



NEW PEDIATRIC OBESITY GUIDELINES: POTENTIAL BENEFITS AND HARMS



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Pediatric Days

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DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIP(S) WITH INELIGIBLE COMPANIES

- Clinical Trial Investigator and Advisory Board Member for Rhythm Pharmaceuticals

REFERENCES TO OFF-LABEL USAGE(S) OF PHARMACEUTICALS OR INSTRUMENTS

- Nothing to disclose

All relevant financial relationships have been mitigated.

LEARNING OBJECTIVES

1. Review the latest American Academy of Pediatrics guidelines for treatment of pediatric obesity
2. Outline the rationale for proactive approach in management of pediatric obesity
3. Describe the importance and limitations of intensive health behavior lifestyle treatment in managing pediatric obesity
4. Outline safety and efficacy of pharmacotherapy and bariatric surgery for pediatric obesity

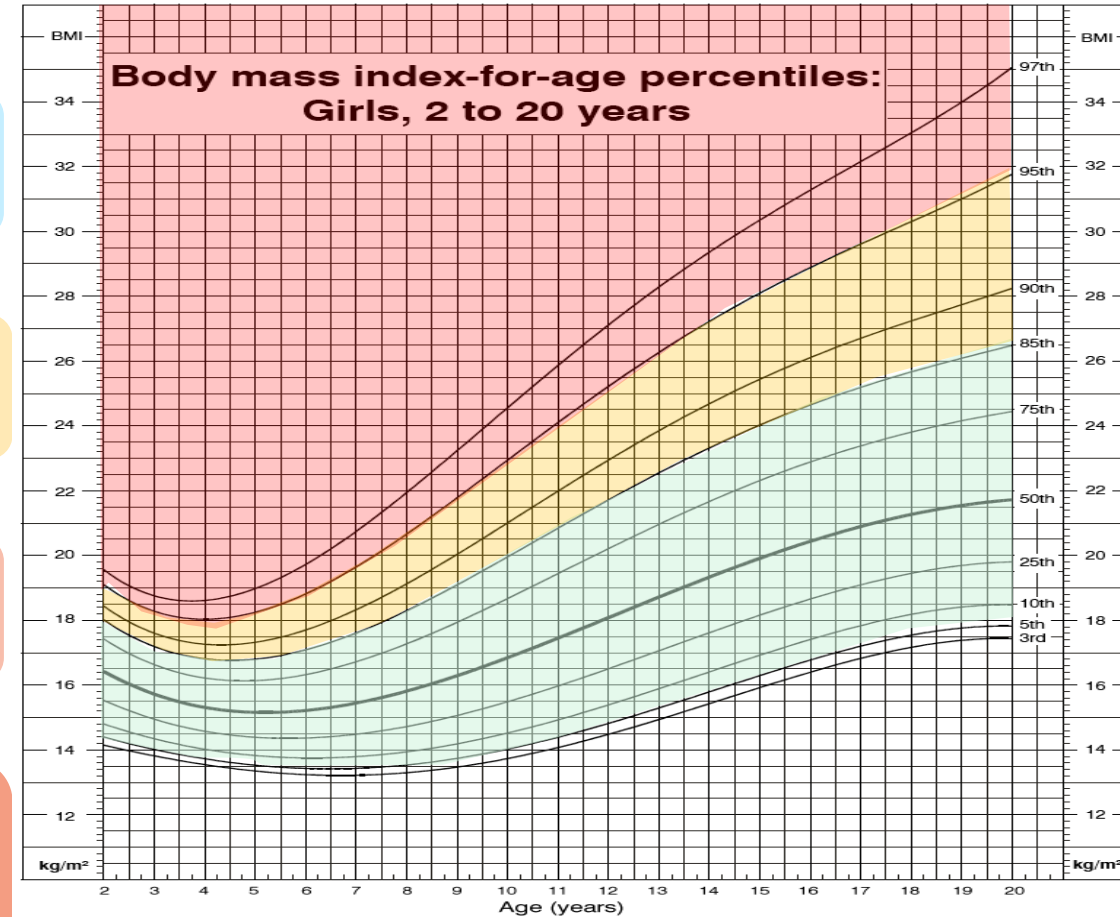
DEFINITION OF PEDIATRIC OVERWEIGHT AND OBESITY

BMI for children 2 years of age and older

Overweight ≥ 85 th percentile to < 95 th percentile

Obesity ≥ 95 th percentile for age and gender

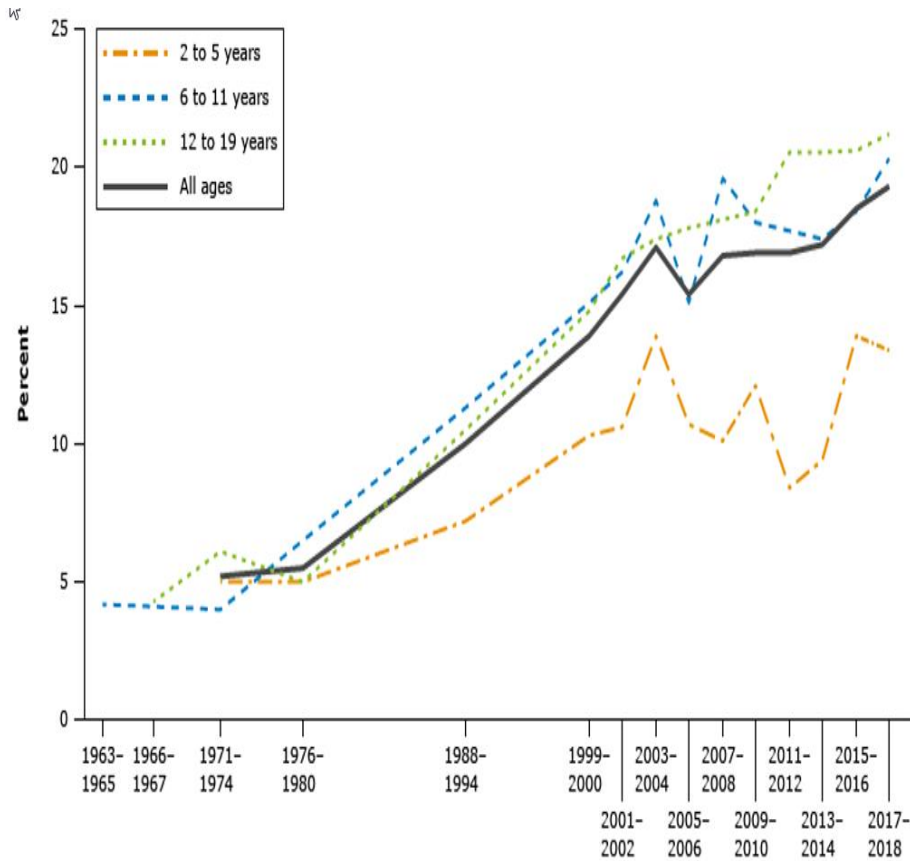
Severe obesity $\geq 120\%$ of the 95th percentile for age and gender or $\geq 35 \text{ kg/m}^2$, whichever is lower



SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



PREVALENCE OF CHILDHOOD OBESITY



Overall prevalence 2-19 years of age 19.7%,
6.1% have severe obesity

12.9% among 2- to 5-year-olds
22.8% among 6- to 11-year-olds
22.1% among 12–19-year-olds

26.2% among Mexican American children
24.8% among non-Hispanic Black children
16.6% among non-Hispanic White children

<https://www.cdc.gov/nchs/data/hestat/obesity-child-17-18/obesity-child.htm>

Hu K, Staiano AE. JAMA Pediatr. 2022;176(10):1037–1039

CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care

American Academy
of Pediatrics



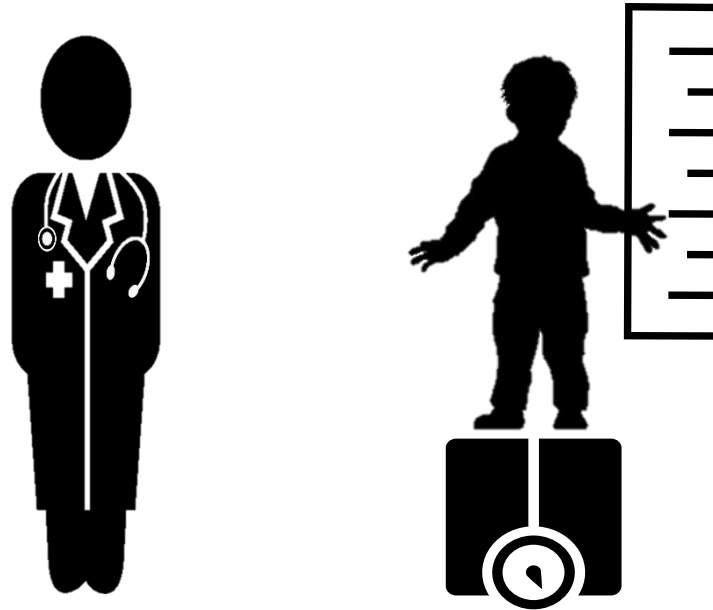
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Executive Summary: Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity

Sarah E. Hampl, MD, FAAP,^a Sandra G. Hassink, MD, FAAP,^b Asheley C. Skinner, PhD,^c Sarah C. Armstrong, MD, FAAP,^d Sarah E. Barlow, MD, MPH, FAAP,^e Christopher F. Bolling, MD, FAAP,^f Kimberly C. Avila Edwards, MD, FAAP,^g Ihuoma Eneli, MD, MS, FAAP,^h Robin Hamre, MPH,ⁱ Madeline M. Joseph, MD, FAAP,^j Doug Lunsford, MEd,^k Eneida Mendonca, MD, PhD, FAAP,^l Marc P. Michalsky, MD, MBA, FAAP,^m Nazrat Mirza, MD, ScD, FAAP,ⁿ Eduardo R. Ochoa, Jr, MD, FAAP,^o Mona Sharifi, MD, MPH, FAAP,^p Amanda E. Staiano, PhD, MPP,^q Ashley E. Weedn, MD, MPH, FAAP,^r Susan K. Flinn, MA,^s Jeanne Lindros, MPH,^t Kymika Okechukwu, MPA^u

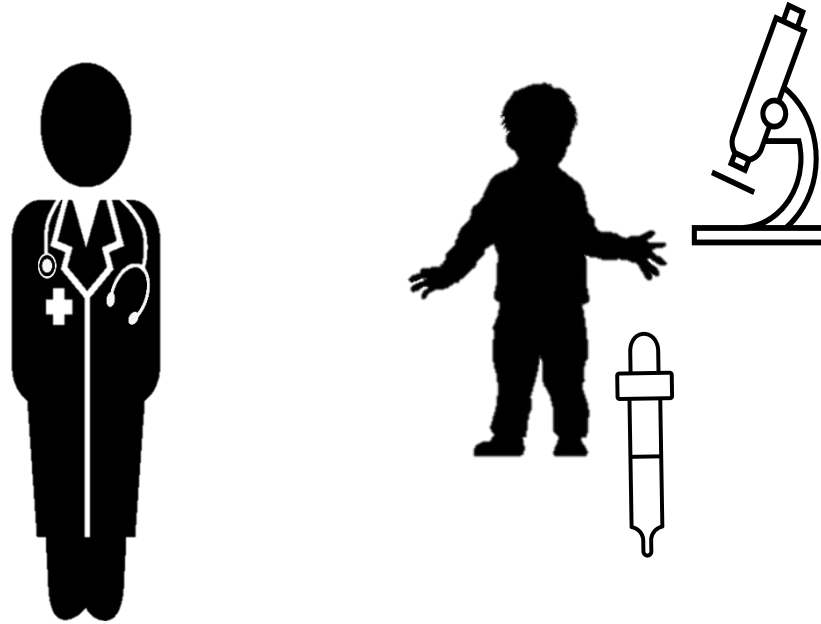
Hampl SE, et al. Pediatrics. 2023;151(2):e2022060641

DIAGNOSIS, MEASUREMENT AND EVALUATION



Primary health care providers should measure height and weight, calculate BMI, and assess BMI percentile at least annually in children 2-18 years of age

DIAGNOSIS, MEASUREMENT AND EVALUATION



Comprehensive patient history, mental and behavioral health screening, social determinants of health evaluation

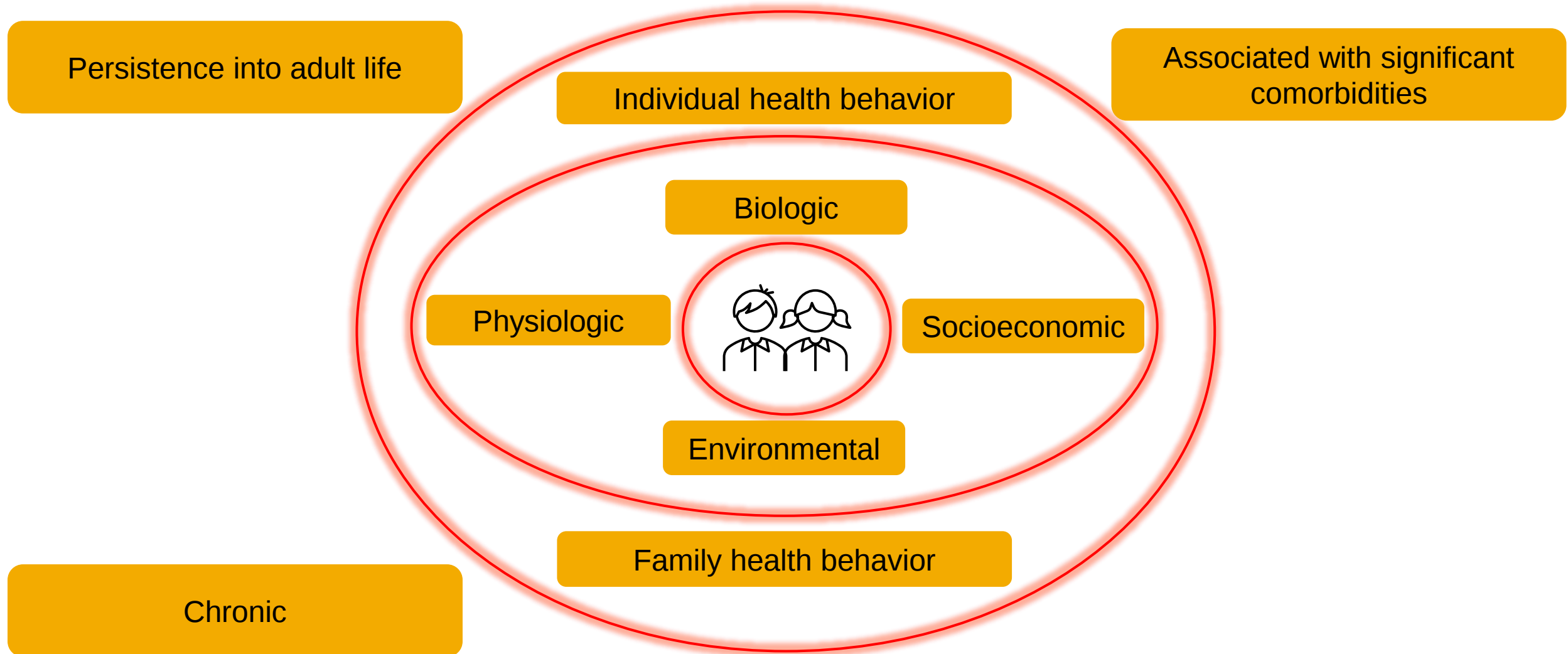
Physical examination for endocrine and genetic causes of weight gain

