2021 Pediatrics Conference

Childhood Nutrition, Feeding, and Weight Management in the Primary Care Setting

May 6–7, 2021

Virtual Conference

healthfirst®
Health Insurance for New Yorkers

SUNY Downstate Health Sciences University


BRIANNA FRANCIS
MILK
MILK
BRIANNA FRANCIS

AGENDA

Thursday, May 6

8:30am–8:35am	**Welcome and Introduction** Maja Castillo, MD, MHA *Assistant Vice President Medical Director, Pediatric Care Management, Pediatric Medical Director, Healthfirst* Eugene Dinkevich, MD, FAAP, Dipl ABOM *Associate Professor of Clinical Pediatrics, SUNY-Downstate Health Sciences*

Keynote Presentation: Primary Care Assessment and Action on Food Insecurity and Its Effects on Child Health and Nutrition

8:35am–9:05am	Cristina R. Fernández, MD, MPH *Assistant Professor, Division of Child and Adolescent Health, Department of Pediatrics, Columbia University Irving Medical Center*
9:05am–9:15am	Question and Answer Session

Panel 1

9:15am–10:30am	Marion Groetch, MS, RDN *Assistant Professor of Pediatrics, Division of Allergy & Immunology, Icahn School of Medicine at Mount Sinai* Complementary Feeding for Health and Food Allergy Prevention Eugene Dinkevich, MD, FAAP, Dipl ABOM *Associate Professor of Clinical Pediatrics, SUNY-Downstate Health Sciences University* Visual Approach to Abnormal Growth Trajectories in a Primary Care Setting
10:30am–10:55am	Question and Answer Session
10:55am–11:00am	Break

AGENDA

Panel 2

11:00am–12:30pm	**Susan Carnell, PhD** *Associate Professor, Johns Hopkins University School of Medicine* Appetitive Traits in Children and Parental Feeding Practices **Mary Jo Messito, MD** *Clinical Associate Professor, Pediatrics, NYU Grossman School of Medicine* Child Obesity Prevention Across the Lifecycle: Primary Care and the Importance of Starting Early **Ellyn Satter, MS, MSSW** *Founder and Developmental Editor, Ellyn Satter Institute* Feed So Children Can Eat and Grow Well
12:30pm–12:55pm	Question and Answer Session
12:55pm–1:00pm	Closing

Friday, May 7

8:30am–8:35am	**Opening Remarks** **Maja Castillo, MD, MHA** *Assistant Vice President Medical Director, Pediatric Care Management, Pediatric Medical Director, Healthfirst* **Eugene Dinkevich, MD, FAAP, Dipl ABOM** *Associate Professor of Clinical Pediatrics, SUNY-Downstate Health Sciences*

Keynote Presentation: Management of Severe Obesity in the Teen in a Primary Care Setting: The Live Light Live Right Model

8:35am–9:05am	**Sarita Dhuper, MD, FACC** *Clinical Associate Professor of Pediatrics, SUNY Downstate Medical Center*
9:05am–9:15am	Question and Answer Session

AGENDA

Panel 1

9:15am–10:30am	**Prantik Saha, MD, MPH** *Assistant Clinical Professor of Pediatrics, Vagelos College of Physicians & Surgeons, Columbia University Irving Medical Center* Basic Principles of Motivational Interviewing (MI) in Obesity Counseling **Eve Khlyavich Freidl, MD** *Medical Director, Eating and Weight Disorders Program, Icahn School of Medicine at Mount Sinai, Associate Professor of Psychiatry* Eating Disorder Presentation in Children and Adolescents
10:30am–10:55am	Question and Answer Session
10:55am–11:00am	Break

Panel 2

11:00am–12:30pm	**Vivian L. Chin, MD** *Assistant Professor of Pediatrics, Pediatric Endocrinologist, SUNY Downstate Health Sciences University* Diagnosis and Management of Type 2 Diabetes in Pediatrics **Lisa C. Hudgins, MD** *Associate Professor of Pediatrics in Medicine, The Rogosin Institute/ Weill-Cornell Medical College* Lipid Disorders and Lipid Screening in Childhood **Jeffrey L. Zitsman, MD** *Director, Center for Adolescent Bariatric Surgery, Morgan Stanley Children's Hospital of NY Presbyterian Columbia University Irving Medical Center* Adolescent Bariatric Surgery
12:30pm–12:55pm	Question and Answer Session
12:55pm–1:00pm	Closing

PROGRAM OVERVIEW

This CME activity is designed to help improve the skill level of primary care providers who care for overweight or obese children in their evaluation, treatment and referral for obesity-related illness.

Obesity rates have increased rapidly in the pediatric populations, especially in minorities and children living in poverty. Recent studies suggest that abnormal weight gain and poor eating practices begin in infancy and young childhood and continue through early school years and adolescence, leading to obesity.

PROGRAM OBJECTIVES

At the conclusion of the event, participants will be able to:

Objective 1

Identify children and adolescents who are overweight, obese or at risk of obesity and understand current principles of medical and surgical management of obesity in children.

Objective 2

Gain an understanding of basic childhood nutrition and introduction of solids in an evidence-based manner to prevent overfeeding and decrease risk of food allergies.

Objective 3

Understand the role of families, environment and culture in childhood weight issues and be able to counsel families using motivational interviewing techniques.

Objective 4

Diagnose pre-diabetes and type two diabetes as well as lipid disorders in the pediatric population.

Objective 5

Understand how to approach eating disorders in childhood and adolescence.

TARGET AUDIENCE

Medical directors, physicians, physician assistants, nurse practitioners, nurses, and practice leaders who serve high-risk populations.

JOINT PROVIDERSHIP ACCREDITATION

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the State University of New York (SUNY) Downstate Health Sciences University and Healthfirst®. The State University of New York Downstate Health Sciences University is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

DESIGNATION STATEMENT

SUNY Downstate Health Sciences University designates this live activity for a maximum of 9.0 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Physician Assistants: AAPA accepts category 1 credit from AOACCME, Prescribed credit from AAFP, and AMA category 1 credit for the PRA for organizations accredited by the ACCME.

Social Workers: SUNY Downstate Health Sciences University is recognized by the New York State Education Department's State Board for Social Work as an approved provider of continuing education for licensed social workers #SW-469.

MOC STATEMENT

Successful completion of this CME activity, which includes participation in the activity and individual assessment of and feedback to the learner, enables the learner to earn up to 9 MOC points in the American Board of Pediatrics' (ABP) Maintenance of Certification (MOC) program. It is the CME activity provider's responsibility to submit learner completion information to ACCME for the purpose of granting ABP MOC credit.

DISCLOSURE STATEMENT

SUNY Downstate Health Sciences University Office of CME (OCME) and its affiliates are committed to providing educational activities that are objective, balanced, and as free of bias as possible. The OCME has established policies that will identify and resolve all conflicts of interest prior to this educational activity. All participating faculty are expected to disclose to the audience, verbally or in writing, any commercial relationships that might be perceived as a real or apparent conflict of interest related to the content of their presentations, and unlabeled/unapproved uses of drugs and devices. Detailed disclosures will be made verbally and/or in writing during the program.

ADA STATEMENT

Special Needs: In accordance with the Americans with Disabilities Act, SUNY Downstate Health Sciences University seeks to make this conference accessible to all. If you have a disability which might require special accommodations, please contact Latoya Norman at 1-212-497-4827 or email your need to Latoya Norman at lnorman@Healthfirst.org.

Maja Castillo, MD, MHA

Assistant Vice President Medical Director, Pediatric Care Management, Pediatric Medical Director, Healthfirst

Dr. Castillo is the Pediatric Medical Director and Assistant Vice President of Pediatric Care Management at Healthfirst. In her leadership role, she provides clinical direction for pediatric care and utilization management, especially for complex and vulnerable child members. Additionally, Dr. Castillo works with the quality, population health, and clinical partnerships teams to advise company-wide strategic initiative development and implementation.

A graduate of the University of Chicago and Columbia University College of Physicians and Surgeons, Dr. Castillo recently received her MHA from Columbia University Mailman School of Public Health. Maja is a respected pediatrician in our region, known for her robust and quality-focused practice with Tribeca Pediatrics and for her years serving as an Assistant Attending Pediatrician in the Pediatric Emergency Department of the Columbia Presbyterian Children's Hospital of New York.

Eugene Dinkevich, MD, FAAP, Dipl ABOM

Associate Professor of Clinical Pediatrics,
SUNY-Downstate Health Sciences University

Dr. Eugene Dinkevich is a General Pediatrician at the State University of NY Downstate Health Sciences University, where he directs the Division of General Pediatrics and Pediatric Primary Care Services. He received his Medical Degree from University of Medicine and Dentistry of NJ—Robert Wood Johnson Medical School, completed Residency in Pediatrics at the Albert Einstein College of Medicine--Social Pediatrics Residency Training Program and a Fellowship in General Academic Pediatrics from the New York University Medical School—Bellevue Hospital Center. For nearly twenty years, Dr. Dinkevich has been involved with efforts to reduce childhood obesity as a primary care physician and as the Director of the Downstart Healthy Lifestyle Center that was recently merged with the Live Light Live Right Program. Dr. Dinkevich is particularly interested in strategies to promote healthy eating practices in young children as a way to prevent obesity. He has lectured nationally and internationally about pediatric obesity and has published in this area.

Cristina R. Fernández, MD, MPH

Assistant Professor, Division of Child and Adolescent Health, Department of Pediatrics, Columbia University Irving Medical Center

Dr. Cristina Fernández is an Assistant Professor of Pediatrics at the Columbia University Irving Medical Center. She received her Master of Public Health from the Yale School of Public Health in epidemiology of microbial diseases, and completed her medical training at the Columbia University Vagelos College of Physicians & Surgeons.

After completing her pediatrics residency at the New York-Presbyterian Hospital/ Columbia University Irving Medical Center, Dr. Fernández undertook a Primary Care Research Fellowship in Community Health there to acquire training in health disparities research. Her innovative research focuses on the areas of food insecurity, maternal-child nutrition, diet-related disparities, and issues in development in vulnerable child populations. As a general pediatrician, newborn hospitalist, and early career clinician-investigator, Dr. Fernández participates in clinical, educational, research, and advocacy initiatives aimed at supporting child health and nutrition. She holds leadership positions with the local American Academy of Pediatrics (AAP) District 2 New York Chapter 3 as well as the national AAP with the Young Physicians Leadership Alliance Leadership Development Program.

Marion Groetch, MS, RDN

Assistant Professor of Pediatrics, Division of Allergy & Immunology, Icahn School of Medicine at Mount Sinai

Marion Groetch is Assistant Professor of Pediatrics and the Director of Nutrition Services at the Jaffe Food Allergy Institute at the Icahn School of Medicine at Mount Sinai in New York City. She is a frequent invited lecturer at both national and international conferences, has contributed significantly to academic research, and has developed and chaired numerous online courses and multiday food allergy conferences.

Marion serves as a Senior Advisor to FARE, on the Medical Advisory Board of IFPIES, as a member of APFEDs Health Sciences Advisory Council, and is the Chair of the International Network of Dietitians and Nutritionists in Allergy.

As an active member of both the American Academy of Allergy, Asthma and Immunology and the European Academy of Allergy, Asthma and Clinical Immunology, she has collaborated with other healthcare professionals and patient advocacy groups in her quest to improve the lives of families living with food allergy. In 2015, she was honored to receive the AAAAI Allied Health Professionals Recognition Award for leadership, education, and mentorship.

Susan Carnell, PhD

Associate Professor, Johns Hopkins University School of Medicine

Susan Carnell received her BA in Experimental Psychology from the University of Oxford and her PhD in Health Psychology at University College London, and completed post-doctoral training at University College London and Columbia University. She is currently Associate Professor in the Division of Child & Adolescent Psychiatry, Department of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine, where she heads the Appetite Lab. A central question motivating her research is, "Why do some children develop obesity while others don't?" Her research program investigates the model that individuals differ in appetite-related biobehavioral traits (e.g., food cue responsiveness, satiety sensitivity) that manifest early in life, show genetic influence, and interact with environmental factors (e.g., family feeding practices) to predict eating behaviors and weight trajectories. To probe this model, she employs a range of methods including behavioral tests, questionnaires, genotyping, hormonal assays, and neuroimaging techniques (fMRI, MRI, PET). Ongoing research projects include investigations of appetite and body weight in infants, children, adolescents, and adults, including studies of bariatric surgery and eating disorders.

Mary Jo Messito, MD

Clinical Associate Professor, Pediatrics, NYU Grossman School of Medicine

Dr. Messito is a general pediatrician with board certification in obesity medicine. She serves as the Director of the Pediatric and Adolescent Healthy Weight Program at NYC Health + Hospitals/Bellevue and NYU Grossman School of Medicine (NYU), the Director of Pediatric Research Initiatives at the NYU Comprehensive Program on Obesity, and co-leader of the NYC Health + Hospitals (H+H) system-wide pediatric obesity initiative.

Dr. Messito has been an educator and primary care pediatrician for low socioeconomic status (SES) immigrant and Hispanic children at Bellevue Hospital Center (BHC) for more than 25 years and has served as director of the pediatric obesity treatment program at Bellevue for the last 10 years.

Building on more than 25 years of clinical focus on obesity prevention, management, and pediatric primary care, Dr. Messito developed a research program at NYU in which she studied health disparities and risk factors during pregnancy and infancy for child obesity in low-income, immigrant and ethnic minority groups. During 15 years of investigation, she has designed and tested prenatal and pediatric clinic-based early child obesity prevention with the evidence-based Starting Early Program (StEP) intervention. StEP is designed to reduce child obesity by promoting optimal nutrition and lifestyle behaviors across the lifecourse, during pregnancy, infancy and early childhood for low-income Hispanic pregnant women and mother-infant pairs. StEP is one of the only child obesity prevention programs to have significant impacts on weight outcomes for children at high risk of health disparities, in addition to improvements in maternal feeding styles and practices and infant activity. Findings from three large USDA-funded clinical trials of StEP have also identified the influence of maternal hardships (e.g., food insecurity, low social support, depression) on health outcomes, such as gestational weight gain, breastfeeding rates, and maternal and child diet quality.

Ellyn Satter, MS, MSSW

Founder and Developmental Editor, Ellyn Satter Institute

Ellyn Satter is a dietitian, family therapist, consultant, author, educator, and internationally recognized authority on eating and feeding. Based on research and her career in counseling and psychotherapy, Satter pioneered the Satter Feeding Dynamics Model (fdSatter) and the Satter Eating Competence Model (ecSatter) and created the Satter Division of Responsibility in Feeding (sDOR), and the validated instruments for testing the models: ecSI 2.0TM and sDOR.2-6yTM. sDOR is the gold standard for feeding children. In addition to many publications including articles, educational materials, and videos, Satter has written four books: Child of Mine: Feeding with Love and Good Sense, Secrets of Feeding a Healthy Family, and Your Child's Weight: Helping without Harming, and How to Get your Kid to Eat: But Not too Much. Satter's publications teach how our eating, and feeding our children, become positive, orderly, and healthful when we feed ourselves faithfully with rewarding meals and, while we are there, eat as much as we want of food we enjoy. Satter is the Founder and Developmental Editor for the Ellyn Satter Institute. www.EllynSatterInstitute.org

Sarita Dhuper, MD, FACC

Clinical Associate Professor of Pediatrics, SUNY Downstate Medical Center

Dr. Dhuper is a clinical associate professor of pediatrics and Director of Pediatric cardiology at SUNY Health Science Center of Brooklyn. A passionate clinician, an educator, and a social entrepreneur, she founded the Live Light Live Right program in 2003. This program received funding from the NY State Department of Health for five years and the Robin Hood Foundation for 14 years. Under her direction, the organization has won numerous awards and received recognition for its work in the fight against childhood obesity. It has received the prestigious HTNYS Health Care Innovation award and the HANYS community improvement award. The program is now an independent registered 5013c organization (livelight.org/).

Dr. Dhuper runs a clinical practice in pediatric cardiology and obesity in Brooklyn and is the network cardiologist for NY Presbyterian Health Care and Long Island Jewish Health Care (Cohen's Children's).

Dr. Dhuper is board certified in Pediatrics, Pediatric Cardiology and Obesity Medicine; a fellow of the American College of Cardiology, American Academy of Pediatrics; and a member of The Obesity Society and Diplomate of the American Board of Obesity Medicine.

Dr. Dhuper's research interests are related to Echocardiography and stress testing, evaluation and outcomes of childhood obesity, metabolic syndrome, and community interventions.

Prantik Saha, MD, MPH

Assistant Clinical Professor of Pediatrics, Vagelos College of Physicians & Surgeons, Columbia University Irving Medical Center

After graduating from Case Western Reserve University medical school and completing a pediatrics residency at Johns Hopkins Hospital, I started practicing general pediatrics initially as a hospitalist, and eventually in primary care. I spent 11 years as a faculty member at Columbia University Medical Center (CUMC), where I completed an MPH at the Columbia Mailman School of Public Health, and I am now practicing primary care pediatrics at a private practice in New York City. After attending several motivating interviewing workshops, I joined the Motivational Interviewing Network of Trainers (MINT) in 2010. I spend about 50% of my work life in medical education, and my interests include providing MI training for primary care providers, medical students and trainees. A sampling of past participants and audiences includes graduate and health professional students at the Institute of Human Nutrition at CUMC, peer education counselors from community based organizations and community-campus partnerships, and medical students and pediatric residents at CUMC. I am also a faculty member of the Columbia HIV Mental Health Training Project, and I have been a visiting professor for the American Academy of Pediatrics section on obesity. My current focus is on the development of an MI curriculum for medical students.

Eve Khlyavich Freidl, MD

Medical Director, Eating and Weight Disorders Program, Icahn School of Medicine at Mount Sinai, Associate Professor of Psychiatry

Eve K. Freidl is an Associate Professor of Psychiatry at the Icahn School of Medicine at Mount Sinai and Medical Director of the Eating and Weight Disorders Program. She joined the faculty in September 2018.

Dr. Freidl earned her medical degree from Drexel University College of Medicine. She was a resident at Montefiore Medical Center and completed Child and Adolescent Psychiatry Resident at Weill Cornell and Columbia University Medical Centers at New York-Presbyterian. Following clinical training, she received a NIMH T32 postdoctoral research training grant to pursue research at Columbia University in affective, anxiety and related disorders. While a research fellow, Dr. Freidl received an American Academy of Child and Adolescent Psychiatry Pilot Research Award to study genetic contributions to stimulant medication side effects of weight loss and growth suppression. She participated in assessment of adolescent bariatric surgery candidates and research related to the functioning and outcomes of these adolescents. She also gained clinical expertise in the evaluation, psychological treatment and pharmacological treatment of eating disorders. From 2013–2018 she worked in the faculty at Columbia University Clinic for Anxiety and Related Disorders (CUCARD) and served as medical director. There she specialized in assessment and treatment of children and adolescents with anxiety and eating disorders.

Dr. Freidl's clinical work remains focused on anorexia nervosa, bulimia nervosa and avoidant/restrictive food intake disorder. Her research interests include treatment development and understanding biological markers that influence illness and affect treatment outcomes.

Vivian Chin, MD

Assistant Professor of Pediatrics, Pediatric Endocrinologist, SUNY Downstate Health Sciences University

Dr. Vivian L. Chin is a pediatric endocrinologist at SUNY Downstate Health Sciences University. She is also the Associate Program Director for the pediatric residency program. She specializes in diabetes and endocrine disorders in children and adolescents, and works closely with the pediatric obesity program for healthy lifestyle management. She has published on thyroid disorders, pediatric diabetes (type 1 and type 2), obesity, bariatric surgery, and polycystic ovarian syndrome (PCOS). She has presented her work at National Conferences and meetings. She oversees fellows' research projects on screening for comorbid conditions in type 1 diabetes, treatment of Hashimoto's thyroiditis with vitamin D deficiency, endothelial dysfunction in obese and diabetic children as well as in adolescents with PCOS, metabolically unhealthy children, and performance of A1c for the diagnosis of prediabetes in overweight children. She obtained her B.A. in biology from Cornell University, her M.D. from NYU School of Medicine and completed her pediatric residency training at Children's Hospital at Montefiore and fellowship training in pediatric endocrinology at New York-Presbyterian Columbia University Medical Center. She is also a graduate of the Columbia Summer Research Institute (2012).

Lisa C. Hudgins, MD

Associate Professor of Pediatrics in Medicine,
The Rogosin Institute/Weill-Cornell Medical College

Dr. Lisa Hudgins is an Associate Professor of Pediatrics in Medicine at Weill Cornell Medical College and for 25 years has been the director of the Pediatric Comprehensive Lipid Control Center located next to The New York Presbyterian Hospital at Cornell.

She evaluates and treats children with elevated blood cholesterol and triglycerides, some severe enough to require medication and other specialized treatments such as lipid apheresis. With Dr. Hudgins' oversight, the center's two experienced dietitians offer expert instruction on the best balance of healthy foods to prevent diabetes and heart disease. Her research informs this advice, since the role of excess dietary saturated fat and sugar in hyperlipidemia is one of her long-standing research interests.

She also studies children with genetic causes such as familial hypercholesterolemia or familial chylomicronemia. It is Dr. Hudgins' firm belief that an early start in childhood with a healthy lifestyle that is maintained lifelong will have the greatest impact on the prevention of slowly developing diseases that become far too prevalent later in adulthood.

Jeffrey L. Zitsman, MD

Director, Center for Adolescent Bariatric Surgery, Morgan Stanley Children's Hospital of NY Presbyterian Columbia University Irving Medical Center

Dr. Zitsman is founder and Director of the Center for Adolescent Bariatric Surgery at the Morgan Stanley Children's Hospital of New York-Presbyterian, recognized by the American College of Surgeons as a MBSAQIP Accredited Adolescent Center. He is Principal Investigator for an FDA-approved adolescent laparoscopic adjustable gastric banding study.

Since 2006 he has performed more than 500 minimal access weight loss procedures. Dr. Zitsman has served as Chairman and Vice-Chairman of the Committee on Obesity of the American Pediatric Surgical Association. He is a member of the Childhood Obesity Committee of the American Society for Metabolic and Bariatric Surgery and has served as a Consultant to the Medical Devices Evaluation Panel of the FDA.

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian KIDS
Morgan Stanley Children's Hospital

Primary Care Assessment and Action on Food Insecurity and Its Effects on Child Health and Nutrition

Cristina R. Fernández, MD MPH
Assistant Professor of Pediatrics
May 6, 2021

Disclosure

Cristina R. Fernández has no disclosures.

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian KIDS
Morgan Stanley Children's Hospital

Objectives

Definitions of food insecurity

Food insecurity and child health and nutrition

Food insecurity and child obesity

Food insecurity assessment in the primary care setting

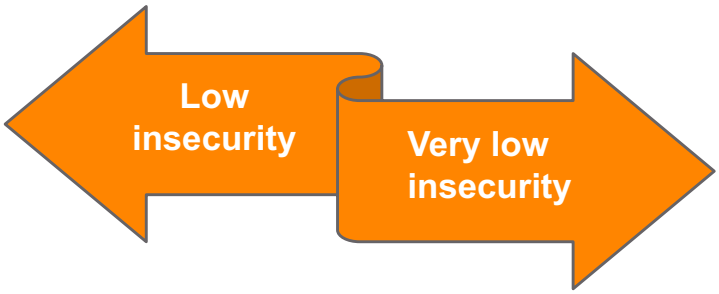
Action steps to address food insecurity and obesity risk

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

FOOD INSECURITY: when a person or household is uncertain of having or acquiring enough food to meet needs of all family members due to limited money and limited resources

No disruption of eating patterns but may be eating a less varied diet



Disruption of eating patterns with reduced food intake of 1 or more household members

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Prevalence of food insecurity, average 2017-19

Food insecurity below U.S. average
Food insecurity near U.S. average
Food insecurity above U.S. average

Source: USDA, Economic Research Service using data from the December 2017, 2018, and 2019 Current Population Survey Food Security Supplements.

U.S. prevalence:

11.1% (2018)

↓

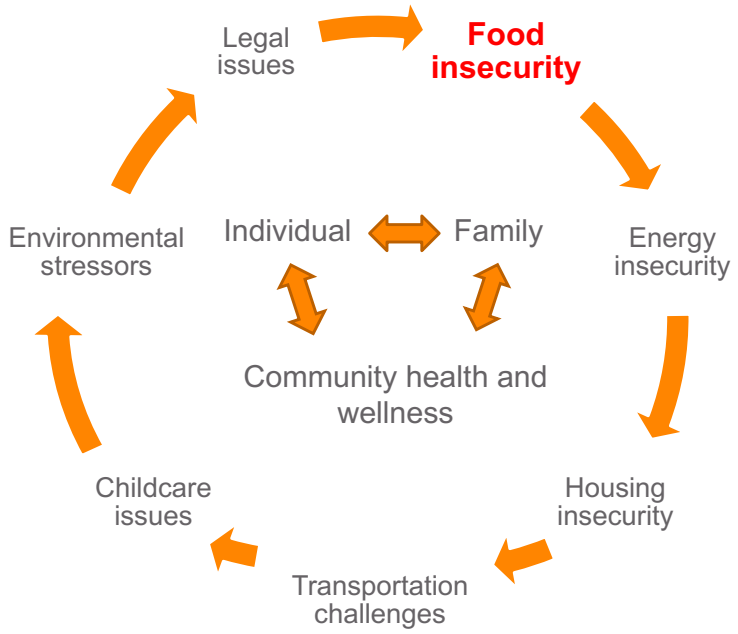
10.8% (2019)

↓

2020??

