Treating Severe Obesity in Children: Non-Surgical Approaches

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National Academies of Sciences
Workshop - Roundtable on Obesity Solutions
April 6, 2017
No Disclosures or Conflicts of Interest
It was the best of times
It was the worst of times
Severe Obesity in Childhood

Identification
Assessment
Treatment
Obese
BMI ≥ 95<sup>th</sup> Percentile

Overweight
85<sup>th</sup> to <95<sup>th</sup> Percentile

Severely Obese
BMI ≥ 99<sup>th</sup> Percentile
CDC BMI (2000) growth chart, girls aged 2 to 20 years.

Gulati A K et al. Pediatrics 2012;130:1136-1140
<table>
<thead>
<tr>
<th>Class 2 Obesity</th>
<th>Adult</th>
<th>Pediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI = / &gt; 35 but &lt; 40</td>
<td>&gt; 120% of the 95&lt;sup&gt;th&lt;/sup&gt; percentile for age and sex (used in place of the 99&lt;sup&gt;th&lt;/sup&gt; percentile)</td>
<td>Recommended by the AHA</td>
</tr>
</tbody>
</table>

| Class 3 Obesity | BMI = / > 40 | > 140% of the 95<sup>th</sup> percentile for age and sex | Recommended by Skinner et al |
Obesity BMI growth chart, girls aged 2 to 20 years.

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Severe Obesity in Childhood

Identification
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Severe Obesity in Childhood

Identification
Assessment
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Severe Obesity Comorbidities

- **Pulmonary**
  - Exercise Intolerance
  - Sleep Apnea
  - Asthma

- **GI**
  - Gallstones
  - GERD
  - Liver Disease

- **Renal**
  - Glomerulosclerosis

- **Musculoskeletal**
  - SCFE
  - Ankle Injuries
  - Tibia Vera
  - Flat Feet

- **Neurological**
  - Pseudotumor Cerebri

- **Cardiovascular**
  - High BP
  - High Lipids
  - Chronic Inflammation

- **Endocrine**
  - Insulin Resistance
  - Diabetes Type 2
  - Precocious Puberty
  - PCOS

- **Psychosocial**
  - Poor self-esteem
  - Depression
  - Stigmatization
Severe Obesity

Comorbidities

Neurological
Pseudotumor Cerebri

Cardiovascular
High BP
High Lipids
Chronic Inflammation

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Severe Obesity

**Comorbidities**
- Neurological: Pseudotumor Cerebri
- Cardiovascular: High BP, High Lipids, Chronic Inflammation
- Endocrine: Insulin Resistance, Diabetes Type 2, Precocious Puberty, PCOS
- Musculoskeletal: SCFE, Ankle Injuries, Tibia Vera, Flat Feet
- Pulmonary: Exercise Intolerance, Sleep Apnea, Asthma
- GI: Gallstones, GERD, Liver Disease
- Renal: Glomerulonephritis
- Psychosocial: Poor self-esteem, Depression, Stigmatization

Exercise Intolerance
Sleep Apnea
Asthma
Severe Obesity in Childhood – Genetics

Severe obesity resulting from single gene mutations (eg, congenital leptin deficiency) or defects in specific chromosomal regions (eg, Prader-Willi syndrome) are well described but is rare.

Melanocortin 4 Receptor Mutations

- Hyperphagia
- Accelerated linear growth
- ~6% in severe early onset obesity

Severe Obesity in Childhood

Identification
Assessment
Treatment
Severe Obesity in Childhood

Treatment

Stage 1  Prevention Plus
Stage 2  Structured Care
Stage 3  Multi-disciplinary
Stage 4  Tertiary Care
One size doesn’t fit all.

STAGE 3
Multidisciplinary Care for Pediatrics
Stage 3
Example of Components from MPOWER Program

- Behavior modification
- Food monitoring
- Goal setting
- Contingency management
- Negative energy balance
- Parental participation (particularly for <12 y/o)
- Systematic evaluation at baseline and specified intervals
- Experienced multidisciplinary team
- More than 26 contact hours

### The Self-Determination Theory

<table>
<thead>
<tr>
<th>Intrinsic Motivation</th>
<th>I’ll do it because I enjoy it and it is pleasurable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Regulation</td>
<td>I’ll do it because it is integrated with my values</td>
</tr>
<tr>
<td>Identified Regulation</td>
<td>I’ll do it because it is important to me</td>
</tr>
<tr>
<td>Introjected Regulation</td>
<td>I know I should do it and I feel ashamed if I don’t</td>
</tr>
<tr>
<td>External Regulation</td>
<td>I’ll do it because my mum will give me a reward</td>
</tr>
<tr>
<td>Amotivation</td>
<td>I’m just not exercising</td>
</tr>
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#### Theoretical Basis and Behavioral Component