Evaluation for obesity related comorbidities

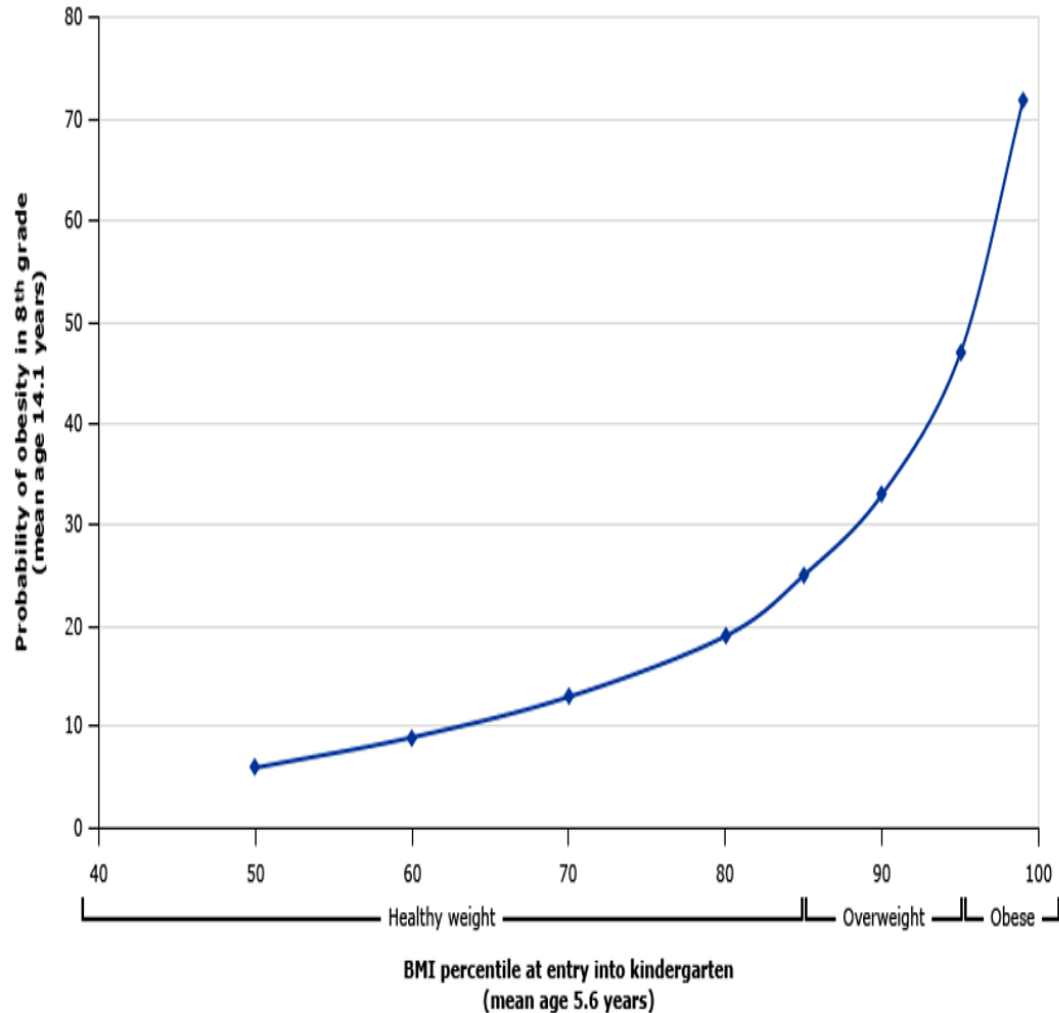
TREATMENT OF CHILDREN WITH OVERWEIGHT AND OBESITY

- Perform initial and longitudinal assessment of **individual, structural, and contextual risk factors** to provide individualized and tailored treatment
- Follow the principles of the medical home and the chronic care model, using a **family-centered and nonstigmatizing approach that acknowledges obesity's biologic, social, and structural drivers**
- **Motivational interviewing** to engage patients and families in treating overweight and obesity

OBESITY IS A COMPLEX AND PERSISTENT DISEASE



TRACKING OF OBESITY DURING CHILDHOOD AND PERSISTENCE IN ADULT LIFE

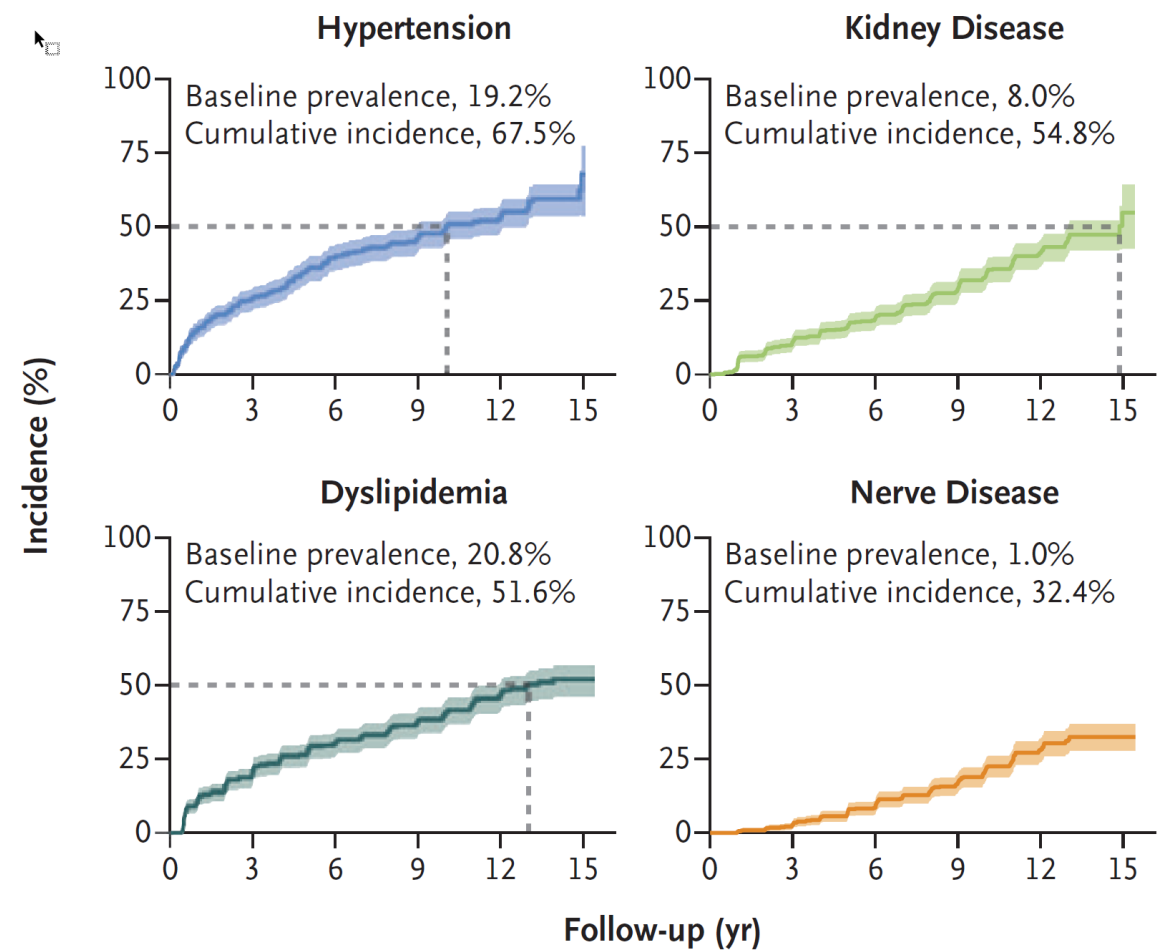


Cunningham SA et al. N Engl J Med 2014; 370:403.

- 82% of individuals who were obese as children (age 11.4 ± 4.0 years) remained obese as adults at follow-up approximately 23 years later
- Simulation models predict that almost 60% today's children will have obesity at the age of 35 years

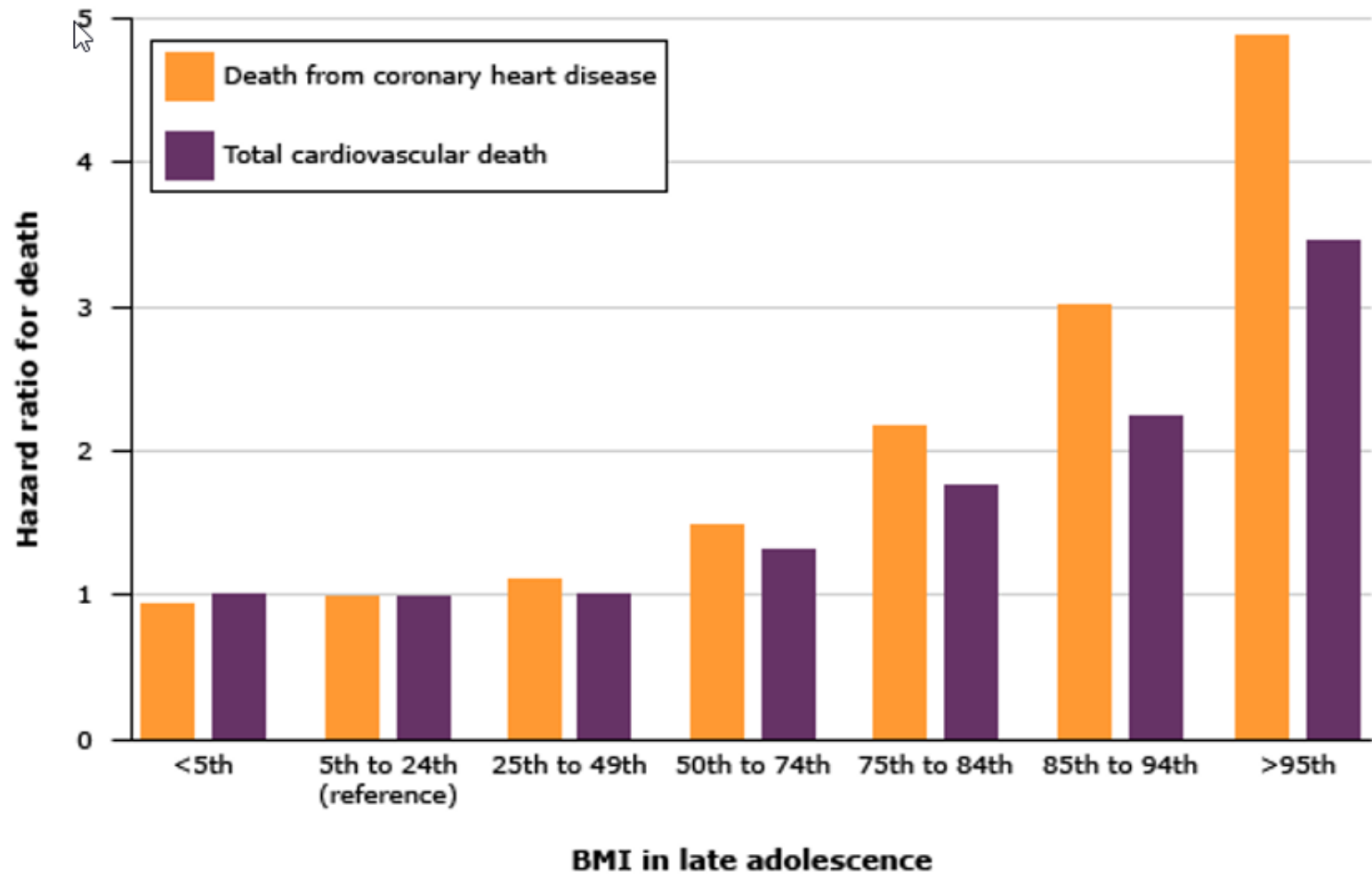
Juonala M et al. N Engl J Med. 2011 Nov;365(20):1876-85.
Ward JZ et al. N Engl J Med. 2017;377(22):2145.

LONG-TERM COMPLICATIONS IN YOUTH-ONSET T2DM



TODAY Study Group, N Engl J Med. 2021 Jul 29;385(5):416-426

BMI IN ADOLESCENCE PREDICTS ADULT CARDIOVASCULAR MORTALITY



Twig G et al. N Engl J Med 2016; 374:2430.

CASE #1

8-year-old female

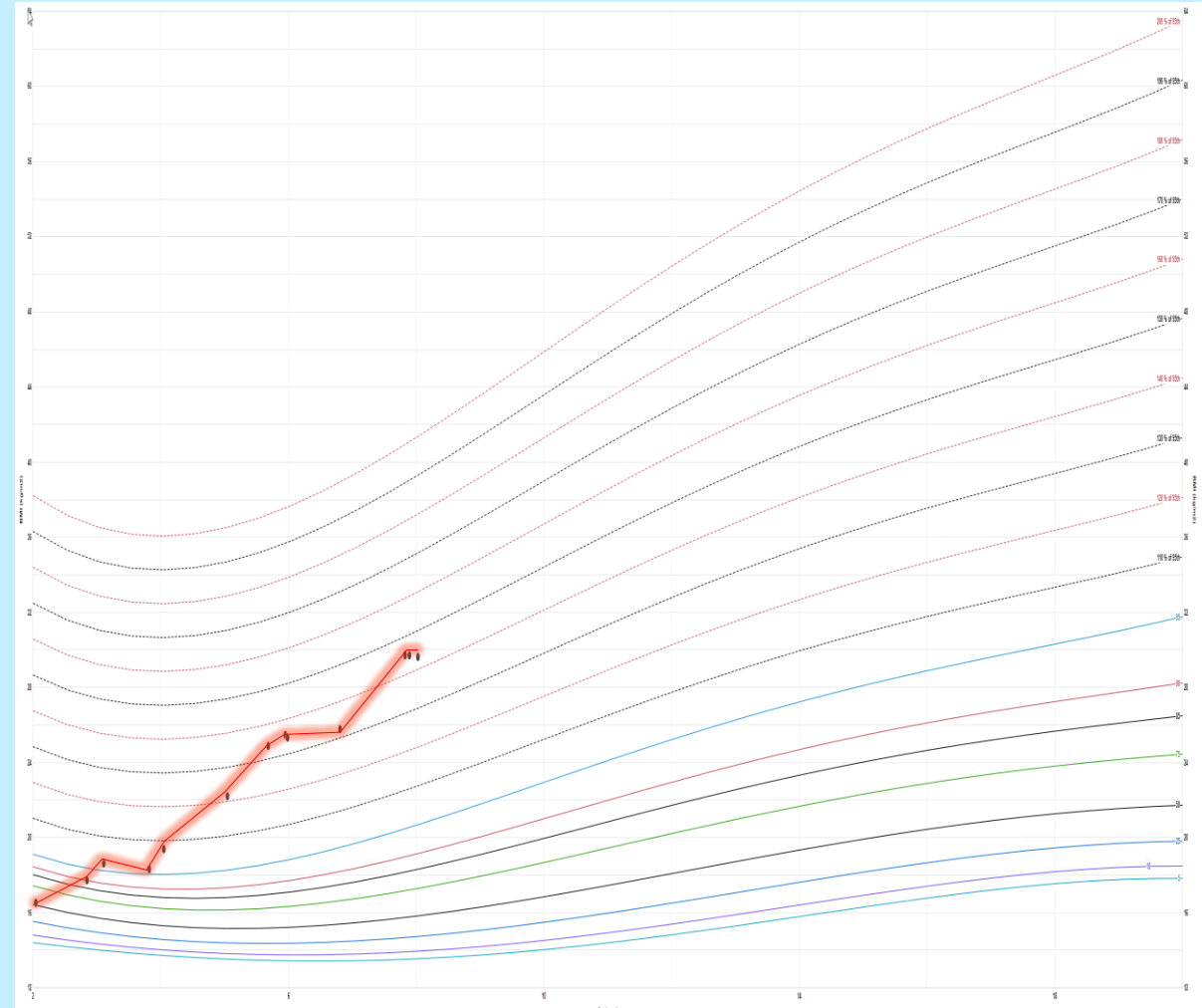
Chief complaint: weight gain since 5 years of age ADHD

Currently at peak weight of 44.6 kg

BMI 29.6 kg/m²
(143% percent of the 95th percentile)

