

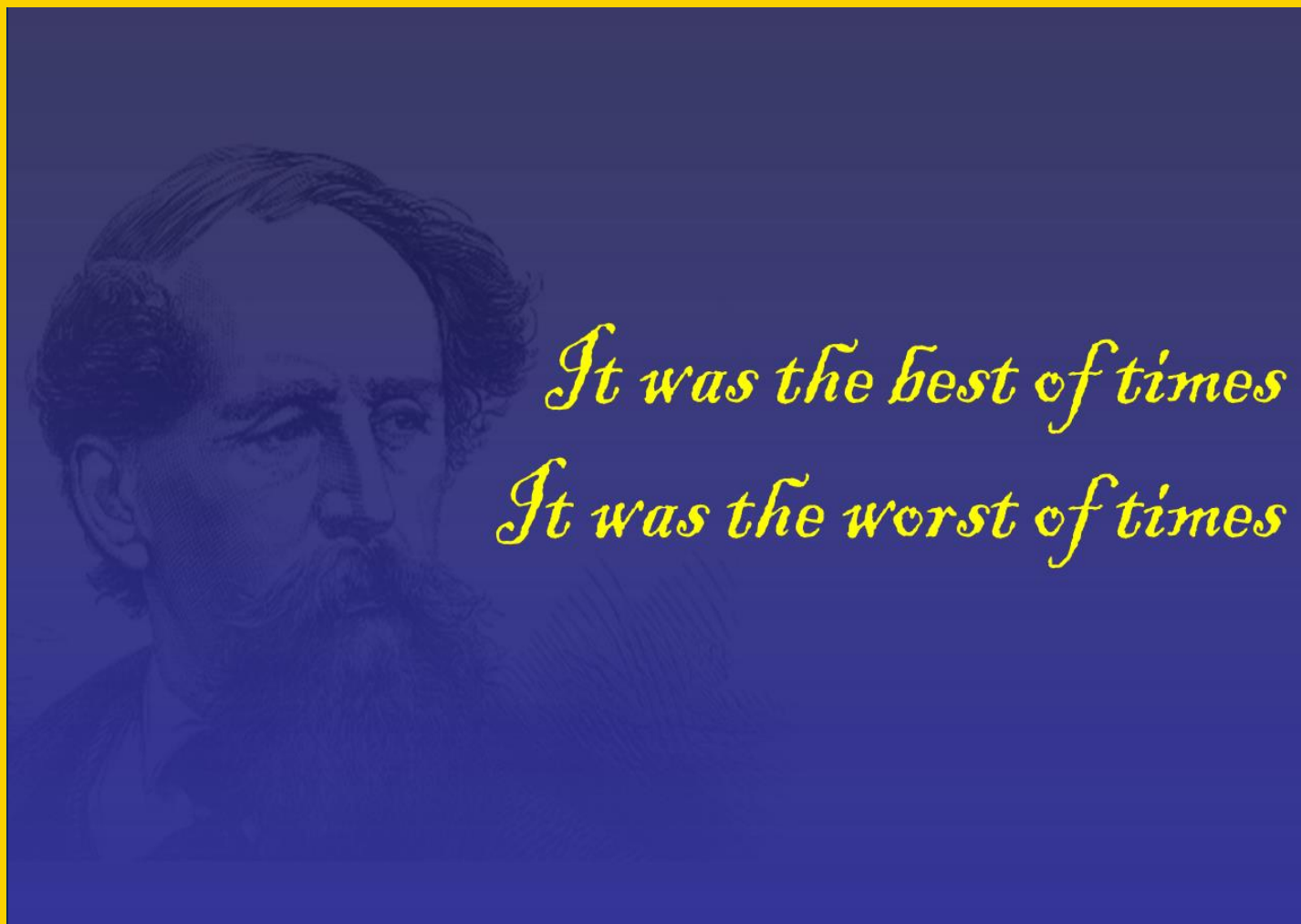


Treating Severe Obesity in Children: Non-Surgical Approaches



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National Academies of Sciences
Workshop - Roundtable on Obesity Solutions
April 6, 2017

