Avoid vomiting

• Meal support to be provided
  – This is not meal SUPERVISION
Meal Support

- https://www.youtube.com/watch?v=l7gyifpv4o4
Working with Schools

• Will not be first time that school is working with a student with ED

• Issues:
  – Disclosure of eating disorder to school
  – Physical activity
  – Meals and snacks
  – Reintegration into school (post-admission)
Disclosure to School

• Helpful for teachers and school staff
  – Maybe missing school regularly for appointments
  – Other children may have questions about Sam

• School triggers for current and future students
  – Health class modifications
Physical Activity

• School
  – Long distances/Stairs
  – Walking A → B okay
  – Elevator?

• Physical Education
  – Difficult– change rooms, swimming
  – Usually no physical activity in beginning
Meals & Snacks

• Meal support
  – School social worker – training?
  – Family member – may be extended family

• Location
  – Classroom
  – Separate room
  – Home (account for time and physical activity)
Reintegration

• May integrate slowly or all at once
  – Advantage and disadvantages
  – Each family is unique
  – Choose some easier classes and phase in other ones over time

• Factors to consider
  – Questions from other students
  – Sensitive topics (nutrition, physical activity, mental health)
Psychotherapy for AN

- May refer for psychotherapy while having nutritional rehabilitation
  - Few well-controlled studies
- Ideally psychotherapy should take place when weight-restored
- Trusting relationship with therapist is key
Family-Based Therapy (FBT)

• Problem-focused, strength-based therapy
• Effective in 50 – 75% of adolescents, who in randomized trials achieved weight restoration by the end of treatment and maintained it for up to five years
• Unified parental action
• Family
  – not the cause of the disorder
  – a positive resource in the adolescent’s weight restoration and return to normal eating and health
Medical Management

• Anorexia nervosa
  – medications have not generally proven themselves to be remarkably effective for the treatment of AN

• Bulimia nervosa
  – TCAs, MAOIs, trazodone, and the SSRIs have demonstrated benefit in the treatment of binge/purge behavior in BN
  – Fluoxetine which has been approved by the FDA for the treatment of adults with BN in both acute and maintenance treatment at a dosage of 60 mg per day
  – Should be continued for at least one year among those who respond positively to the medication within the first eight weeks
Self-care in Providing ED Care

• Acknowledge that providing ED care is very demanding and challenging
  – Difficult interactions with patient and parents
  – Resources limited
  – No immediate satisfaction
• Peer supervision
• Structure clinics appropriately (ex. 1 ED slot)
What weight am I look for?

Setting Progress Weight
Anorexia Nervosa DSM-5

• Criterion #1:
  – Previous: Less than 85% ideal body weight
  – Current: Persistent restriction of energy intake leading to significantly low body weight (in context of what is minimally expected for age, sex, developmental trajectory, and physical health)
Should I be concerned?
<table>
<thead>
<tr>
<th>Age</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
<th>Stature (cm)</th>
<th>BMI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>100</td>
<td>20</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

*To Calculate BMI: Weight (kg) = Stature (cm) - Stature (cm) x 10,000 or Weight (lb) = Stature (in) - Stature (in) x 703

Should I be concerned?
2 to 20 years: Boys
Stature-for-age and Weight-for-age percentiles

Mother's Stature
Father's Stature

Date | Age | Weight | Stature | BMI*  
--- | --- | --- | --- | ---  

*To Calculate BMI: Weight (kg) = Stature (cm) - Stature (cm) x 10,000 or Weight (lb) = Stature (in) - Stature (in) x 703

Published May 30, 2000 (modified 11/21/02).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Diseases Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
Should I be concerned?
2 to 20 years: Boys
Stature-for-age and Weight-for-age percentiles

<table>
<thead>
<tr>
<th>Mother’s Stature</th>
<th>Father’s Stature</th>
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Published May 30, 2000 (modified 11/21/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with
the National Center for Chronic Diseases Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts
Expected Weight: 67kg
Expected Weight: 67kg
Current Weight: 51kg
Expected Weight: 67kg
Current Weight: 51kg