Physical examination: acanthosis nigricans

Labs: fasting blood glucose 98, A1C 5.6%,
ALT 20

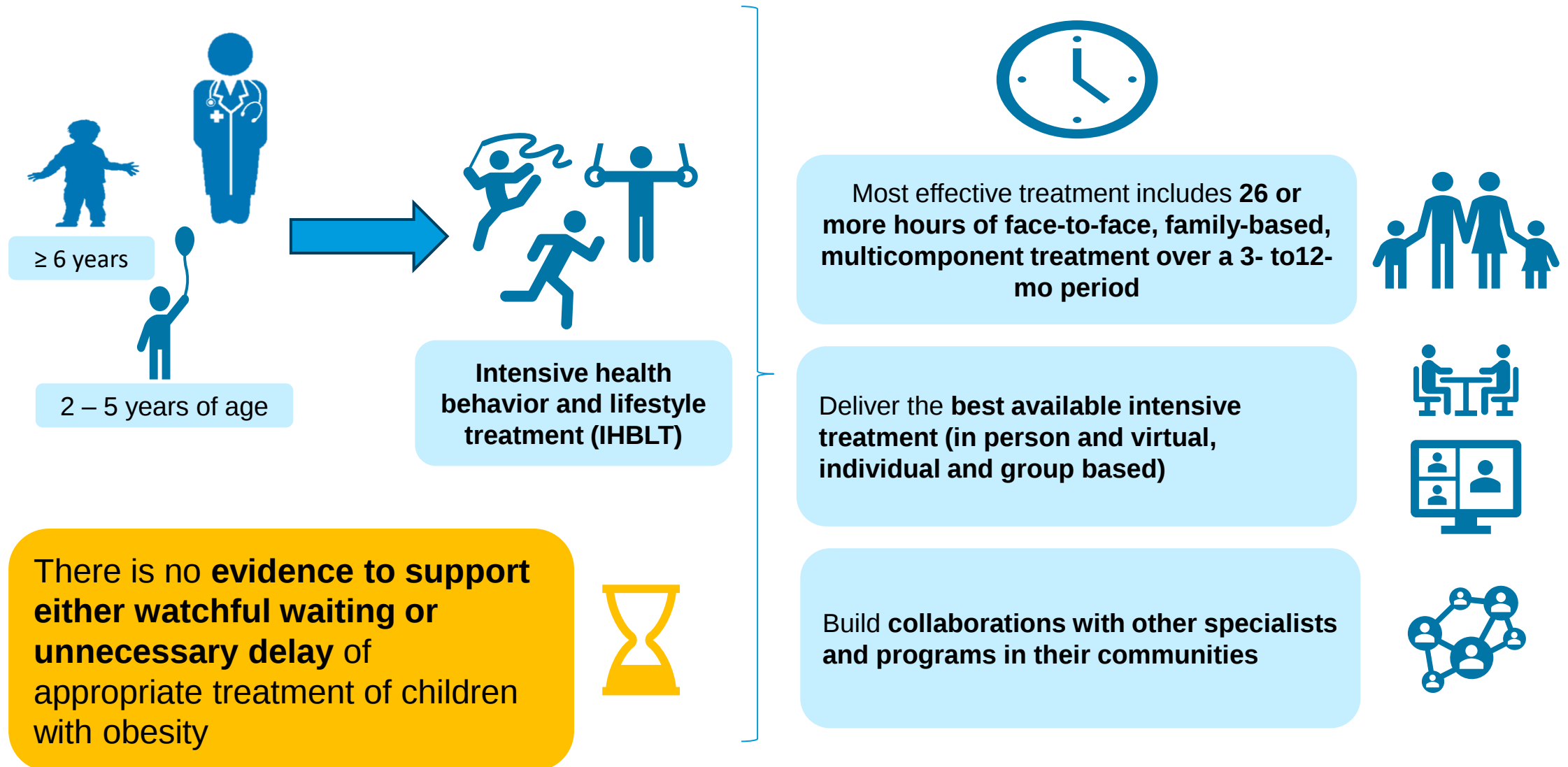


CASE #1

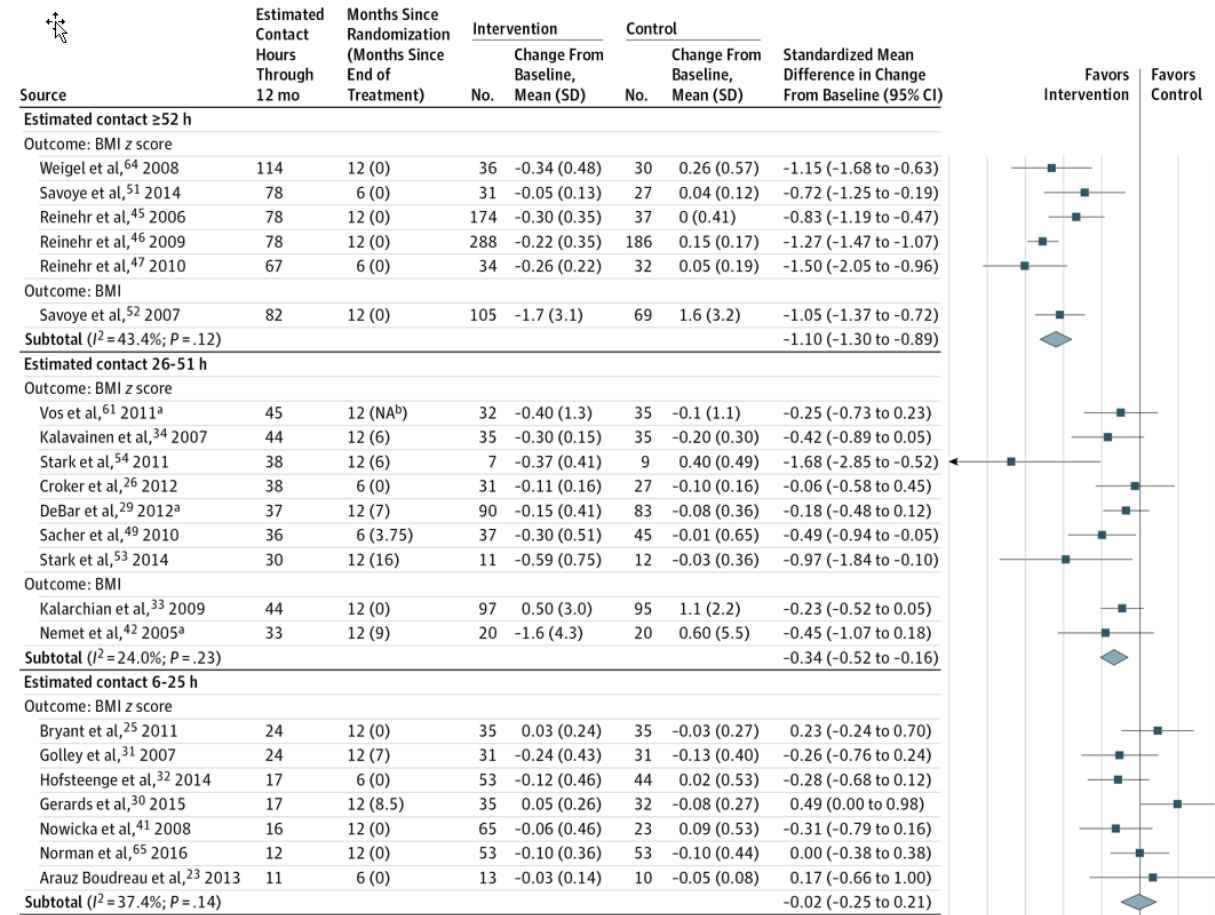
What is the next best step ?

- 1) Very low-calorie diet
- 2) Semaglutide
- 3) Laparoscopic sleeve gastrectomy
- 4) Intensive health behavior and lifestyle treatment

INTENSIVE LIFESTYLE MODIFICATIONS



SYSTEMATIC REVIEW FOR THE US PREVENTIVE SERVICES TASK FORCE

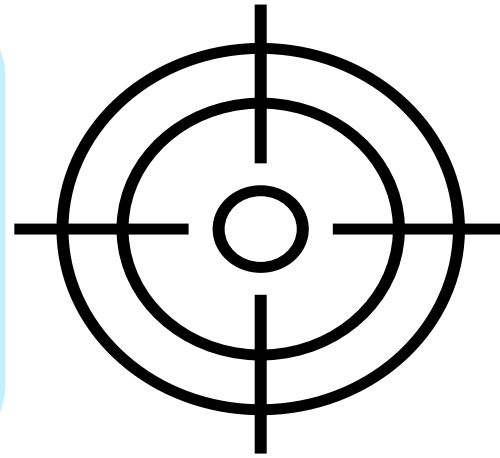


O'Connor et al. JAMA. 2017;317(23):2427-2444.

GOALS OF TREATMENT

Decrease excess body fat

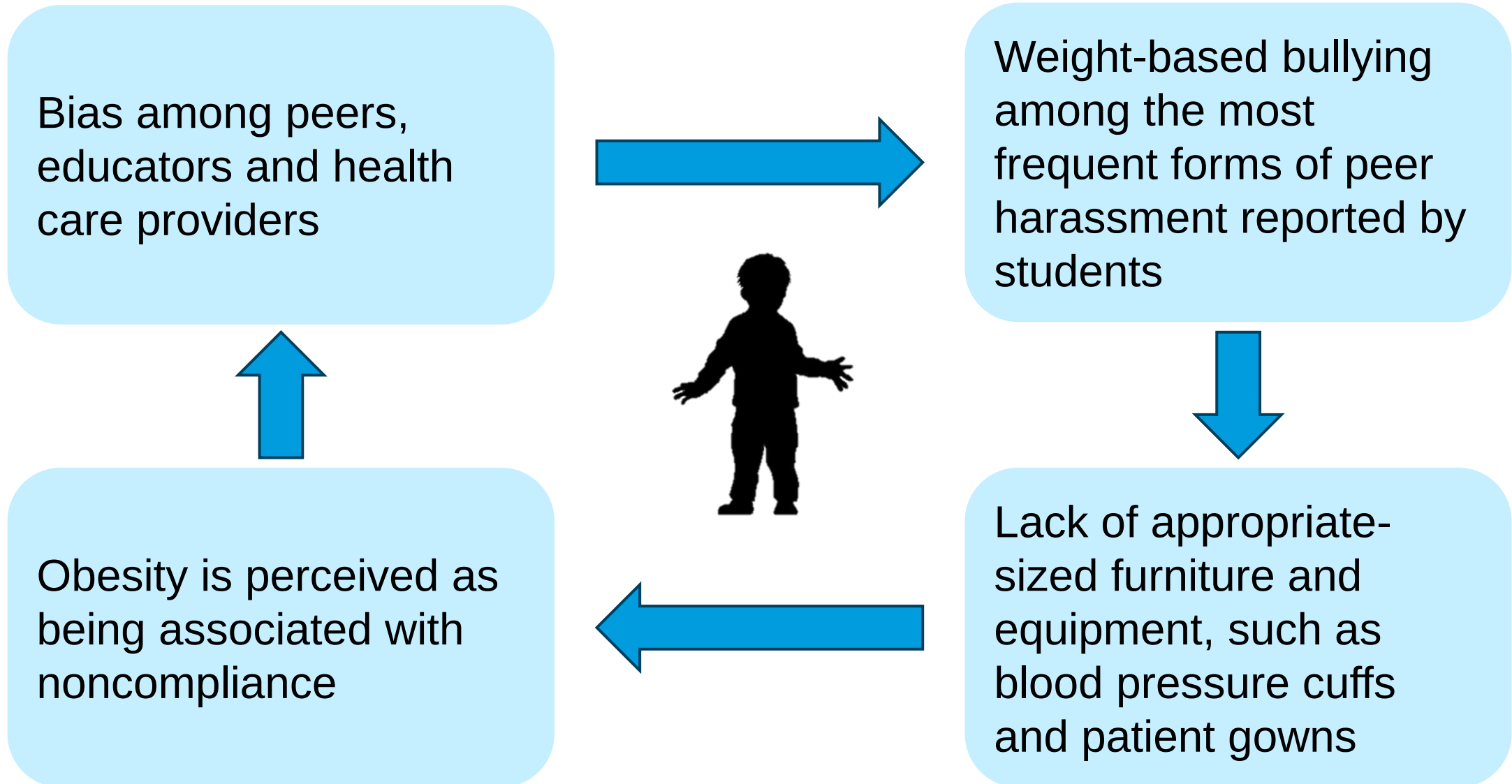
Improvement in comorbidities(type 2 diabetes mellitus, hypertension, dyslipidemia, obstructive sleep apnea etc)



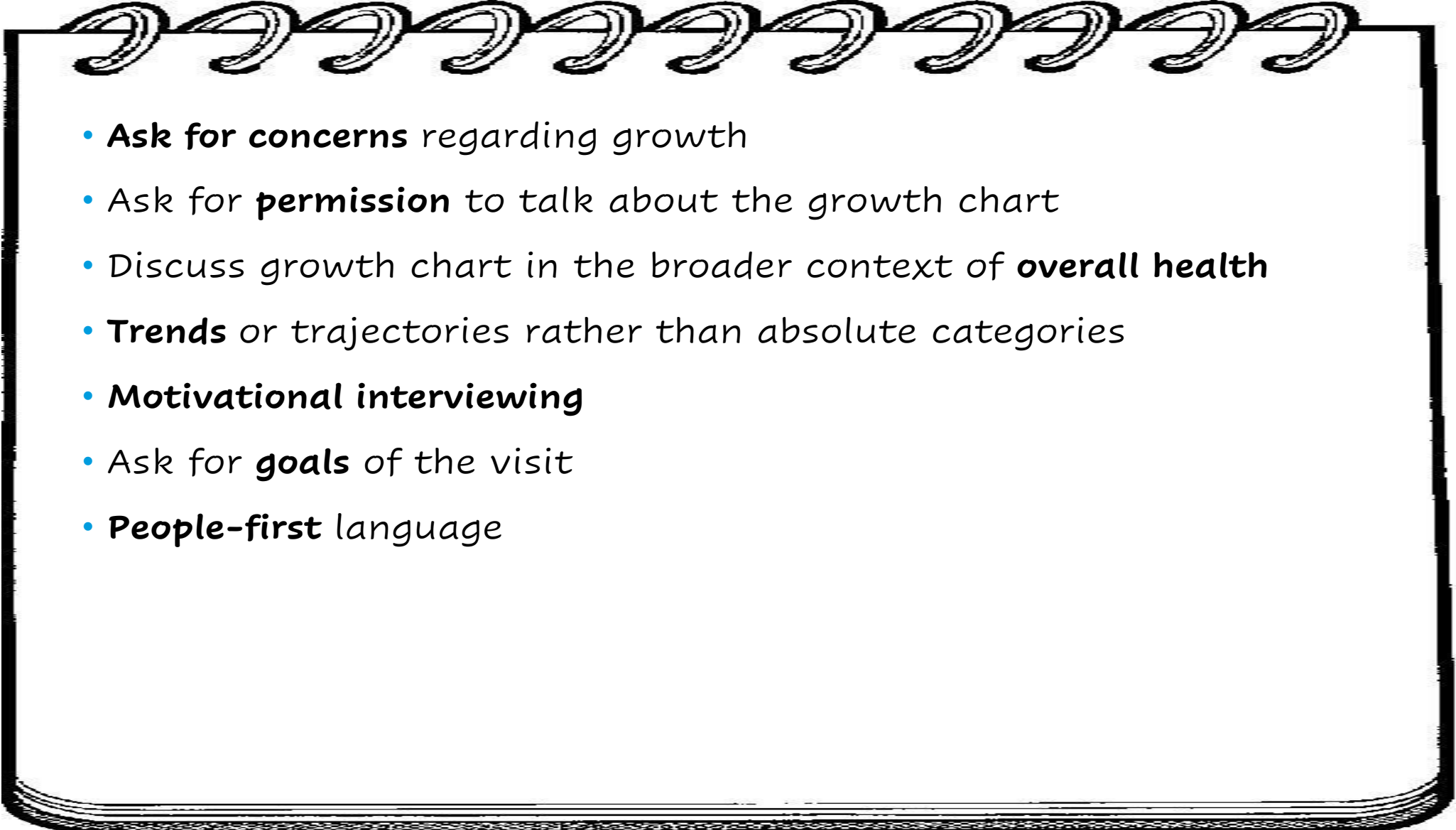
Specific weight loss goal should be individualized based on previous trajectory, comorbidities, patient/family preferences