No Disclosures or Conflicts of Interest



Identification

Assessment

Treatment

**Severe Obesity in
Childhood**

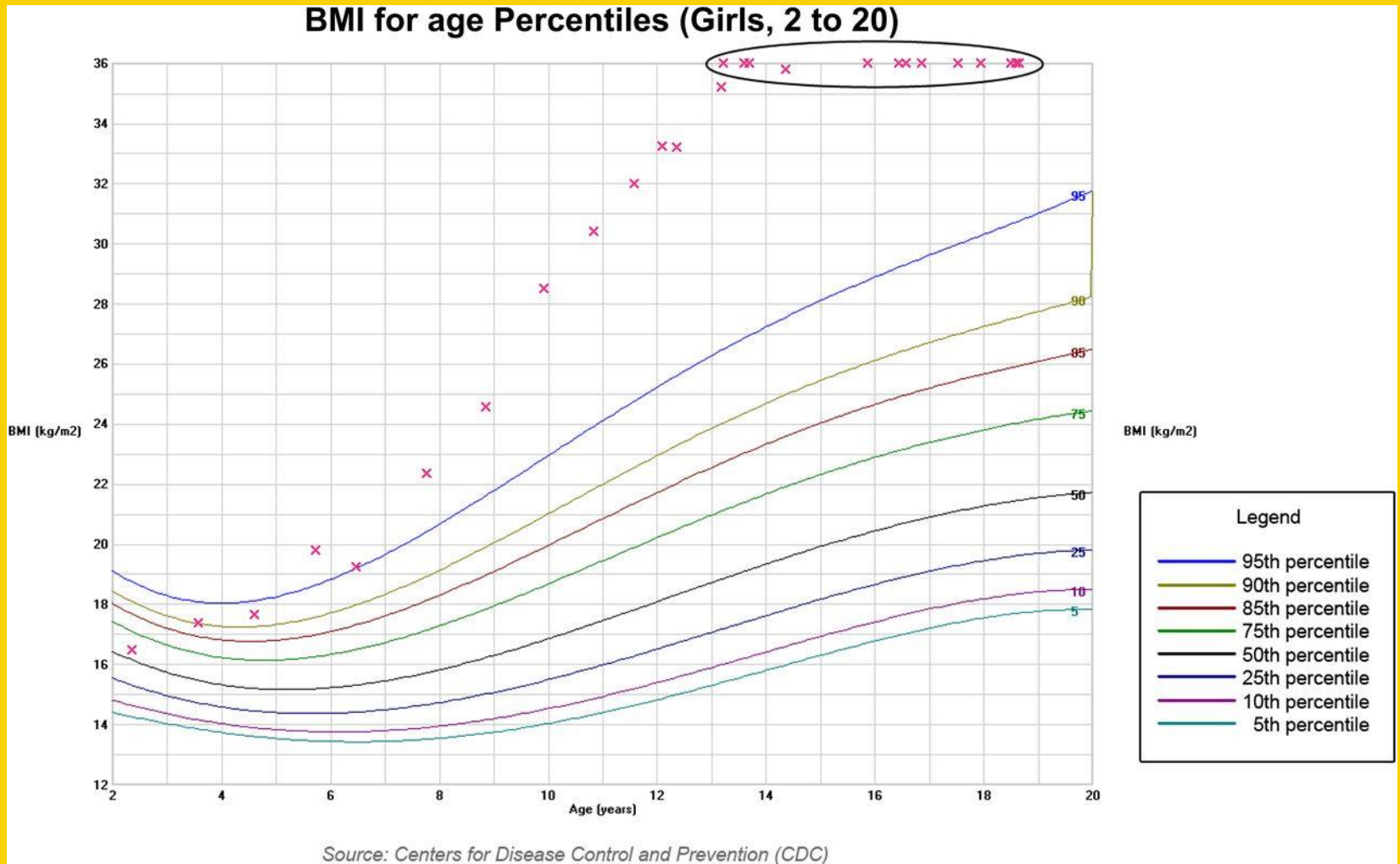
Identification

Assessment

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**Severe Obesity in
Childhood**

CDC BMI (2000) growth chart, girls aged 2 to 20 years.

