Managing Pediatric Obesity in Primary Care

Erica Ting, MD - Med-Peds PGY4
28 April 2021 CUHCC RSS
objectives

1. Understand the pathophysiology of obesity as a disease with biopsychosocial drivers
2. Develop a framework for evaluation and treatment of obesity in children and adolescents
3. Discuss how CUHCC can more effectively serve and support patients and families in managing excess weight
Obesity is becoming more prevalent in the U.S.
...not only in adults but also in kids

1999-2000

Overweight: 28.8%
BMI < 85th percentile: 91.7%

Class I obesity: 14.6%
Class II obesity: 4.0%

2015-2016

Overweight: 36.1%

BMI < 85th percentile: 38.5%

Class I obesity: 18.5%
Class II obesity: 6.0%
Class III obesity: 1.9%
667

(AT LEAST)

pediatric patients at CUHCC with obesity
Definitions

<table>
<thead>
<tr>
<th>BMI</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 85%ile</td>
<td>Overweight</td>
</tr>
<tr>
<td>≥ 95%ile</td>
<td>Obesity, Class I</td>
</tr>
<tr>
<td>≥ 120% of 95%ile</td>
<td>Obesity, Class II</td>
</tr>
<tr>
<td>≥ 140% of 95%ile</td>
<td>Obesity, Class III</td>
</tr>
</tbody>
</table>

BMI = \( \frac{\text{weight (kg)}}{\text{height (m)}^2} \)
Her body is BEAUTIFUL—strong, kind and wise.
obesity is a disease
Obesity is defined as a chronic, progressive, relapsing, and treatable multi-factorial, neurobehavioral disease, wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical, and psychosocial health consequences.
...so what’s the cause?
“Set point” theory

social drivers of obesity in childhood

- Food advertising aimed at children
- Large portion sizes
- Over consumption of sugar sweetened beverages
- Declines in overall physical activity, both before and after school hours
- Decreased physical education and recess time at school
- Increased frequency of eating away from home
- Community environments that inhibit active living
- Increased screen time
- Increased availability of low-cost, high calorie, refined grains, and added sugars
Drivers of Appetite and Energy Balance

Social

CNS

Peripheral

Environment and lifestyle

- Taste & Smell Palatability
- Cost/Reward Optimization
- Availability
- Clock
- Cues & Social Habits

"Cognitive & Emotional Brain"

"Metabolic Brain"

Energy In
Internal Millieu Nutrient Sensing
Nutrient Partitioning
Energy Out

Individual predisposition/"Wiring"

Genetic
Epigenetic
Imprinted
Early life events
Biological drivers of appetite and energy balance

- GABA
- LEPTIN
- DOPA
- INSULIN
- GLP-1
- GHRELIN
- ADIPONECTIN
Congenital leptin deficiency

- Early-onset obesity with hyperphagia
- Giving leptin normalizes energy intake
- No effect on metabolic rate

Fig. 1. Effects of recombinant human leptin treatment in leptin deficiency.

Farooqi and O’Rahilly, 2006
Genetic drivers

Monogenic obesity syndromes
- POMC/MC4R mutation
- Congenital leptin deficiency

Metabolic stress in mothers gets passed down to fetuses

Prader-Willi Syndrome

Obesogen exposure

Zheng and Berthoud, 2008
CNS drivers

Food Intake

- Cognitive
- Hedonic
- Homeostatic

I need to eat.

I want to eat.

Should I eat?
What should I eat?

I need to eat.
Drivers of Appetite and Energy Balance

Peripheral + CNS + Social

Lifestyle change
Pharmacotherapy
Bariatric/Metabolic Surgery
evaluating & treating
Tasks

1. Identify high-risk BMI and assess health
2. Assess readiness for treatment
3. Provide resources to support lifestyle change and family goals for physiological and psychological wellness
4. Prevent increasing BMI and health risk
178% of the 95%ile Class 3 obesity
Talking to families

1. Ask permission
2. Use preferred terms
3. Avoid blame
4. Focus on health (not weight or appearance)
5. Seek to understand

Faircloth et al., 2019
Red flags

- Abnormal linear growth
- Developmental delay

Endocrine evaluation

- Early-onset obesity (<5yo)