BMI SD reduction of 0.25 to 0.5 associated with improvement in metabolic variables

OBESITY STIGMA AND BIAS

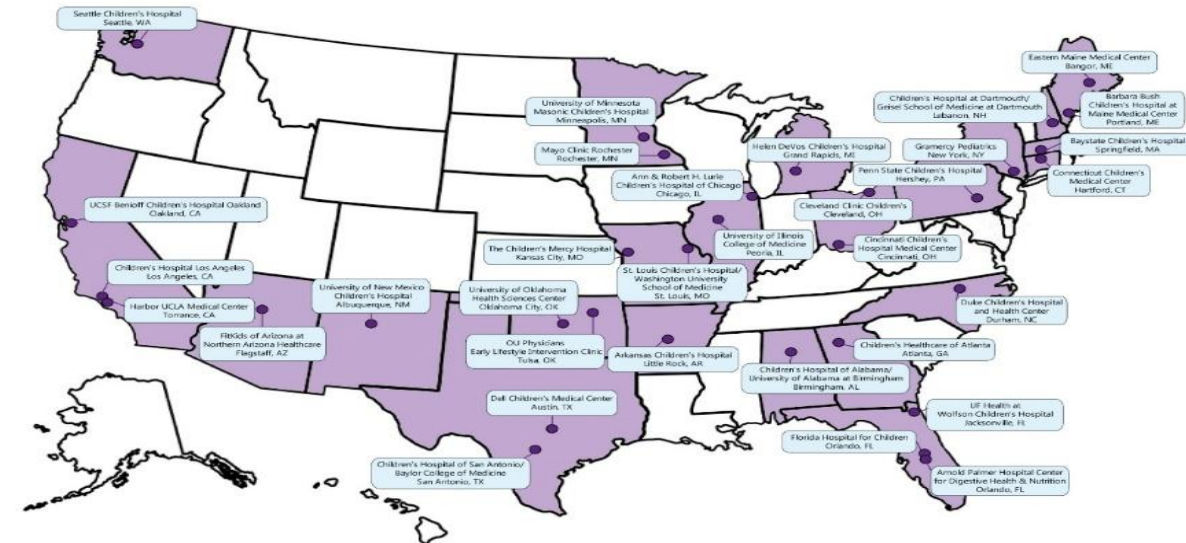


HOW TO BEGIN THE CONVERSATION

- 
- **Ask for concerns** regarding growth
 - Ask for **permission** to talk about the growth chart
 - Discuss growth chart in the broader context of **overall health**
 - **Trends** or trajectories rather than absolute categories
 - **Motivational interviewing**
 - Ask for **goals** of the visit
 - **People-first** language

EFFICACY OF LIFESTYLE MODIFICATION THERAPY

- Pediatric Obesity Weight Evaluation Registry
- 6454 patients 2-18 years of age
- 31 sites multicomponent pediatric weight management programs
- 73% with severe obesity



Kumar et al. J Pediatr 2019; 208:57-65.e4

EFFICACY OF LIFESTYLE MODIFICATION THERAPY



	Change in Percent of 95 th percentile for BMI (%BMI _{p95})		
Age group (y)	4-6 months	7-9 months	10-12 months
2-5	-0.6 (-5 to 4) n=113	-1.7 (-6 to 4) n=69	-1.9 (-8 to 3) n=45
6-11	-1.8 (-6 to 1) n= 1035	-2.0 (-7 to 2) n=635	-2.2 (-7 to 2) n=403
12-14	-2.0 (-6 to 1) n=534	-2.9 (-8 to 1) n=319	-3.7 (-11 to 1) N=207
15-18	-2.1 (-7 to 1) n=451	-3.4 (-9 to 1) n=230	-3.7 (-11 to 2) n=127

Change in % BMI at 4-6 months:
-0.32(-3.2 to 2.2) in 12–14 yo
-0.77(-4.1 to 1.6) in 15-18 yo

ANTIOBESITY MEDICATIONS

Pediatricians and other PHCPs should offer adolescents 12 y and older with obesity wt loss pharmacotherapy, according to medication indications, risks, and benefits.

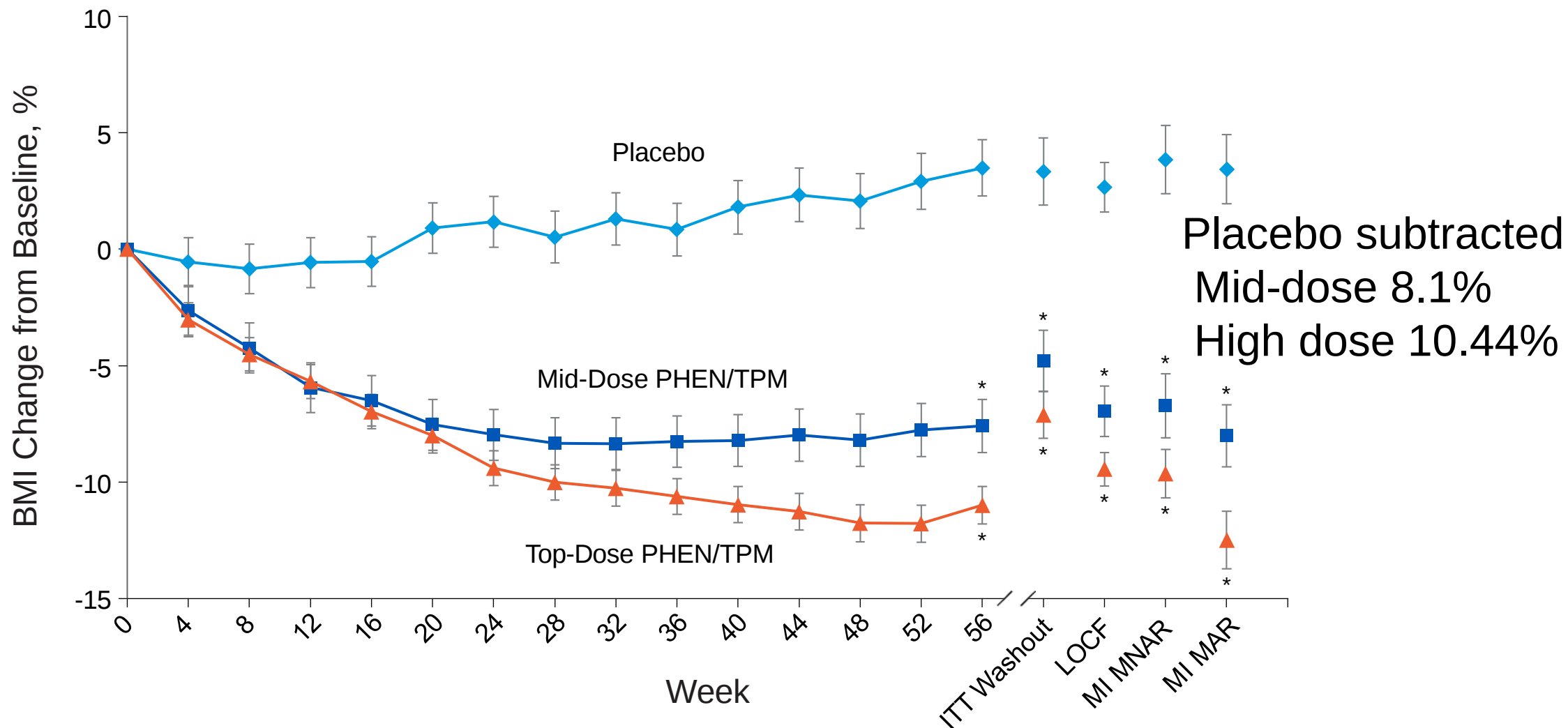


May offer children ages 8 through 11 y of age with obesity weight loss pharmacotherapy, according to medication indications, risks, and benefits.

APPROVED WEIGHT LOSS MEDICATIONS FOR CHILDREN

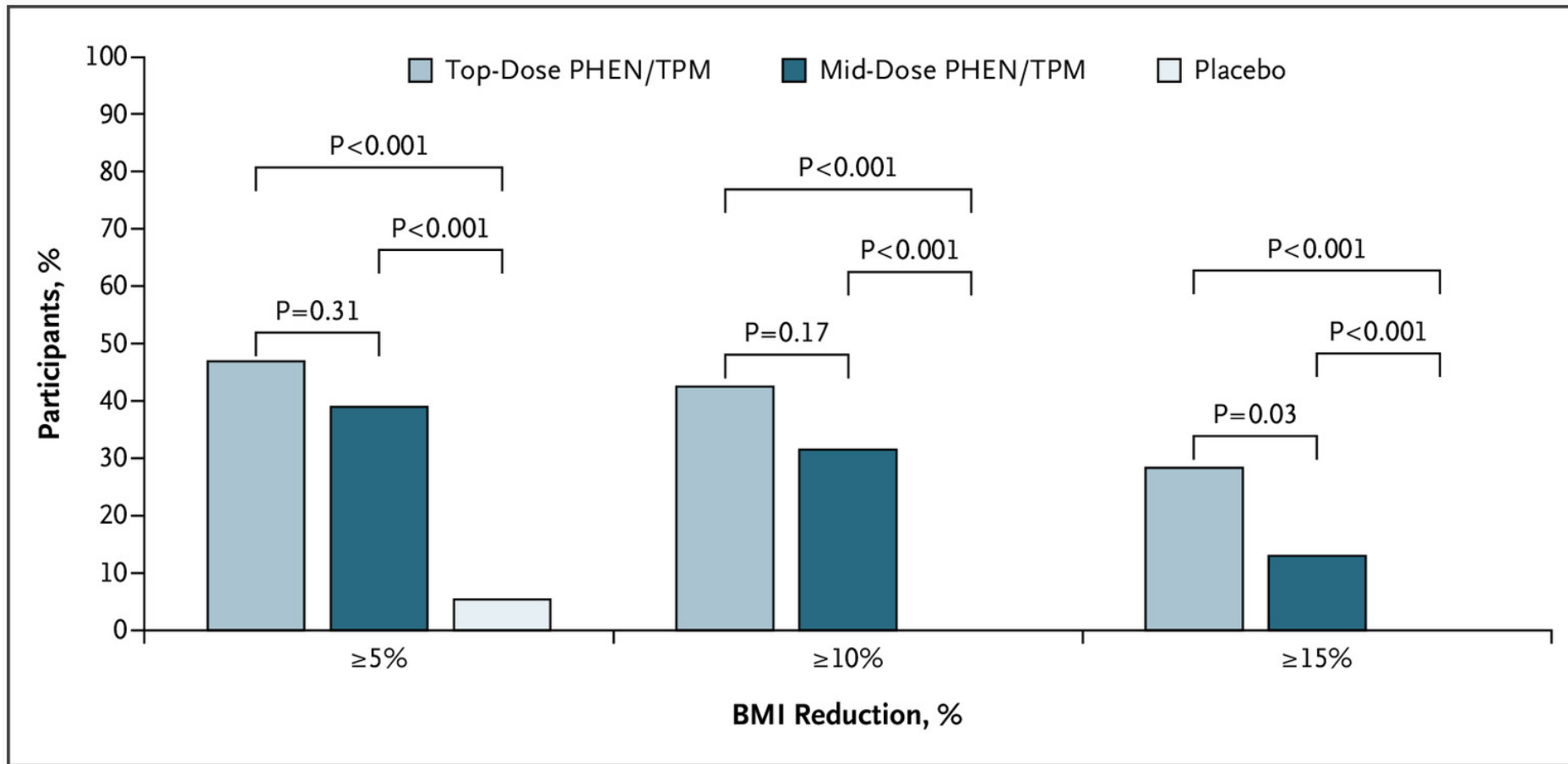
Phentermine	16 years
Orlistat	≥ 12 years
Phentermine/topiramate	≥ 12 years
Liraglutide 3 mg	≥ 12 years
Semaglutide 2.4 mg	≥ 12 years
Setmelanotide	≥ 6 years

PHENTERMINE-TOPIRAMATE IN ADOLESCENTS WITH OBESITY



Kelly et al: NEJM Evid. 2022 Jun;1(6):10.1056

PHENTERMINE-TOPIRAMATE IN ADOLESCENTS WITH OBESITY



Improvement in triglyceride and HDL-C levels

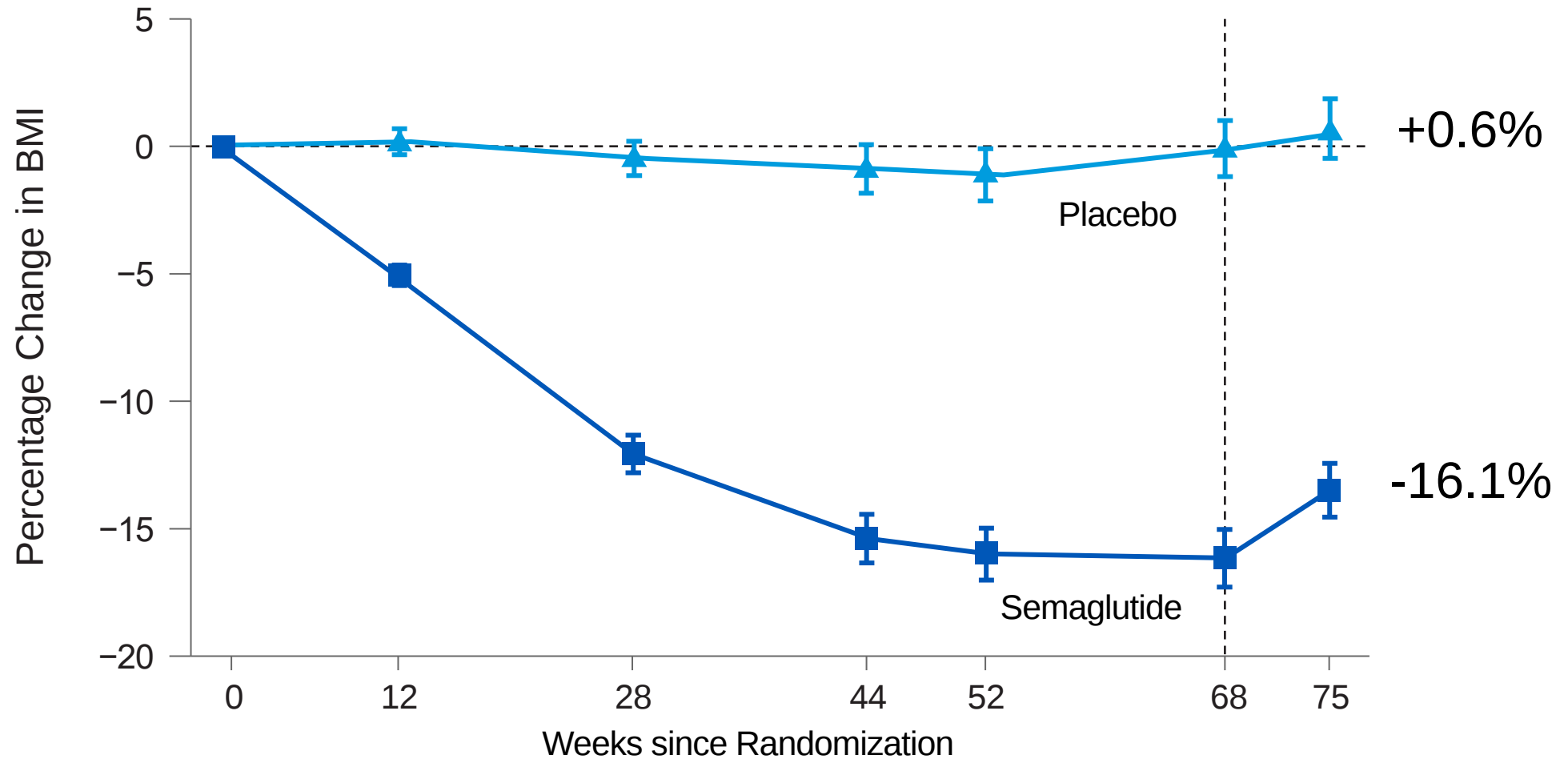
Kelly et al: NEJM Evid. 2022 Jun;1(6):10.1056