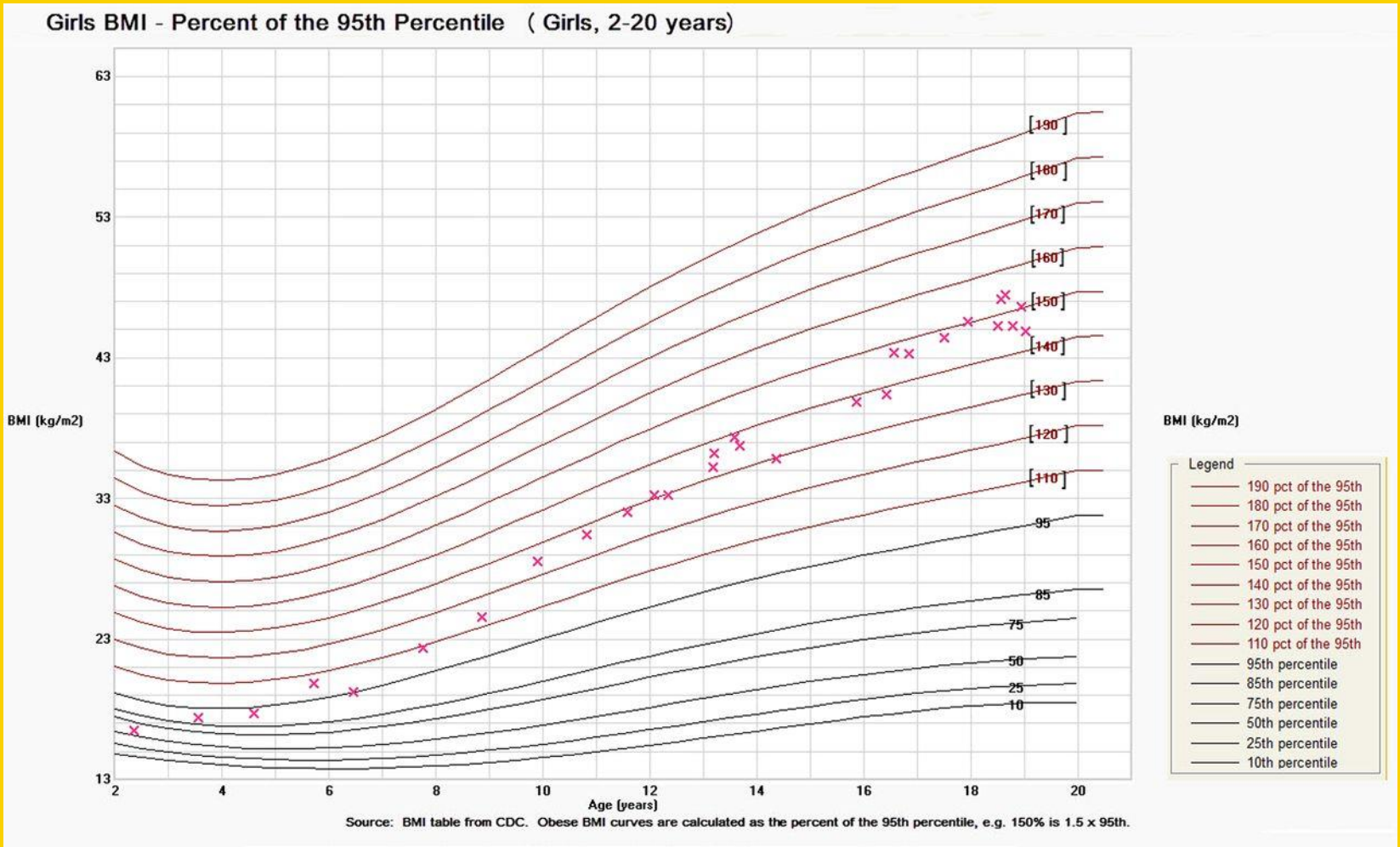


Gulati A K et al. Pediatrics 2012;130:1136-1140

	Adult	Pediatrics
Class 2 Obesity	BMI = / > 35 but < 40	> 120% of the 95 th percentile for age and sex (used in place of the 99 th percentile) Recommended by the AHA
Class 3 Obesity	BMI = / > 40	> 140% of the 95 th percentile for age and sex Recommended by Skinner et al

Childhood Obesity Classification of Severe Obesity

Obesity BMI growth chart, girls aged 2 to 20 years.



Gulati A K et al. Pediatrics 2012;130:1136-1140

Identification

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**Severe Obesity in
Childhood**

Identification

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**Severe Obesity in
Childhood**