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital



COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Objectives

Definitions of food insecurity

Food insecurity and child health and nutrition

Food insecurity and child obesity

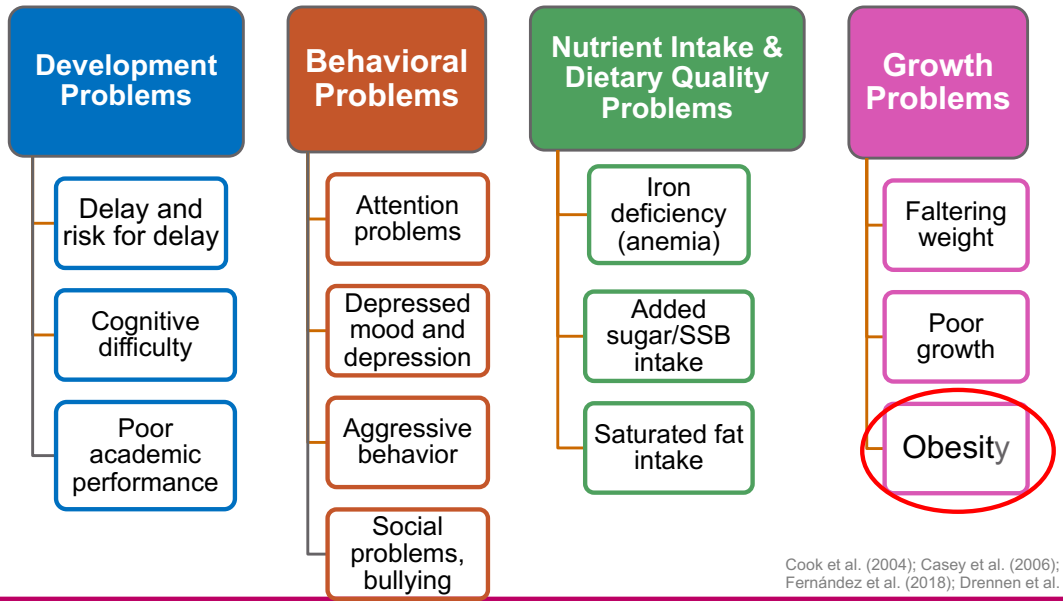
Food insecurity assessment in the primary care setting

Action steps to address food insecurity and obesity risk

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Child food insecurity has been associated with:



Cook et al. (2004); Casey et al. (2006); Rose-Jacobs et al. (2008); Fernández et al. (2018); Drennen et al. (2019)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Objectives

Definitions of food insecurity

Food insecurity and child health and nutrition

Food insecurity and child obesity

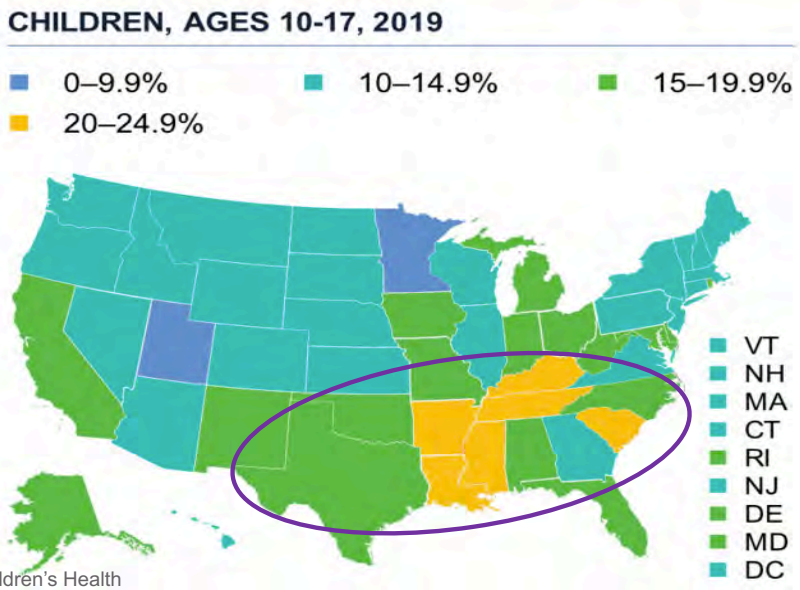
Food insecurity assessment in the primary care setting

Action steps to address food insecurity and obesity risk

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

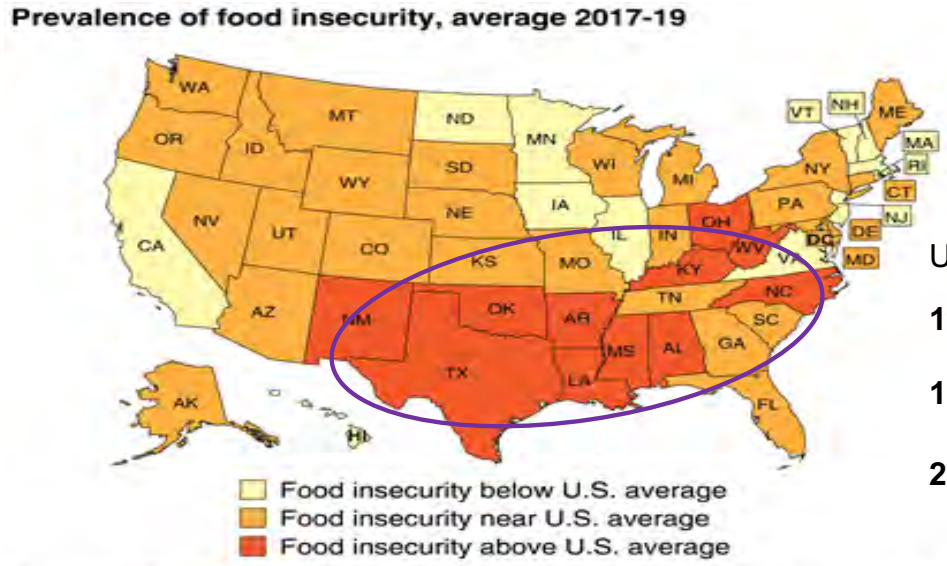
Child obesity prevalence



Source: The National Survey of Children's Health

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital



U.S. prevalence:

11.1% (2018)

↓

10.8% (2019)

↓

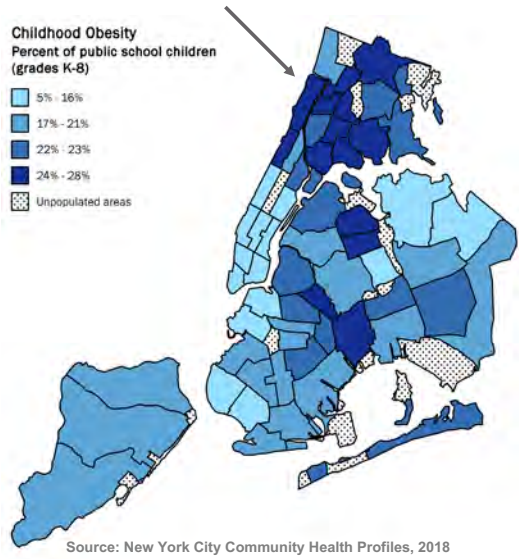
2020??

Source: USDA, Economic Research Service using data from the December 2017, 2018, and 2019 Current Population Survey Food Security Supplements.

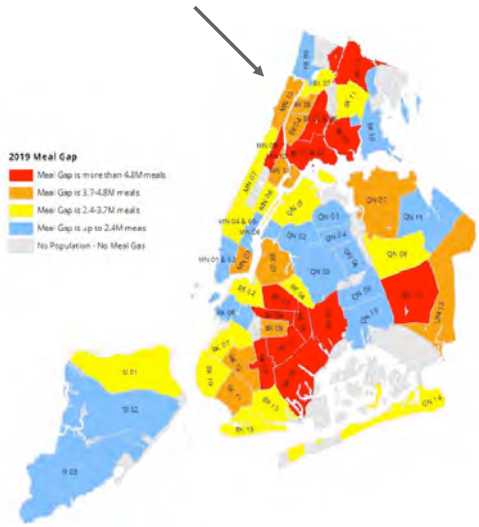
COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

New York City: Food insecurity & obesity



Source: New York City Community Health Profiles, 2018



Source: Gundersen CA, et al. *Map the Meal Gap 2017: Food Insecurity and Child Food Insecurity Estimates at the County Level.* Feeding America, 2017. Released in 2019

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Proposed mechanisms for food insecurity effect on child obesity

- ↑ Dietary intake of total calories, saturated fat, added sugars
- ↑ Economic hardship ~ reliance on calorically dense less healthful food
- ↑ Economic hardship ~ transient kitchen access and less cooking at home
- ↑ Parenting challenges around food → feeding styles, "clean your plate"

Shin et al. (2015); Au et al. (2019); Brown et al. (2019); Speirs et al. (2016)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Food insecurity and child obesity debate

No significant association

- Relationship with overweight/obesity among preschoolers
- Relationship with overweight/obesity and adiposity-related outcomes in children age 10-15 years

Metallinos-Katsaras et al. (2009, 2012); Zhu et al. (2019); Au et al. (2019)

- No relationship with overweight/obesity among preschoolers in NHANES
- No relationship with overweight/obesity in children age 8-15 years

Bhattacharya et al.(2004); Casey et al. (2006); Drennen et al. (2019); Gundersen et al., (2008)

A significant association

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Food insecurity and child obesity debate

- Inconsistent measures for food insecurity
- Inconsistent cut-offs for overweight and obesity
  - percentiles vs. z-scores
  - overweight + obese (≥85%) vs. just obese (≥95%)
  - categorical vs. continuous outcome measure
- Inconsisent findings across genders
- Range of sample sizes

Eisenmann et al. (2011); Brown et al. (2016)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Objectives

Definitions of food insecurity

Food insecurity and child health and nutrition

Food insecurity and child obesity

Food insecurity assessment in the primary care setting

Action steps to address food insecurity and obesity risk

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Food insecurity assessments

(1) USDA 18-item Household Food Security Survey Module
- Validated in English, Spanish, and Chinese
  - Raw score 0—High food security
  - Raw score 1-2—Marginal food security
  - Raw score 3-7—Low food security
  - Raw score 8-18—Very low food security

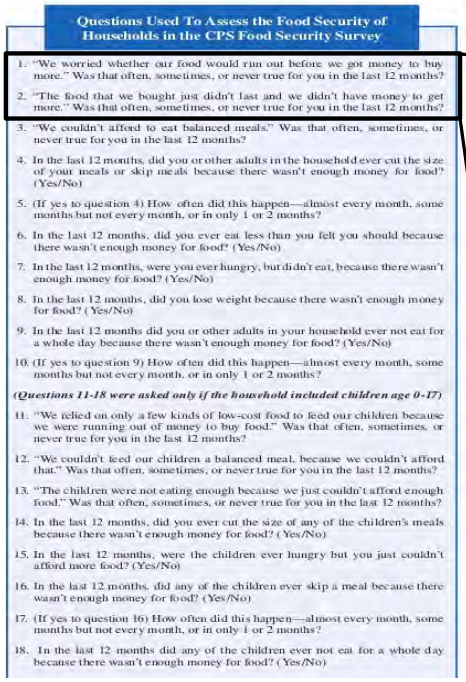
(2) USDA "Short-Form" 6-item Food Security Survey Module

(3) USDA 9-item Food Security Survey for Youth ≥ 12 Years-Old

(4) The 2-item Hunger Vital Sign™

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital



Questions Used To Assess the Food Security of Households in the CPS Food Security Survey

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn't eat, because there wasn't enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn't enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children age 0-17)

11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?
13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes/No)

The Hunger Vital Sign™

Was this often, sometimes, or never true for you in the last 12 months?

1. **"We worried our food would run out before we got money to buy more.**
2. **"The food we bought just didn't last and we didn't have money to get more."**

Positive (+) screen for food insecurity if response is "often true" or "sometimes true" to either or both of the above statements

Hager et al., *Pediatrics* (2010)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Food insecurity assessment in the primary care setting: experiences and challenges

- Time constraints
- Competing priorities for screening (e.g. mental health screening)
- Forgetting to screen (i.e. lack of prompt and/or not knowing how)
- Limited knowledge of food insecurity as a health issue
- Unsure how to manage a positive screen
- Not knowing what community resources may be available to help families
- Discomfort with sensitivity of food insecurity issue
- Missing cultural context when screening non-English speaking families

Hoisington et al. (2012); Barnidge et al. (2017) ; Beck et al. (2015); O'Malley et al. (2013)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Factors affecting food insecurity screening outcomes

- Self-assessment vs. administered screens
  - almost 30% of families screen positive when self-assessed in clinic waiting room with web-based tool
- Incorporation of screening into clinical workflow
  - increased report of food insecurity during well child visits by pediatric residents using EMR-based screen and prompts
- Referral provision
  - greater willingness to report food insecurity when referral options are listed after screening questions

Hassan et al., 2015; Burkhardt et al., 2012; Bottino et al., 2016

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Objectives

Definitions of food insecurity

Food insecurity and child health and nutrition

Food insecurity and child obesity

Food insecurity assessment in the primary care setting

Action steps to address food insecurity and obesity risk

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Case

A mother presents to the pediatric primary care office with her 14 year-old daughter. The mother is concerned about her daughter's clothing size and some new bullying at school. She says she is going through a "hard time" finding affordable housing and lost their SNAP benefits. When you speak with the 14 year-old privately for HEADDS screening she discloses that she mainly eats at school with little beyond some packaged food available at home.

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

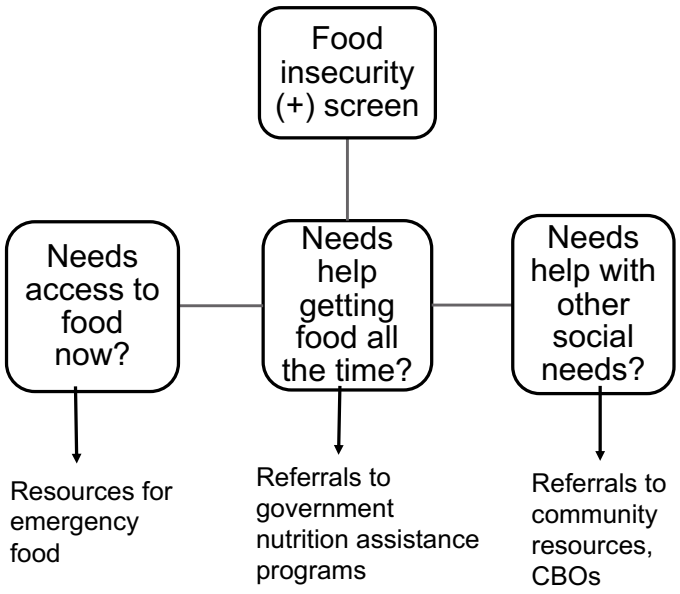
NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Addressing food insecurity in the primary care setting

Is the food insecurity problem acute or chronic?

What are contributing or associated factors with food insecurity for the particular family/child?

What does the family/child need at that moment?



COLUMBIA
COLUMBIA UNIVERSITY DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Government nutrition assistance programs – the food safety net

Supplemental Nutrition Assistance Program (SNAP)

Supplemental Nutrition Program for Women, Infants, and Children (WIC)

National School Lunch Program

National School Breakfast Program

Child and Adult Care Food Program

Summer Food Service Program

COLUMBIA
COLUMBIA UNIVERSITY DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Addressing food insecurity: resources

FEEDING AMERICA

35 YEARS FOOD BANK FOR NEW YORK CITY

HUNTER COLLEGE NEW YORK CITY FOOD POLICY CENTER

RESCUING FOOD FOR NEW YORK'S HUNGRY
CITY HARVEST
cityharvest.org

CUNY URBAN FOOD POLICY INSTITUTE

COLUMBIA
COLUMBIA UNIVERSITY DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Addressing food insecurity: workflows

When to screen	Before visit?	During visit?	After visit?	
How to screen	Self-administered vs. staff-administered?	Paper, smart device, computer?		
Who screens	MD?	RN?	Clinical staff?	Administrative staff?
How often to screen	All health maintenance visits?	Once a year?		
Where to refer	Partnerships with community-based organizations	SNAP Enrollment centers	Local emergency food centers	

COLUMBIA
COLUMBIA UNIVERSITY DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Addressing food insecurity: communication

Communicate with family with food insecurity about child weight status and next steps

- Ascertain parent stress level, worries, and priorities
- Understand parents' perception of and concerns about their child's weight
  - families with food insecurity can adopt unhealthy eating behaviors with increased snacking under the incorrect assumption that their preschooler child is underweight
  - Identify stakeholders in or out of the household who procure the food and cook
  - Discuss social supports, government assistance, grocery lists, and food budgets
- Motivational interviewing for incremental food purchasing and food behavior change at home

Kral et al. (2017); Dovico et al. (2020)

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

Summary

- Food insecurity – a crucial health-related social need that may increase risk for child overweight and obesity
  - Many studies find higher prevalence of overweight/obesity among food insecure children but results are still inconclusive
  - mechanisms of action focus on nutrient intake and dietary behavior
- Further research on a significant positive or negative relationship between government nutrition assistance programs and child overweight and obesity are needed
- Food insecurity screening can identify families and children at risk and target nutritional resources, assistance, and interventions

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

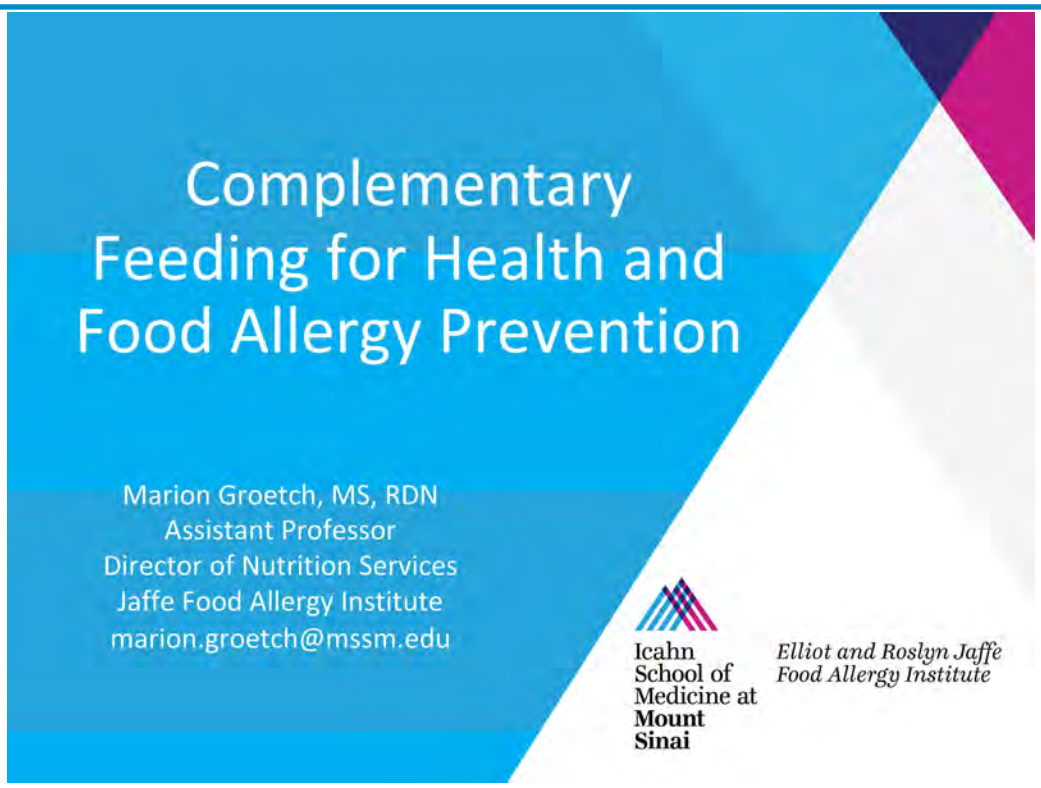
NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital

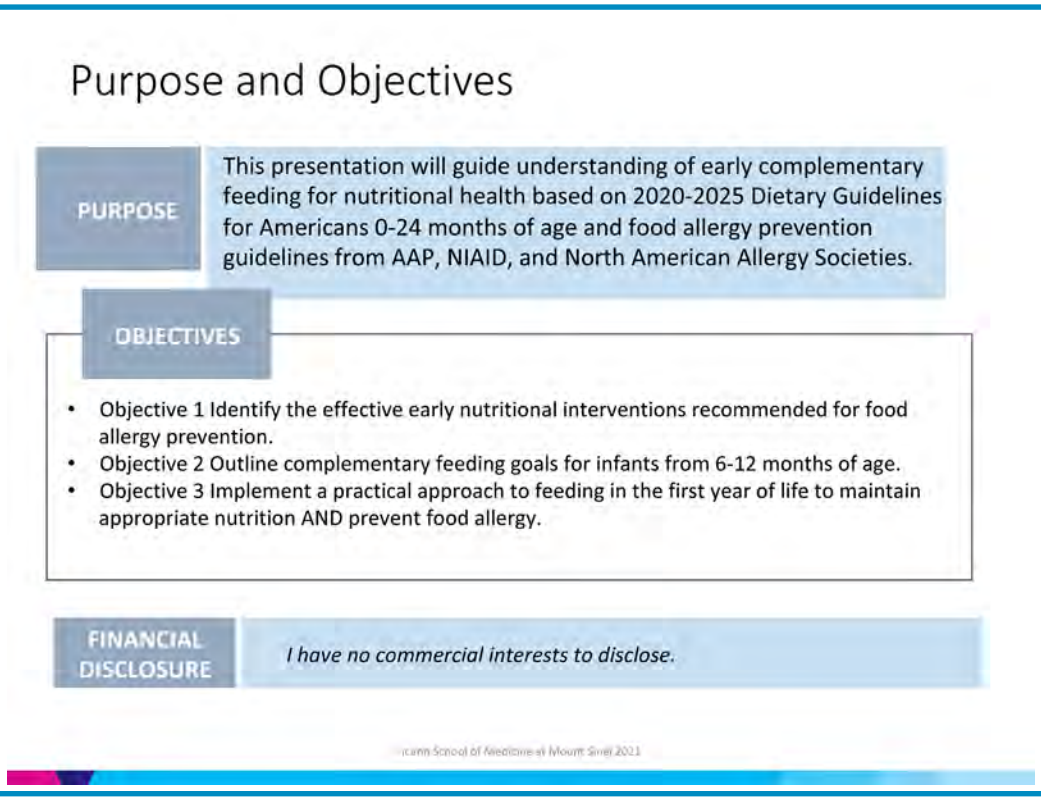
Contact me with questions!

Cristina R. Fernández, MD MPH
Assistant Professor of Pediatrics
Columbia University Irving Medical Center
crf2101@cumc.columbia.edu
Twitter: @DrCFernandez

COLUMBIA
COLUMBIA UNIVERSITY
DEPARTMENT OF PEDIATRICS

NewYork-Presbyterian Kids
Morgan Stanley Children's Hospital


Complementary Feeding for Health and Food Allergy Prevention
Marion Groetch, MS, RDN
Assistant Professor
Director of Nutrition Services
Jaffe Food Allergy Institute
marion.groetch@mssm.edu
Icahn School of Medicine at Mount Sinai
Elliot and Roslyn Jaffe Food Allergy Institute


Purpose and Objectives
PURPOSE
This presentation will guide understanding of early complementary feeding for nutritional health based on 2020-2025 Dietary Guidelines for Americans 0-24 months of age and food allergy prevention guidelines from AAP, NIAID, and North American Allergy Societies.
OBJECTIVES
Objective 1 Identify the effective early nutritional interventions recommended for food allergy prevention.
Objective 2 Outline complementary feeding goals for infants from 6-12 months of age.
Objective 3 Implement a practical approach to feeding in the first year of life to maintain appropriate nutrition AND prevent food allergy.
FINANCIAL DISCLOSURE
I have no commercial interests to disclose.

American Academy of Pediatrics (AAP) History of Prevention Guidelines

- AAP Committee on Nutrition (CON) 2000[1]
  - ➢No milk until 12 months
  - ➢No egg until 2 years
  - ➢No peanut, tree nuts, fish or shell fish until 3 years of age.

2008 AAP advised there is no convincing evidence for delaying the introduction of highly allergenic foods after 4-6 months of age for the prevention of allergy. [2]

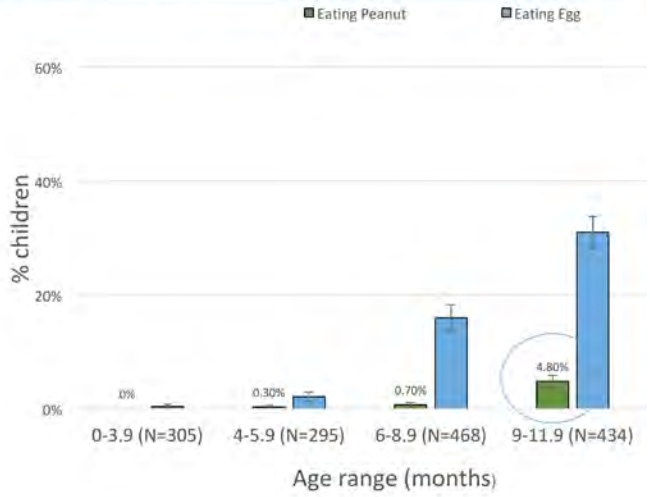
1. AAP Committee on Nutrition. *Pediatrics*. 2000;106(2 pt 1):346-349.
2. Greer FR, et al. *Pediatrics*. 2008;121(1):183-191.

Evaluation of the Introduction of Allergen Containing Foods: Feeding Infants and Toddlers Study (FITS) 2016

Marion Groetch, MS, RDN[1], Laura Czerkies, MS, RD[2], Erin Quann, PhD, RD[2], Jami Boccella, RD, CLC[2], Joel Hampton, MS[3], Andrea Anater, PhD, MPH, MA[3] Anna Nowak-Wegrzyn, MD, PhD[4]

Accepted for publication Annals of Allergy, Asthma, and Immunology. 2021

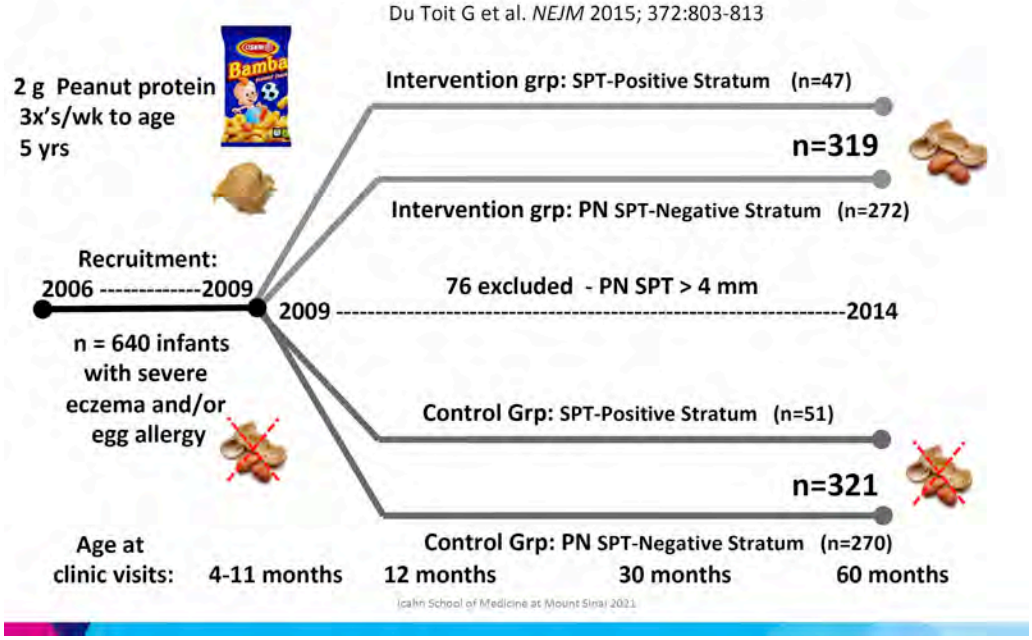
In 2016, there were very low rates of reported peanut consumption across the study population with < 1% of any age group prior to 9 months of age and < 6% in any age group prior to 12 months-of-age consuming peanut.