Genetic evaluation

- Signs/symptoms of eating disorder
  - Severe body image issues
  - Binge eating

Eating disorder referral

Styne et al., 2017; Cuda, 2020
Screen for comorbidities

- Weight, height, BMI
- Hypertension
- Insulin resistance/diabetes
  - Acanthosis nigricans
  - A1c/glucose tolerance
- Hormonal dysregulation/PCOS
  - Hirsutism/acne
  - Free/total TST, SHBG
- Increased ICP/IIH
  - Fundoscopic exam

- Musculoskeletal dysfunction
  - Scoliosis
  - Blount’s
  - SCFE
  - Gross motor delay
- NAFLD
  - ALT
- Dyslipidemia
  - Fasting lipids
- OSA
- Mental health disorders

Styne et al., 2017
Current routines

- Activity/Active play
  - Difficult? Fun?
- Screen time
- Sleep
- Body image
- Family role modeling

- Feeding
  - What?
  - How much?
  - How often?
  - Where?
  - Why?
- Food insecurity
Live Well Pledge

Today, I will try to feed myself when I am hungry.
Today, I will try to be attentive to how foods taste and make me feel.
Today, I will try to choose foods that I like and that make me feel good.
Today, I will try to honor my body’s signals of fullness.
Today, I will try to find an enjoyable way to move my body.
Today, I will try to look kindly at my body and to treat it with love and respect.

Signature: ___________________________ Date: ___________________

An excerpt from *Health at EVERY Size* by Linda Bacon, PhD

www.HAESbook.com
Yes, I did it!

I will do it

I can do it

I'll try to do it

How do I do it?

I want to do it

I can't do it

I won't do it

Which step have you reached today?
Prevention Plus
- BMI < 85th percentile or < 95th percentile with no health risk factors
- Basic Healthy Behaviors

Structured Weight Management
- BMI > 95th percentile or ≥ 85th percentile with health risk factors
- Monthly visits working on behavior change and MI
- Dietician evaluation

Comprehensive Multidisciplinary Intervention
- Structured intervention at more frequent intervals (weekly for 8-12 weeks) by team experienced with care of children affected by obesity
- Family involvement, supervised activity
- Negative energy balance through diet and exercise
- May include medication management, meal replacements

Tertiary Care Intervention
- Tertiary care center with designed protocol
- May include meal replacements, weight loss medications
- May include weight loss surgery
Endocrine Society guidelines

- Fast foods
- Added table sugar
- Sugar-sweetened beverages
- High-fructose corn syrup
- High-fat/sodium/processed foods
- Saturated fat intake
- Nonacademic screen time to 1-2h/day

- Family-centered changes
- Whole fruits (no juice)
- ≥ 20 min/day mod-vigorous activity
- Promote self-esteem
- Start medications if lifestyle changes unsuccessful
- Stop medications after 12-week therapeutic trial if ineffective
Prevention Plus
- BMI <85th percentile or < 95th percentile with no health risk factors
- Basic Healthy Behaviors

Structured Weight Management
- BMI > 95th percentile or ≥ 85th percentile with health risk factors
- Monthly visits working on behavior change and MI
- Dietician evaluation

Comprehensive Multidisciplinary Intervention
- Structured intervention at more frequent intervals (weekly for 8-12 weeks) by team experienced with care of children affected by obesity
- Family involvement, supervised activity
- Negative energy balance through diet and exercise
- May include medication management, meal replacements

Tertiary Care Intervention
- Tertiary care center with designed protocol
- May include meal replacements, weight loss medications
- May include weight loss surgery
Assessment to guide advanced therapies in patients 10+ yo