Pulmonary

Exercise Intolerance
Sleep Apnea
Asthma

GI

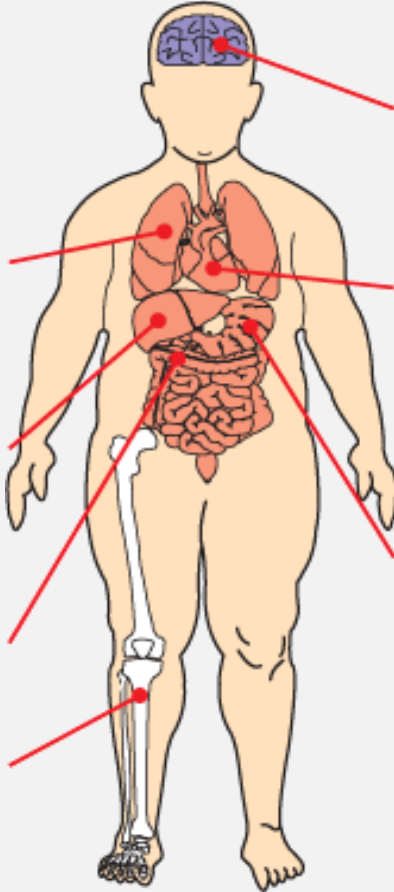
Gallstones
GERD
Liver Disease

Renal

Glomerulosclerosis

Musculo-skeletal

SCFE
Ankle Injuries
Tibia Vera
Flat Feet



Neurological

Pseudotumor
Cerebri

Cardio-vascular

High BP
High Lipids
Chronic
Inflammation

Endocrine

Insulin Resistance
Diabetes Type 2
Precocious
Puberty
PCOS

Psychosocial

Poor self-esteem
Depression
Stigmatization

Severe Obesity Comorbidities

Pulmonary

Exercise Intolerance
Sleep Apnea
Asthma

GI

Gallstones
GERD
Liver Disease

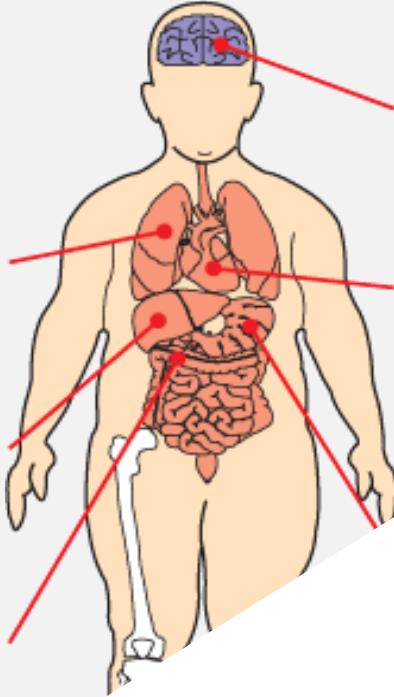
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Neurological

Pseudotumor Cerebri

Cardio-vascular

High BP
High Lipid
Chronic

Psychosocial

Poor self-esteem
Depression
Stigmatization



Pulmonary

Exercise Intolerance
Sleep Apnea
Asthma

GI

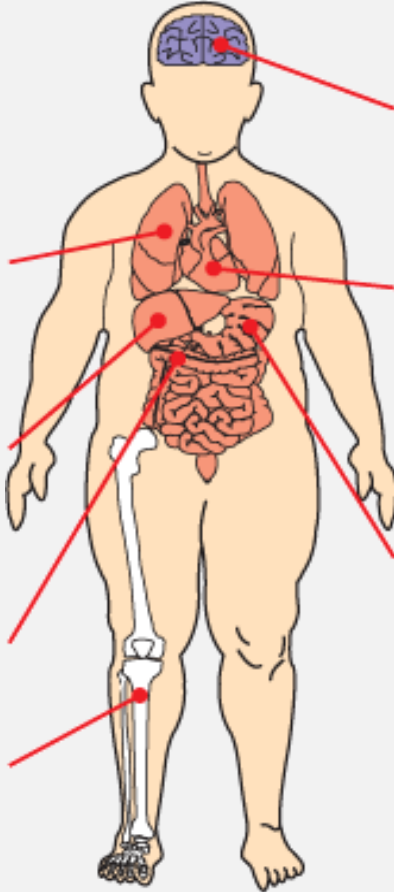
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Neurological

Pseudotumor Cerebri

Cardio-Vascular

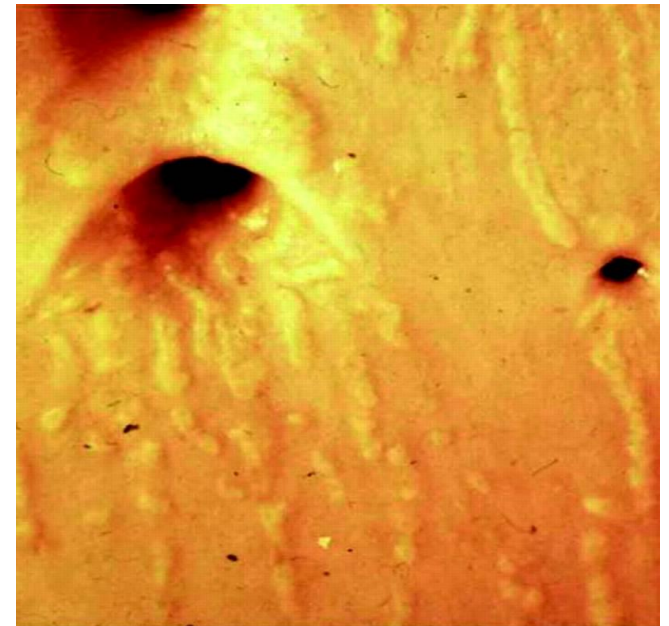
High BP
High Lipids
Chronic Inflammation