Randomized Controlled Trials that Changed the Landscape

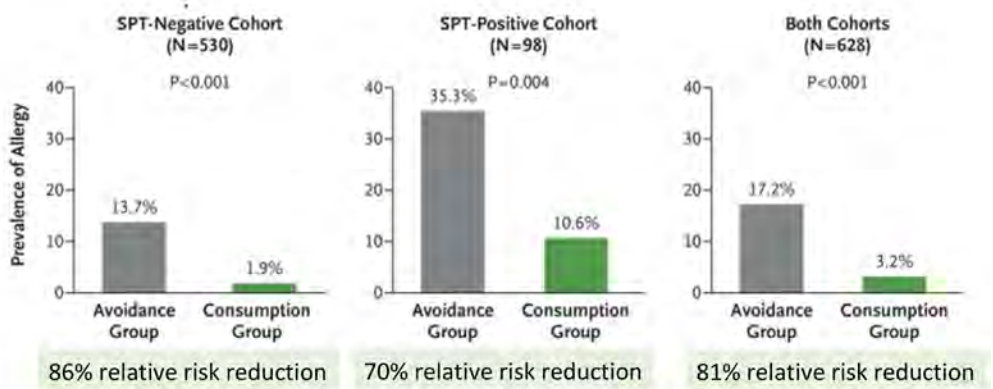
Landmark LEAP Trial Design

Du Toit G et al. *NEJM* 2015; 372:803-813



Icahn School of Medicine at Mount Sinai 2021

LEAP Outcome: Intention to Treat Analysis

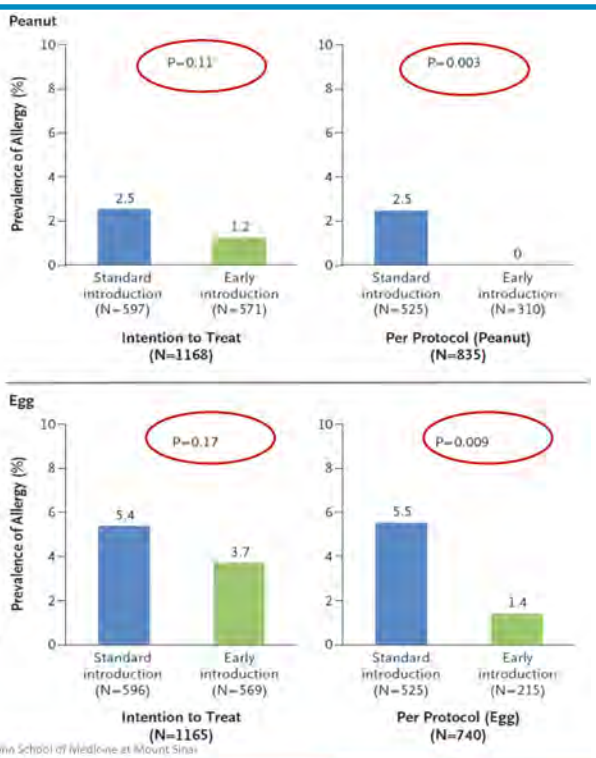


Du Toit G et al. *NEJM* 2016; Jul 28;375(4):398

EAT Trial

Perkin MR et al. *NEJM* 2016

- 1,162 Exclusively breastfed infants enrolled in the trial (median age = 3.4 months)
- Randomized to early introduction of milk, egg, peanut, fish, wheat & sesame (n=567) or standard feeding* (n=595)
- Overall, by ITT analysis, there was no significant difference in food allergy or SPTs between groups.
- Adherence – Early feeding: 43.1%Egg/62% PN; Standard: 92.9%
- PP Analysis however was significant
- Children who were introduced peanut and cooked egg from 3 months of age PER PROTOCOL were significantly less likely to have peanut and egg allergy



*Exclusive breastfeeding until 6 months of age.

Early introduction egg clinical trials

Fleischer, et al. J Allergy Clin Immunol Practic 2021

Study	Full Title	Study Type	Population	Intervention	Primary Outcome	Results
STAR[4] (Australia)	Solids Timing for Allergy Reduction	Blinded RPCT (n=86)	High-risk infants with moderate to severe eczema	• Daily consumption of egg vs placebo powder from 4-8 months • 0.9 g raw whole egg powder daily (0.4 g protein/day) • Cooked egg at 8 months	IgE-mediated egg allergy at 12 months based on positive SPT and egg OFC	• Study terminated early: 1/3 of patients reacted to egg at entry OFC • At 12 months, 33% had egg allergy in egg group vs 51% in control (not significant)
STEP[9] (Australia)	Starting Time for Egg Protein	Blinded RPCT (n=820)	Intermediate risk: • atopic moms (allergic disease + positive envir SPT • Infants: no allergic dz	• Daily consumption of egg vs placebo powder from 4-6.5 months • 0.9 g raw whole egg powder daily (0.4 g protein/day)	IgE-mediated egg allergy at 12 months based on positive SPT and egg OFC	• No significant differences in egg allergy between groups • No anaphylactic reactions at initial egg intro
HEAP[8] (Germany)	Hens Egg Allergy Prevention	Blinded RPCT (n=406)	Normal risk general population • Infants with IgE <0.35 kU/L at enrollment	• Thrice weekly 2.5 g egg protein from 4-6 months of age until 12 months	Sensitization to egg based on egg IgE ≥0.35 kU/L at 12 months of age	• No evidence of preventing egg sensitization or allergy • High rate of anaphylaxis at egg introduction at entry

Early introduction egg clinical trials (continued)

Fleischer, et al. J Allergy Clin Immunol Practic 2021

Study	Full Title	Study Type	Population	Intervention	Primary Outcome	Results
BEAT[7] (Australia)	Beating Egg Allergy Trial	Blinded RPCT (n=319)	Intermediate risk: • Infants with 1st degree relative with atopy • Infants: neg egg SPT	• Daily consumption of egg vs placebo powder at 4 months • 350 mg protein daily raw whole egg powder • Cooked egg at 8 months	Sensitization to egg by SPT at 12 months of age	• Subjects in egg group vs placebo had significantly less egg sensitization (10.7% vs 20.5%, p=0.03) • No harm with egg intro
PETIT[10] (Japan)	Preventing egg allergy in infants with AD	Blinded RCT (n=121)	High-risk infants with atopic dermatitis	Daily consumption of 50 mg heated egg from 6-9 months Daily consumption of 250 mg heated egg from 9-12 months	IgE-mediated egg allergy at 12 months of age based on OFC	• Prevalence of egg allergy 37.7% in placebo vs 8.3% in egg group (p=0.0013) • No SAEs

JAMA | Original Investigation

JAMA. 2016 Sep 20;316(11):1181-1192.

Timing of Allergenic Food Introduction to the Infant Diet and Risk of Allergic or Autoimmune Disease

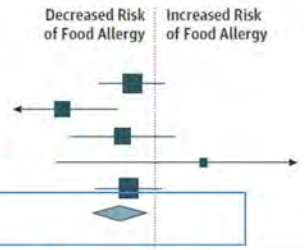
A Systematic Review and Meta-analysis

Despo Ierodiakonou, MD, PhD; Vanessa Garcia-Larsen, PhD; Andrew Logan, PhD; Annabel Groome, BSc; Sergio Cunha, MD; Jennifer Chivinge, BSc; Zoe Robinson, BSc; Natalie Geoghegan, BSc; Katharine Jarrold, BSc; Tim Reeves, BSc; Nara Tagiyeva-Milne, PhD; Ulugbek Nurmatov, MD, PhD; Marialena Trivella, DPhil; Jo Leonardi-Bee, PhD; Robert J. Boyle, MD, PhD

Moderate-certainty evidence from 5 trials (1915 participants) that early egg introduction at 4 to 6 months associated with reduced egg allergy (Risk Ratio 0.56, 95% CI 0.36=0.87, P=0.009)

A Risk of food allergy

Outcome	Dietary Introduction of Allergenic Food: Early, No. of Events	Early, Total No.	Late, No. of Events	Late, Total No.	Risk Ratio (95% CI)
Egg allergy					
Perkin et al,[6] 2016	21	569	32	596	0.69 (0.40-1.18)
Natsume et al,[17] 2016	5	60	23	61	0.22 (0.09-0.54)
Tan et al,[18] 2016	8	130	13	124	0.59 (0.25-1.37)
Bellach et al,[16] 2015	2	142	1	156	2.20 (0.20-23.97)
Palmer et al,[15] 2013	14	42	18	35	0.65 (0.38-1.11)
Random-effects model Heterogeneity: I^2 = 35.8%; P = .18		943		972	0.56 (0.36-0.87)



Updated Guidelines

2017 Addendum Guidelines for the Prevention of Peanut Allergy in the US: Report of the Report of the National Institute of Allergy and Infectious Diseases- sponsored expert panel: recommend early introduction of peanut in those at risk of peanut allergy

Togias, A., Cooper, S. F., Acebal, M. L. et al. J Allergy Clin Immunol. 2017

Summary of Addendum Guideline-When to introduce

Togias A, Cooper SF, Acebal ML, Assa'ad A, Baker JR, Jr., Beck LA, et al. J Allergy Clinol. 2017;139(1):29-44.

Guideline	Infant Criteria	Recommendations	Introduce Peanut
1	Severe eczema and/or egg allergy	Strongly consider evaluation by sIgE and/or SPT, and if necessary an oral food challenge.*	As early as 4-6 months *
2	Mild to moderate eczema	Introduce peanut-containing foods	Around 6 months
3	No eczema/no food allergy	Introduce peanut-containing foods	Age appropriate and in accordance with Family/ cultural practices

*Based on test results, introduce peanut containing foods

https://www.niaid.nih.gov/sites/default/files/peanut-allergy-prevention-guidelines-clinician-summary.pdf

2019 American Academy of Pediatrics- SUMMARY

The Effects of Early Nutritional Interventions on the Development of Atopic Disease in Infants and Children

INFANT feeding:

- There is no evidence that avoiding allergenic foods during pregnancy and lactation prevents atopic disease.
- There is **no evidence that delaying** introduction of allergenic foods, including peanuts, fish, eggs beyond 4-6 months of age prevents atopic disease.
- There is evidence that early introduction of infant-safe forms of peanut **reduces the risk** for peanut allergies.
- Data are less clear for timing of introduction of egg. (AAP 2019 Prevention Guidelines do not specifically recommend early introduction of egg.)

Greer, Sicherer, Burks. Pediatrics. 2019 Apr;143(4)

Ninth Edition Dietaryguidelines.gov

- Begin complementary foods around 6 months of age
- It is important to introduce potentially allergenic foods along with other complementary foods.
- If an infant has severe eczema, egg allergy, or both (conditions that increase the risk of peanut allergy), age-appropriate, peanut containing foods should be introduced into the diet as early as age 4 to 6 months. This will reduce the risk of developing peanut allergy.
- Potentially allergenic foods (e.g., peanut, egg, cow milk products, tree nuts, wheat, crustacean shellfish, fish, and soy) should be introduced when other complementary foods are introduced to an infant's diet.

ELSEVIER

The Journal of Allergy and Clinical Immunology: In Practice

Volume 9, Issue 1, January 2021, Pages 22-43.e4

Review and Feature Article

A Consensus Approach to the Primary Prevention of Food Allergy Through Nutrition: Guidance from the American Academy of Allergy, Asthma, and Immunology; American College of Allergy, Asthma, and Immunology; and the Canadian Society for Allergy and Clinical Immunology

David M. Fleischer MD [a], Edmond S. Chan MD [b], Carina Venter PhD, RD [a], Jonathan M. Spergel MD, PhD [c], Elissa M. Abrams MD, MPH [d], David Stukus MD [e], Marion Groetch RD [f], Marcus Shaker MD, MS [g], Matthew Greenhawt MD, MBA, MSc [a]

Icahn School of Medicine at Mount Sinai 2021

A Consensus Approach to the Primary Prevention of Food Allergy Through Nutrition

The Journal of Allergy and Clinical Immunology: In Practice

- Introduce cooked egg and peanut-containing products to all infants, irrespective of their relative risk of developing peanut allergy, starting around 6 months of life (and not before 4 mo.)
- While screening for sensitization and/or in-office introduction is not required prior to introduction, this remains an option to consider for families that prefer to not introduce at home; this decision is preference-sensitive and should be made taking into account current evidence and family preferences.

Peanut allergy is common in infants with moderate-severe eczema, whereas family history without eczema is not a major risk factor- suggesting screening only those with significant eczema. Even within the first year of life, introduction at later ages is associated with a higher risk of peanut allergy among those with eczema, supporting introduction of peanut as early as possible.

Age and eczema severity, but not family history, are major risk factors for peanut allergy in infancy

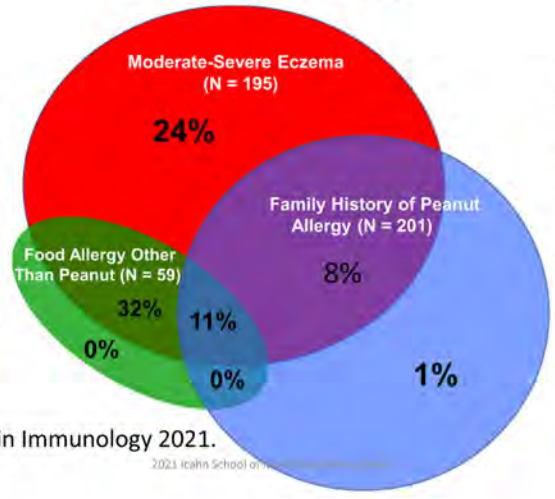
Rates of peanut allergy

Population:

- 321 infants 4-11 months of age with:
  - no history of peanut exposure or allergy testing
  - at least one risk factor

Procedures:

- Skin prick test and oral food challenge (or observed feeding) to determine peanut allergy status

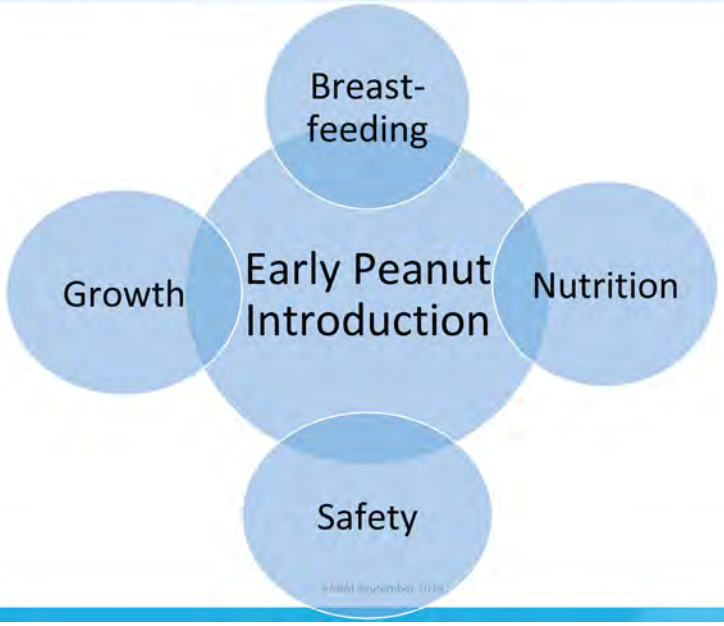


Risk Modification:

- Higher age and SCORAD (SCORing Atopic Dermatitis) score increase risk
- In the absence of eczema, family history confers very little risk
- Among those with eczema, food allergy other than peanut increases risk

Keet et al. J Allergy Clin Immunology 2021.

What is the **nutritional impact** of early allergic introduction?



Safety and Feasibility

LEAP
- **No Choking Episodes**
- **Whole peanut avoided**
- **Weekly target achieved (6 g peanut protein)**

Whole nuts
> 5 years of age

Clumps of chunks of peanut butter-
> 4 years of age

Feeney et al. J Allergy Clin Immunol. 2016 Oct;138(4):1108-1118
Venter, Groetch J Allergy Clin Immunol. 2016 Oct;138(4):1119-1121

The Food Allergy Guidelines portal
https://www.niaid.nih.gov/diseases-conditions/guidelines-clinicians-and-patients-food-allergy
Guidelines for parents:
https://www.niaid.nih.gov/sites/default/files/peanut-allergy-prevention-guidelines-parent-summary.pdf

LEAP- GROWTH

- No difference in weight, height, BMI, waist circumference, and subscapular and triceps skin fold up to 5 years

LEAP- NUTRITION and BREASTFEEDING

- **Breastfeeding duration equivalent**
- **Mean protein and energy intakes equivalent**
- **Micronutrient intakes equivalent (Calcium, vitamin D, zinc and iron), although improvements overall are needed in regard to iron and zinc**
- **Carbohydrate intake lower in the introduction group due to less starchy (21, 30 months) and sugary foods (30, 60 months)**
- **Fat intake was higher in consumption group**
- **No difference in fruit and vegetable intake**

Feeney et al. J Allergy Clin Immunol. 2016 Oct;138(4):1108-1118
Venter, Groetch J Allergy Clin Immunol. 2016 Oct;138(4):1119-1121

What is the impact on protein intake?

- FITS 2016 data indicate that protein intake is easily met in the diets of toddlers.
- 2020-2025 Dietary Guidelines state that protein foods, including meats, poultry, eggs, seafood, nuts, seeds, and soy products, are important sources of iron, zinc, protein, choline, and long chain polyunsaturated fatty acids.

LEAP-When comparing highest quartile of peanut consumers to the avoiders, they had significantly higher intakes of vegetable protein and lower intakes of animal protein expressed as a percent of total grams at 21, 30, and 60 months
Feeney et al. J JACI 2016

Welker, Jacquier, Catellier, Anater, Story. J Nutr. 2018 Sep 1;148(9S)

Approximately how much peanut product equals 2 grams of peanut protein?

a) 21 Bamba Sticks
b) 2 teaspoons peanut butter
c) 2 teaspoons peanut powder or flour
d) 10 peanuts
e) All of the above

ÄÄÄÄ September 2019

Nutritional comparison 2g peanut protein

	Natural Peanut Butter	Peanut	Peanut Flour	Peanut Butter	Bamba Snack
Serving size	2 tsp	10 peanuts	2 tsp	2 tsp	21 sticks
Calories	60	45	13	60	93
Fat g	5	3.9	0.02	5	6.1
Sodium mg	1.6	1	7	48	68
Sugar(g)	<0.5	0.38	<0.5	1.3	0.4

Bamba:
Peanuts, Corn, Palm oil and salt
Traditional Peanut butter: Peanuts, Sugar, Palm Oil, Salt, Molasses.

How do allergens fit in a complementary infant feeding plan?

Beginning at 6 months: Children in this age group consume small quantities of foods, so it's important to make every bite count!

- Some infants may show developmental signs of readiness before age 6 months, but introducing complementary foods before age 4 months is not recommended.
- Waiting until after age 6 months to introduce foods is not recommended.
- Complementary foods are necessary to ensure adequate nutrition and exposure to flavors, textures, and different types of foods.
- Introduce infants to potentially allergenic foods along with other complementary foods.
- Avoid foods/beverages with added sugars, limit foods high in sodium.

U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. December 2020. Available at DietaryGuidelines.gov

2020-2025 Dietary Guidelines

- Iron is a dietary component of public health concern for under-consumption among older infants ages 6 through 11 months who are fed primarily human milk and consume inadequate iron from complementary foods as are zinc and protein if under-consumed in complementary foods.
- Vitamin D, choline, and potassium are notably under-consumed by all older infants.
- Protein foods, including meats, poultry, eggs, seafood, nuts, seeds, and soy products, are important sources of iron, zinc, protein, choline, and long chain polyunsaturated fatty acids

U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. December 2020. Available at DietaryGuidelines.gov

WHAT to feed your baby (as tolerated and advised by your baby's doctor) (89):

Food Group	Daily Servings for 6-12 months of age
Milk & dairy	Continue breastfeeding on demand (or formula feeding) while introducing complementary foods. Serve up to ¼- ½ cup dairy foods such as plain yogurt.
Grains	1/2 - 1 ounce ½ ounce daily should be fortified with iron and zinc for the breastfed infant. Otherwise choose whole grain options.
Meats & proteins	3/4 - 3 ounces Serve a variety of meat, poultry, eggs, fish, nuts and seeds.
Fruits and vegetables	1/8-1/2 cup each Serve a variety of dark green, red, orange and other vegetables and fruits.

The amounts listed in this table are approximate *amounts to serve* so caregivers know how to provide nutrition in a balanced, diverse, and proportional manner. These amounts are NOT a prescription on *how much your baby should eat* as each baby is unique.

Food Group	Daily Servings for 12-24 months no longer nursing (or formula fed)
Milk & Dairy	1 2/3 - 2 cups
Grains	1 ¾ -3 ounces
Meat & Proteins	2 ounces
Vegetables	2/3 -1 cup each
Fruits	½- 1 cup
Oils (g/day)	9-13 (about 2 tsp)

Scientific Report of the 2020 Dietary Guidelines Advisory Committee Report to the Secretary of Agriculture and Secretary of Health and Human Services.
https://www.dietaryguidelines.gov/sites/default/files/2020-07/ScientificReport_of_the_2020DietaryGuidelinesAdvisoryCommittee_first-print.pdf

Groetch, et al. Dietary Management of FPIES during COVID 19 Annals 2021

What is a serving according the Dietary Guidelines for Americans 2020-2025?

Protein foods (2 per day*):

- 3 teaspoons nut or seed butters- or ½ ounce of nuts or seeds
- 1 egg
- 1 ounce fish

Grains (1/2-2*)

- ½ cup pasta or 1 slice of bread

Dairy-based food i.e. yogurt (1/4 – ½ cup*)

* Estimates based on DGA 2020-2025

ELSEVIER

The Journal of Allergy and Clinical Immunology: In Practice

January 2021

Clinical Commentary Review

Practical Challenges and Considerations for Early Introduction of Potential Food Allergens for Prevention of Food Allergy

Brian Schroer MD [a], Marion Groetch MS, RDN [b], Douglas P. Mack MSc, MD [c, d], Carina Venter PhD, RD [e]

- Aligned with early infant nutrition
- Implementing guidelines- dosing and maintenance
- Commercial vs Conventional Products for Early Introduction

Barriers To Early Introduction

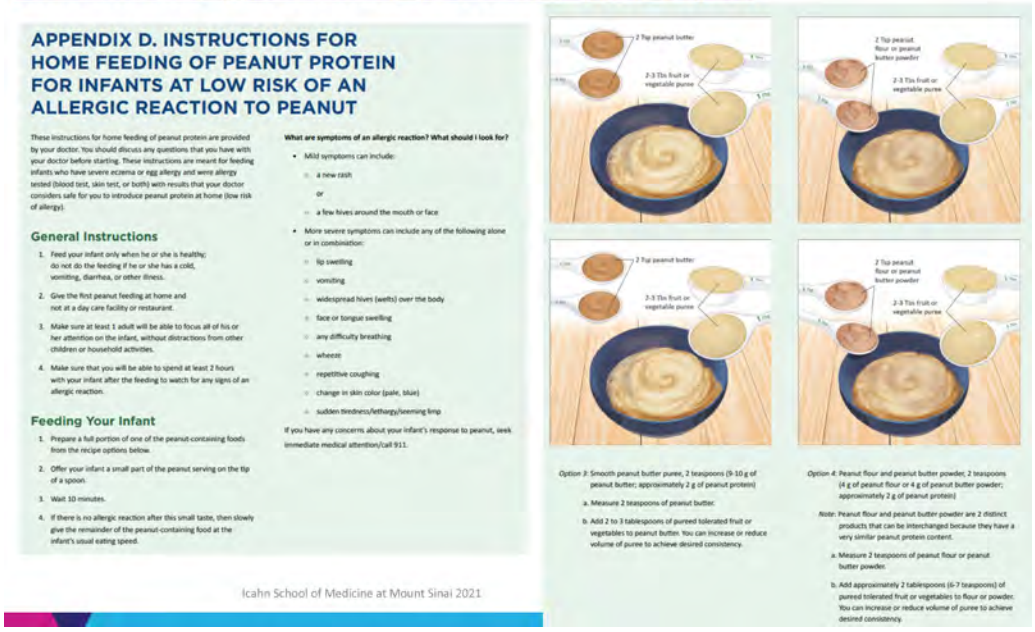
2019 Survey evaluated parental and pediatrician awareness and implementation of guidelines.

- Overall, high physician and parent comfort level with the guidelines, but low or modified implementation.
- Physician implementation is complicated by assumption of parental reluctance, as well as access to allergists for referrals, access to infant-safe peanut, and time.
- There were discrepant results with regard to physician-perceived barrier of parental acceptance (60%) and parent-reported comfort (90%).
- Parental fears about reactions and choking could be addressed by the pediatrician and with written materials.

Lai, Sicherer. Ann Allergy Asthma Immunol. 2019 Jun

How do I advise my patients?

https://www.niaid.nih.gov/sites/default/files/addendum_guidelines_peanut_appx_d.pdf



APPENDIX D. INSTRUCTIONS FOR HOME FEEDING OF PEANUT PROTEIN FOR INFANTS AT LOW RISK OF AN ALLERGIC REACTION TO PEANUT

These instructions for home feeding of peanut protein are provided by your doctor. You should discuss any questions that you have with your doctor before starting. These instructions are meant for feeding infants who have severe eczema or egg allergy and were allergy tested (blood test, skin test, or both) with results that your doctor considers safe for you to introduce peanut protein at home (low risk of allergy).

General Instructions

1. Feed your infant only when he or she is healthy; do not do the feeding if he or she has a cold, vomiting, diarrhea, or other illness.
2. Give the first peanut feeding at home and not at a day care facility or restaurant.
3. Make sure at least 1 adult will be able to focus all of his or her attention on the infant, without distractions from other children or household activities.
4. Make sure that you will be able to spend at least 2 hours with your infant after the feeding to watch for any signs of an allergic reaction.