PHENTERMINE-TOPIRAMATE IN ADOLESCENTS WITH OBESITY

- The overall incidence of any adverse event was relatively similar across the placebo, mid-dose, and top-dose groups
- One participant in the top dose category was hospitalized for a bile duct stone within 1 week of completing the study
- One participant in the top dose category reported depression, and suicidal ideation: had been exposed to only the mid dose and experienced several recurrences of these events over a period of approximately 105 days after study drug discontinuation
- No apparent effect on growth, development, mental health, or cognition

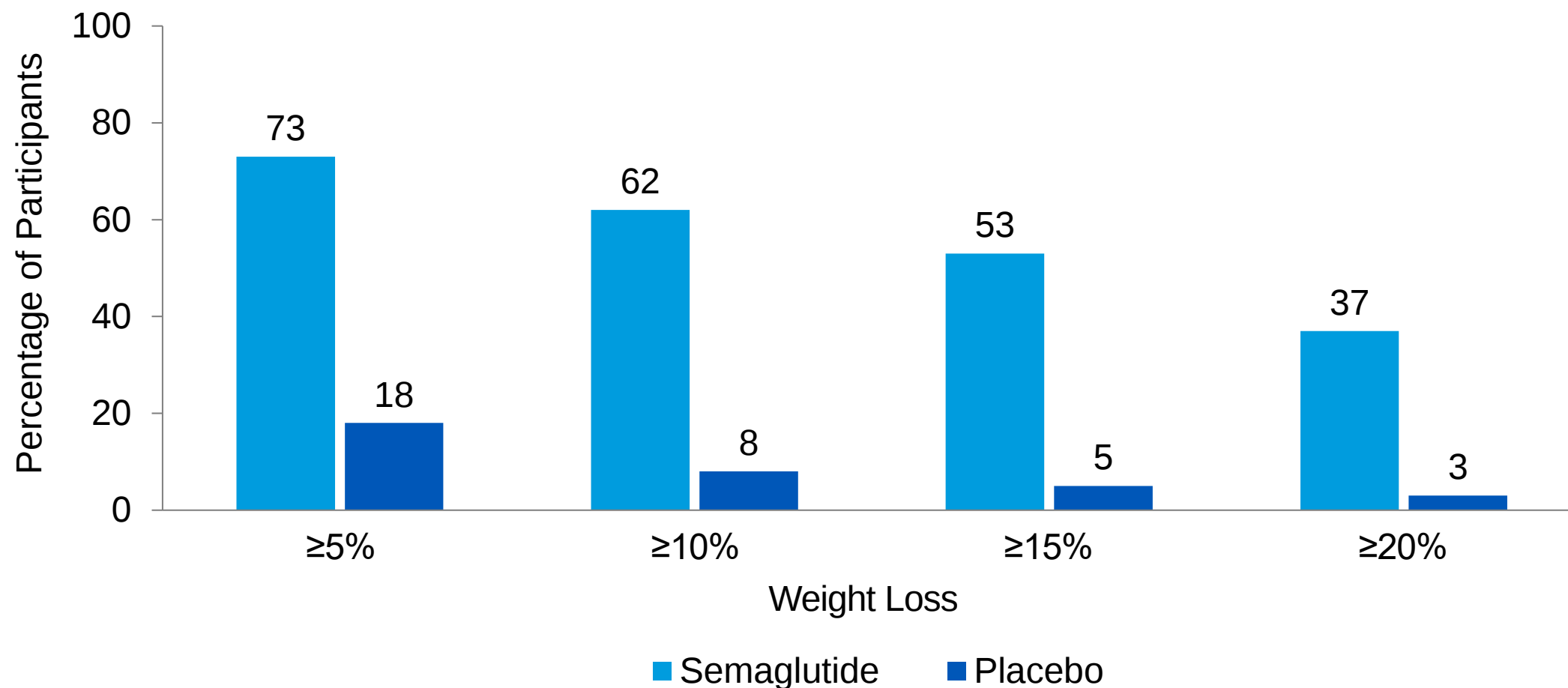
Kelly et al: NEJM Evid. 2022 Jun;1(6):10.1056

SEMAGLUTIDE IN ADOLESCENTS WITH OBESITY



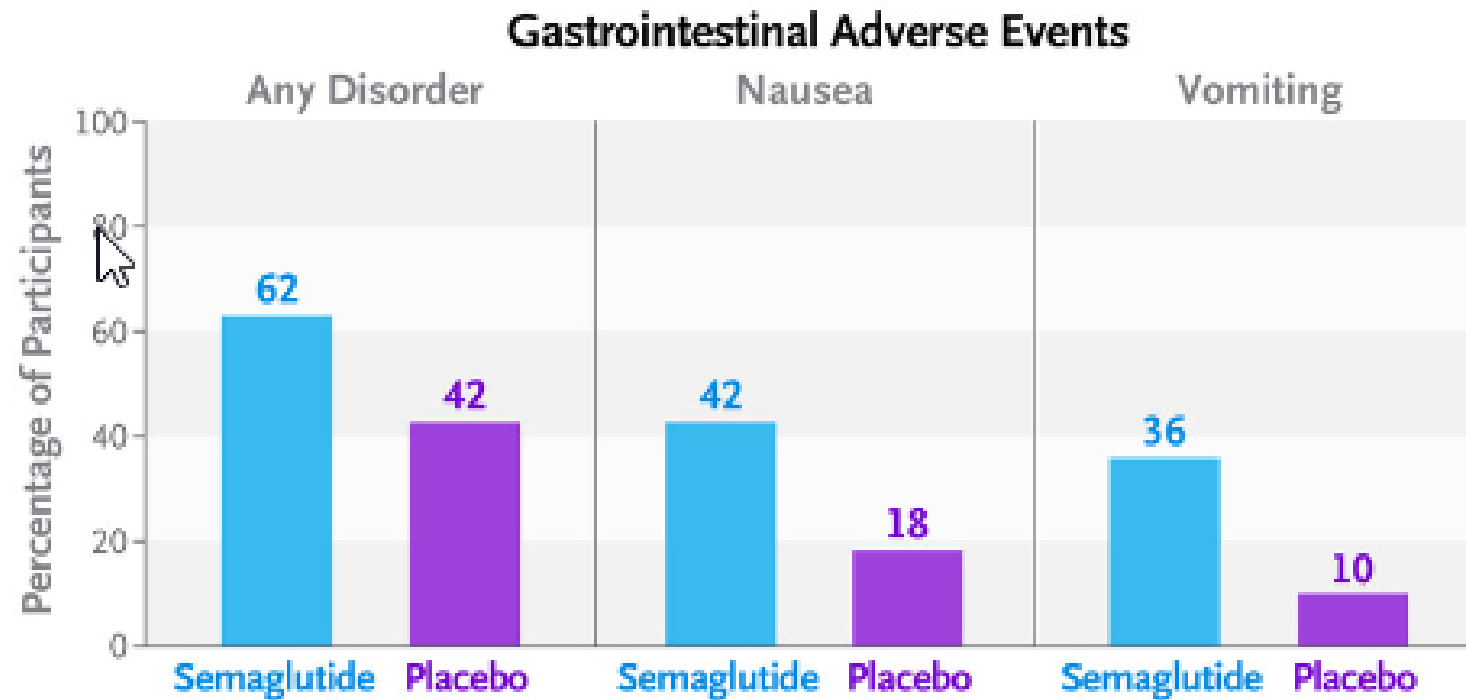
Weghuberj et al: N Engl J Med 2022;387:2245-5

SEMAGLUTIDE IN ADOLESCENTS WITH OBESITY



Weghuberj et al: N Engl J Med 2022;387:2245-5

SEMAGLUTIDE IN ADOLESCENTS WITH OBESITY



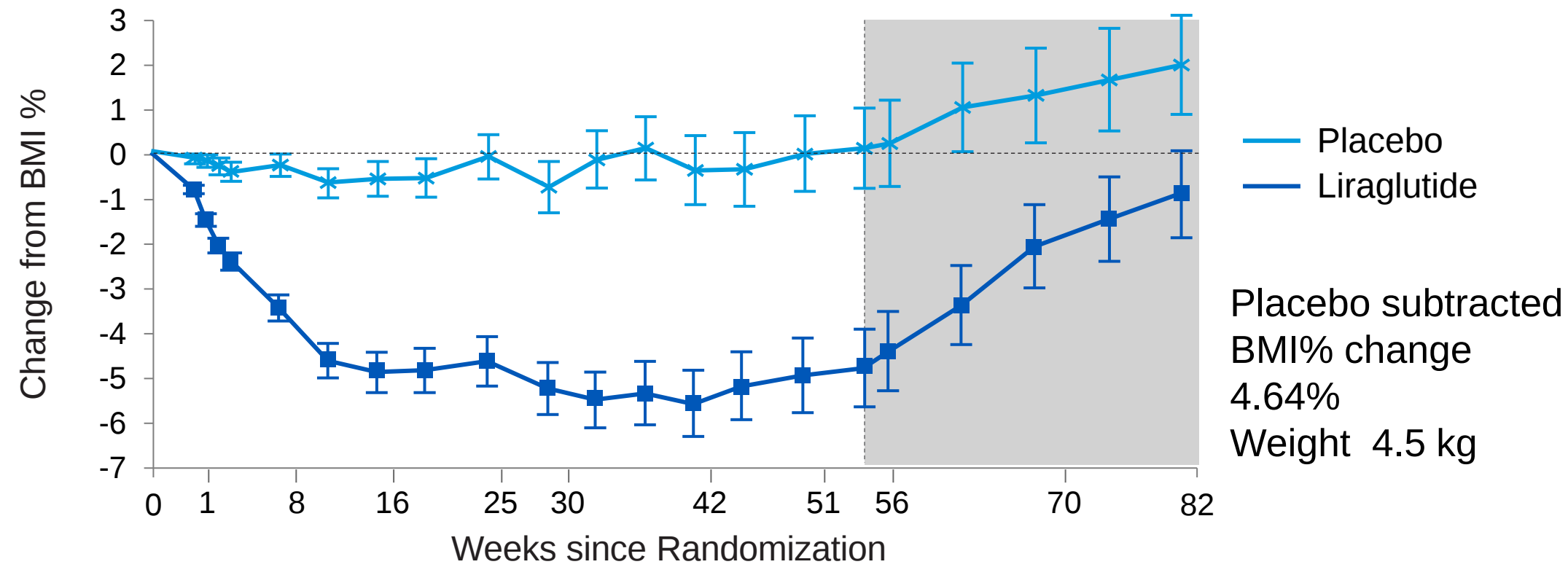
Weghuberj et al: N Engl J Med 2022;387:2245-5

IMPROVEMENT IN CARDIOMETABOLIC RISK FACTORS WITH SEMAGLUTIDE

End Point	Semaglutide (n=134)	Placebo (n=67)	Difference, Semaglutide vs. Placebo (95% CI) [†]	P Value
Change in waist circumference – cm	-12.7	-0.6	-12.1 (-15.6 to -8.7)	
Change in glycated hemoglobin level – percentage points				
Participants without type 2 diabetes	-0.4	-0.1	-0.2 (-0.3 to -0.1)	
All participants ^{**}	-0.4	-0.1	-0.3 (-0.3 to -0.2)	
Change in blood pressure – mm Hg				
Systolic	-2.7	-0.8	-1.9 (-5.0 to 1.1)	
Diastolic	-1.4	-0.8	-0.6 (-3.0 to 1.8)	
Percentage change in lipid levels ^{††}				
Total cholesterol	-8.3	-1.3	-7.1 (-10.5 to -3.5)	
HDL cholesterol	8.0	3.2	4.7 (-1.0 to 10.7)	
LDL cholesterol	-10.2	-3.4	-7.0 (-11.9 to -1.8)	
VLDL cholesterol	-28.4	1.6	-29.5 (-37.3 to -20.8)	
Triglycerides	-28.4	2.6	-30.2 (-38.0 to -21.5)	
Percentage change in ALT level ^{††}	-18.3	-4.9	-14.1 (-25.2 to -1.4)	

Weghuber et al: N Engl J Med 2022;387:2245-5

LIRAGLUTIDE AS WEIGHT LOSS DRUG IN ADOLESCENTS



Kelly et al: N Engl J Med 2020;382:2117-28

WEIGHT LOSS MEDICATIONS IN PEDIATRICS

FDA approval for medications age 12 and up

Short term data shows efficacy

Heterogeneity in response and poor predictors of response

Weight regain is seen after discontinuation of the medications

Some medications that cause weight loss are approved in younger children for other indications

Off label use common in pediatrics

Individualized decision based on age, severity of obesity, comorbidities, patient and family goals/preferences and insurance

CASE # 2

16-year-old male presents with H/O excessive weight since age 3

Obstructive sleep apnea (AHI 30 per hour) and asthma

Struggles with excessive hunger

Sedentary behavior

Has been seen by nutrition and social worker for lifestyle modification therapy

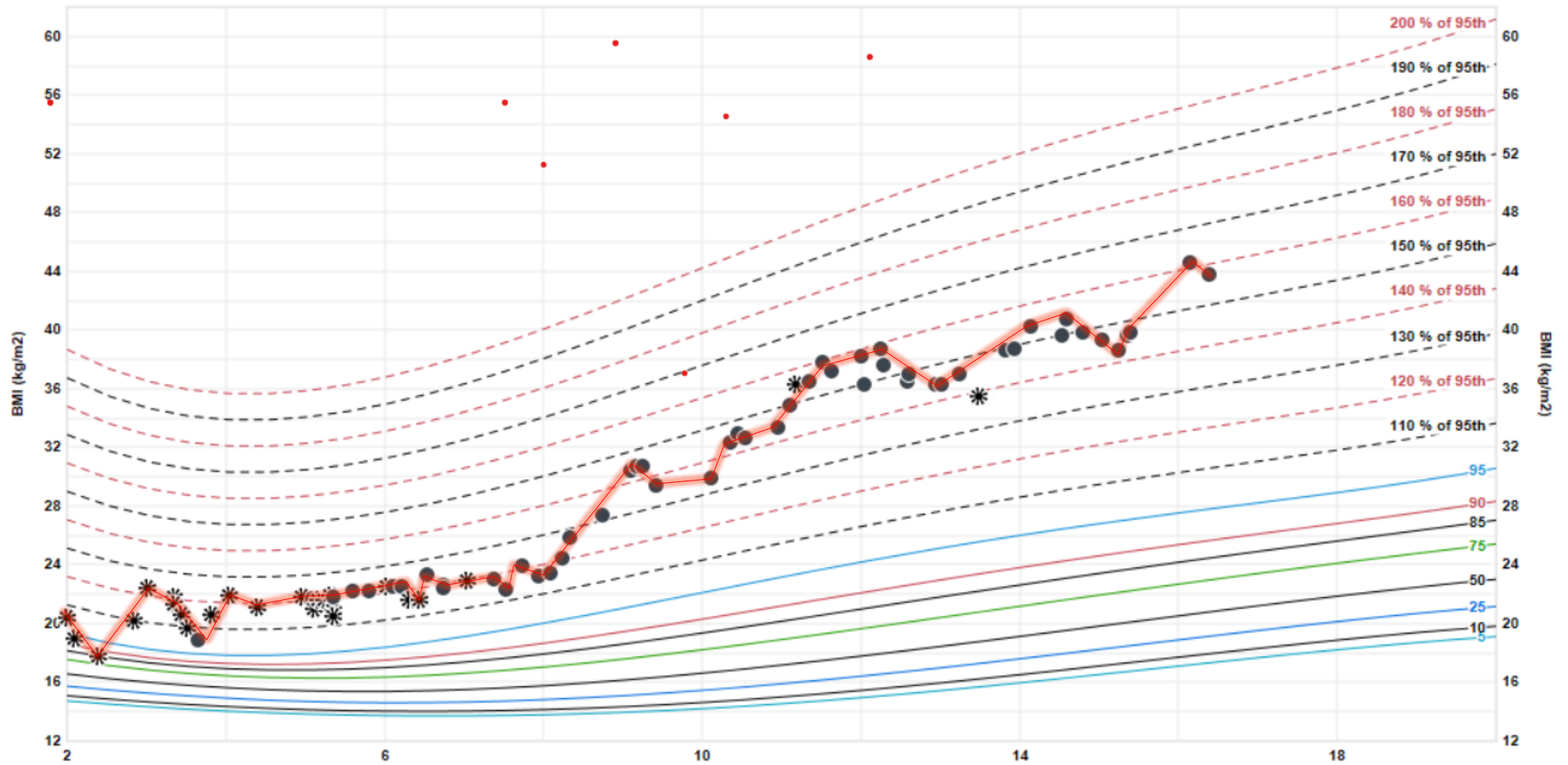
3% weight loss with phentermine-topiramate; liraglutide and semaglutide not covered by insurance

CASE #2

Physical examination: Wt 160 kg BMI 44kg/m² BP 150/95

Labs: Fasting plasma glucose 115 mg/dL, HbA1c 6.2% , TC 180 mg/dL , HDL 20 mg/dL, TG 350 mg/dL, ALT 150 U/L

Assessment: Class 3 obesity due to excessive hunger and decreased physical activity complicated by severe OSA, hypertension, prediabetes, NAFLD, hypertriglyceridemia and low HDL cholesterol



CASE #2

What is the next best step?