Endocrine

Insulin Resistance
Diabetes Type 2
Precocious Puberty
PCOS

Psychosocial

Poor self-esteem
Depression
Stigmatization



Pulmonary

Exercise Intolerance
Sleep Apnea
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GI

Gallstones
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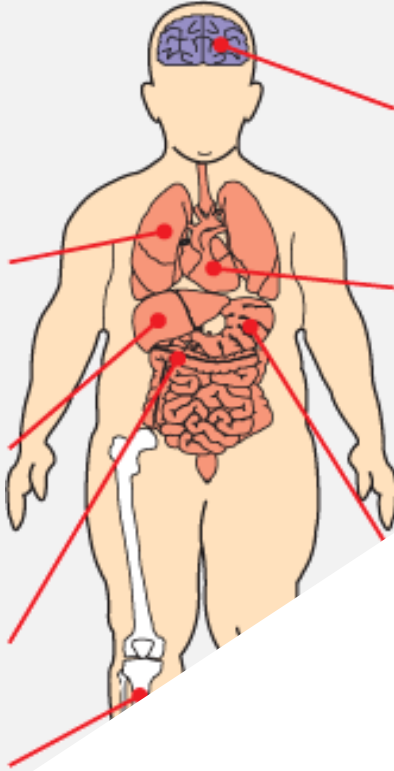
Renal

Glomerulosclerosis

Musculoskeletal

Tibia Vera

Flat Feet



Neurological

Pseudotumor Cerebri

Cardio-vascular

High BP
High Lipid
Chronic
Inf

Depression
Stigmatization



Pulmonary

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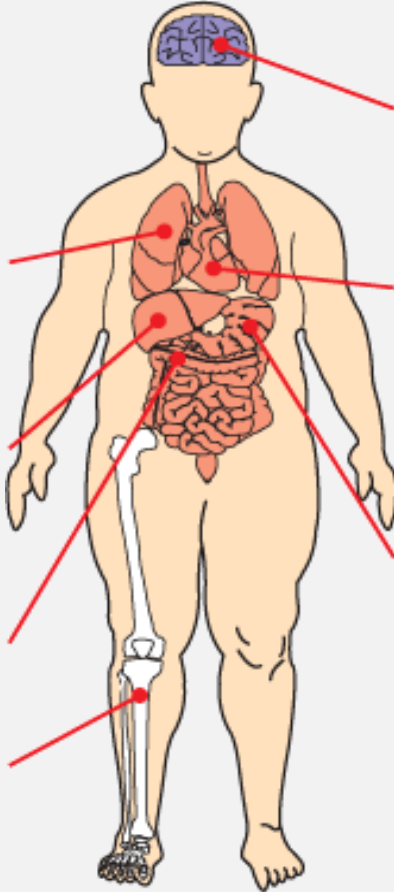
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Personality
Depression
Stigmatization



Melanocortin 4 Receptor Mutations

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

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.

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**Severe Obesity in
Childhood**

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**Severe Obesity in
Childhood**