Feeding Your Infant

1. Prepare a full portion of one of the peanut-containing foods from the recipe options below.
2. Offer your infant a small part of the peanut serving on the tip of a spoon.
3. Wait 10 minutes.
4. If there is no allergic reaction after this small taste, then slowly give the remainder of the peanut-containing food at the infant's usual eating speed.

What are symptoms of an allergic reaction? What should I look for?

- Mild symptoms can include:
  - a new rash
  - or
  - a few hives around the mouth or face
- More severe symptoms can include any of the following alone or in combination:
  - lip swelling
  - vomiting
  - widespread hives (welts) over the body
  - face or tongue swelling
  - any difficulty breathing
  - wheeze
  - repetitive coughing
  - change in skin color (pale, blue)
  - sudden tiredness/lethargy/seeming limp

If you have any concerns about your infant's response to peanut, seek immediate medical attention/call 911.

Option 3: Smooth peanut butter puree, 2 teaspoons (9-10 g of peanut butter; approximately 2 g of peanut protein)

a. Measure 2 teaspoons of peanut butter.

b. Add 2 to 3 tablespoons of pureed tolerated fruit or vegetables to peanut butter. You can increase or reduce volume of puree to achieve desired consistency.

Option 4: Peanut flour and peanut butter powder, 2 teaspoons (4 g of peanut flour or 4 g of peanut butter powder; approximately 2 g of peanut protein)

Note: Peanut flour and peanut butter powder are 2 distinct products that can be interchanged because they have a very similar peanut protein content.

a. Measure 2 teaspoons of peanut flour or peanut butter powder.

b. Add approximately 2 tablespoons (6-7 teaspoons) of pureed tolerated fruit or vegetables to flour or powder. You can increase or reduce volume of puree to achieve desired consistency.

Icahn School of Medicine at Mount Sinai 2021

Clinical Pearls - Introduce allergens!

- Beneficial for prevention
  - ➢Peanut- One strong RCT, and multiple guideline recommendations.
  - ➢Egg- A few strong RCTs, and now guideline recommendations.
- Although other allergens have not been studied or not studied sufficiently, there are observational data suggesting harm from intentional delayed introduction.
- Early introduction did not impact breastfeeding duration and growth. (EAT trial)
- Early introduction of peanut did not have a negative impact on breastfeeding duration, growth, nutritional intake. (LEAP trial)
- After Early Introduction: Feed Often!

- 1. Fleischer D, et all Allergy Clin Immunol Prac. 2021;9(1):22-43.
- 2. Schroer B, Groetch M, Mack D, Venter C. J Allergy Clin Immunol Prac. 2021;9:44-56.
- Du Toit G et al. *NEJM* 2015; 372:803-813

Resources

Dietary Guidelines:

https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf

NIAID Handouts:

https://www.niaid.nih.gov/sites/default/files/addendum_guidelines_peanut_appx_d.pdf

NIAID Guidance for Health Care Providers:

https://www.niaid.nih.gov/sites/default/files/peanut-allergy-prevention-guidelines-clinician-summary.pdf

Dietitians in Food Allergy

- INDANA www.indana-allergynetwork.org/
- FARE https://www.foodallergy.org/our-initiatives/education-programs-training/fare-training/pediatric-food-allergy-course

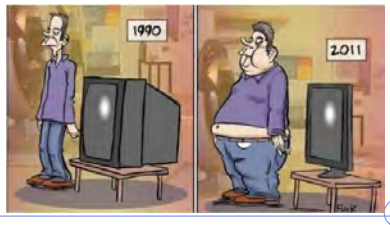
Contact Information

Name:	Marion Groetch
Title:	Assistant Professor
Organization:	Icahn School of Medicine at Mount Sinai, Division of Pediatric Allergy & Immunology
Email:	Marion.groetch@mssm.edu
Phone:	212-241-5548

Visual approach to abnormal growth trajectories in the primary care setting

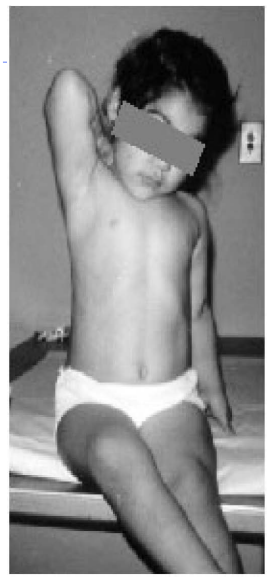
Eugene Dinkevich, MD, FAAP, Dipl ABOM

Division of General Pediatrics
Department of Pediatrics
SUNY-Downstate Medical Center
Brooklyn, NY



https://badcure.wordpress.com/2012/06/26/is-obesity-a-choice/

Who is obese?



85-95%

≈ 95%

>99th

Courtesy of Dr. Mary Horlick, NIH/NIDDK

2

Visual approaches to identification and prevention of obesity

Birth to 3 years of age (first 1000 days)

"'Weight fate' starts early; nearly half of obese 8th graders were overweight in kindergarten"
Marchione M. Star-Tribune. Jan 31, 2014

3

Risk factors for early weight gain

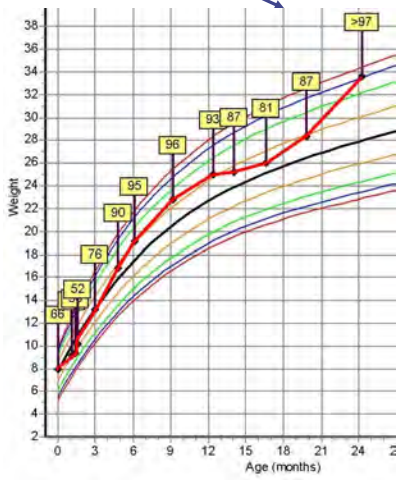
- Pregestational and gestational factors (epigenetics)
  - Maternal smoking during pregnancy
  - Parental obesity
  - Maternal over and under-nutrition
  - Maternal stress
- First 1000 days
  - Misconception about normal growth
  - Breast feeding vs formula feeding
  - Family eating habits
  - Child rearing practices (feeding style)

Obesity Prevention Source.Prenatal and Early Life Influences. HT Chan School of Public Health https://goo.gl/MoUBn5. Downloaded April 9, 2021

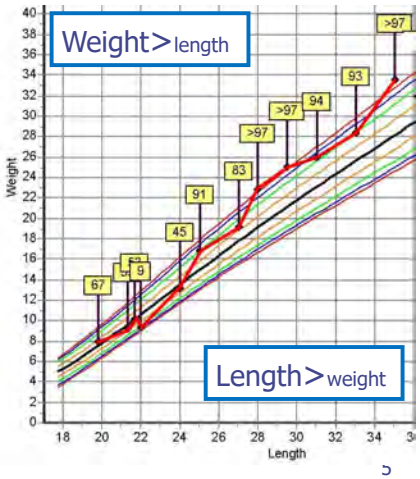
4

Case study: 2 years old girl with abnormal growth trajectory

Weight for age



Weight for Length



5

Prevention strategies: birth to 3 years (motivational interviewing)

- Assess parental concern
  - Do you think that your child is too thin, too heavy (big) or just right?
  - Do you worry when your child doesn't eat?
  - Do you make your child eat when s/he refuses?
  - Do you sometimes give your child junk or fast food when he/she didn't eat?

6

Prevention strategies: birth to 3 years

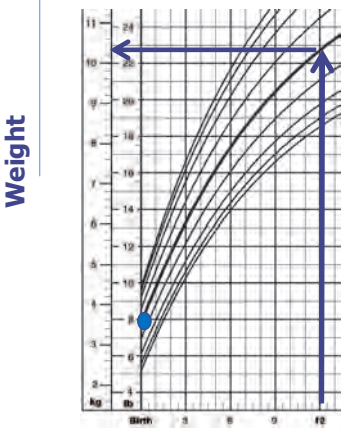
- Provide specific counseling
  - Discuss and demonstrate normal growth and feeding
    - Show growth chart
    - Relationship between growth and appetite in the first three years of life
  - Discuss the "3-day eating cycle" for toddlers
  - Use The Ellyn Satter Method for eating responsibilities

http://www.ellynsatter.com/ellyn-satters-division-of-responsibility-in-feeding-i-80.html 7

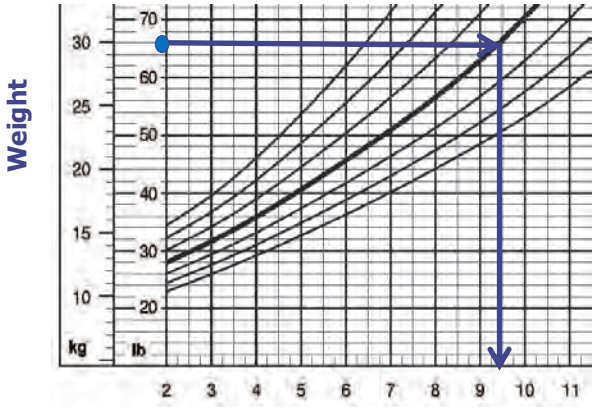
Normal infant growth (CDC growth charts)

Healthy children triple their weight at 1 and 9-10 years old

CDC boys 0-36 mo



CDC boys 2-20 yrs old



8

Counseling strategies for first 1000 days

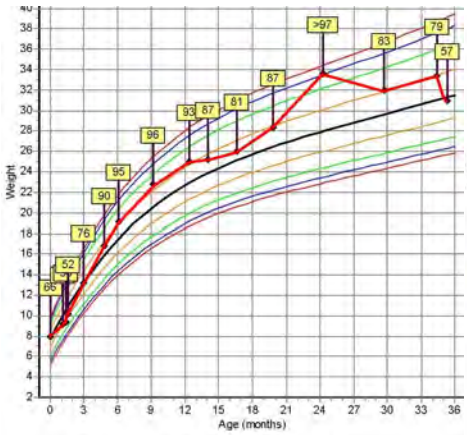
- The Three-Day Eating cycle
  - Adult eating cycle—three meals per day
  - Toddler eating cycle
    - Day 1: how parents want her to eat
    - Day 2: doesn't eat just picks
    - Day 3: eat so-so
  - Two good eating days per week—job is done
- Ellyn Satter—division of responsibility in feeding

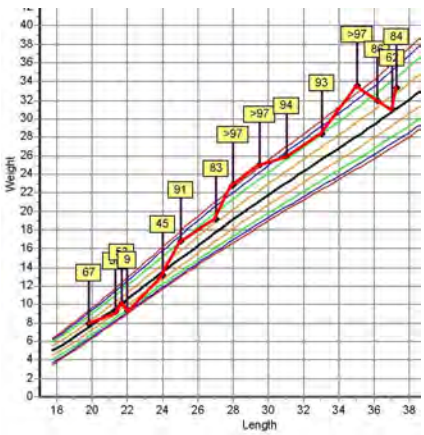
9

Case study: weight post counseling

Weight

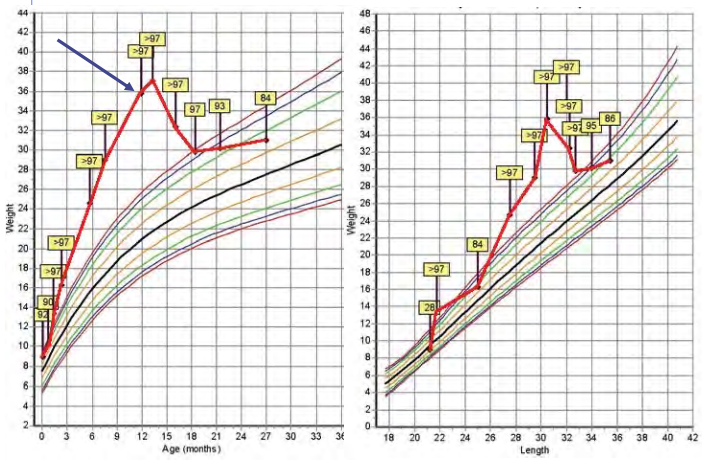
Weight for Length





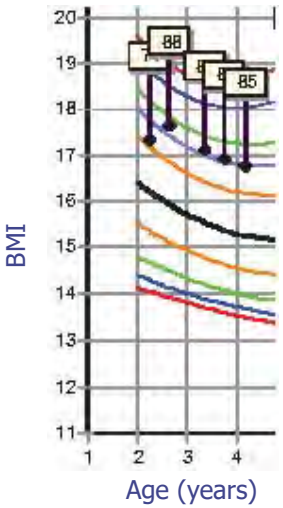
10

Toddler: AH



11

AH at 9 mo and 20 months



12

Preschool through elementary school-- no need to lose weight!

13

BMI (1835)

$$BMI = \frac{Weight}{Height^2}$$

Adolphe Quetelet
1796 -1874

- Utility
  - Readily available in primary care
  - Related to cardiometabolic disease in adults
- Limitations in children
  - Requires tracking percentiles, hard to use in obese children
  - Difficult to measure reliably in children
  - Difficult to explain to parents--risk between BMI in childhood and disease is attenuated

Staiano A, Katzmarzyk P. Int J Obesity. 2012; 36:1261–1269

14

Explaining BMI to parents—measure of "roundness"

- The "dumpling" explanation for children who are growing taller
- No need to lose weight until children go through growth spurt

Flour: ½ cup
Water: 60 ml

15

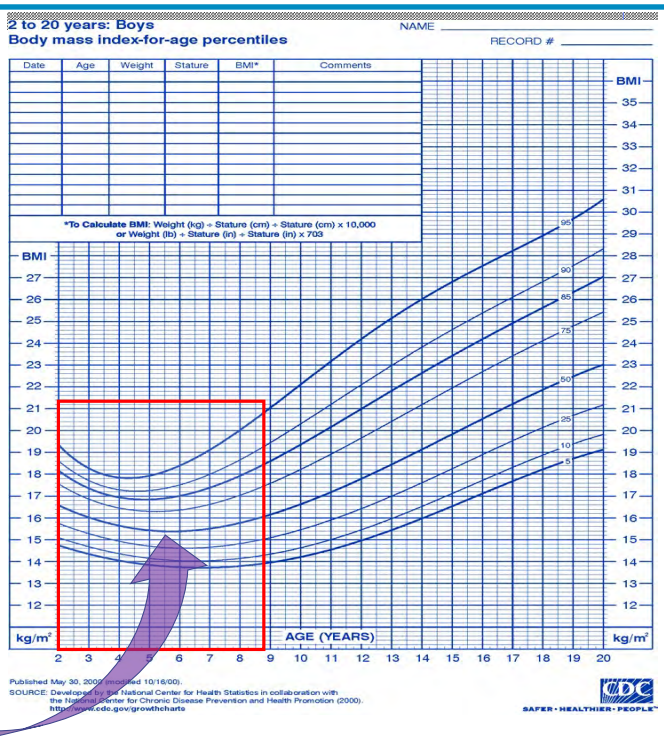
BMI trajectory predicts obesity risk

- In high risk young children difficult to assess risk of obesity because most children have multiple risk factors
  - African-American and Hispanic children
  - Low SES children
  - Parental obesity
  - Parental diabetes or other weight related morbidity
- Need other ways to predict who will become obese while the child still has normal BMI

16

BMI Chart

$$BMI = \frac{wt}{ht^2}$$

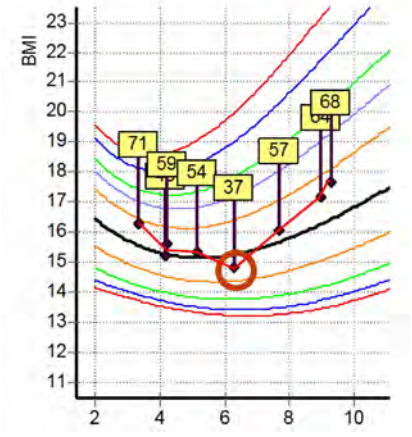


Nadir in BMI, aka Adiposity Rebound

17

Preschool Children—BMI predicts weight gain

$$BMI = \frac{wt}{ht^2}$$



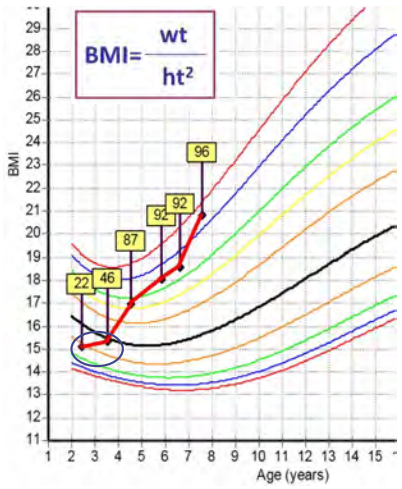
Normal AR

Normal BMI Pattern

- Seen in 36% of children
- Age: 84±14 months
- Risk of Overweight at 7 years old:
  - Overweight: 3%
  - Obese: 5%

18

Extremely high risk pattern

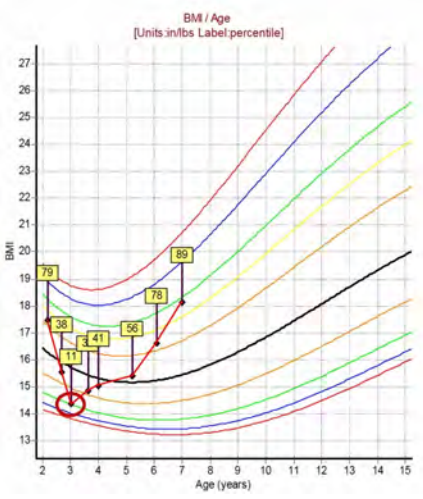


Absent AR (no nadir)

- Prevalence: 15%
- Diagnosed by 39±8 mo
- OR for ovwt/ob: 25.1
- At Diagnosis, 43% of children have normal BMI

19

Very high risk pattern



Early AR (early nadir)

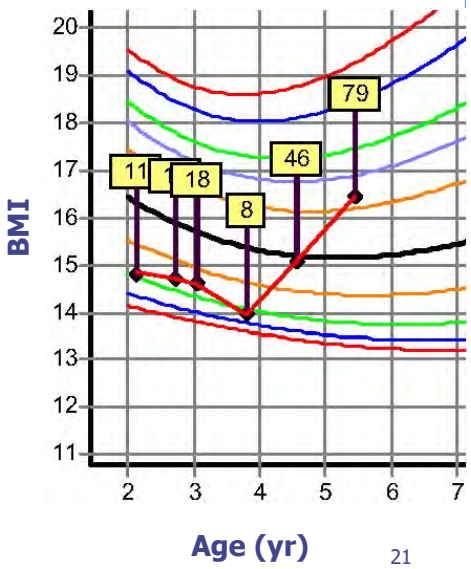
- Prevalence: 48%
- Diagnosed at: 55± 11 mo
- OR for ovwt/ob: 4.3
- At Diagnosis, 70% of children have normal BMI and 16% were overweight

BMI= wt / ht²

20

Case study: Healthy African-American girl

- BMI between 8th and 18th percentile from 2 to 4 years old
- Gained 71% in BMI over 1.5 years
- Weight gain discussed at the 4.5 yr old visit
- Lifestyle/nutritional counseling started



21

Effective counseling for preschool families: assess current practices*

- Nutrition:
  - Eating outside of home/school per week
  - Intake of juice and milk daily
  - Eating breakfast per week
  - What kind of snacks
- Activity:
  - TV/screen time per week:
  - Regular exercise per week:

*Based on the "15 min obesity prevention protocol" from Davis M. Pediatrics. 2007:120:S245

22

Snack vs junk?

Snacks come from "natural food"






23

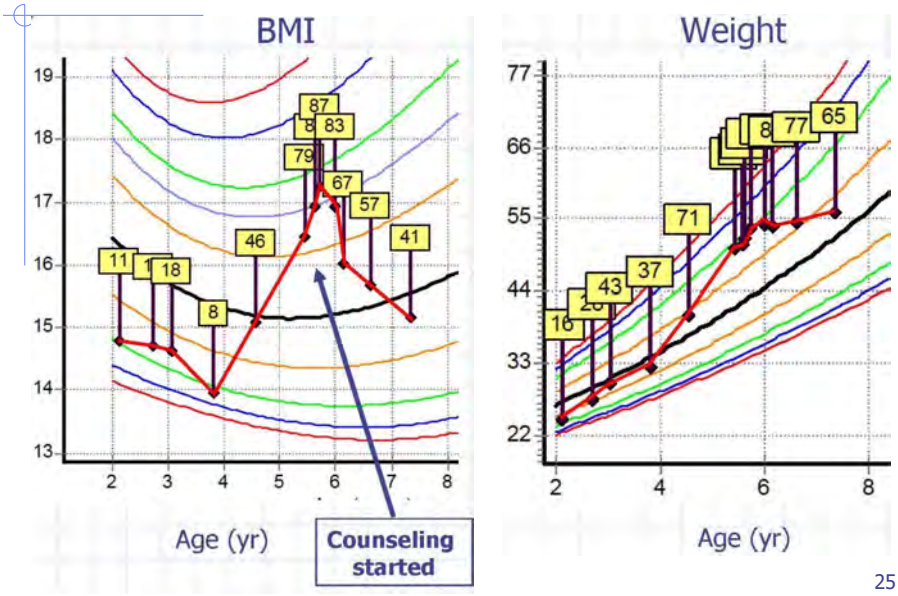
Intervention: Assessment motivation, develop a joint plan (modified MI)

- Assess concern (scale of 1-10)
  - Importance to change
  - Confidence in being successful
- Develop 3 targets for change
  - 2 Dietary targets
    - Family choose from eating habits discussion
    - Try for 1 positive (start eating breakfast) and one negative (cut down to 1 glass of juice, fast food 2 times per months), be specific
  - 1 Physical activity issues (Screen time, walking to school, playing in park, sports)
- Provide positive feedback
- Agree on a follow-up time (3 months)

Adapted from: Barlow S. Pediatrics. 2007;120 Suppl 4:S164-92

24

Recognition of early AR: breaking the obesity trajectory—2 year follow up



25

Conclusion

- Primary prevention is often effective to prevent overweight and obesity in young children
- Tracking growth (weight, height, BMI) at all well and sick visits is key to early identification of growth abnormalities
- Clinicians need to educate parents about normal growth and healthy eating beginning in infancy
- Understanding what motivates parents and children is key to effective counseling

26

JOHNS HOPKINS MEDICINE

Appetitive traits in children, and parental feeding practices

Susan Carnell, PhD

Division of Child and Adolescent Psychiatry
Department of Psychiatry and Behavioral Sciences
Johns Hopkins University School of Medicine

Childhood Nutrition, Feeding and Weight Management in the Primary Care Setting, 6th May 2021

Purpose and Objectives

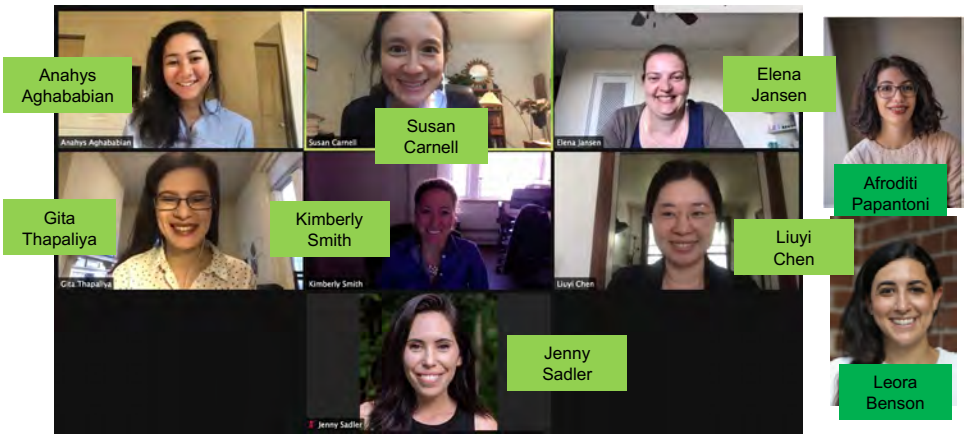
PURPOSE	*To educate attendees on the science of appetitive traits and parent feeding practices to help them help parents to help children maintain a healthy weight.*
OBJECTIVES	1-Understand the role of appetitive traits in influencing body weight in childhood 2-Understand the contribution of genetics to child eating behavior 3-Be able to give parents evidence-based suggestions for food parenting practices to support healthy child growth
FINANCIAL DISCLOSURE	*None*

Agenda

1. Biobehavioral model of child obesity
2. Child appetite & obesity: genetic influences
3. Child appetite & obesity: food parenting
4. Evidence-based suggestions for parents

Who am I?

The Appetite Lab



JOHNS HOPKINS MEDICINE

4

Agenda

1. Biobehavioral model of child obesity
2. Child appetite & obesity: genetic influences
3. Child appetite & obesity: food parenting
4. Evidence-based suggestions for parents

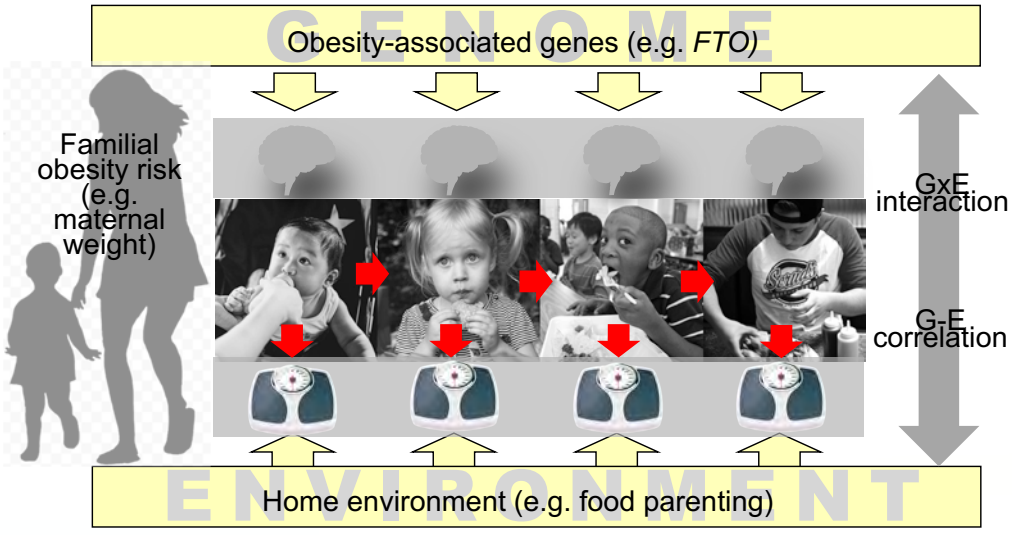
An 'obesogenic' food environment…

JOHNS HOPKINS MEDICINE

But still significant individual differences in body weight – why?