Percentage: \( \frac{51\text{kg}}{67\text{kg}} = 76\% \)

IBW
No growth chart
No previous growth points

• Weight for height
• BMI 50% and calculate expected weight
• Weight at which lost period
• Get creative
  – Look at old pictures – proportional, stocky, lanky?
  – Look at family build
What weight do we want for a teen to achieve?
Previously tracking height = 85%
Brother’s height = 85%

Previously tracking height = 85%
Brother’s height = 85%

Expected height = 85%

Previously tracking height = 85%
Brother’s height = 85%
Expected height = 85%
Previously tracking height = 85%

Previously tracking weight = 85%
Brother’s height = 85%

Expected height = 85%

Previously tracking height = 85%

Expected weight = 85% = 57 kg

Previously tracking weight = 85%
Brother’s height = 85%

Expected height = 85%

Previously tracking height = 85%

Expected weight = 85% = 57 kg

Current weight = 42 kg
Expected weight = 85% = 57 kg

Current weight = 42 kg

Percentage: 42kg/57kg = 74% IBW
PW (IBW) = 57kg is currently at 74%
Sam’s Growth chart

Progress Weight: 63kg
Actual weight: 50.4kg

%PW = 80%
Sam comes back to your office two months later after fainting in class for the second time this week.
1. What is your approach to this development?
2. What would your assessment now include?
Results

Ht: 166 cm
Wt: 44.1 kg
BMI: 16.0
%PW: 70%

BP supine: 103/70  HR 45
BP standing: 90/61  HR 82
Oral temp: 36.2 C
### Results of Investigations

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>129</td>
<td>135 - 175</td>
</tr>
<tr>
<td>MCV</td>
<td>75</td>
<td>80 - 100</td>
</tr>
<tr>
<td>WBC</td>
<td>3.9</td>
<td>4.0 - 11.0</td>
</tr>
<tr>
<td>Abs neutrophils</td>
<td>2.2</td>
<td>2.0 - 7.5</td>
</tr>
<tr>
<td>Platelets</td>
<td>140</td>
<td>150 - 400</td>
</tr>
<tr>
<td>Sodium</td>
<td>133</td>
<td>135 - 145</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.0</td>
<td>3.5 – 5.2</td>
</tr>
<tr>
<td>Chloride</td>
<td>104</td>
<td>98 - 108</td>
</tr>
<tr>
<td>Creatinine</td>
<td>121</td>
<td>67 - 117</td>
</tr>
<tr>
<td>Urea</td>
<td>8.8</td>
<td>2.7 – 8.4</td>
</tr>
<tr>
<td>Glucose</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>2.39</td>
<td>2.15 - 2.60</td>
</tr>
<tr>
<td>Phosphate</td>
<td>1.19</td>
<td>0.90 – 1.65</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.86</td>
<td>0.70 – 1.00</td>
</tr>
<tr>
<td>Total protein</td>
<td>54</td>
<td>60 – 80 g/L</td>
</tr>
<tr>
<td>Albumin</td>
<td>30</td>
<td>35 - 55 g/L</td>
</tr>
<tr>
<td>AST</td>
<td>19</td>
<td>(&lt; 35)</td>
</tr>
<tr>
<td>ALT</td>
<td>11</td>
<td>(&lt; 50)</td>
</tr>
<tr>
<td>TSH</td>
<td>0.78</td>
<td>0.47 - 3.41</td>
</tr>
<tr>
<td>ESR</td>
<td>2</td>
<td>2 - 30</td>
</tr>
<tr>
<td>Urine dip negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celiac screen</td>
<td>historically negative</td>
<td></td>
</tr>
</tbody>
</table>

**ECG** - sinus bradycardia 43 bpm
QTc 460
What is your next step?
Criteria for hospitalization

• Acute medical stabilization

• < 75% BMI for age, sex, and Ht (or < 75% PW)
• Hypoglycemia < 2.5 mmol/L
• Electrolyte disturbance
  – Hypokalemia
  – Hyponatremia
  – Hypophosphatemia/Hypomagnesemia
  – Metabolic acidosis/alkalosis
ECG abnormalities