- **e.g. Self-Determination Theory**
- **Social Cognitive Theory**
Motivational Interviewing and Dietary Counseling for Obesity in Primary Care: An RCT

Kenneth Resnicow, PhD; Fiona McMaster, PhD; Alison Bocian, MS; Donna Harris, MA; Yan Zhou, MS; Linda Snetselaar, PhD; Robert Schwartz, MD; Esther Myers, PhD, RDN; Jaquelin Bocle, MD; Jan Foster, MS, RD; Donna Hollinger, MS, RDN, LD; Karen Smith, MS, RDN, LD; Susan Woolford, MD, MPH; Dru Mueller, MS, RDN, LD; Richard C. Wasserman, MD, MPH

BACKGROUND AND OBJECTIVE: Few studies have tested the impact of motivational interviewing (MI) delivered by primary care providers on pediatric obesity. This study tested the efficacy of MI delivered by providers and registered dietitians (RDs) to parents of overweight children aged 2 through 8.

METHODS: Forty-two practices from the Pediatric Research in Office Settings Network of the American Academy of Pediatrics were randomly assigned to 1 of 3 groups. Group 1 (usual care) measured BMI percentile at baseline and 1- and 2-year follow-up. Group 2 (provider

Motivational Interviewing – A recent RCT in primary care offices demonstrated significant decreases in BMI percentile.
<table>
<thead>
<tr>
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<tr>
<td>1</td>
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Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI2) - Intervention
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<tr>
<td>1</td>
<td>X</td>
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<tr>
<td>2</td>
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<td>X 4 sessions</td>
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<td>X</td>
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<tr>
<td></td>
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<td>4 sessions</td>
<td>X 6 sessions</td>
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### Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI2) – Results

<table>
<thead>
<tr>
<th>Study Group</th>
<th>2 Year Difference in Mean BMI Percentile (SE)</th>
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<tr>
<td>Group 1 Usual Care</td>
<td>-1.8 (0.98)</td>
</tr>
<tr>
<td>n = 158</td>
<td></td>
</tr>
<tr>
<td>Group 2 PCP</td>
<td>-3.8 (0.96)</td>
</tr>
<tr>
<td>n = 145</td>
<td></td>
</tr>
<tr>
<td>Group 3 PCP &amp; Dietitian</td>
<td>-4.9 (0.99)</td>
</tr>
<tr>
<td>n = 154</td>
<td></td>
</tr>
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</table>
Delicious weight loss that lasts. See for yourself!

Stage 4 Nutrition Approaches
Liquid Diet
Stage 4 Medications
Orlistat (age 12+)
Phenteramine (age 16+)
Orlistat

Stage 4 Medications
Lipase inhibitor

Flatulence with steatorrhea
Fecal incontinence and diarrhea
Decreased absorption of vitamins A, D, E and K

- Adhere to recommended behavioral changes
- Physiological maturity in also a consideration
- BMI $\geq 35$ with severe comorbidities or $\geq 40$ with less severe comorbidities
- Pass psychosocial evaluation including decisional capacity and ability to give assent
- Greater weight loss but not appropriate for all severely obese children.
Multidisciplinary Treatment Challenges

- High attrition rates 27-73%
  - May be higher in minority populations & low-income families
  - Scheduling difficulties
  - Unmet needs/expectations
- Low reach
- Poor adherence
- Poor post-program weight loss maintenance
- High costs
- Poor reimbursement

Great Expectations:
The best of times
The Spring of Hope

Multidisciplinary Treatment Opportunities
• Trials of new medications
• Personalized care
• Better integration between primary and tertiary care
• Greater connections with community sectors
• Increased use and capability of technology in the treatment of severe obesity (for patients, parents, and providers)
Technology may improve…

- Integration of monitoring technology into EMR
- Tailoring to individual characteristics
- Incorporation of gamification
- Easy measurement of energy balance
- Remote monitoring
- Lower costs
You said you value an active life, healthy food choices will help you reach this goal.

Consider a fresh salad for lunch.

Technology
How to impact behavior between clinic visits

Great Expectations: The Winter of Despair
The Spring of Hope

Thank You

Questions