JOHNS HOPKINS MEDICINE

Biobehavioral model of child obesity development



Rainier Ridao / Ekaterina Shakharova / CDC on Unsplash

Appetitive characteristics

- What are appetitive characteristics?
  - Enduring dispositions toward food, or eating styles, that differ between individuals
  - E.g. Food cue responsiveness
    - How responsive one is to external food cues e.g. sight of food
  - E.g. Satiety responsiveness
    - How responsive one is to internal cues e.g. gut hormones

Carnell & Wardle, 2008 Proc Nut Soc

Satiety responsiveness/Slowness in eating[a] (Factor 1; 28% variance)	
My child gets full up easily	.71
My child has a big appetite	.57
My child leaves food on his/her plate at the end of a meal	.66
My child gets full before his/her meal is finished	.72
My child cannot eat a meal if s/he has had a snack just before	.59
My child eats slowly	.78
My child takes more than 30 minutes to finish a meal	.71
My child finishes his/her meal very quickly	.72
My child eats more and more slowly during the course of a meal	.77
Fussiness (Factor 2; 13% variance)	
My child enjoys tasting new foods	.88
My child enjoys a wide variety of foods	.74
My child is interested in tasting food s/he hasn't tasted before	.84
My child refuses new foods at first	.85
My child decides that s/he doesn't like food, even without tasting it	.82
My child is difficult to please with meals	.64
Food responsiveness (Factor 3; 9% variance)	
My child's always asking for food	.65
If given the chance, my child would always have food in his/her mouth	.79
Given the choice, my child would eat most of the time	.81
If allowed to, my child would eat too much	.71
Even if my child is full up, s/he finds room to eat his/her favourite food	.56
Enjoyment of food (Factor 4; 7% variance)	
My child enjoys eating	.68
My child loves food	.64
My child is interested in food	.57
My child looks forward to mealtimes	.62
Desire to drink (Factor 5; 5% variance)	
If given the chance, my child would always be having a drink	.89
If given the chance, my child would drink continuously throughout the day	.90
My child is always asking for a drink	.88
Emotional undereating (Factor 6; 4% variance)	
My child eats less when s/he is upset	.84
My child eats less when s/he is angry	.73
My child eats less when s/he is tired	.60
My child eats more when s/he is happy	.70
Emotional overeating (Factor 7; 3% variance)	
My child eats more when anxious	.85
My child eats more when annoyed	.71
My child eats more when worried	.79
My child eats more when s/he has nothing else to do	.28[b]

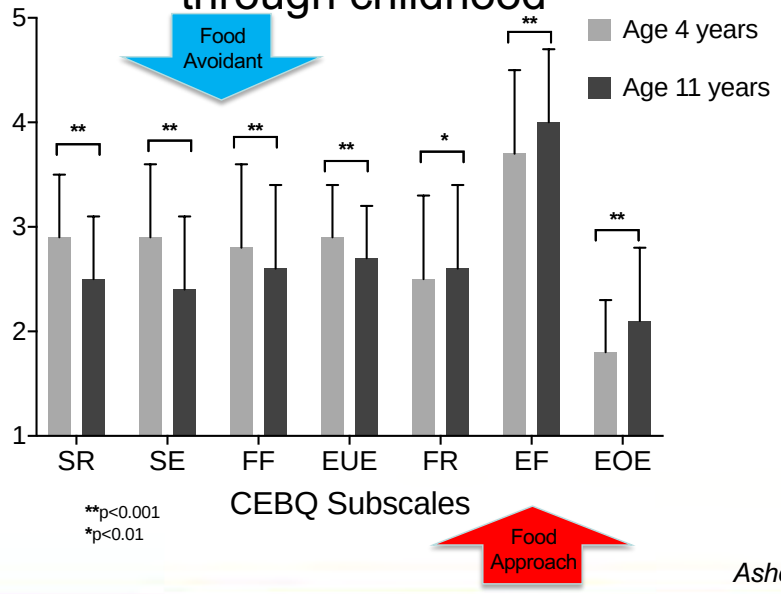
FOOD AVOIDANT

FOOD APPROACH

Child Eating Behavior Questionnaire (CEBQ)

Wardle et al, 2001 J Child Psychol & Psychia; Carnell & Wardle, 2007 Appetite

CEBQ: development of appetitive characteristics through childhood



Ashcroft et al, 2008 EJCN

CEBQ: tracking of appetitive characteristics through childhood

Table 2 Bivariate correlations for the seven CEBQ subscales between ages 4 and 11 years

CEBQ subscales	R
Satiety responsiveness	0.46
Slowness in eating	0.46
Food responsiveness	0.44
Enjoyment of food	0.45
Food fussiness	0.55
Emotional overeating	0.45
Emotional undereating	0.29

Abbreviation: CEBQ, Child Eating Behaviour Questionnaire.
All *P*-values <0.01 level; two-tailed.

Ashcroft et al, 2008 EJCN

1 'Enjoyment of food'	My baby seemed contented while feeding My baby enjoyed feeding time My baby loved milk My baby became distressed while feeding (R)
2 'Food responsiveness'	If given the chance my baby would always be feeding Even when my baby had just eaten well s/he was happy to feed again if offered My baby could easily take a feed within 30 minutes of the last one My baby was always demanding a feed If allowed to my baby would take too much milk My baby frequently wanted more milk than I provided
3 'Slowness in eating'	My baby fed slowly My baby finished feeding quickly (R) My baby took more than 30 minutes to finish feeding My baby sucked more and more slowly during the course of a feed
4 'Satiety responsiveness'	My baby got full up easily My baby got full before taking all the milk I thought s/he should have My baby found it difficult to manage a complete feed My baby had a big appetite

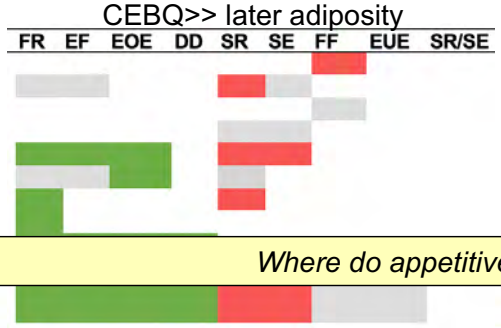
Baby Eating Behavior Questionnaire (BEBQ)

Llewellyn, van Jaarsveld, Johnson, Carnell & Wardle, 2011 Appetite

Appetitive characteristics & child weight/adiposity

- Systematic review and meta-analysis in children aged 1-18y
- 20 countries, 14 languages, 314 full-text articles
- 57 (46 cross-sectional, 11 longitudinal) met inclusion criteria (measure fidelity, non-overlap in samples) = n=36,535 1-14y
- Cross-sectional data – robust associations w adiposity
  - Food approach, +ve (FR **r=0.22**; EF r=0.17; EOE r=0.15; DD r=0.10)
  - Food avoidant, -ve (SR **r=-0.21**; SE r=-0.15; FF r=-0.08; EUE r=-0.09)

CEBQ>> later adiposity



BEBQ>>later adiposity

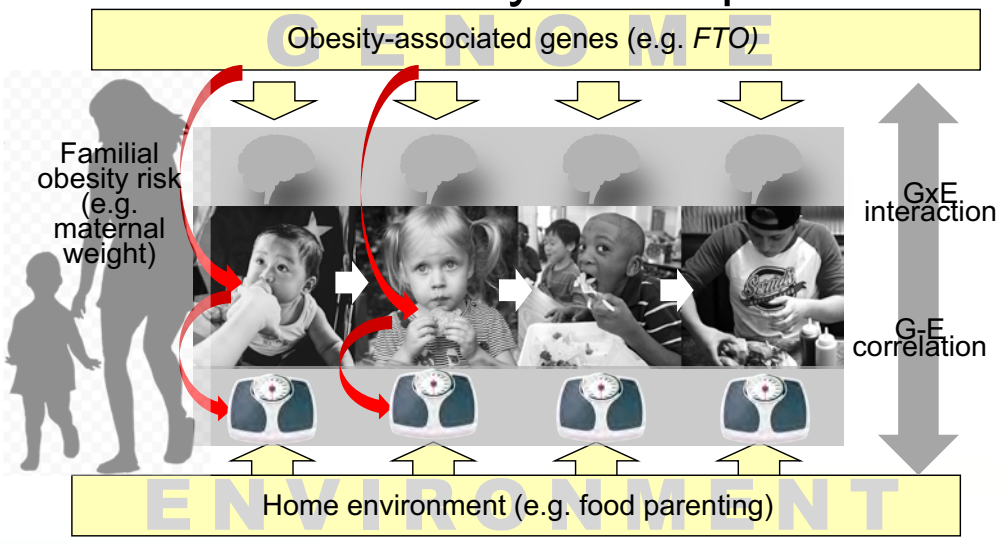
Where do appetitive characteristics come from?

Kininmonth, Smith et al, 2021 Ob Revs

Agenda

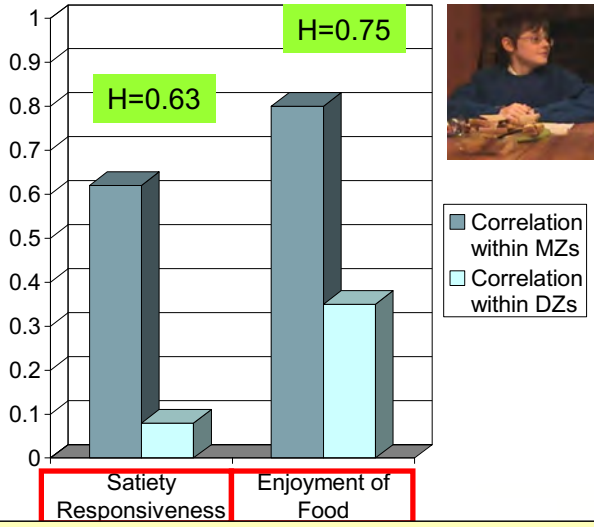
1. Biobehavioral model of child obesity
2. Child appetite & obesity: genetic influences
3. Child appetite & obesity: food parenting
4. Evidence-based suggestions for parents

Biobehavioral model of child obesity development



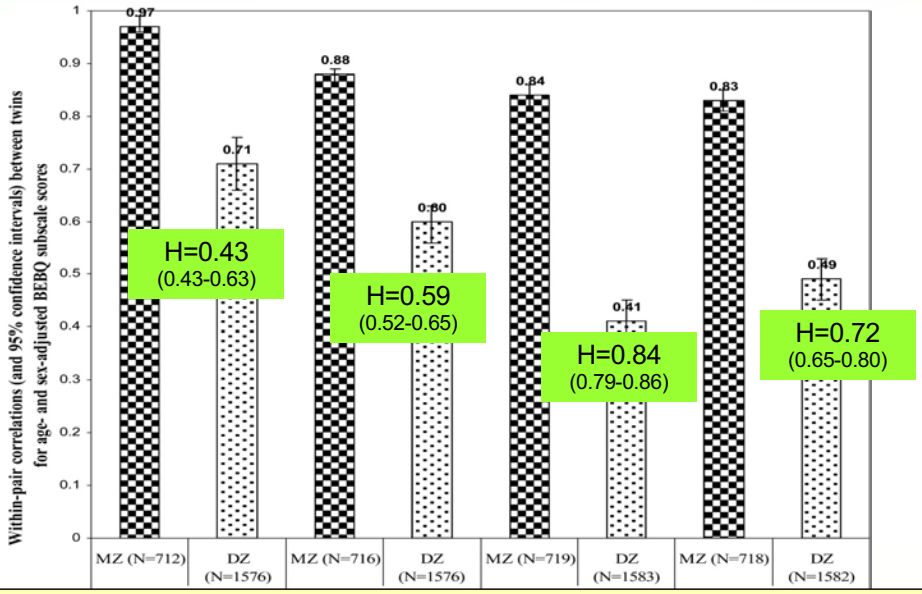
Rainier Ridao / Ekaterina Shakharova / CDC on Unsplash

Twin studies: Heritability of appetitive characteristics in 8-11 year olds



FF similarly heritable (3y) (*Smith et al, 2018*)
but EOE and EUE show more environmental influence (4y) (*Herle et al, 2018*).

Twin studies: Heritability of appetite in infancy

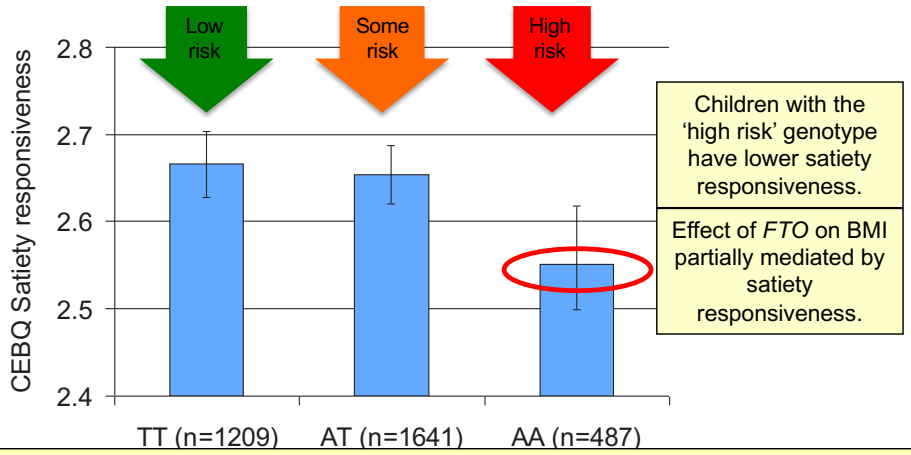


Which genes are implicated?

Llewellyn, van Jaarsveld, Johnson, Carnell & Wardle, 2010 AJCN

Genetic association studies:

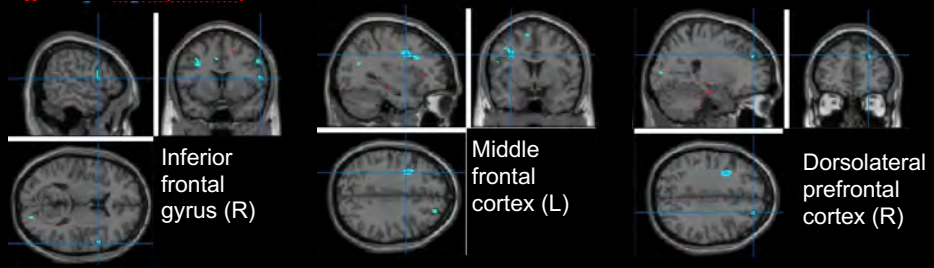
FTO rs9939609 & appetite



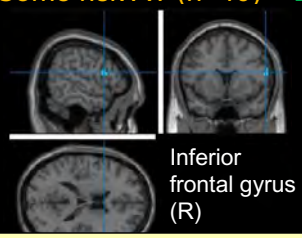
Also evidence that polygenic obesity risk score (even excluding *FTO)* influences satiety responsiveness and thereby body weight (*Llewellyn et al, 2014*). Also variants with sub-threshold weight effects (*Khera et al, 2019*)?

Neuroimaging studies: *FTO rs9939609* & neural response to food vs. non-food cues in fed condition in adolescence

High risk AA (n=13) < Low risk TT (n=23)



Some risk AT (n=40) < Low risk TT (n=23)



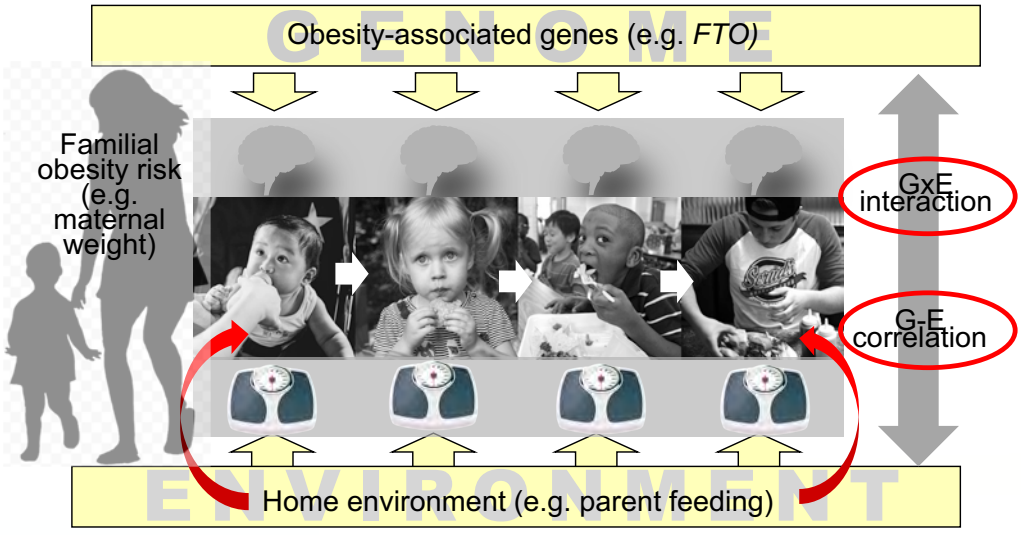
Lower activation of brain regions implicated in self-regulation in adolescents with higher risk genotypes under conditions of satiety.

What about parents?

Agenda

1. Biobehavioral model of child obesity
2. Child appetite & obesity: genetic influences
3. Child appetite & obesity: food parenting
4. Evidence-based suggestions for parents

Biobehavioral model of child obesity development

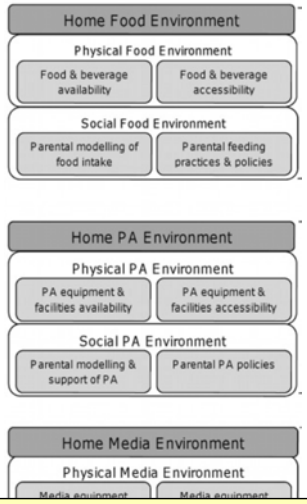


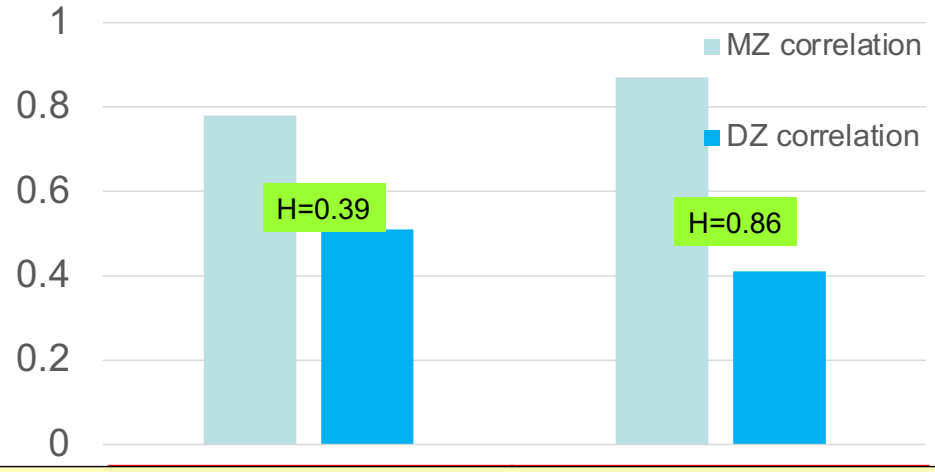
Rainier Ridao / Ekaterina Shakharova / CDC on Unsplash

Gene-environment interaction:

JOHNS HOPKINS MEDICINE

Heritability of child BMIz varies by home environment





Obesity-related genes are more strongly associated with body weight in more obesogenic home environments >> dynamic interplay between genes and environment through development.

Which food parenting factors are associated with child eating behavior and obesity?

Responsive feeding in infancy

JOHNS HOPKINS MEDICINE

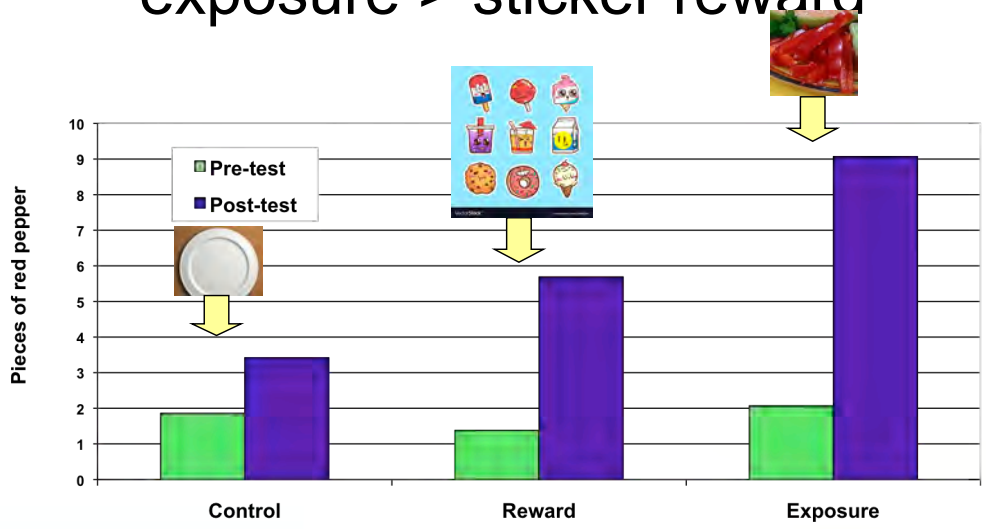
Text box 1. Responsive feeding: Key steps and principles

Key Steps	Key Principles
Child displays hunger signals	Pleasant, warm, and nurturing feeding environment
Caregiver properly interprets hunger signals	Child seated comfortably facing caregiver and others
Predictable feeding response from caregiver	Clear and consistent reciprocal communication of feeding expectations
Child displays satiety signals	Predictable feeding schedules help ensure child is hungry when offered food
Predictable "stop feeding" response from caregiver	Offering of healthy developmentally appropriate beverages and healthy, tasty foods
	Responding promptly to the child's hunger and satiety signals
	Feeding response needs to be emotionally supportive, contingent, and developmentally appropriate

RCTs testing responsive feeding interventions in infancy (INSIGHT, NOURISH, SLIMTIME, Healthy Beginnings, POI) suggest obesity prevention effect (*Spill et al, 2019 AJCN*).

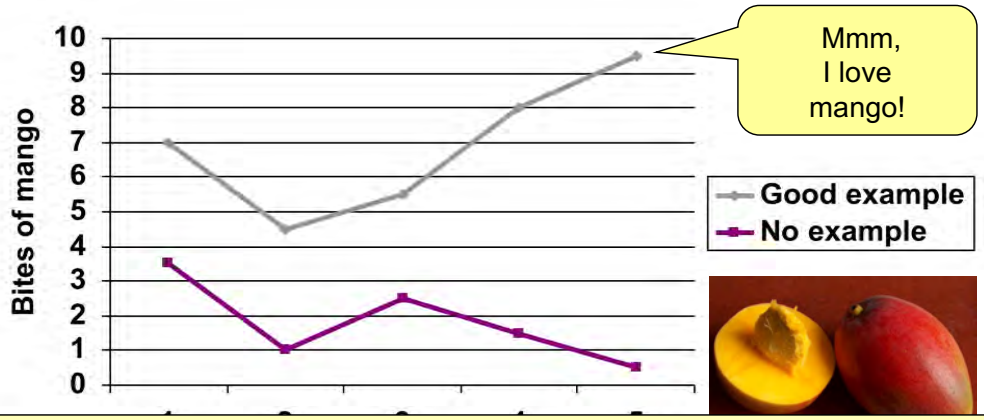
What about early childhood?

Teaching healthy eating behavior: exposure > sticker reward



Wardle et al, 2003 Eur J Clin Nutr

Teaching healthy eating behavior: enthusiastic modelling



Intervention studies show that exposure and modelling promote healthy food consumption (*Barends et al, 2019 Appetite; Nekitsing et al, 2018 Appetite*). Also beneficial effects of home FVJ availability and accessibility for 9-12 y olds (*Cullen et al, 2003 Health Educ & Beh*) and adolescents (*Campbell et al, 2007 Ob*).

Family meals

- In children/adolescents, eating with family associated with healthier diet.
- Associations with weight outcomes less consistent.

A Review of Associations Between Family or Shared Meal Frequency and Dietary and Weight Status Outcomes Across the Lifespan

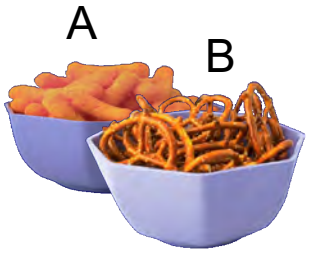
Jayne A. Fulkerson, PhD[1]; Nicole Larson, PhD, MPH, RD[2]; Melissa Horning, BSN[1]; Dianne Neumark-Sztainer, PhD, MPH, RD[2]

Need further research into mechanisms for positive dietary effects, and need to address types of food & portion sizes within family/shared meals for obesity prevention.

What about direct attempts made by parent to influence eating?

What happens when you restrict children's access to snack foods?

- 68 3-5y old children were presented with two snack foods
  - Free access to Food A
  - Limited access to Food B
- What happened when children were given free access to both?
- Children said they wanted Food B
- Children chose Food B over Food A
- Children ate more of Food B



Fisher & Birch, 1999 Appetite

Restriction could promote intake of commonly restricted junk-foods…

What happens when you pressure children to eat?

Johnson & Birch, 1994 Pediatrics

- 77 3-5y olds were given a fruit drink followed by a standard lunch on 2 days
  - On one day drink was low energy, on other day drink was high energy
  - 'Regulated' response is to eat less after high energy, more after low energy drink
- Parents completed questions about parental control over feeding
  - e.g. My child should eat everything on his/her plate

Pressure to eat could disrupt children's ability to regulate their intake based on internal signals…

What about weight? Cross-sectional studies show high restriction--high weight, high pressure--low weight. Longitudinal studies show mixed findings.

What happens when you use food as a reward?

A 

B 

Newman & Taylor, 1992 J

- 86 4-7y old children were asked to choose two snacks that they liked equally
- Snack A was presented as a means to win a taste of Snack B
- What happened to children's liking for the snacks?
- Children said they liked Snack A ('means' snack) less than before

Instrumental feeding could promote intake of energy-dense foods often used as rewards…

What about weight? Cross-sectional studies suggest positive association. Some evidence that instrumental feeding at 2y predicts greater BMIz increase at 3y, and emotional feeding at 2y predicts emotional eating at 3y.