- Prolonged QTc > 450
- Bradycardia < 45
- Other arrhythmias (other than sinus bradycardia)
Hemodynamic instability

- Bradycardia < 45 bpm
- Hypotension < 80/50 mmHg
  - If HR < 50 or sBP < 90 – repeat manually
- Hypothermia (core body temp < 35.6°C)
- Orthostatic changes
  - BP and HR supine and standing
  - Increase in HR > 30 bpm
  - Decrease in BP > 20mmHg (systolic) or 10mmHg (diastolic)
Acute medical complications of malnutrition

• Syncope
• Seizures
• Cardiac failure
• Liver failure
• Renal failure/severe dehydration
• Pancreatitis
Other

- Refeeding syndrome
  - Marked edema
  - Hypophosphatemia
- Severe depression
- Pregnancy
- Poor response to outpatient treatment
  - Unreliable follow-up
Results

Ht: 166 cm
Wt: 44.1 kg
BMI: 16.0
%PW: 70%

BP supine: 103/70  HR 45
BP standing: 90/61  HR 82
Oral temp: 36.2 C
Results of Investigations

**Hemoglobin** 129 (135-175)
**MCV** 75 (80-100)
**WBC** 3.9 (4.0-11.0)
Abs neutrophils 2.2 (2.0 – 7.5)
**Platelets** 140 (150-400)

**Sodium** 133 (135-145)
**Potassium** 3.0 (3.5 – 5.2)
Chloride 104 (98-108)
Creatinine 121 (67-117)
Urea 8.9 (2.7 – 8.4)
Glucose 3.8

**Calcium** 2.39 (2.15-2.60)
Phosphate 1.19 (0.90 – 1.65)
Magnesium 0.86 (0.70 – 1.00)
**Total protein** 54 (60 – 80 g/L)
**Albumin** 30 (35-55 g/L)

**AST** 19 (< 35)
**ALT** 11 (< 50)
**TSH** 0.78 (0.47- 3.41)
**ESR** 2 (2-30)
Urine dip negative
Celiac screen historically negative

**ECG** – sinus bradycardia **43 bpm**
**QTc** 460
Goals of admission

• Safely refeed the patient
• Avoid re-feeding syndrome caused by too rapid feeding
• Avoid underfeeding by too cautious rates of feeding
• Manage behavioural problems (multidisciplinary)
• Manage family concerns
• Arrange appropriate discharge/transfer plan for patient
• Restore medical stability
• Achieve safer BMI
• Stabilize body weight
• Reduce acute purging or other eating disorder behaviours
• Develop appropriate eating behaviour for medical stability in community
AED Eating Disorders A Guide to Medical Care
Prognosis: met analysis

- Mortality: SMR 12
- Recovery: 46.9%
- Improvement: 33.5%
- Continuing problem: 20.8%

- Hannah Koestler. London

N=5590 in 119 patient studies The British Journal of Psychiatry (2009)
NEDIC www.nedic.ca

• National Eating Disorder Information Centre

University Health Network
Toronto, Canada.

• Toll Free  1-866-633-4220
• Toronto    416-340-4156
Sheena’s Place

Support for eating disorders

• 87 Spadina Road,
  Toronto M5R 2T1
• Spadina subway station
• Tel (416) 927 8900
• Fax (416) 927 8844

• www.sheenasplace.org
FEAST

• Families Empowered And Supporting Treatment of Eating Disorders

• An international organization of and for caregivers to reduce the suffering caused by eating disorders

• Promote research education and evidence based treatment

• www.feast-ed.org
CMHA

• CMHA Eating Disorders
  – https://cmha.ca/mental-health/understanding-mental-illness/eating-disorders/
Learning Objectives

At the end of this presentation you should be able to

• Describe the features of eating disorders presenting in adolescence in the context of set point theory

• Develop a therapeutic approach to managing eating disorders in family practice settings

• Recognize the red flags that may require hospitalization or specialist intervention
THE FINAL WORD

I don't like your fashion business mister
And I don't like these drugs that keep you thin
I don't like what happened to my sister
First we take Manhattan, then we take Berlin