- 1) Very low-calorie diet
- 2) Semaglutide
- 3) Laparoscopic sleeve gastrectomy
- 4) Intensive health behavior and lifestyle treatment

METABOLIC AND BARIATRIC SURGERY



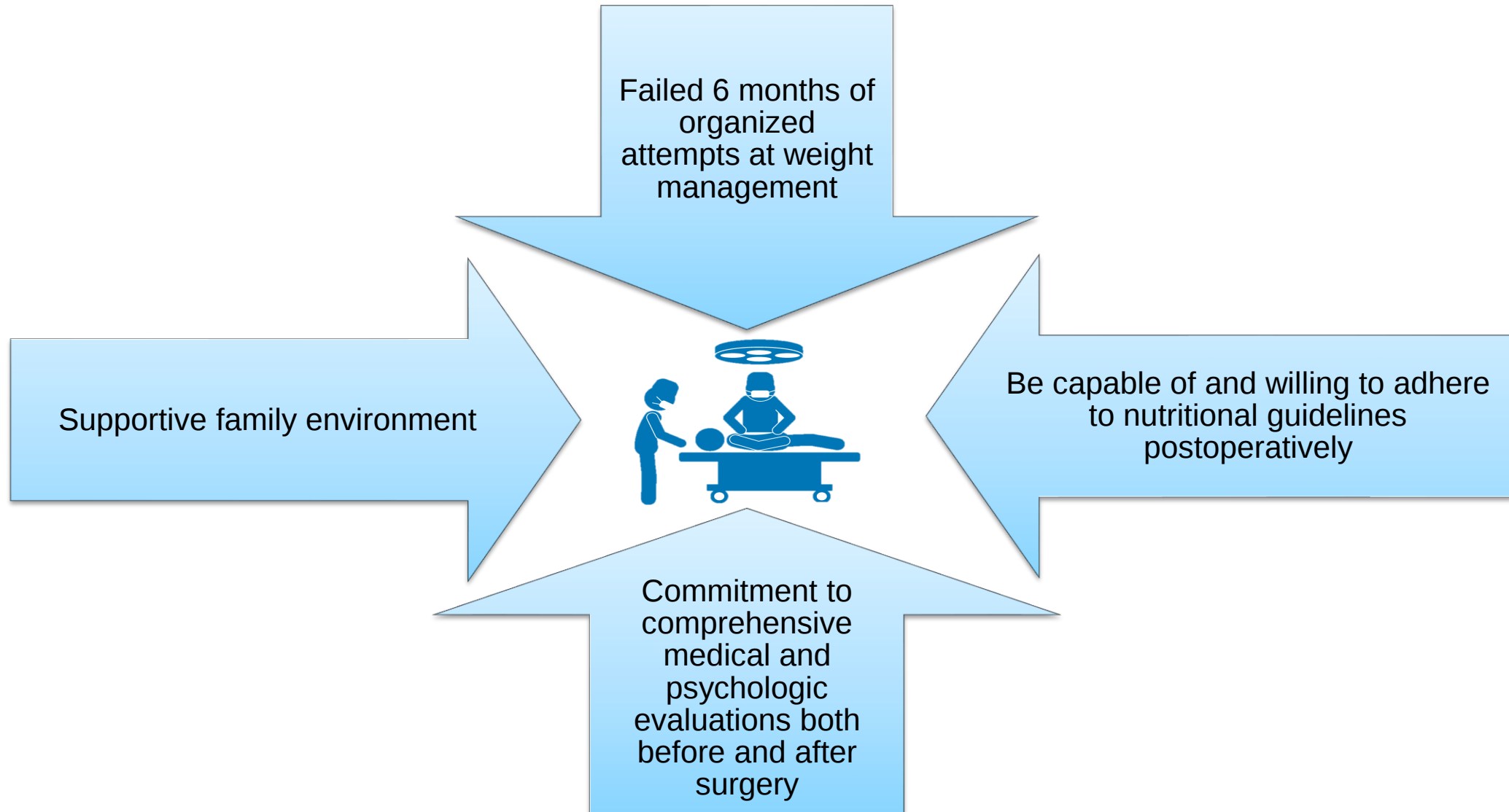
BMI ≥ 35 kg/m² or **120% of the 95th percentile** with clinically significant co-morbid condition (T2DM, OSA(AHI>5) sleep apnea, IHH, NASH, Blount's disease, SCFE, GERD or HT)

OR

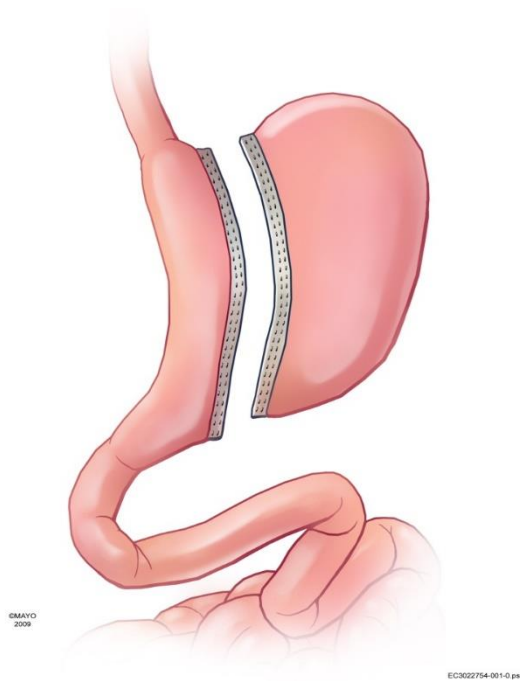
BMI ≥ 40 kg/m² or **140% of the 95th percentile**

Adolescents considered as those between 10-19 years of age

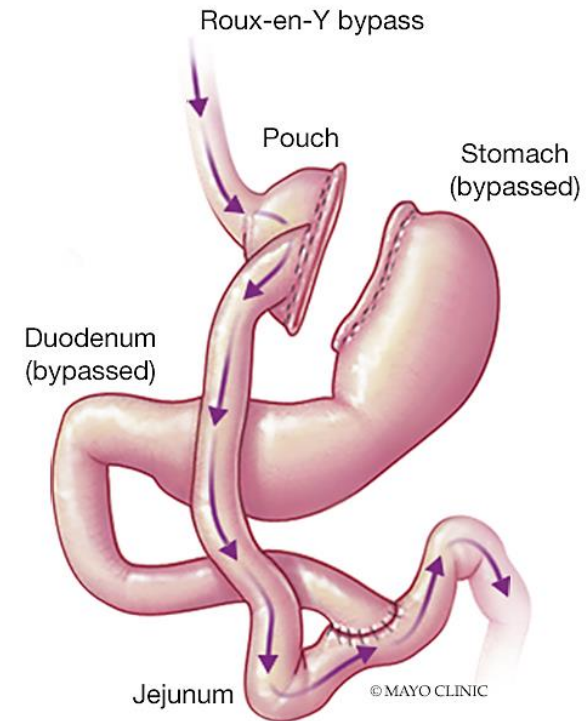
CANDIDATES FOR BARIATRIC SURGERY



BARIATRIC PROCEDURES IN ADOLESCENTS

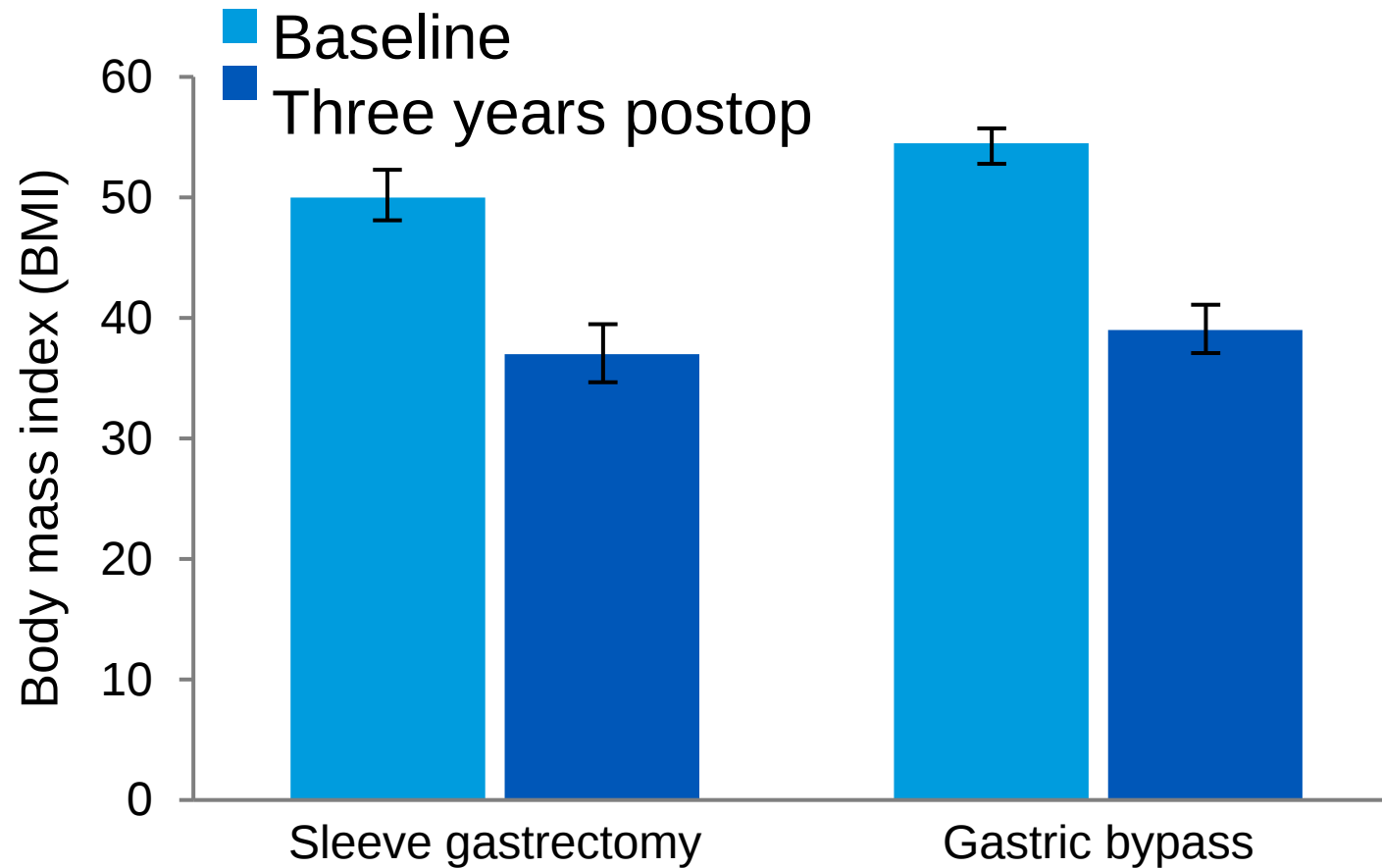


Sleeve Gastrectomy



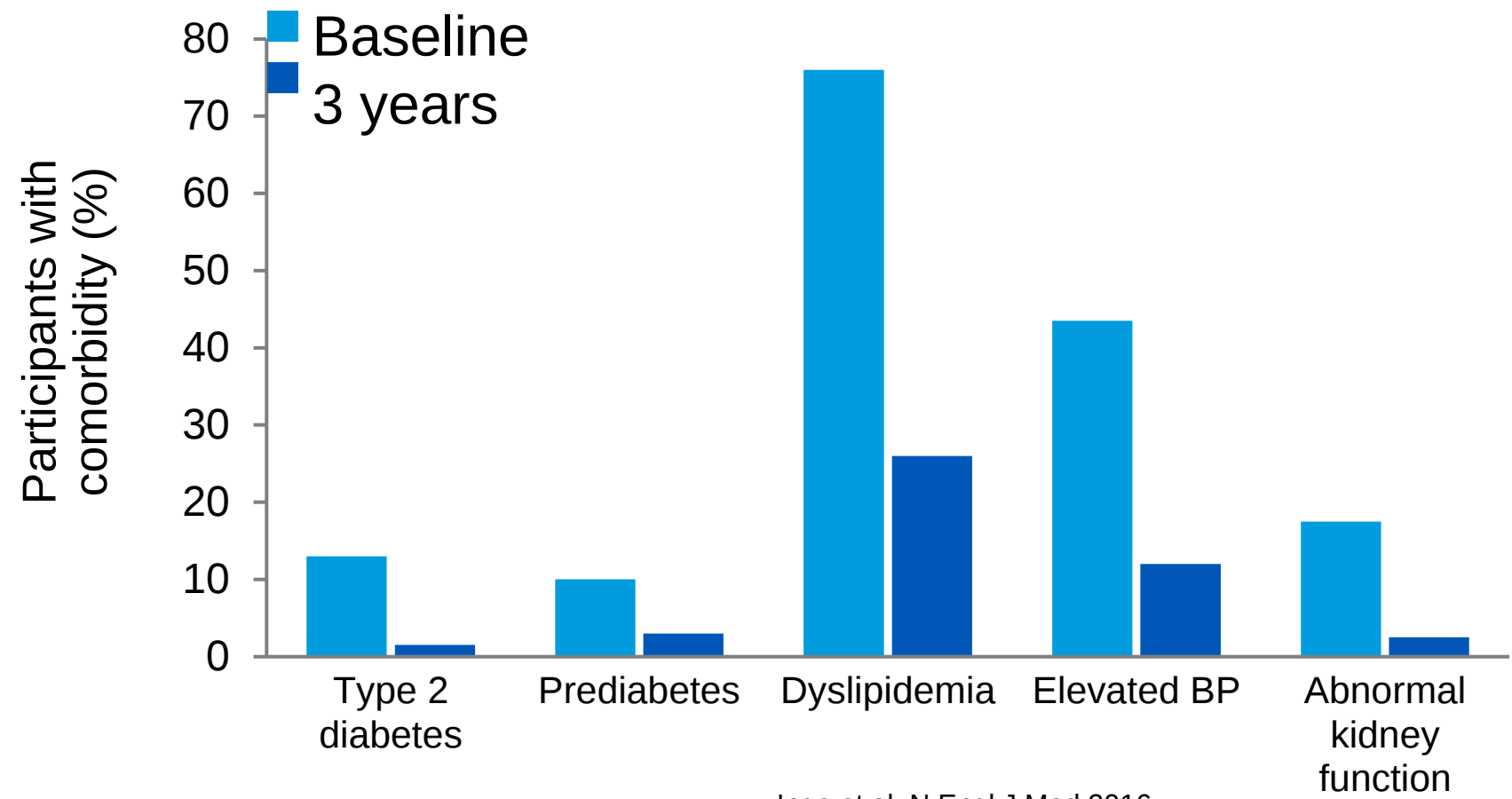
Roux-en-Y Gastric Bypass

DECLINE IN BMI AFTER BARIATRIC SURGERY



Inge et al. N Engl J Med 2016

RESOLUTION OF COMORBIDITIES AFTER BARIATRIC SURGERY





Long-term Outcomes Following Adolescent Metabolic and Bariatric Surgery

Andrew J. Beamish,^{1,2}  Elizabeth Ryan Harper,³ Kajsa Järholm,^{4,5}  Annika Janson,^{6,7} 
and Torsten Olbers^{5,8} 