Year and author	Feeding practices		
	Restriction	Pressure	Monitoring
Campbell et al., 2010	–		
Hennessy et al., 2010	–	–	0
Olvera and Power, 2010			
Webber et al., 2010a	0	0	0
Webber et al., 2010b	0		0
Webber et al., 2010c	0		0
Costa et al., 2011	+	0	0
Gubbels et al., 2011	+	–	–
Hughes et al., 2011			
Marshall et al., 2011			0
Rodenburg et al., 2011			
Taylor et al., 2011	+	–	0
Zhang and McIntosh, 2011	0		0
Cardel et al., 2012	+	–	
Jansen et al., 2012	+	–	0
Lee and Keller, 2012		–	
Manen et al., 2012	+	–	0
Murashima et al., 2012	+		
Noor et al., 2012	+	–	0
Rodenburg et al., 2012			
Tovar et al., 2012			
Blissett and Bennett, 2013	+	0	0
Dev et al., 2013	+	0	0
Tschann et al., 2013	+	–	–
Yilmaz et al., 2013			
Frankel et al., 2014			
Hancock et al., 2014			
Holland et al., 2014	+	–	–
Karp et al., 2014	+	–	0

Monitoring *e.g. How much do you keep track of the sweets (candy, ice cream cake, pies, pastries) that your child eats?*

Cross-sectional and longitudinal studies suggest Monitoring has no effect or protective effect

It ain't what you do, it's the way that you do it (*Hughes et al, 2008 J Dev Beh Ped*).

Beyond mom…

Journal of the Academy of Nutrition and Dietetics

Investigating the Relationship of Body Mass Index, Diet Quality, and Physical Activity Level between Fathers and Their Preschool-Aged Children

Father diet quality (HEI via ASA-24) >> preschool child diet quality.

Nutrition & Dietetics
Journal of the Dietitians Association of Australia

Systematic Review · Full Access

Influence of grandparents on the dietary intake of their 2–12-year-old grandchildren: A systematic review

Kylie G. Young, Kerith Duncanson, Tracy Burrows

First published: 15 February 2018 | https://doi.org/10.1111/1747-0080.12411 | Citations: 13

9/16 studies reported grandparental child feeding attitudes & behaviours considered to negatively influence child dietary intake, 3/16 positive influences, 7/16 conflict and tensions between parents & grandchildren, often resulting in poor feeding practices, 4/16 grandparent cohabitation related to increased rates of child overweight and obesity.

Reviews

Public Health/Pediatric Obesity · Full Access

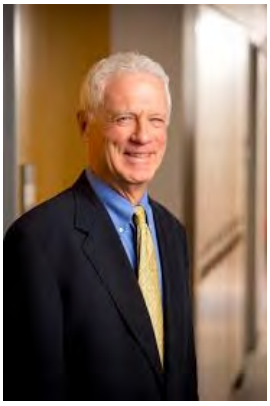
Systematic review of the relationship between childcare educators' practices and preschoolers' physical activity and eating behaviours

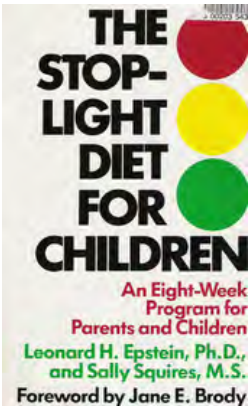
S. Ward, M. Bélanger, D. Donovan, N. Carrier

A few studies showing positive impacts of educators using recommended practices e.g. modelling, letting child select servings.

What about when a weight problem is established? What are successful treatment options?

Family-Based Treatment for Child Obesity (Epstein, 1988)





- Eat a core of 900 calories per day.
- Do not exceed 1200 to 1500 calories per day.
- Do not eat more than four RED foods per week.

Goal = limit calories and encourage intake of nutrient rich foods vs. calorie dense foods

FBT components

- Family learns about **calories** & basics of healthy **nutrition**, given a **food reference guide** with color code, and group strongly encouraged to **remove all RED foods** from their home.
- Plus other supports to help manage eating behaviors, food selection, and food preparation e.g. **self-monitoring** training emphasizing independent control of food intake by the participants including **food diary, weight charting, PA recording**.
- **Parents** are encouraged to **review** their children's records with their children and to **praise** them for accurately completing their records.
- Parents and children are taught the importance of serving as **models** for other family members as well as the importance of **praise** for family members who make **progress** toward their goals.
- Family members also may have weekly to monthly contact with a **behavioral therapist** to aid self-monitoring, get feedback, answer questions.

Good efficacy of FBT (reduction in percentage overweight) at 4 mo and sustained weight loss to 12 mo with enhanced social facilitation maintenance. *Wilfley et al, 2017 JAMA Ped*

Other potential influences…

PHYSICAL & SEDENTARY ACTIVITY

Greater TV time at 3 y predicts obesity at 7 y.
Reilly et al, 2008 BMJ

SLEEP

Short sleep duration (</=10h/night) associated with obesity in 2-20y.
Cappuccio et al, 2008 Sleep

One day of sleep restriction (no nap & 2.3h bedtime delay) increases dietary intake up to 2d later in preschoolers.
Mullins et al, 2017 J Sleep Res

STRESS

Greater 1-y weight gain in Head Start preschoolers from families who became food insecure.
Jansen et al, 2017 Soc Sci Med

Higher prenatal stressors specific to storm (e.g. danger due to falling ice, spending time in temporary shelters) associated with more child obesity, controlling for other potential risk factors.
Hohwu et al, 2015 Psychoneuroendo

Agenda

1. Biobehavioral model of child obesity
2. Child appetite & obesity: genetic influences
3. Child appetite & obesity: food parenting
4. Evidence-based suggestions for parents

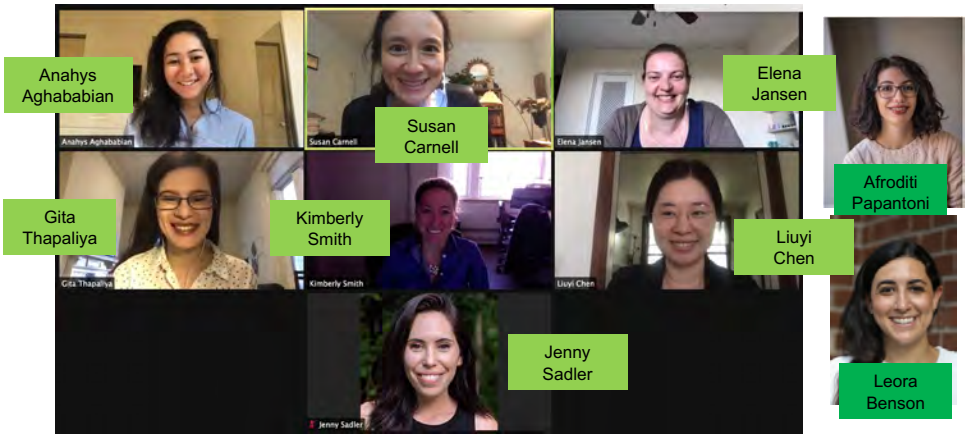
Evidence >> suggestions

- Appetitive characteristics are measurable in childhood and infancy, develop but persist over time, and are cross-sectionally and prospectively associated with weight.
- Appetite is heritable, and obesity-associated genetic variants including those on *FTO* affect weight via appetite, e.g. neural food cue responses
- In infancy, breastfeeding and responsive feeding may be beneficial
- In early and later childhood/adolescence, home food availability/ exposure, parent modeling and family meal structure may be helpful
- Rigid parental control over feeding and non-nutritive feeding may be unhelpful, but authoritative & covert strategies can help
- Family-based behavioral approaches following simple healthy diet plan and emphasizing self-monitoring have been successful
- Supporting longer sleep, less sedentary time and more PA are recommended

Take-home message?

Due to genetic, environmental and biological forces, some children will find it more difficult than others to maintain a healthy-weight. Understanding how and when these forces act, and adopting evidence-based food parenting practices, may help support healthy growth in children.

The Appetite Lab



R01DK113286 (SC/SD); R01DK117623 (ES); K99R00DK088360 (SC), UH/UG3OD023313 (SD); DRC P&F; Dalio Explore Fund; Klarman foundation; JH Science of Learning Institute award, JH Discovery award

Contact Information

Susan Carnell

Associate Professor

Division of Child & Adolescent Psychiatry, Dept of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine

susan.carnell@jhmi.edu

410-955-7192

Child Obesity Prevention Across the Lifecycle: Primary Care and the Importance of Starting Early

Mary Jo Messito, MD
Clinical Associate Professor of Pediatrics
NYU Grossman School of Medicine

Childhood Nutrition, Feeding and Weight Management in the Primary Care Setting, 6th May 2021

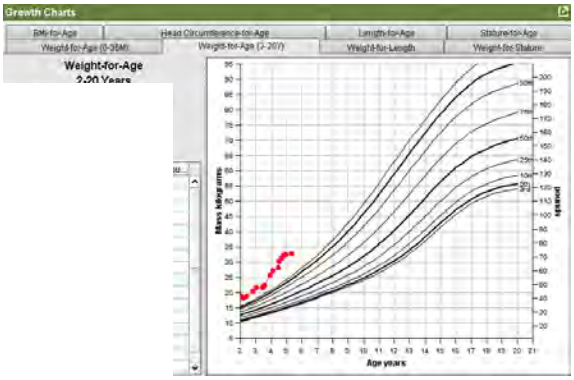
Overview

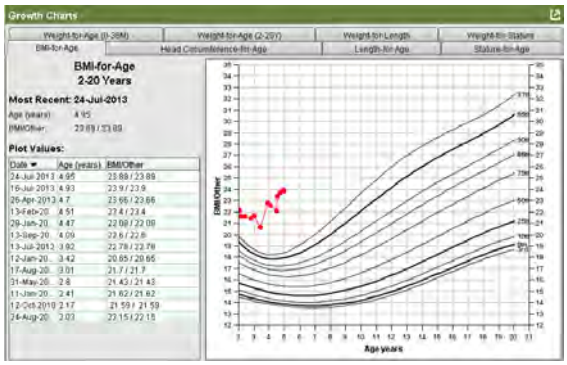
- How I got started
- Childhood obesity
  - History
  - Demographics/Disparities
  - Co-morbidities
  - Etiology
- Prevention
  - Adolescent/school age/young children
- Early obesity: Etiology of early obesity
- Prevention across the lifecycle: Infancy and pregnancy
  - Home visiting interventions
  - Primary care based interventions
  - Starting Early
- Suggestions for primary care providers
  - Cultural considerations

Disclosures: None

How I got started

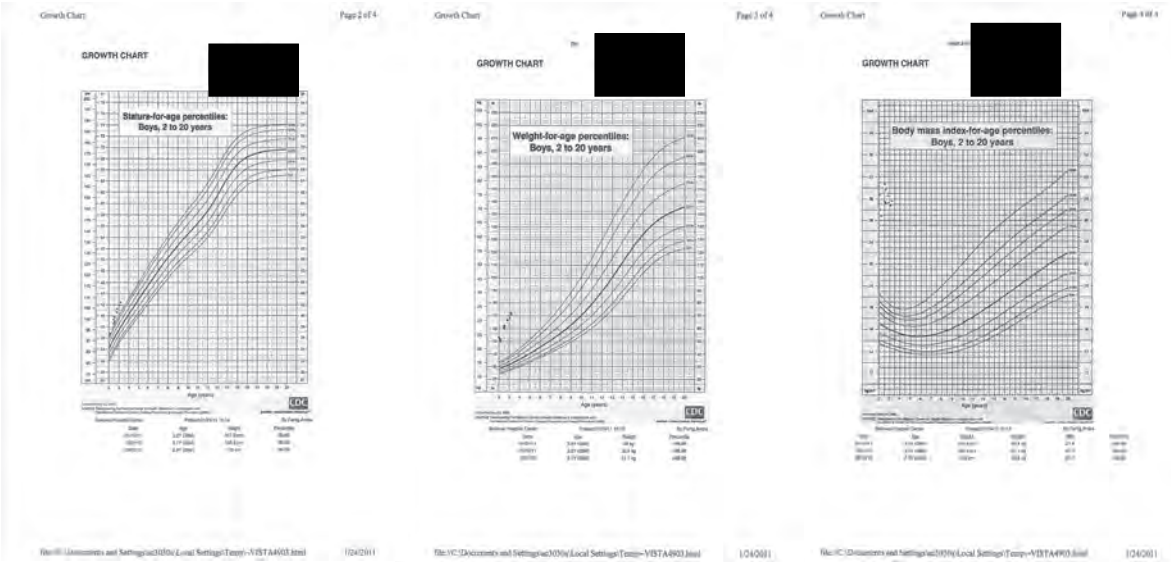
- General pediatrician and clinician educator based at Bellevue for over 25 years
- Rise in early child obesity in my practice over 10 years



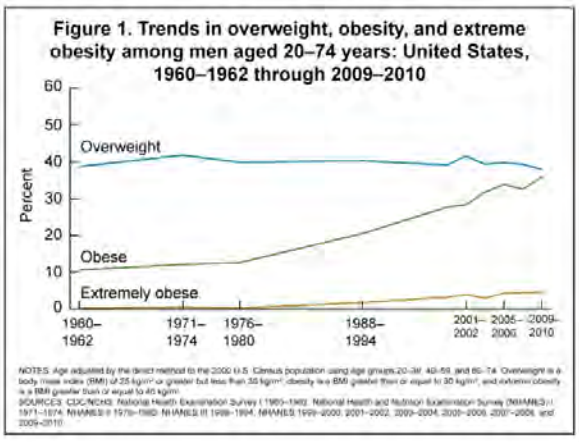


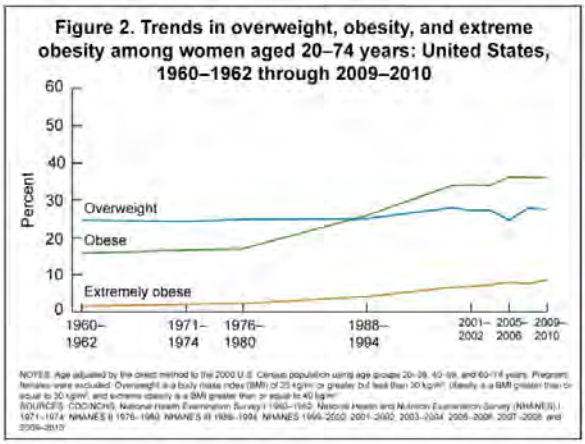
Two Patients

- Chris and Areli
- Followed by me since birth



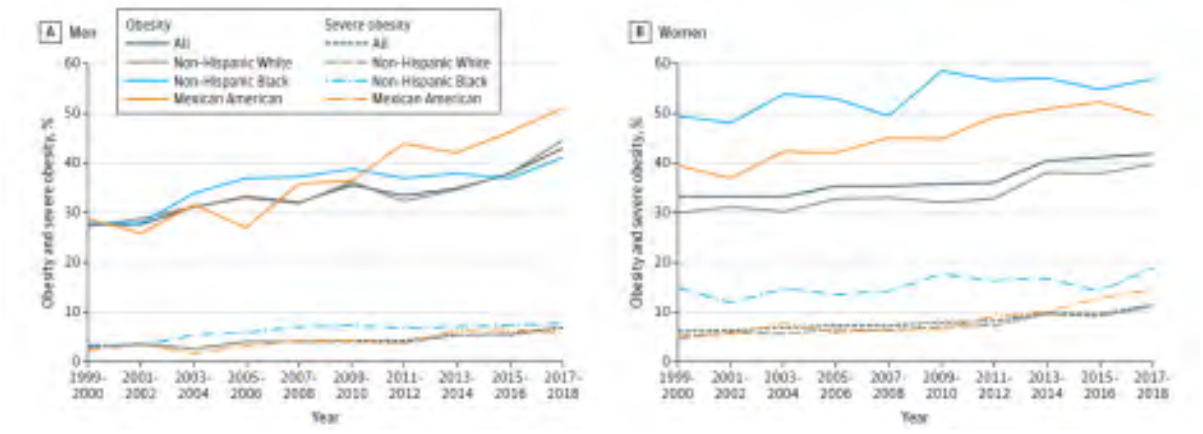
History of Obesity Trends: Adults 1960-2010
from National Health and Nutrition Examination Surveys (NHANES)





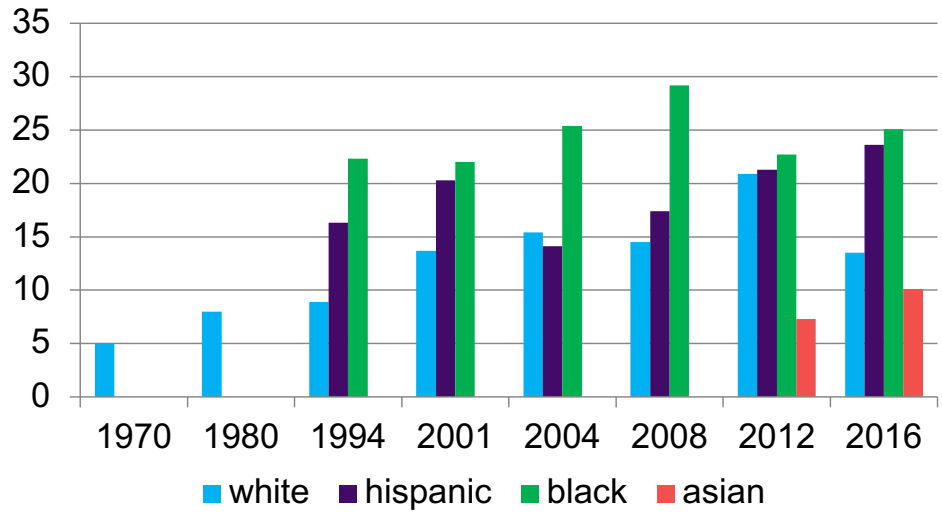
5 Footer can go here

History of Obesity Trends: Adults - 2000-2018

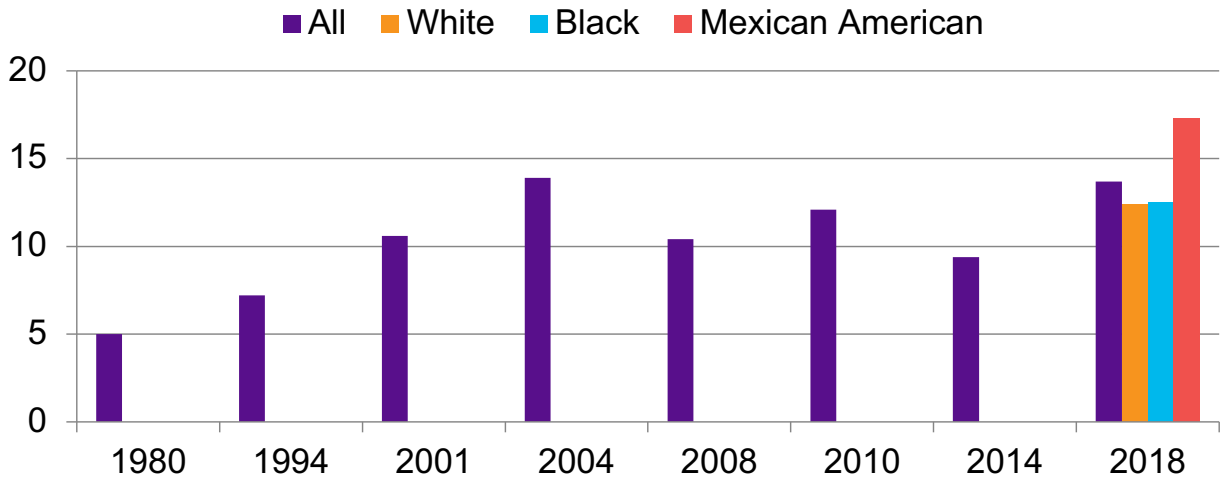


6 Footer can go here

History of Child Obesity Trends:
Children 2-19 years old

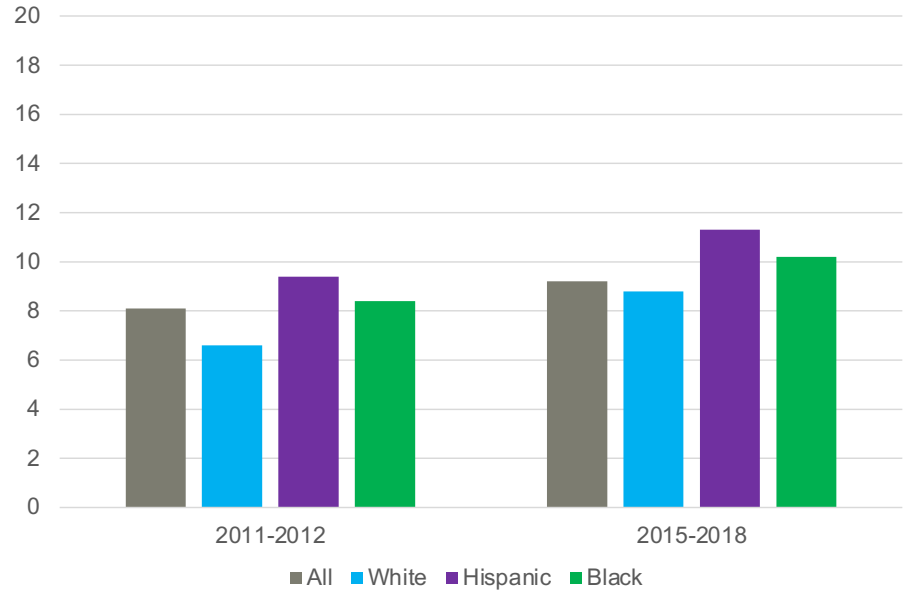


Prevalence of Obesity in Young Children:
2 -5 year olds



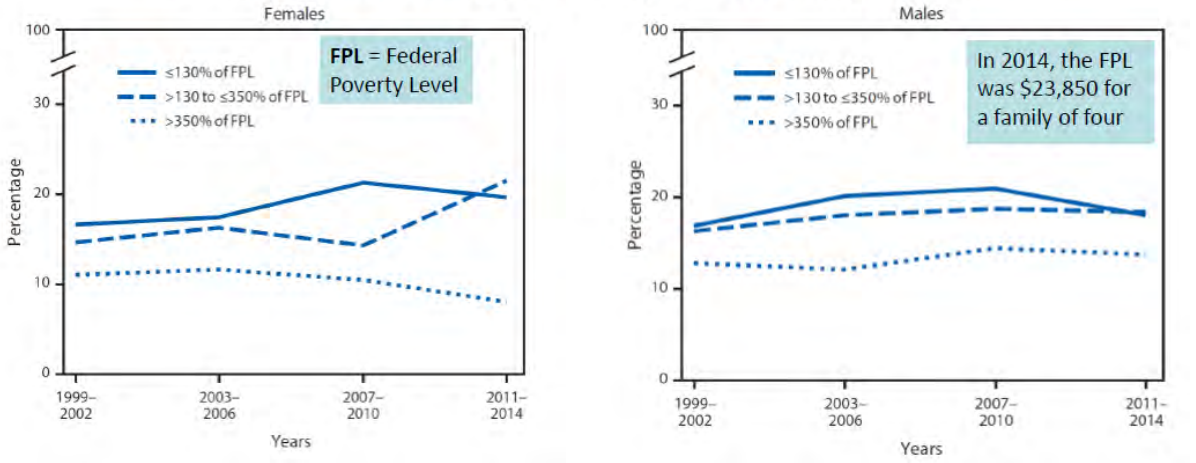
Ogden, et al. Trends in Obesity Prevalence by Race and Hispanic Origin—1999-2000 to 2017-2018. JAMA Sept, 2020 V 324, N12 p1208-1210

Prevalence of Obesity in Infants and Toddlers:
0 – 2 years old



Poverty-related Disparities in Rates of Childhood Obesity

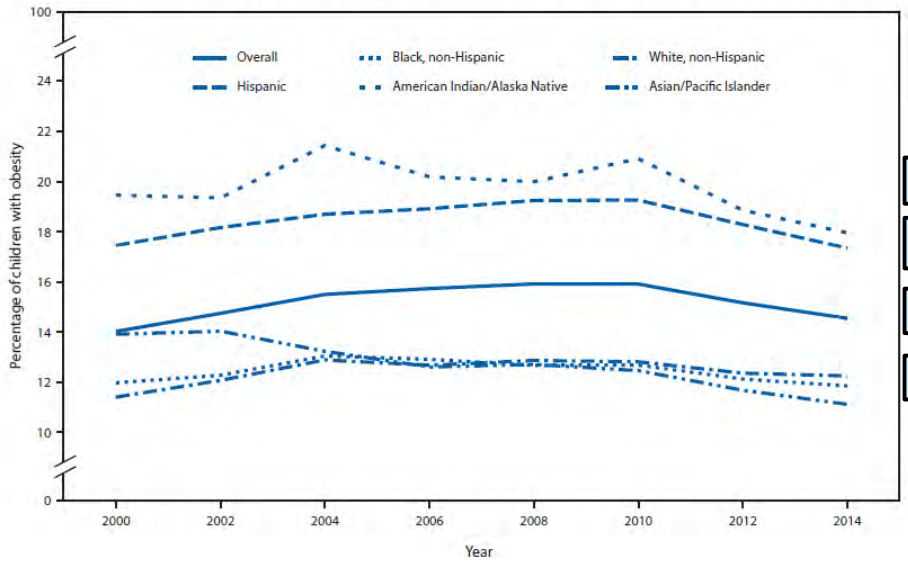
Trends in Obesity Prevalence among Youth aged 2–19 years, by Household Income—National Health and Nutrition Examination Survey, United States, 1999–2002 through 2011–2014



Ogden et al, MMWR 2018

Obesity Rates Among Participants in WIC

FIGURE. Prevalence of obesity* among WIC participants aged 2–4 years, overall and by race/ethnicity — United States,† 2000–2014



Black

Hispanic

Overall

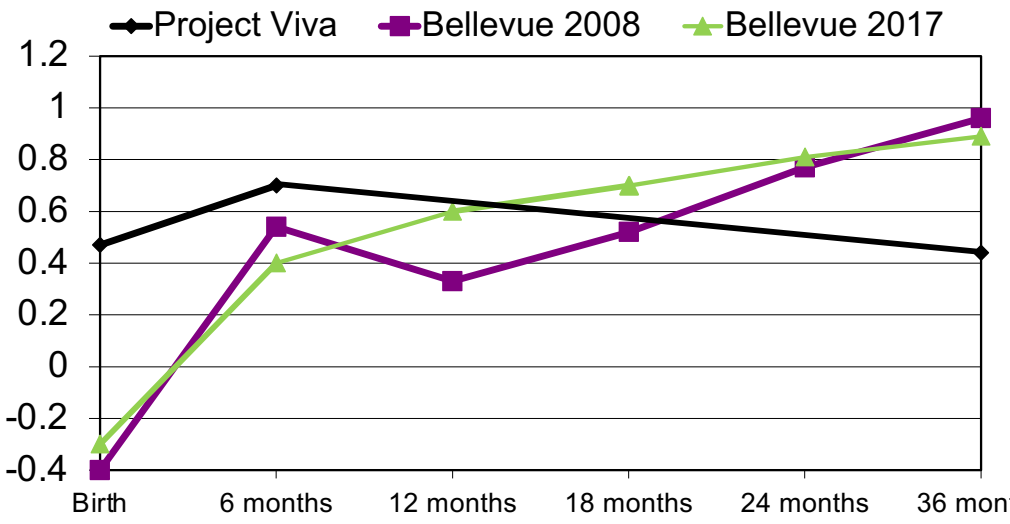
White

Pan et al., MMWR, 2016

Health consequences of child obesity

- Severe and impact every organ system
  - Pulmonary: Asthma, obstructive sleep apnea
  - GI: liver damage/cirrhosis, gallstones, GE reflux, colon cancer
  - Cardiovascular: high blood pressure, risk of heart attack, stroke
  - Metabolic: Type 2 diabetes, hypercholesterolemia
  - Renal: chronic kidney disease
  - Orthopedic: osteoarthritis, SCFE, Avascular necrosis of femoral head
  - Endocrine: early puberty, irregular menses, infertility PCOS
  - Neurological headaches, psuedotumor cerebri
- Mental Health: eating disorders, anxiety, depression, bullying

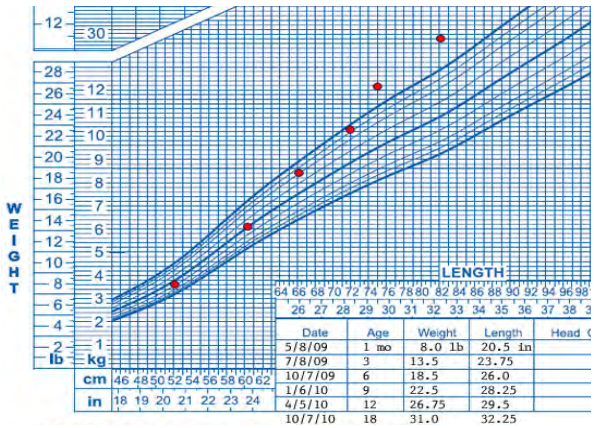
When Does Obesity Begin?