Treatment

Stage

1

Prevention
Plus

Stage

2

Structured
Care

Stage

3

Multi-
disciplinary

Stage

4

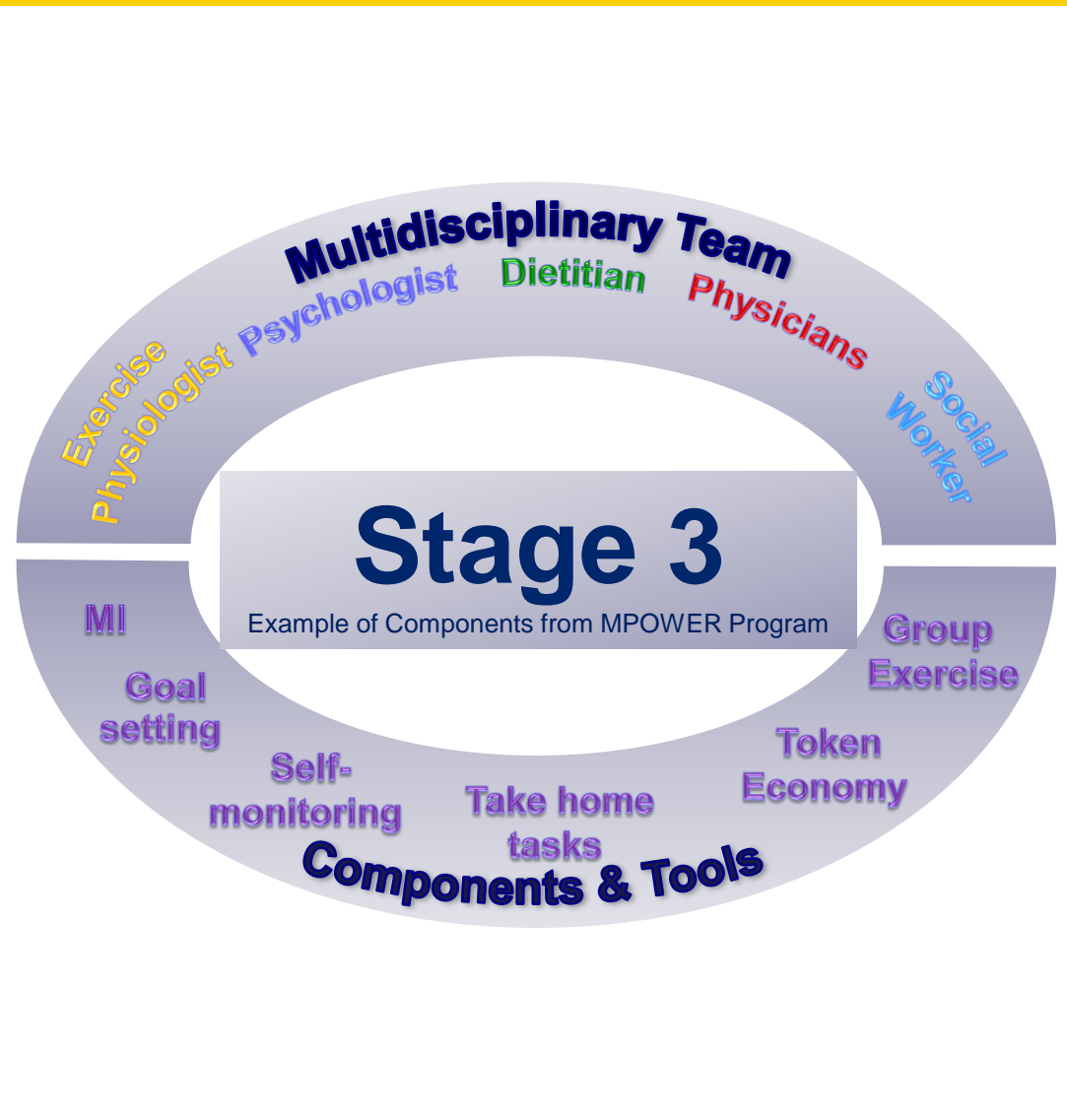
Tertiary
Care

**Severe Obesity in
Childhood**

One size *doesn't* fit all.




STAGE 3
Multidisciplinary
Care for Pediatrics





- 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


Intrinsic Motivation

I'll do it because I enjoy it and it is pleasurable 

Integrated Regulation I'll do it because it is integrated with my values 

Identified Regulation I'll do it because it is important to me 

Introjected Regulation I know I should do it and I feel ashamed if I don't 

External Regulation I'll do it because my mum will give me a reward 

I'm just not exercising 

Amotivation

**Theoretical Basis
and Behavioral
Component**
e.g. Self-Determination
Theory
Social Cognitive Theory

PEDIATRICS®

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Motivational Interviewing and Dietary Counseling for Obesity in Primary Care: An RCT

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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.