The NEW ENGLAND JOURNAL of MEDICINE

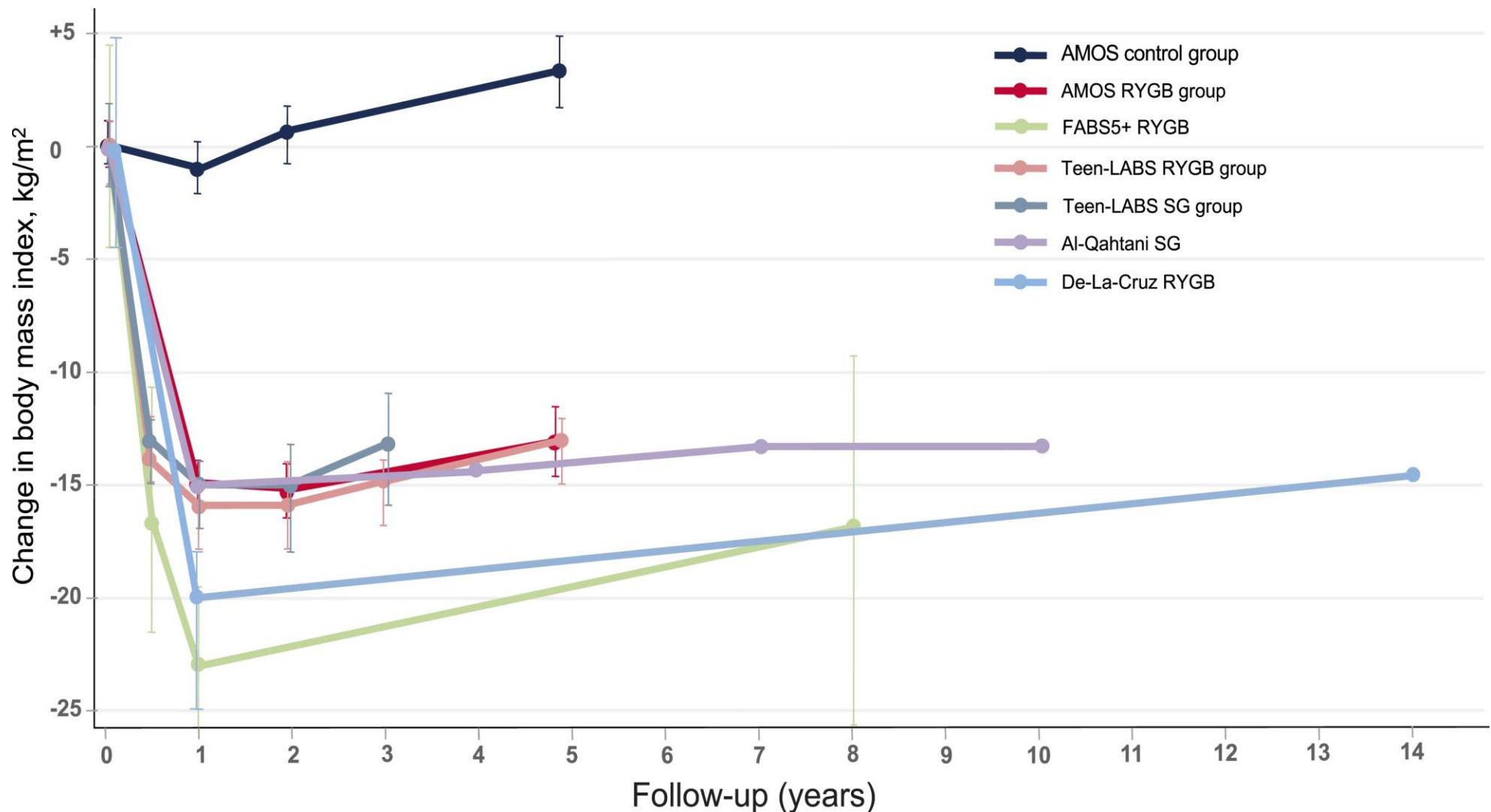
ORIGINAL ARTICLE

Five-Year Outcomes of Gastric Bypass in Adolescents as Compared with Adults

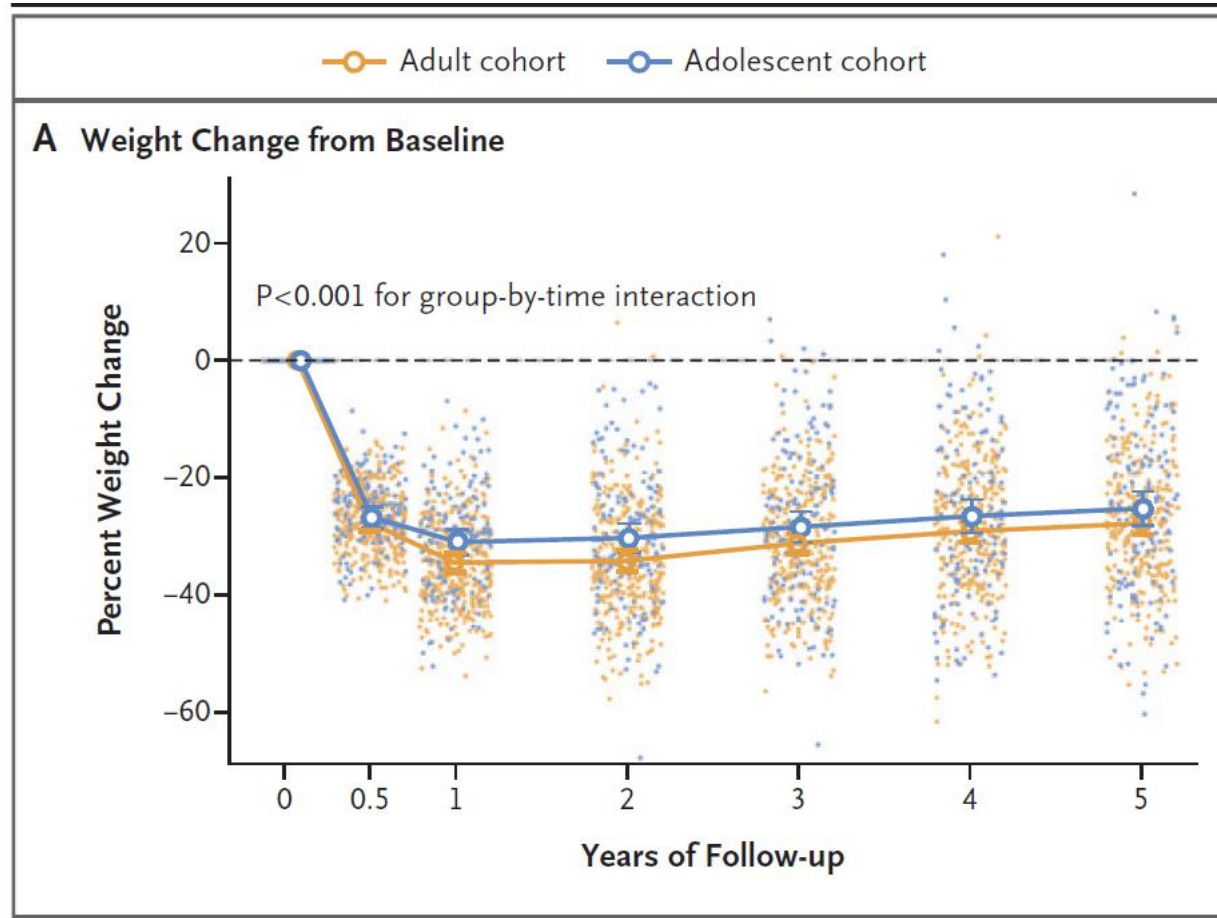
Thomas H. Inge, M.D., Ph.D., Anita P. Courcoulas, M.D., Todd M. Jenkins, Ph.D.,
Marc P. Michalsky, M.D., Mary L. Brandt, M.D., Stavra A. Xanthakos, M.D.,
John B. Dixon, Ph.D., M.B., B.S., Carroll M. Harmon, M.D., Ph.D.,
Mike K. Chen, M.D., Changchun Xie, Ph.D., Mary E. Evans, Ph.D.,
and Michael A. Helmrath, M.D., for the Teen–LABS Consortium

N Engl J Med 2019;380:2136-45.

LONG-TERM OUTCOMES FOLLOWING ADOLESCENT MBS

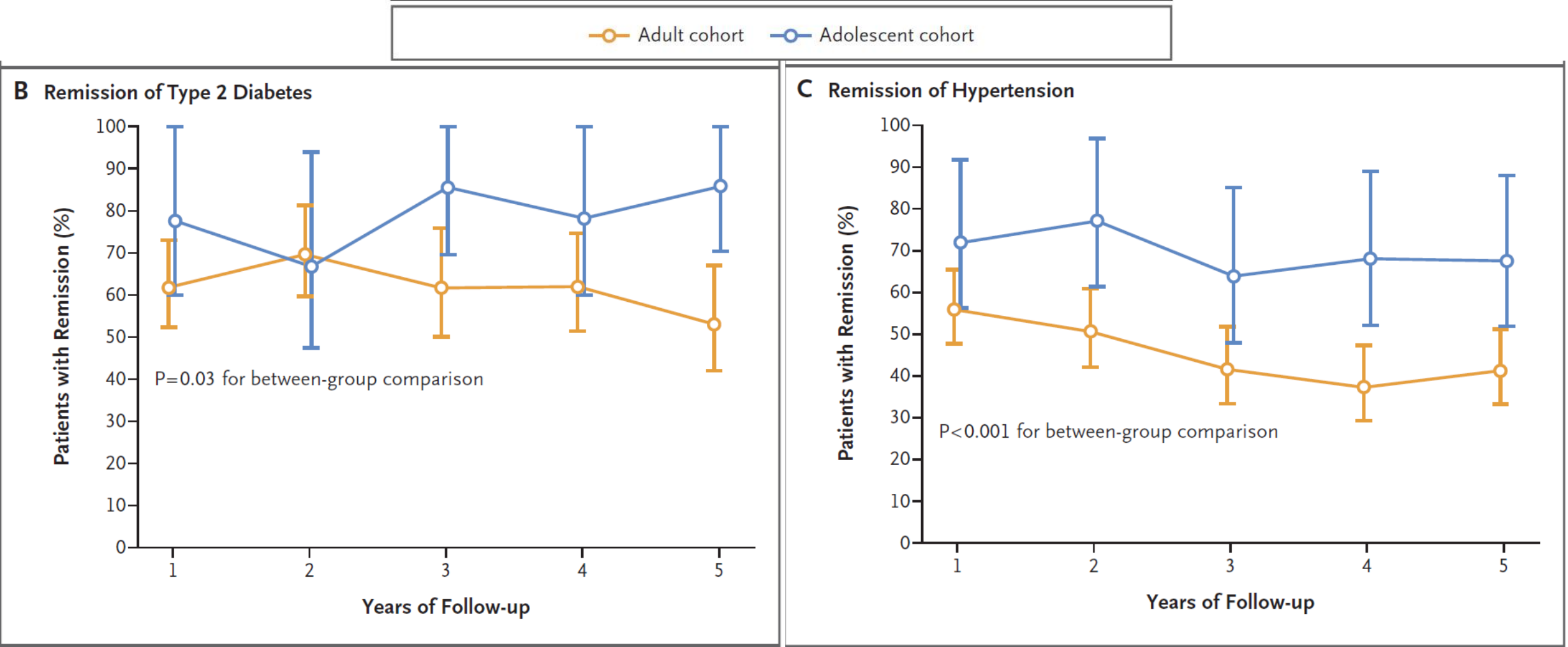


WEIGHT LOSS IN ADOLESCENTS VERSUS ADULTS FOLLOWING MBS



Inge T et al. N Engl J Med 2019;380:2136-45.

DIABETES AND HYPERTENSION REMISSION BETTER IN ADOLESCENTS THAN IN ADULTS



ADVERSE EFFECTS FOLLOWING ADOLESCENT MBS

- Nutritional deficiencies
 - Vitamin B12, iron, calcium, and vitamin D
 - Requires lifelong supplementation
- Bone health
 - Reduction in bone mineral density 2 years after MBS
 - Related to substantial weight loss?
 - Increase in bone resorption in adults, RYGB > SG
- Other
 - GERD after sleeve gastrectomy
 - 5-year cumulative reintervention rate ~25%

DEATH AND ABDOMINAL REOPERATIONS 5 YEARS AFTER RYGB

Table 3. Death and Abdominal Reoperations 5 Years after Gastric Bypass Surgery.

Variable	Adolescents (N = 161)			Adults (N = 396)		
	<i>no. of participants/ total no. (%)</i>	<i>no. of events</i>	<i>rate per 500 person-yr (95% CI)</i>	<i>no. of participants/ total no. (%)</i>	<i>no. of events</i>	<i>rate per 500 person-yr (95% CI)</i>
Death	3/161 (1.9)	3	1.96 (0.63–6.08)	7/396 (1.8)	7	2.26 (1.08–4.74)
Intraabdominal operations within 5 years	32/161 (20)	46	19.5 (12.8–29.8)	51/310 (16)	55	10.3 (6.8–15.7)*
Cholecystectomy	21/152 (14)†	21	9.4 (5.1–17.3)	23/210 (11)	23	7.1 (3.9–12.8)
Surgery for bowel obstruction	6/161 (4)	6	2.5 (0.7–8.5)	6/310 (2)	7	1.4 (0.4–4.8)
Repair internal hernia	4/161 (2)	6	2.0 (0.6–7.4)	10/310 (3)	10	1.3 (0.4–4.5)
Gastrostomy	2/161 (1)	3	2.0 (0.6–6.1)	2/310 (1)	2	0.3 (0.05–2.3)
Other	10/161 (6)	10	3.9 (1.5–10.0)	13/310 (4)	13	2.1 (0.8–5.3)

MAYO CLINIC PEDIATRIC BARIATRIC OUTCOMES

Co-morbidities

	Presurgery	Post Surgery				
		6 mos.	1 year	2 year	3 year	4 year
Diabetes						
Non-insulin	9	2	2	2	1	0
Insulin	1					
GERD	9	1	2	1	0	0
Sleep Apnea	22	10	9	6	5	0
Hypertension	5	2	1	2	1	0
Hyperlipidemia	1	1	1	1	1	0
Other Health considerations						
Previous Pulmonary Embolism	1					
Immunosuppressive Therapy	2					
Previous Cardiac Surgery	1					
Antihypertensives	5					

DO OBESITY TREATMENTS CAUSE EATING DISORDERS?