Mendelsohn 2009, Taveras 2009

Early Child Obesity: Infants and Children under 2 years old

- Definition: Obesity/High Weight for Length
  - ≥ 97.7 % = z-score of 2 on the WHO growth charts or
  - ≥ 95th% for age and sex CDC 2000 charts
- Excess infant weight gain
  - Weight status in the first 6 months of life was associated with obesity at 3 years old (Taveras et al., 2009)
  - Crossing upwards 2 or more major weight for-length percentiles in the first 24 months of life was associated with obesity at 5 and 10 years old (Taveras et al., 2011)



Health Risks Early Child Obesity:

- Obesity during infancy obesity linked to:
  - Increased hospital admissions
  - Increased respiratory morbidity, e.g. asthma, lower respiratory infection
  - Delayed gross motor milestones
- Obesity in infancy increases the risk of adult obesity
  - 40-60% of overweight toddlers are obese in adolescence
- Independent risk for weight related morbidities later in life

Morbidity of Overweight (>85th Percentile) in the First 2 Years of Life. Shibli et al, Pediatrics 2008;122:267–272

Schwimmer 2006

Racial/ethnic disparities are established during infancy and persist into adulthood

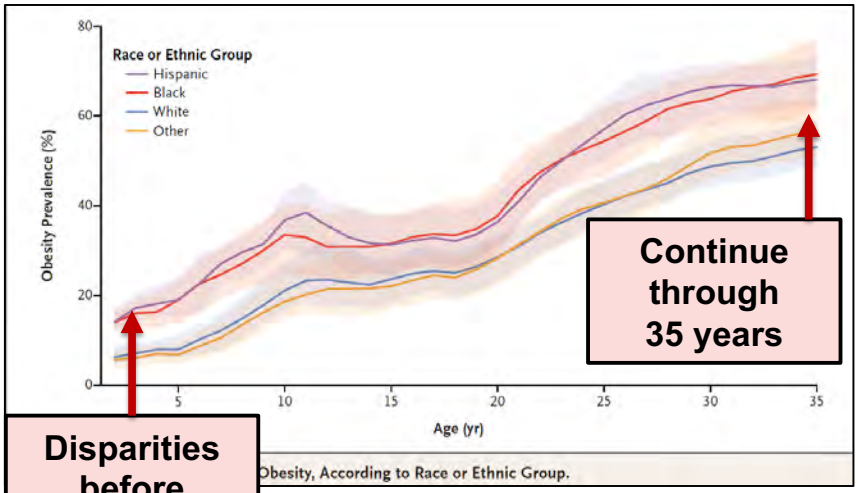

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Simulation of Growth Trajectories of Childhood Obesity into Adulthood

Zachary J. Ward, M.P.H., Michael W. Long, Sc.D., Stephen C. Resch, Ph.D., Catherine M. Giles, M.P.H., Angie L. Cradock, Sc.D., and Steven L. Gortmaker, Ph.D.

Racial/ethnic disparities noted in infancy and remain constant through adulthood



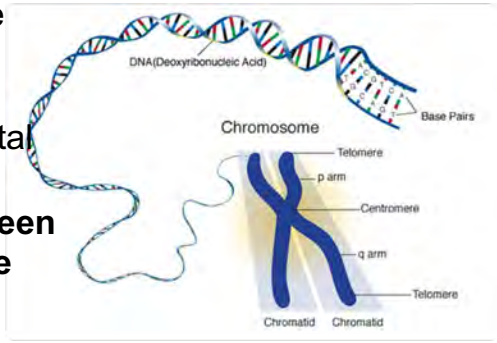
Continue through 35 years

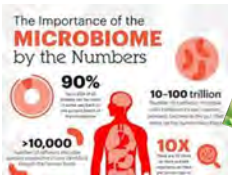
Disparities before 2 years

Ward et al., NEJM 2017

Etiology: What causes child obesity?

- Obesity is a complex phenotype caused by interaction between genetic predisposition and environmental and developmental factors
- **Fundamental imbalance between caloric intake and expenditure required to maintain health weight**





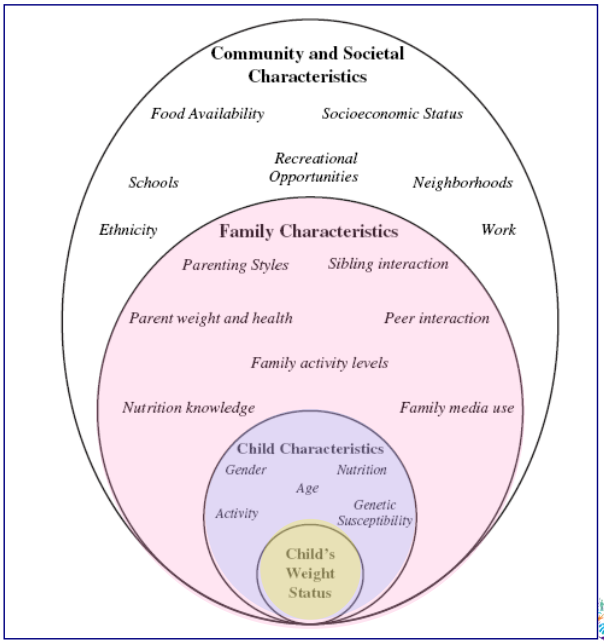
Etiology: Ecological Model of Child Obesity

Environment
Economic, Educational and work opportunities
Discrimination
Agriculture systems

Community
Food availability
Parks and recreation
Safety

Family
- Social support
- Barriers to healthy behaviors
- Parent weight and health
- Parenting and feeding

Individual
- Prenatal factors
- Birth weight, growth trajectory
- Appetite
- Temperament ?



Individual Factors:

Neuroendocrine regulation of energy balance

- Leptin -protein hormone secreted by adipose cells
  - Fasting: low
  - Post-prandial: higher
- Low leptin levels
  - increase appetite &
  - decrease energy expenditure
- Leptin deficiency & receptor defects occur
  - most obese people have high leptin levels

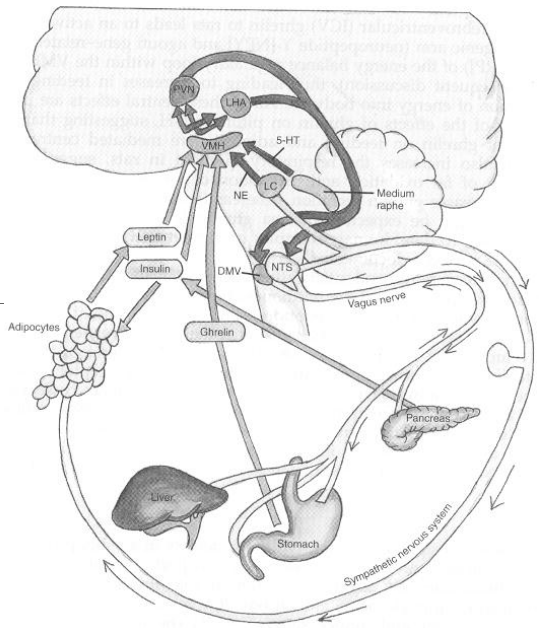


Table 1
Major neuropeptides involved in appetite regulation

Neuropeptides	Appetite stimulating Orexigenic	Appetite suppressant Anorexigenic agents
Central	1. Neuropeptide Y 2. Melanin concentrating hormone (MCH) 3. Orexins/hypocretins 4. Agouti-related peptide (AGRP) 5. Galanin 6. Endogenous opioids 7. Endocannabinoids	1. Cocaine and amphetamine related transcript (CART) 2. Melanocortins (POMC) 3. Glucagon like peptide 4. Corticotropin releasing factor (CRF) 5. Insulin 6. Serotonin 7. Neurotensin
Peripheral	1. Ghrelin	1. Peptide YY 2. Cholecystokinin (CCK) 3. Leptin 4. Amylin 5. Insulin 6. Glucagon-like peptides 7. Bombesin

Environmental and Community Factors:

Processed foods are heavily promoted to children

80 Kcal

240 Kcal

1200 Kcal

And its very easy to overconsume…

HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Daily Recommended Intake

daily	Age	1 yr	2-3 yr	4-8 yr	9–13yr	14–18yr
calories	male	900	1000	1400	1800	2200
	female	900	1000	1200	1600	1800
% calories from fat		30-40	30-35	25-35	25-35	25-35
%calories from protein		5- 20	5- 20	5 - 20	10 - 30	10 - 30
% calories from CHO		45-65	45-65	45-65	45-65	45-65
Fiber (gm)		19	19	25	26♀31♂	29♀38♂
Iron (mg)		7	7	10	8	15♀11♂
Sodium (mg)			1000	1200	1500	1500
Vitamin D (IU)		600	600	600	600	600
Calcium (mg)		700	700	1000	1300	1300
Milk (cups)		2	2	2	3	3
Protein e.g. meat/beans (cups)		1.5	1.5	3♀4♂	5 ♀♂	5♀ 6♂
Grains- ≥ half whole grain (oz)		2	3	4♀5♂	5♀ 6♂	6♀7♂
Fruit (cups) **2 servings/d**		1	1	1.5♀♂	1.5♀♂	1.5♀2♂
Vegetables (cups) **3 servings/d**		.75	1	1♀5♂	2♀2.5♂	3♀3.5♂

Environmental and Community Factors: Food Policy

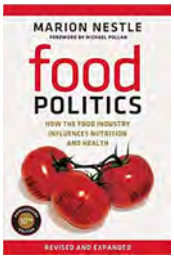
Processed Food—An Experiment That Failed

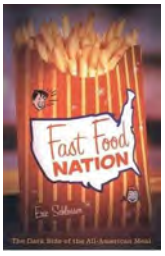
Lustig. JAMA Pediatrics March 2017 Volume 171, Number 3 (.

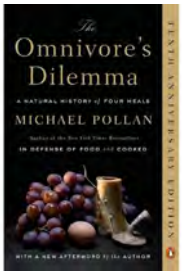
Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report

Lancet 2019; 393: 791–846

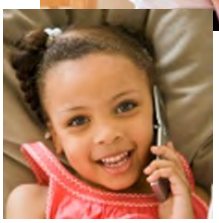
Obesity is a risk factor for 3 of the 4 leading causes of non-communicable diseases worldwide: cardiovascular diseases, type 2 diabetes, and certain cancers…Few countries have developed environmentally sustainable dietary guidelines that ensure food security, improve diet quality, health and wellbeing and respond to climate change. Many countries' efforts to include these principles in dietary guidelines failed due to pressure from food industry lobbies, especially the beef, dairy, sugar, and ultra-processed food and beverage industry sectors.







Environmental and Community Factors: Physical Activity and Screen Time

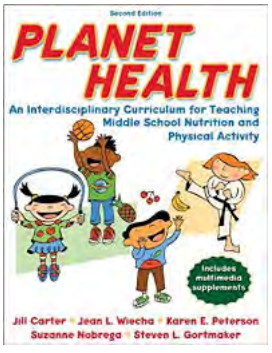


23

Child Obesity Prevention: Brief History

- Many well designed trials in diverse settings, over 25 years
  - For children 6-19
  - Schools, community, after school
  - Improvement in behaviors
  - Some reduction in weight
  - Multicomponent programs integrated into school PE, food systems, with outreach to parents & home most effective
  - Limited reduction in subsequent obesity
  - Impact is reduced after programs end

pa nap sacc pa **nutrition** AND physical **activity** self-**assessment** FOR child care



24

Prevention for Early Child Obesity

- Obesity in children younger than 2 y/o
- Was not common practice to diagnose obesity in infants or toddlers until recently
- Guidelines for obesity definitions, evaluation and prevention start at age 2
- Chubby infants considered healthy
- 'Baby fat' was not thought to predict later obesity or health risk

REVIEW ARTICLE

Interventions Aimed at Decreasing Obesity in Children Younger Than 2 Years

A Systematic Review

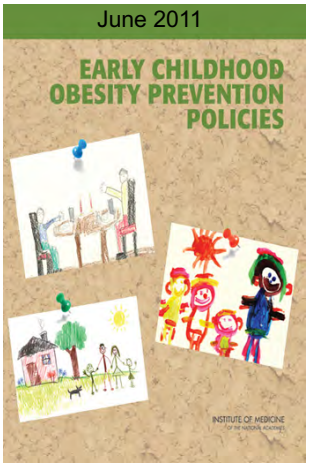
Philip J. Ciampa, MD, MPH; Disha Kumar, BA; Shari L. Barkin, MD, MSHS; Lee M. Sanders, MD, MPH; H. Shonna Yin, MD, MS; Eliana M. Perrin, MD, MPH; Russell L. Rothman, MD, MPP

ARCH PEDIATR ADOLESC MED/VOL 164 (NO. 12), DEC 2010 WWW.ARCHPEDIATRICS.COM

1098

Dec 2010
12 papers in the review

June 2011



Systematic Review from 2011: Conclusions

- Strong evidence supports impact of child obesity prevention programs on BMI, especially targeted to children aged six to 12 years.
- Promising policies and strategies:
  - School curriculum that includes healthy eating, physical activity and body image
  - Increased sessions for physical activity and fundamental movement skills in school
  - Support for teachers and parents to implement health promotion activities
- **Childhood obesity prevention research must now move towards identifying how effective intervention components can be embedded within health, education and care systems and achieve long term sustainable impacts.**
- **<u>Only 8 studies conducted with children under age 3</u>**

Cochrane Library
Trusted evidence.
Informed decisions.
Better health.

Cochrane Database of Systematic Reviews

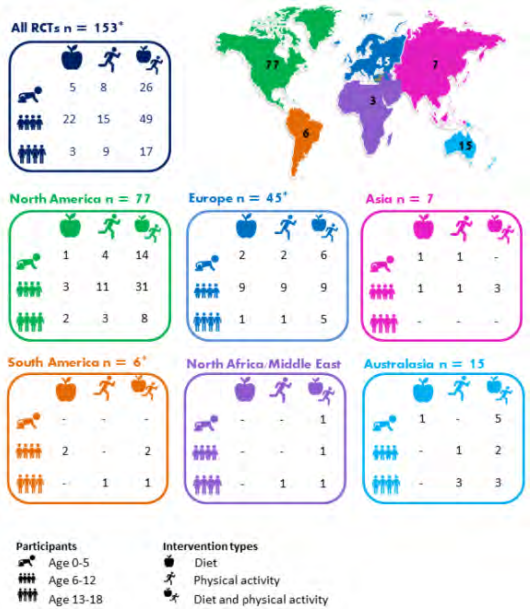
Interventions for preventing obesity in children

Cochrane Systematic Review - Intervention Version published: 07 December 2011

26

HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Systematic review from 2019: conclusions



Cochrane Library
Trusted evidence.
Informed decisions.
Better health.

Brown T, et al. Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews* 2019, Issue 7. Art. No.: CD001871. DOI: 10.1002/14651858.CD001871.pub4.

Summary of findings:

- Interventions that include diet and physical activity can reduce obesity risk in 0 to 5 y/o children.
- Interventions with diet and/or physical activity can reduce obesity risk in 6 to 18 y/o children.
- Childhood obesity prevention interventions **do not** result in adverse effects or health inequalities.
- **>40 studies in 0 to 5 y/o children**.
- Settings included: childcare (n = 22); healthcare (n = 5); home (n = 6), school (n = 2); and community (n = 4).

Risk Factors for Early Child Obesity: Individual and Family Factors

- Before and during pregnancy:
  - Excess gestational weight gain
  - Diabetes
  - C-section
  - Maternal obesity
  - Paternal obesity
  - Maternal diet quality
- During infancy
  - Infant appetite/eating style
  - Food Parenting:
    - Feeding styles
    - Feeding practices
  - Lifestyle behaviors

Parent Feeding Styles, Practices and Lifestyle Behaviors

Protective:

- Responsive feeding styles
- Exclusive breast feeding
- Adequate fruit and vegetable intake
- Regular meal and snack pattern, family meals
- Infant activity: tummy time, free floor play
- Adequate sleep: ≥ 12 hours for infant, ≥ 11 for toddlers

Obesity Promoting

- Pressuring, restricting, indulgent or laissez faire styles
- Early intro to solids
- Sugary drinks
- Prolonged bottle feeding
- Excess milk

Barriers to Healthy Behaviors: Family and Community Factors

- Depression:
  - Adding cereal to the bottle was associated with maternal depressive symptoms (Lucas, Messito, Gross et al J Nutr Educ Behav. 2017)
- Social Support:
  - Maternal social support is protective for child obesity (Katzow, Messito, Gross et al J Pediatrics. 2019)
- Food insecurity:
  - Lower personal sense of control over preventing early obesity (Gross et al., Academic Pediatrics, 2016)
  - Non-responsive controlling feeding styles (both pressuring and restrictive) Gross et al., Pediatrics, 2012)
  - Additive effects of food insecurity during both pregnancy and infancy was related to mothers exhibiting greater indulgent, pressuring and laissez-faire feeding styles (Gross et al, Appetite, 2018)
- Material Hardships:
  - Financial difficulty and multiple hardships were associated with decreased infant night sleep. (Duh-Leong, Messito, Gross et al Acad Pediatr. 2020)

30 Footer can go here

Early Child Obesity Prevention Programs

- Increased number over last 5-10 years
- Vary by setting, delivery methods
  1. Supplemental food programs:
     - WIC and SNAP (aka food stamps)
  2. Home visiting
  3. Community
  4. Primary care

https://homvee.acf.hhs.gov/Models.aspx

Healthy Beginnings

- The Healthy Beginnings Trial
  - Disadvantaged areas of Sydney, Australia,
  - Led by trained community nurses
  - Eight home visits one during the antenatal period, and seven at 1, 3, 5, 9, 12, 18 and 24 months after birth
  - RCT of 667 first time mothers and their infants

- First trial with positive impacts on infant weight at age 2 years
  - Mean BMI was significantly lower in the intervention group than in the control group, with a difference of 0.29 (p=0.04)

Wen et al, BMJ, 2012

Intervention Nurses Start Infants Growing on Health Trajectories (INSIGHT) study

- Rural Pennsylvania with middle-income white families
  - Led by research nurses
  - Home visits at child age 1, 4, 7, 10, 12, and 24 months
  - RCT of 279 first time mothers and their infants

- First US trial with impacts on infant weight at age 3 years old
  - Responsive parenting group had a lower mean BMI z score than controls (−0.13 vs. 0.15; absolute difference −0.28; p = .04)
  - Responsive parenting group had less obesity than controls (2.6% vs. 7.8%; absolute difference −5.2%; *P* = .08)

Paul et al, JAMA, 2018

Primary Care Models for delivering Early Child Obesity Prevention

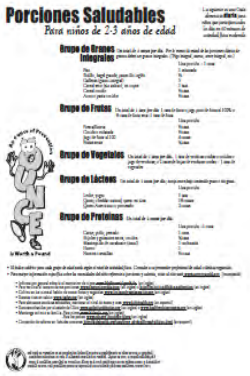
- Provides a unique, underutilized opportunity to address limitations
- Advantages include:
  - High frequent prenatal and pediatric visits
  - Widely attended, even among high-risk families
  - Use of existing infrastructure to lower cost and decrease need for additional transportation
  - Ability to build on preexisting provider relationships

- Primary care provider visits are too brief to conduct intensive obesity prevention needed for high risk families
  - Can be used as a framework for supplemental preventive activities
- Successful implementation efforts have addressed disparities in early child development and school readiness using the primary care setting

- Experience with primary care-based early obesity prevention is more limited

Ounce of Prevention

An Evaluation of Mother-Centered Anticipatory Guidance to Reduce Obesogenic Infant Feeding Behaviors



CONCLUSIONS: Brief specific interventions added to well-child care may affect obesogenic infant feeding behaviors of mothers and deserves further study as an inexpensive approach to preventing childhood obesity. Pediatrics 2012;130:e507–e517

35

HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Greenlight Intervention

- **Low literacy booklets** and **"tangible tools"** (e.g., portion size snack cups)
- Beginning at age 2 months at each well-child check-up in first 2 years of life
- **Physician communication training** (teachback, goal-setting)

- Health literacy-informed approach to provider-parent communication
  - Easy-to-understand, 4th-6th grade
  - Behavior/action-oriented
  - Empowering/activating language
  - Color-coded "traffic light" theme
  - Visuals to support text – photos, graphics
  - Gives providers tools to enhance communication

Centering Parenting

- Group prenatal and pediatric primary care visits
  - Demonstrated positive impacts
    - Better attendance at well-child visits
    - Better immunization rates
    - Extended breastfeeding
    - More time with the provider
    - Group social support
- Children enrolled in well baby groups (n=47) compared to traditional well individual visits had less obesity at age 2 years (2.1% vs. 15.0%; p = 0.02)

Machuca et al, Childhood Obesity 2016

Limitations of Existing Early Child Obesity Prevention Interventions

- **Challenges in achieving population-level reach**
  - Home visiting models currently reach approximately 15% of at-risk families
  - Highlighting the need for additional platforms to support population scalability.
- **Limited generalizability to US low-income communities**
  - Either outside of the United States (US)
  - Middle- or high-income US communities- not targeting those at highest risk
- **Require a group primary care visit model**
- **Depend on provider delivery**
  - Not enough time in visit
- **Begin too late in the life course**
  - Infant feeding decisions are made during pregnancy or post partum periods
  - Pregnancy factors impact child weight

Starting Early

- Designed to fill gaps in existing programs
  - Supplement to standard prenatal and pediatric primary care delivered by RD/CLC
  - Does not require a group model
  - 3rd trimester of pregnancy through age 3
- Developed for groups at highest risk of disparities
  - Culturally tailored and ecologically informed
  - Support for poverty related stressors
- Components include:
  - Individual Counseling and Nutrition/Parenting Support Groups
  - Consistent groups of mother-infant dyads
  - Interactive discussion, problem solving, parenting, demonstrate skills practice
  - Virtual and in person groups

Starting Early
Empezando Temprano

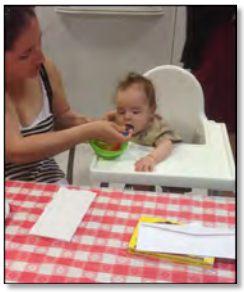
USDA
United States Department of Agriculture
National Institute of Food and Agriculture

NYC HEALTH+ HOSPITALS
Bellevue

Starting Early Intervention

Nutrition and Parenting Support Groups

Tummy time at 2 months

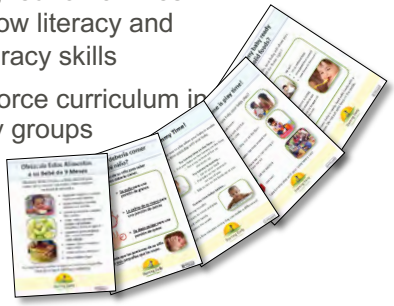


Starting solids at 6 months

5 S's - How to soothe your baby

Bilingual Plain Language Handouts

- Designed for families with low literacy and numeracy skills
- Reinforce curriculum in family groups



Nutritional DVD

- Culturally-specific content
- Stars "real" families from NYC WIC centers
- Improve parent nutrition knowledge

Study Design

- 5-year randomized controlled trial
- Enrolled 533 women
- Starting Early intervention vs. standard of care
- 3rd trimester of pregnancy to child age 3 years
- Urban public hospital in both obstetrics and pediatrics
- Objective
  - To determine Starting Early Program impacts on child weight outcomes between birth and 3 years in low-income Hispanic families.