**Hunger**
- Food seeking/sneaking
- Timing in relation to food

**Satiety**
- Fullness
- Vomiting

**Hedonic eating**
- Emotional eating
- Cravings

**Binge eating**
- Loss of control, guilt

**Behavioral strategies**
- Restriction
- Distraction
- Response

**Iatrogenic**
- Medications

---

GLP-1, phentermine

GLP-1, topiramate

topiramate, naltrexone

Lisdexamfetamine, topiramate

topiramate

Metformin, topiramate

Sweeney, 2021; Fox et al, 2019
# FDA-approved for weight loss in pediatrics

<table>
<thead>
<tr>
<th>Drug</th>
<th>Age for Obesity</th>
<th>Age for T2DM</th>
<th>Dosage &amp; Titration</th>
<th>Side Effects</th>
<th>Price (340B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phentermine</strong></td>
<td>16+</td>
<td>10+</td>
<td>15-37.5mg qAM OR 8mg bid-tid</td>
<td>Limited data on BMI reduction, Increased HR/BP, palpitations, ischemic events, valvular disease, restlessness, insomnia, potential abuse/dependence</td>
<td>~$20-$25</td>
</tr>
<tr>
<td><strong>Liraglutide</strong></td>
<td>12+</td>
<td></td>
<td>0.6mg qD SQ, titrate weekly by 0.6mg to max 3mg/day</td>
<td>5% BMI reduction, Increased HR, GI side effects</td>
<td>~$15/box</td>
</tr>
<tr>
<td><strong>Orlistat (Alli)</strong></td>
<td>12+</td>
<td></td>
<td>120mg tid ONLY AC 80mg tid ONLY AC Alli (80% effective)</td>
<td>2.5% BMI reduction, Oily spotting; flatus with discharge, GI symptoms resolve after 4 weeks, Risk for malabsorption of ADEK</td>
<td>~$15</td>
</tr>
</tbody>
</table>

Fox and Kelly, 2021
# Off-label use of medications

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Atypical antipsychotic-associated weight gain</td>
<td>Metformin (10+ for prediabetes) Topiramate (2+ for seizures)</td>
</tr>
<tr>
<td>02</td>
<td>Comorbid seizures, migraines, mood lability</td>
<td>Topiramate</td>
</tr>
<tr>
<td>03</td>
<td>Combination pills for adults that have no data in peds</td>
<td>Phentermine/topiramate (Qsymia) Naltrexone/bupropion (Contrave)</td>
</tr>
</tbody>
</table>

Fox and Kelly, 2021
Medication follow-up

- Monthly visits for 3 months
  - Side effects (CV, BP, HR)
  - BMI effect
    - If increasing, discontinue
    - If not fully effective, consider dose titration or addition of other medications
- Always in conjunction with ongoing lifestyle changes, interdisciplinary team support
Individual experience will vary

15mg/day produced 2-5% BMI reduction at 6 months

Retrospective chart review at the UMN Peds Weight Management Clinic

---

Ryder et al., 2017
12yo F with BMI 40 due to strong hunger, FHx, limited physical activity, some binge eating

Started phentermine 15mg daily

Started 1400kcal flex meal plan + PT

Repeat cardiac echo: no change in LV mass

-20 mos:
- Change in BMI – 29.6%
- Change in weight – 40 lbs
- Phentermine decreased to 15 mg QOD

Fox and Kelly, 2021
Pediatric weight management in the Twin Cities

University of Minnesota (+ Surgery)
Allina Health
Hennepin Health
Children’s St. Paul
weight management at CUHCC
Is CUHCC an inclusive environment?

- Appropriate furniture
- Accessible exam tables
- Assistive devices
- Split toilet seat - specimen collectors with handles
- Inclusive reading materials
- Scales in private areas
- Right-sized medical equipment
- Welcoming staff
- Non-stigmatizing language
How do we currently support kids with overweight and obesity?

What opportunities are there to provide more effective care?
Favorite resources?

Free fruits and vegetables!
- Waite House, Brian Coyle Center
UConn Rudd Center
APA - How to talk to kids about weight and health
Move and Thrive - videos for teens for movement and mindfulness
references

- Fox, C. K., & Kelly, A. S. (2021). Anti-Obesity Medications “101” (pp. 1–74). Presented at the Advanced Therapies for Pediatric Obesity, Minneapolis, MN.
- Jastreboff, A. (2021). Obesity pathophysiology (pp. 1–29). Presented at the Advanced Therapies for Pediatric Obesity, Minneapolis, MN.
references

- Sweeney, B. (2021). Assessment of the pediatric patient with obesity (pp. 1–30). Presented at the Advanced Therapies for Pediatric Obesity, Minneapolis, MN.