	Usual Care	MI (Pediatric Providers)	MI (RDs)
1			
2			
3			

Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI²) - Intervention

	Usual Care	MI (Pediatric Providers)	MI (RDs)
1	X		
2			
3			

Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI) - Intervention

	Usual Care	MI (Pediatric Providers)	MI (RDs)
1	X		
2		X 4 sessions	
3			

Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI²) - Intervention

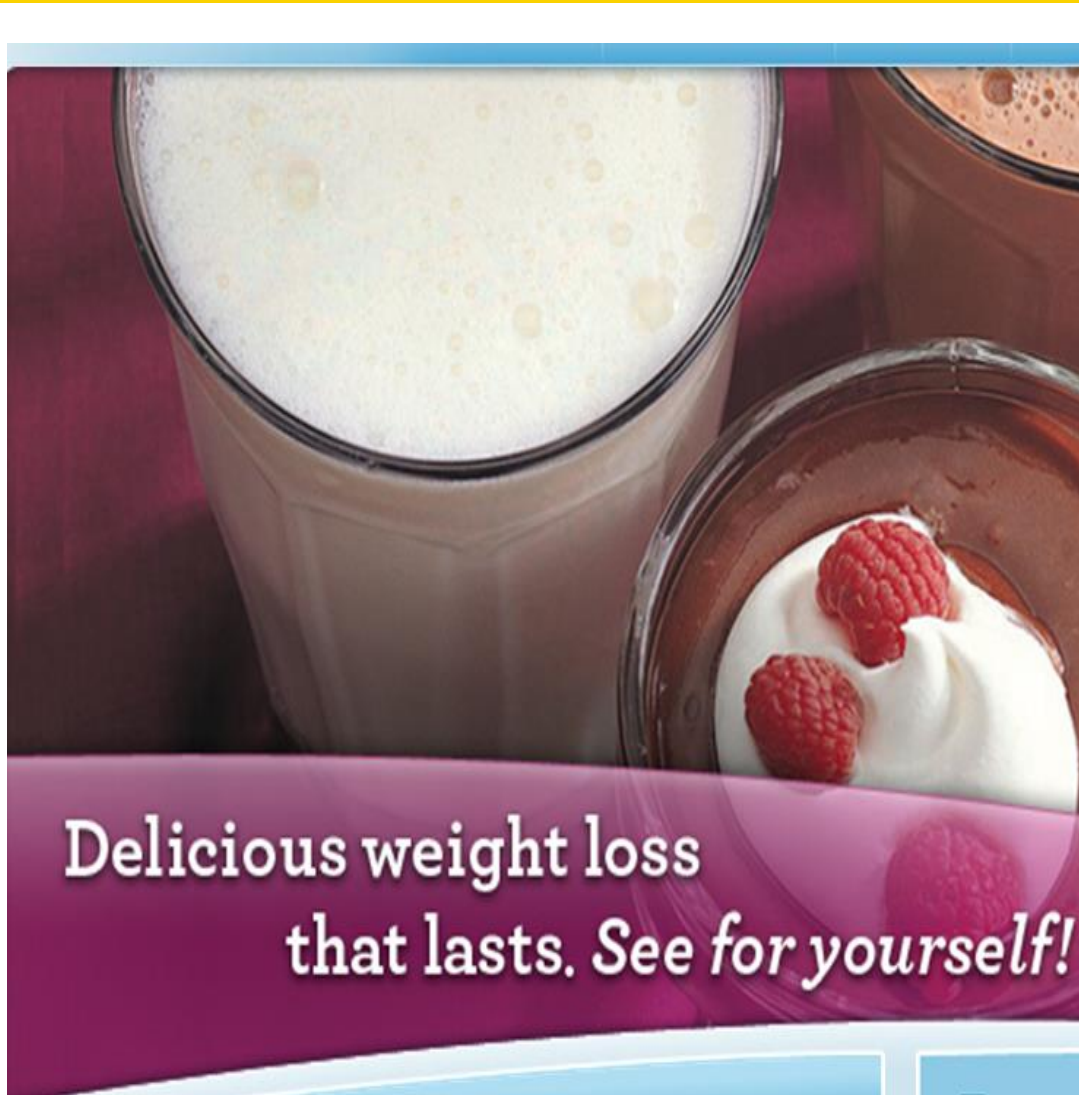
	Usual Care	MI (Pediatric Providers)	MI (RDs)
1	X		
2		X 4 sessions	
3		X 4 sessions	X 6 sessions

Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI²) - Intervention

Mean 2 Year BMI Percentile Change by Study Group

Study Group	2 Year Difference in Mean BMI Percentile (SE)
Group 1 Usual Care n = 158	- 1.8 (0.98)
Group 2 PCP n = 145	- 3.8 (0.96)
Group 3 PCP & Dietitian n = 154	- 4.9 (0.99)

Brief Motivational Interviewing (MI) to Reduce Body Mass Index (BMI2) – Results



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 is also a consideration
- BMI ≥ 35 with severe comorbidities or ≥ 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.