[ABOUT](#)[LEARN](#)[RESOURCES](#)[PARTICIPATE](#)[BLOG](#)

As the Collaborative of Eating Disorders Organizations (CEDO), we strongly oppose the new clinical guidelines introduced by the American Academy of Pediatrics. We do not support intentional weight loss in children via the methods included in the guidelines, especially the recommendation of bariatric surgery and pharmaceutical products for children. The eating disorders community is on the frontline responding to the harm that is done when children's relationship with food and body is disrupted. We are very concerned about the message this aggressive approach to childhood and adolescent "obesity" sends to the healthcare community, parents and guardians, and young people. Additionally, we believe it is irresponsible to call for ending weight biases while simultaneously perpetuating weight stigma through medical guidelines that put children at increased mental and physical health risks.

We stand firmly against the new American Academy of Pediatrics "Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents with Obesity." The statements made throughout these guidelines are problematic at best, and at worst, put American children and adolescents at serious risk for developing eating disorders, disordered eating, and other mental and physical health issues.

<https://www.allianceforeatingdisorders.com>

Slide courtesy of Dr. Bridget Biggs

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IHBLTS COULD LOWER ED RISK AND IMPROVE WEIGHT-RELATED HEALTH

Patient-Centered Care for Obesity: How Health Care Providers Can Treat Obesity While Actively Addressing Weight Stigma and Eating Disorder Risk

Michelle I. Cardel, PhD, MS, RD*; Faith A. Newsome*; Rebecca L. Pearl, PhD; Kathryn M. Ross, PhD, MPH; Julia R. Dillard; Darci R. Miller, MPH; Jacqueline F. Hayes, PhD; Denise Wilfley, PhD, MA; Pamela K. Keel, PhD; Emily J. Dhurandhar, PhD; Katherine N. Balantekin, PhD, RD

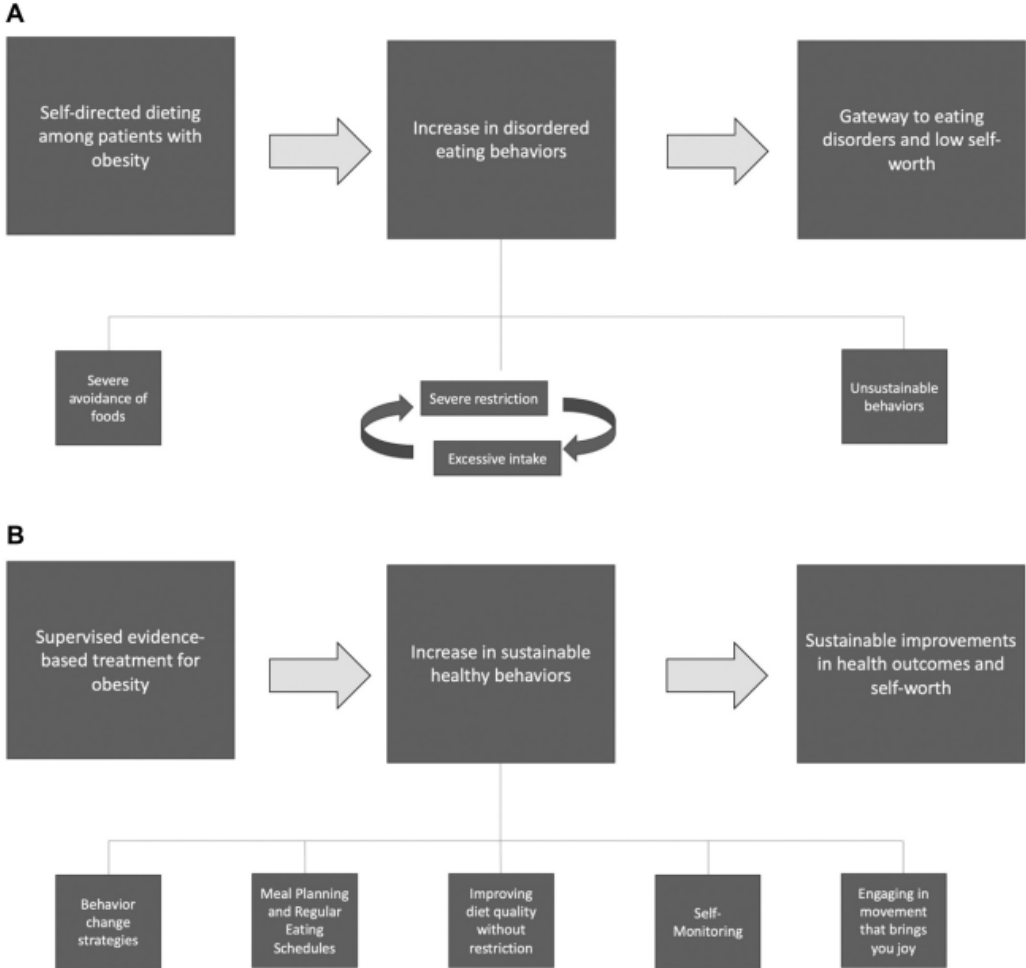


Figure 2. (A) The relationship between self-directed dieting and health-related outcomes.⁶⁰⁻⁶⁶ (B) The relationship between supervised, evidence-based obesity treatment and health-related outcomes.^{7,16,17,20,67-87}

Slide courtesy of Dr. Bridget Biggs

Treatment of obesity, with a dietary component, and eating disorder risk in children and adolescents: A systematic review with meta-analysis

Hiba Jebeile^{1,2}  | Megan L. Gow^{1,2}  | Louise A. Baur^{1,2}  | Sarah P. Garnett^{1,2}  |
Susan J. Paxton³  | Natalie B. Lister^{1,2} 

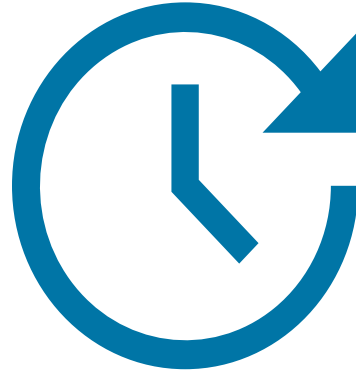
- 36 studies met inclusion criteria
 - 5 reported ED prevalence—4 decreased, 1 reported 3/56 had BED at 6-yr fu
 - 13 reported ED risk scores—12 decreased, 1 increased related to dieting subscale, meta-analyses showed length of treatment associated with greater risk reduction
 - 11 reported bulimic symptoms—all decreased or no change
 - 4 reported drive for thinness—decreased or no change
 - Binge eating (5 studies) & emotional eating (2 studies)—decreased or no change

WHAT ABOUT MEDICATIONS & SURGERY?

- Medications: Little information found on ED diagnosis or symptoms
- Surgery: Overall positive, case reports of ED incidence
 - Improved disordered eating behaviors in teens compared to lifestyle (Sarwer et al., 2017, Obes Surg)
 - Improved BE & compensatory behaviors (Williams-Kerver et al., 2019, Curr psychiatry Rep)
 - Improvements in BE persist 5 yr f/u adults (Jaervholm et al, 2020, Lancet)
 - Case reports of BED, BN, AN

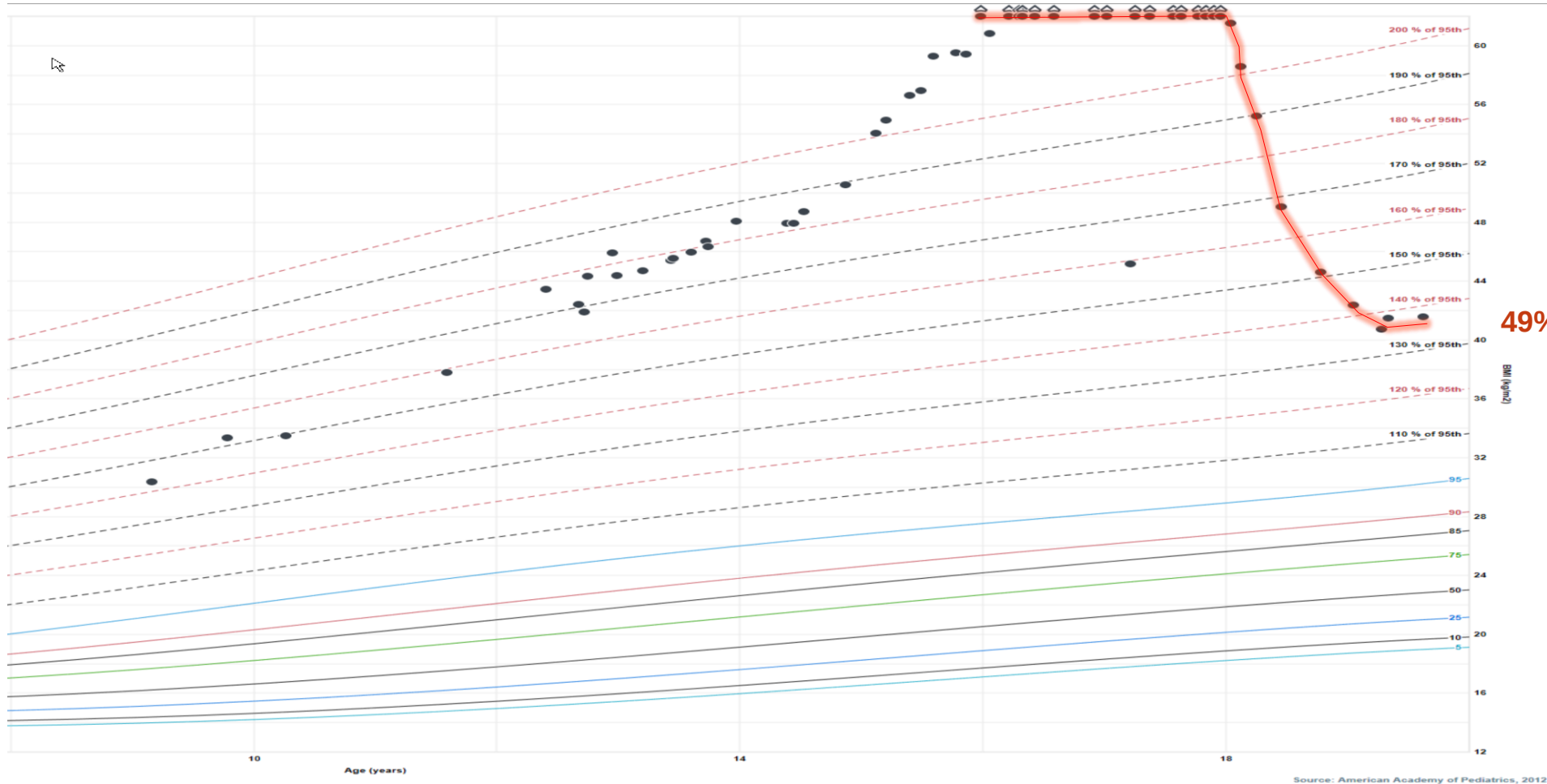
Slide courtesy of Dr. Bridget Biggs

OBESITY TREATMENT



Participation in structured, supervised weight management programs **decreases current and future eating disorder symptoms** (including bulimic symptoms, emotional eating, binge eating, and drive for thinness) up to 6 years after treatment

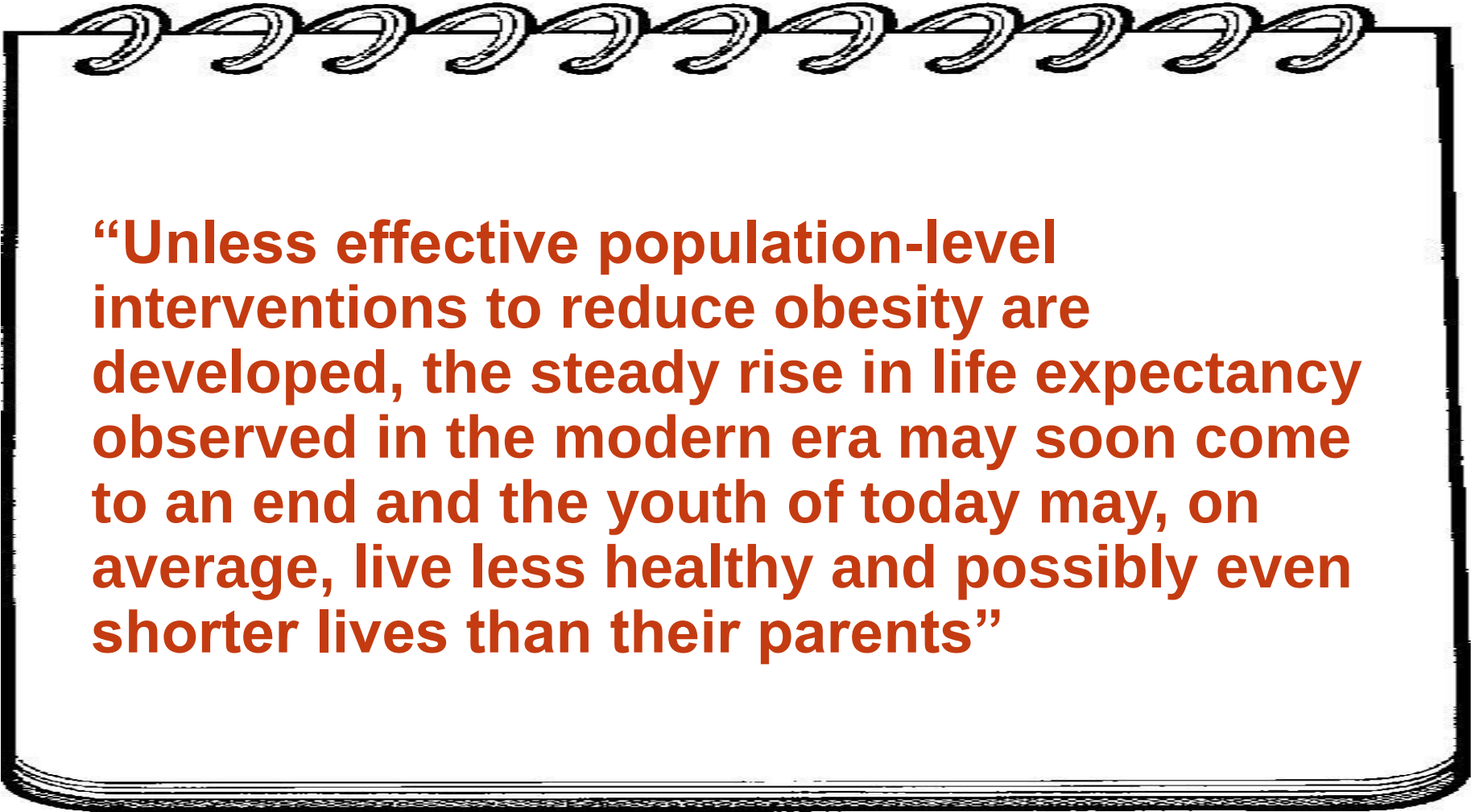
Peak preoperative BMI 69.2
kg/m²
Preoperative weight 202 kg
BMI at 18 months 42 kg/m²



49% Weight loss

SUMMARY

- There is no benefit to watchful waiting or delayed treatment of childhood obesity
- Intensive health behavior and lifestyle treatment is the most effective known behavioral treatment of childhood obesity
- Adolescents 12 y and older with obesity should be offered weight loss pharmacotherapy, according to medication indications, risks, and benefits, as an adjunct to health behavior and lifestyle treatment
- Adolescents 13 y and older with severe obesity should be referred for evaluation for metabolic and bariatric surgery

A graphic of a spiral-bound notebook with a black cover and a white page. The spiral binding is at the top. The text is written in a bold, orange-red font on the page.

“Unless effective population-level interventions to reduce obesity are developed, the steady rise in life expectancy observed in the modern era may soon come to an end and the youth of today may, on average, live less healthy and possibly even shorter lives than their parents”

Olshansky, NEJM 2005; 352: 1138-1145

QUESTIONS & DISCUSSION