Stage 4 Bariatric Surgery



Great Expectations:
The worst of times
The Winter of Despair

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



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University of Michigan
C.S. Mott Children's Hospital

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email: peds-mpower@med.umich.edu
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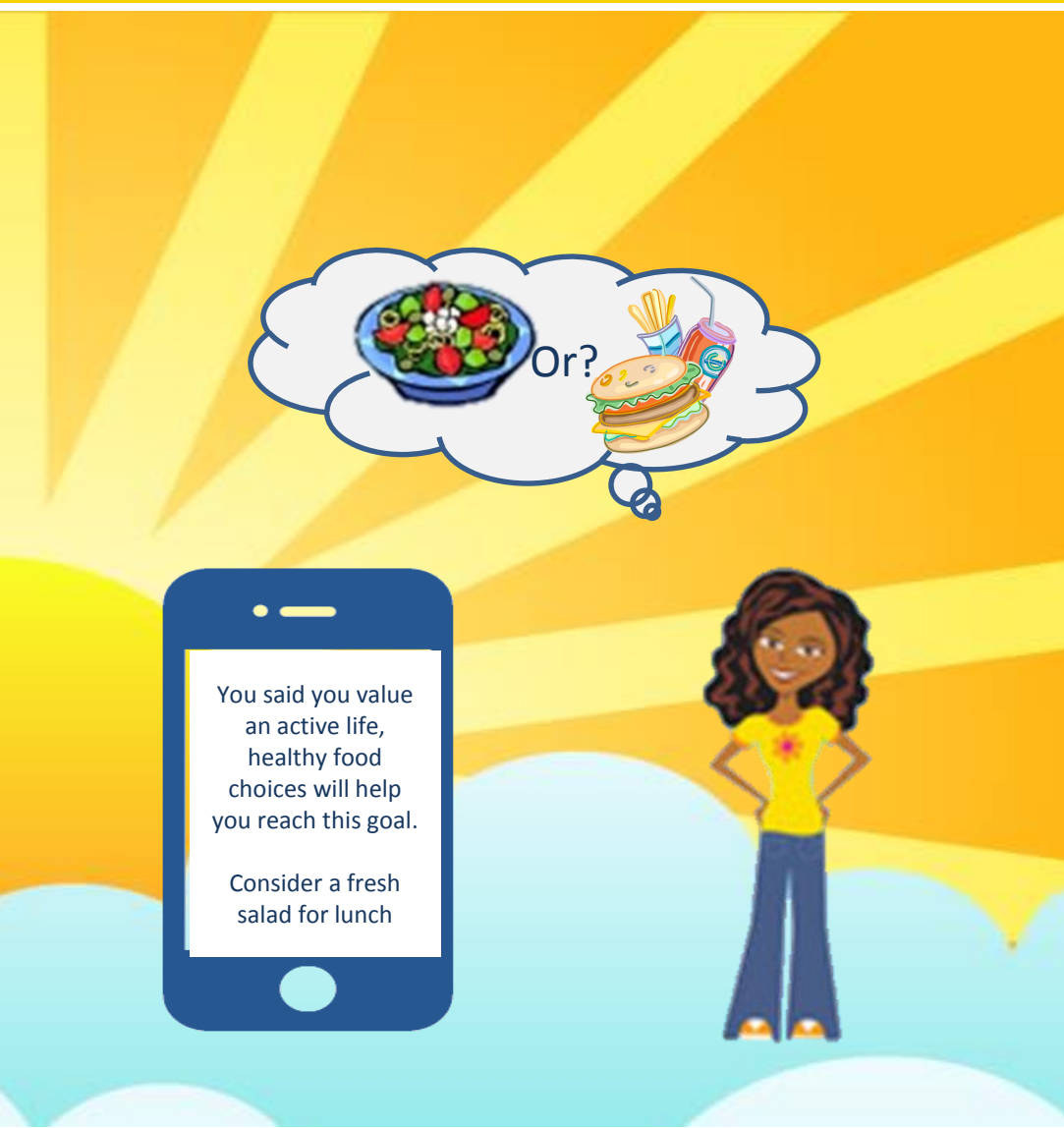


Featuring:
MPOWER Programs
Weight Loss Surgery

Technology

How to impact behavior between clinic visits

Okorodudu DE, et al. Innovative interventions to promote behavioral change in overweight or obese individuals: A review of the literature. *Ann Med.* 2015 May;47(3):179-85.



Technology

How to impact behavior between clinic visits



Great Expectations:

The Winter of Despair

The Spring of Hope

Thank You

Questions