Baseline Data: Pregnancy (n=533)

Characteristics	Baseline Sample	
Prenatal	**Control n=267**	**Intervention n=266**
Age (years (SD))	**28.1 (5.8)**	**29.0 (6.1)**
Primiparous	**38.7%**	**30.8%**
US born	**18.3%**	**18.1%**
Education (less than HS)	**31.1%**	**39.4%**
Married	**71.1%**	**72.9%**
Working	**15.6%**	**18.1%**
Pre-pregnancy obese	**29.4%**	**28.5%**
Depressive symptoms	**32.5%**	**31.8%**
Food insecurity	**35.5%**	**28.6%**
WIC participant	**86.0%**	**90.0%**

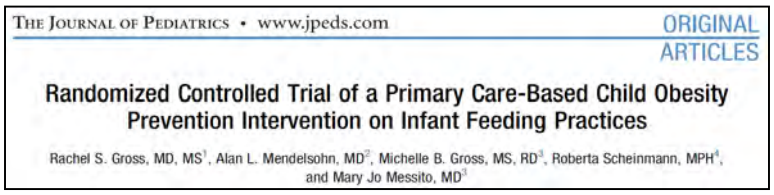
Starting Early Program Impacts

3 months old

- Increased exclusive breastfeeding
- Increased breastfeeding intensity
- Decreased early introduction of solids
- Increased tummy time

10 months old

- Decreased juice consumption
- Decreased non-responsive feeding styles


THE JOURNAL OF PEDIATRICS • www.jpeds.com ORIGINAL ARTICLES

Randomized Controlled Trial of a Primary Care-Based Child Obesity Prevention Intervention on Infant Feeding Practices

Rachel S. Gross, MD, MS[1], Alan L. Mendelsohn, MD[2], Michelle B. Gross, MS, RD[3], Roberta Scheinmann, MPH[4], and Mary Jo Messito, MD[3]


Original Article PEDIATRIC OBESITY

Obesity

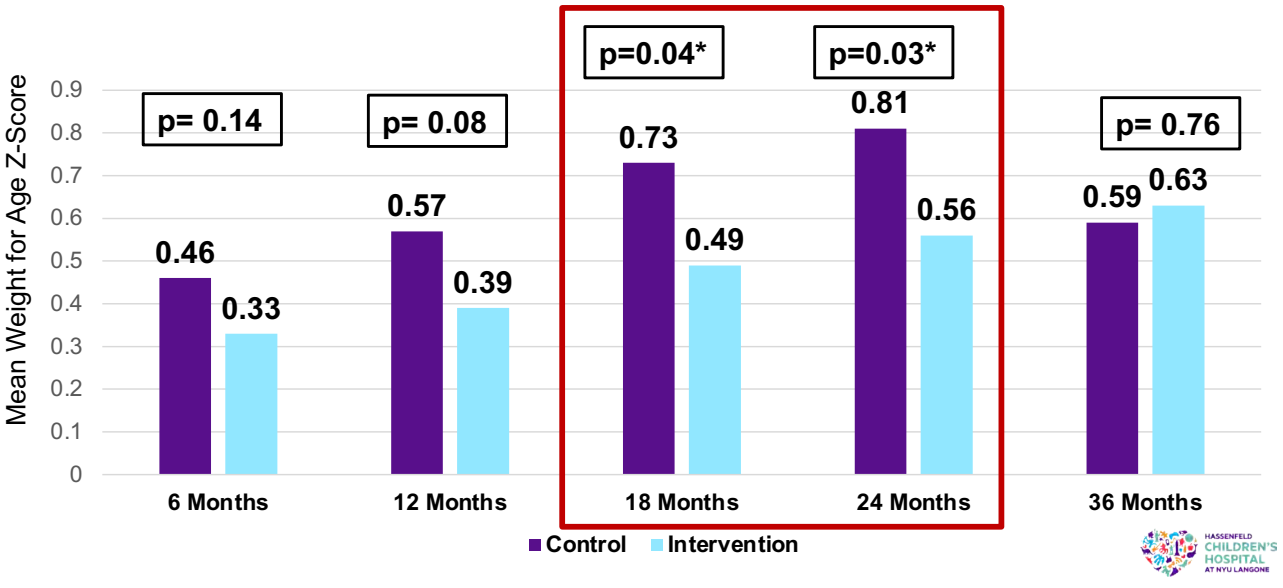
Randomized Controlled Trial of an Early Child Obesity Prevention Intervention: Impacts on Infant Tummy Time

Rachel S. Gross[1], Alan L. Mendelsohn[2,3], H. Shonna Yin[3,4], Suzy Tomopoulos[4], Michelle B. Gross[4], Roberta Scheinmann[3], and Mary Jo Messito[4]

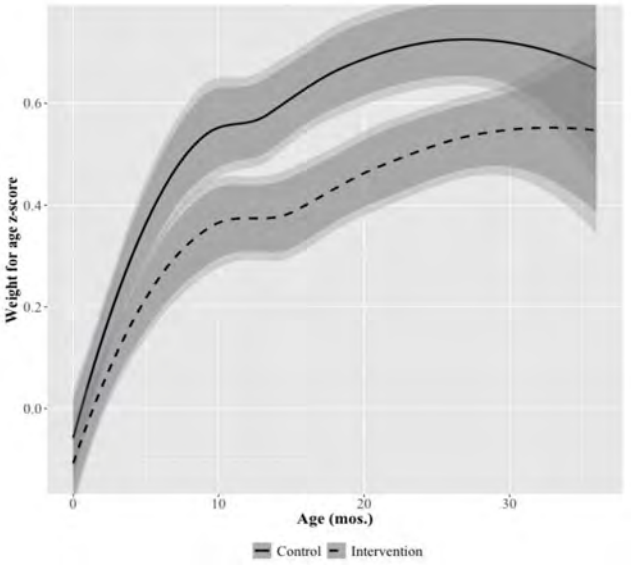

AFRI_Starting Early Program Impacts on Feeding at Infant 10 Months Age: A Randomized Controlled Trial

Mary Jo Messito, MD,[1] Michelle W. Katzow, MD, MS,[2] Alan L. Mendelsohn, MD,[3] and Rachel S. Gross, MD, MS[1]

Impact of Starting Early Program on Mean Infant Weight for Age Z-Scores



Starting Early Program Impacts on Weight for Age Z-Score Trajectories between Birth to 3 years



Trajectory of weight gain from 1-2 years was significantly lower for the intervention group (B=-0.19, p=0.047)

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

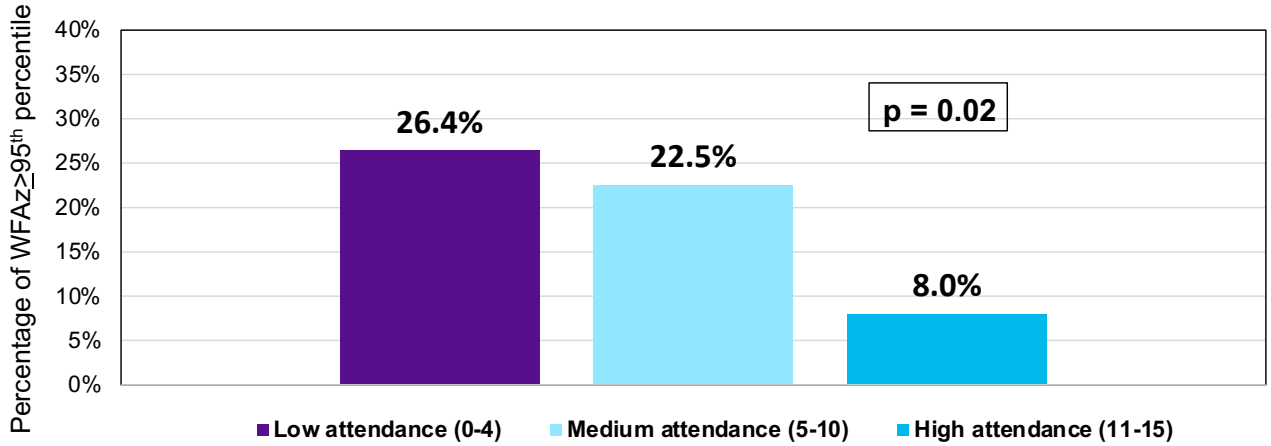
Prenatal and Pediatric Primary Care–Based Child Obesity Prevention Program: A Randomized Trial

Mary Jo Messito, Alan L. Mendelsohn, Michelle W. Katzow, Marc A. Scott, Sarvenaz Vandyousefi and Rachel S. Gross

Pediatrics originally published online September 3, 2020;

HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Dose Effects Weight Status at Age 3 Years (WFAz ≥95th percentile)



HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Limitations

- Using medical record reviews to obtain anthropometrics
  - Inaccuracies are common in clinically measured length/height
  - Limited our use of weight for length z-scores
- Our focus on low-income Hispanic families may limit generalizability

Implications

- One of the first trials to demonstrate significant weight impacts in families at high risk of early child obesity using a population-scalable model
- Additional study is needed to understand how best to sustain impacts beyond age 2 years
  - Increase engagement and reduce participation barriers
  - Target the changing multifactorial causes of obesity during the preschool period

Suggestions for Primary Care Providers - 1

- Assess risk early
  - Family hx obesity important predictor
  - LGA or SGA , delivery type
- Elicit parent concerns:
  - How do you feel about your child's weight?
  - Many worried about obesity
- Early weight gain trajectory
  - Rising percentiles
- Parent feeding styles
- Infant appetite
- Address stressors to support above: refer to service for mental health, nutrition and housing support, etc.

49

Suggestions for Primary Care Providers - 2

- Infant feeding practices
  - If combination feeding decrease formula
  - Timing of solid intro
  - What foods given
- Toddler
  - Bottle use, milk and 'milk' intake
  - LIMIT SETTING
- Delay screen intro, and model limited use
- Meal structure and organization: example setting
- Advocacy: offer any available preventive programs, work with day care, school system, neighborhood to improve food and activity environment

50

Cultural Considerations

1. Recent immigrants
2. Preference for chubby baby
3. Differences by age and sex
4. Making healthy recipes for cultural food preferences
5. Barriers to physical activity

1. May prefer co-sleeping, breastfeeding into 2nd year
2. Perceive baby 'fat' as healthy, or temporary
3. Excess weight perceived for girls or older children
4. Ask about cooking methods, healthy substitutions
5. Perception of cold weather as unhealthy

51

HASSENFELD CHILDREN'S HOSPITAL AT NYU LANGONE

Acknowledgments: Starting Early Team

- Co-PI Rachel Gross, MD, MS
- Co-investigators
  - Alan Mendelsohn, MD
- Project Fellow
  - Michelle Katzow, MD
- Post Doc
  - Sarvenaz Vandyoussefi
- Registered Dietitian
  - Janneth Bancayan, BS, RD
- Project Coordinator
  - Stephanie Gonzalez
- Research Assistants
  - Cristina Vazquez
  - Fabiola Bravo
  - Cecilia Snyder

Financial Support

Agriculture and Food Research Initiative (AFRI)
USDA National Institute of Food and Agriculture,
Program Name: Childhood Obesity Prevention: Integrated Research, Education, and Extension to Prevent Childhood Obesity
Program Code: A2101 Grant/Award #: 2011-68001-30207

NIH/NICHD –
National Institute of Child Health and Human Development
Grant/Award #: 1K23HD081077-01

Thank you

Mary Jo Messito, MD
Clinical Associate Professor of Pediatrics
NYU Grossman School of Medicine

mary.messito@nyulangone.org

Feed so children can eat and grow well

Ellyn Satter, MS, MSSW, Dietitian and Family therapist

Ellyn Satter INSTITUTE

Purpose and Objectives

PURPOSE

Introduce the possibilities of feeding so children can eat and grow well

OBJECTIVES

Participant will be able to:

1. Demonstrate common feeding errors that disrupt children's eating and growth.
2. Identify common misconceptions that precipitate feeding errors.
3. Show how to avoid feeding errors by following. the Satter Division of Responsibility in Feeding
4. Consider using sDOR.2-6y, a validated questionnaire for assessing feeding dynamics.

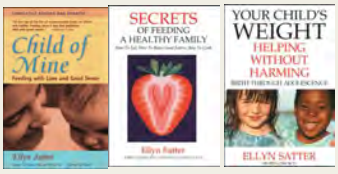
FINANCIAL DISCLOSURE

Receive royalties from educational materials about fdSatter and ecSatter.

Ellyn Satter, MS, MSSW

Dietitian and family therapist
Author of books, journal articles, and educational materials
Lecturer, consultant
Created fdSatter, ecSatter, sDOR
Validated ecSI 2.0, sDOR.2-6y
Eating disorders clinician (ret)
Psychotherapist (ret)
RD in clinical practice (ret)
Volunteer for ESI

Books



Videos

Teaching materials

Booklets

Founder and Developmental Editor

Ellyn Satter INSTITUTE

Provides efficient, effective, evidence-based guidance
Protects the integrity of the Satter models

www.ellynsatterinstitute.org

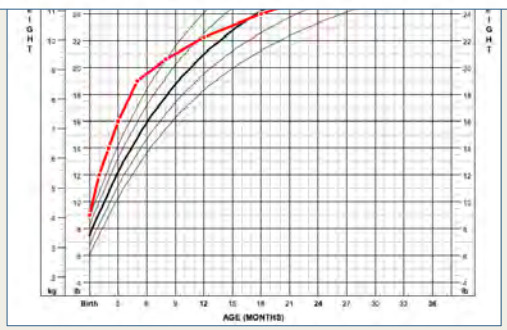
Feeding errors disrupt children's eating and growth

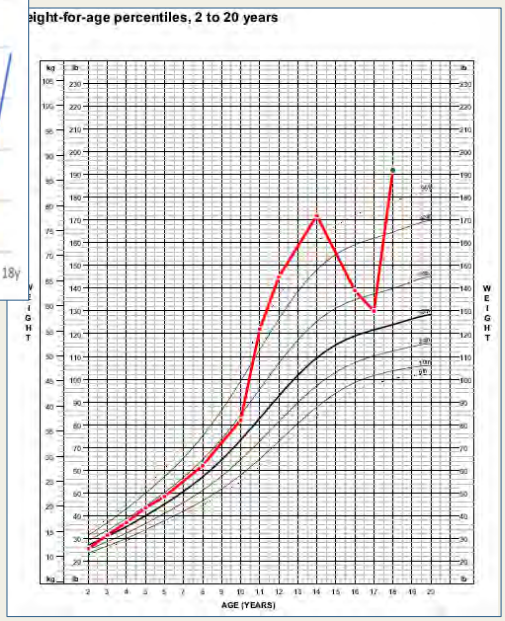
Feeding with Love and Good Sense II DVD vignettes

Spanish FWLGS II DVD Vignettes

fdSatter is Weight-neutral

Feeding errors disrupt growth, eating

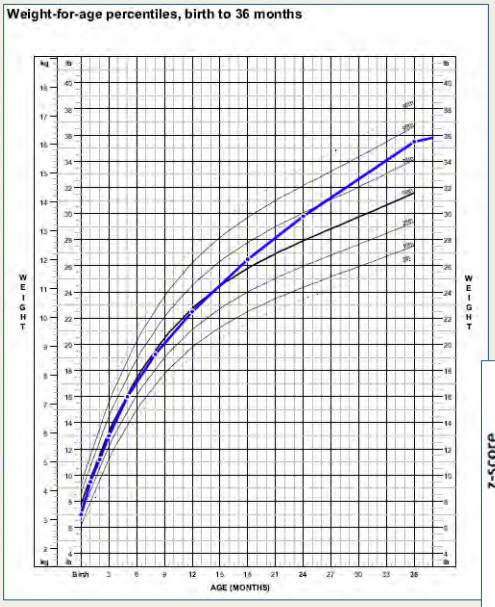


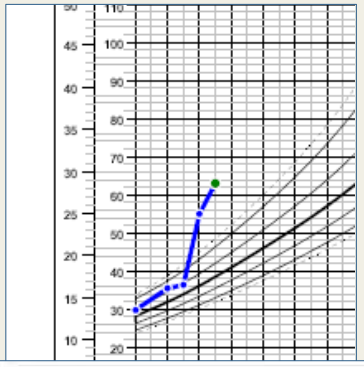


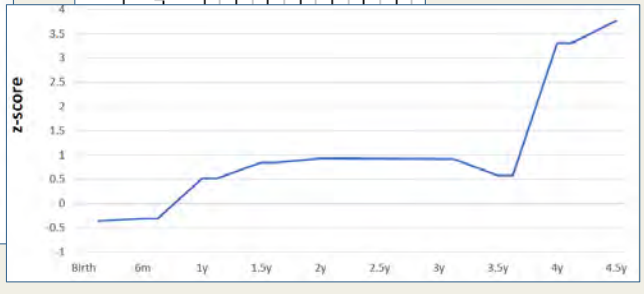
Understanding and using z-scores

fdSatter is Weight-neutral

Feeding errors disrupt growth, eating







Understanding and using z-scores

Misconceptions = feeding errors

Misinterpretation of “normal” puts pressure on eating

When parents feed based on sDOR, children eat what and as much as they need and grow consistently

Children push themselves along to learn to eat the food parents eat, even through . . .

- They refuse new foods at first
- Some are especially slow to eat unfamiliar food
- Some are especially sensitive to tastes and textures

Children are inclined to maintain preferred and stable body weight, even through . . .

- Some have big appetites, some small
- Some grow rapidly, some slowly
- Some eat a great deal; others not so much
- Some love food; others not so much
- Most vary greatly day-to-day in what, how much they eat

Nutrition and health policy puts pressure on feeding

Guidelines:
Prevention, treatment child overweight/ obesity

- Get children to grow below the 85th BMI percentile
- Get children to eat “healthy” food, e.g. fruits, vegetables, whole grain
- Use low-fat dairy, other protein foods
- Manage portion sizes
- Restrict sugar, fat

Nutrition and health policy puts pressure on feeding

Guidelines for child overweight/ obesity

Get chil… below the 85th

…ood, e.g.

…foods

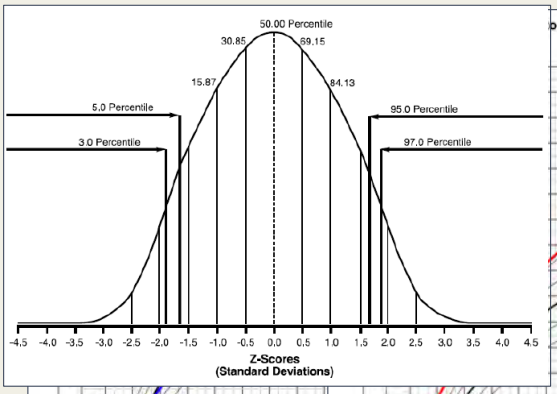
R…

Multidisciplinary 26+ hour health-policy intervention ≠ BMI change
O’Connor 2017 *JAMA* Screening

Children whose parents perceive them as overweight gain more weight age 4-13 years
Robinson 2016 *Pediatrics* Parental

fdSatter is Weight-neutral

Defining weight outcome puts pressure on feeding



Follow sDOR

Parents who follow sDOR do better

Lohse B, Mitchell DC. Valid and Reliable Measure of Adherence to Satter Division of Responsibility in Feeding. *JNEB. 2020(November 12, 2020).*

https://authors.elsevier.com/sd/article/S1499-4046(20)30716-8

Higher scores on sDOR.2-6y™ correlate with

Lower child nutrition risk

Lower restriction and pressure on child's eating

Higher parent Eating Competence

Lower parent cognitive restraint (eating)

Higher parent sleep quality

Lower parent stress

More positive parent psychosocial functioning

sDOR.2-6y™

12 items. Sample questions:

Caregiver leadership: What, when, where

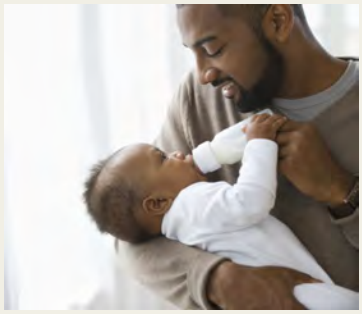
- My family has meals at about the same times every day.
- We have food left over after meals.
- I make something special for my child when s/he won't eat.

Child autonomy: How much, whether

- If I think my child hasn't had enough, I try to get him or her to eat a few more bites.
- I let my child eat whenever s/he feels like eating.
- I let my child eat until s/he stops eating and doesn't want any more.

Get permission for usage: https://tinyurl.com/sDOR.2-6y application

Satter Division of Responsibility in Feeding

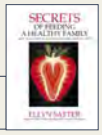


Infant

Parent: *What*

Child: *How much, how often,* and *everything else*

Satter EM. The feeding relationship, JADA 86:352, 1986
Satter EM. Part 2, "The Feeding Relationship" in *Secrets of Feeding a Healthy Family*



Satter Division of Responsibility in Feeding

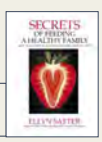
Transitional child

Parent:

- Still and always responsible for *what*
- Becoming responsible for *when* and *where*

Child: *How much, w*hether

Satter EM. The feeding relationship, JADA 86:352, 1986
Satter EM. Part 2, "The Feeding Relationship" in *Secrets of Feeding a Healthy Family*



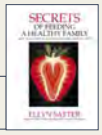
Satter Division of Responsibility in Feeding

Toddler through adolescent

Parent: *What*, *when*, *where* of *feeding*

Child: *How much, whether* of *eating*

Satter EM. The feeding relationship, JADA 86:352, 1986
Satter EM. Part 2, "The Feeding Relationship" in *Secrets of Feeding a Healthy Family*



sDOR Outcome: Positive eating attitudes/behaviors

Allow children to eat as much as they need of a variety of food

Feel good about eating

Are comfortable with unfamiliar food

Go by feelings of hunger and fullness to know how much to eat and how to grow

Enjoy family meals and behave well there

https://www.ellynsatterinstitute.org/satter-eating-competence-model/

Words/concepts that interfere with sDOR

Insisting family meals be "healthy"
"We don't sit down and eat together if it's fast food, like we would if it was home cooked." Berge 2013 JAND Perspectives . . .

Pressuring the child to eat

Rewarding, reasoning, complimenting, applauding, explaining, promoting "healthy," elaborate modeling

Trying to get the child to eat less

Asking "what does your tummy say" or "do you want to be healthy/run fast," "eat your vegetables and you can have. . ." "saying "are you sure you want that," the *look*

Eating competence and food security

sDOR: *Critical* to provide enough to eat

Among low-income people, Eating Competent parents are less likely to worry about money for food. They are confident of their food- and money-management skills.

Eating Competent parents are more likely to maintain the structure of family meals and snacks.

sDOR in detail

6. Teaching your child to be a good eater

How were you fed as a child?
Do you want to feed your child the way you were fed?
How do you feel about your own eating?
Do you want your child to eat the way you do?

Step by step, starting with breast – or formula-feeding, then solid foods, then soft and easy-to-eat grownup food from family meals, you teach your child to be a good eater. Your child will learn to eat the food you eat.

To feed your child, do your own jobs and let him do his jobs.
- You decide *what*, *when* and *where* your child gets to eat.
- Your child decides *how much* and *whether* he eats-of what you make.

Don't get your jobs mixed up with your child's jobs.
- If you don't do your jobs, your child will eat poorly and not behave at meals.
- If you get bossy and try to do his jobs, he will get upset and not eat.

Your jobs:
- Have a schedule for meals and snacks.
- Refuse begging for food or drink handouts (except water) between times.
- Choose food you enjoy to buy, cook and put on the table.
- Enjoy your own meal. Pay attention to your own eating.
- Keep meals pleasant. Talk and listen. Don't fight or scold. Turn off the TV.
- Let him use his fingers, fork or spoon. Let him get messy.

Your child's jobs:
- Learn to eat at family meal and snack times.
- Come to the table hungry and ready to eat.
- Pick and choose from what you have put on the table. Not make a fuss.
- Decide how much and *if* he will eat. Enjoy his meal.
- Behave nicely at the table. Be good company.
- Not make a mess to bug you.

Parents can relax and enjoy feeding even though . . .

sDOR let children eat what and as much as they need and grow consistently

Children . . .
- refuse new foods at first
- are especially slow to eat unfamiliar food
- are especially sensitive to tastes and textures

Children . . .
- eat a little or a lot
- love food or not so much
- eat a food one time and ignore it the next

Brief intervention

Brief intervention

Ask “how is feeding going?”

Accurately interpret growth

Teach what is normal child eating behavior

Support parents’ feeding role

- Encourage family meals, structured snacks
- Teach sDOR


Thank you!
Ellyn Satter, MS, MSSW
Founder and Developmental Editor
www.EllynSatterInstitute.org

MANAGEMENT OF SEVERE OBESITY IN THE TEEN IN A PRIMARY CARE SETTING : The Live Light Live Right Model

Sarita Dhuper, MD. FACC
Founder & Executive Director
Live Light Live Right.
Director Pediatric Cardiology
Clinical Associate Professor of Pediatrics .
Diplomate American board of Obesity Medicine
SUNY Health Sciences, Brooklyn NY
Livelight.org

LIVE LIGHT LIVE RIGHT

Purpose and Objectives

PURPOSE

PROVIDE AN UNDERSTANDING OF THE PATHOPHYSIOLOGY, COMORBIDITIES AND MANAGEMENT OPTIONS OF SEVERE OBESITY IN TEENS

OBJECTIVES

Objective 1: To understand and communicate the multifactorial causes for obesity with interindividual variations.

Objective 2: Apply current guidelines for evaluation and treatment strategies in adolescent obesity.

Objective 3: Identify the range of interventions and the relative effectiveness in a real world setting especially in minority ethnic groups.

Objective 4: To understand the effectiveness and safety of weight Loss medications and metabolic surgery in youth and the role of the pediatrician in coordination of care.

FINANCIAL DISCLOSURE

None

LIVE LIGHT LIVE RIGHT

Agenda

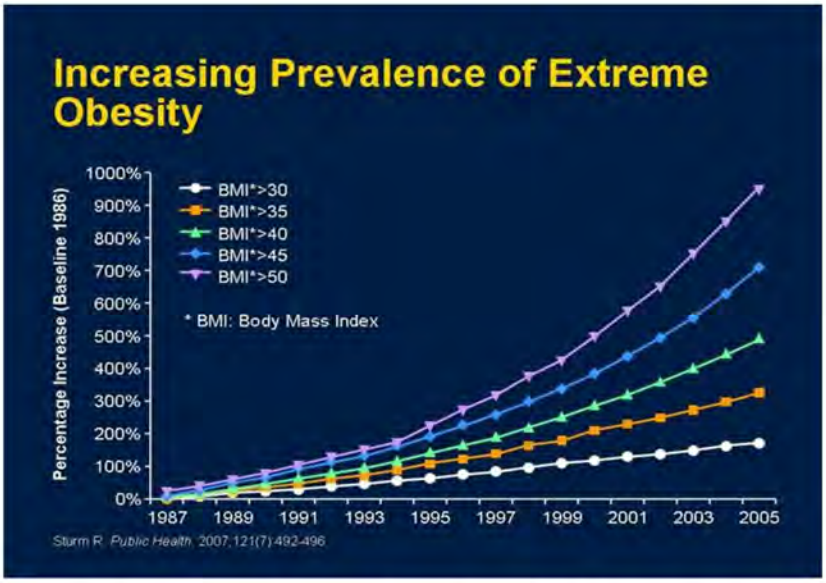
- Discuss Pathophysiology Of Obesity
- Evaluation in a primary care setting
- Treatment options
- Live Light Live Right Model
- Referrals and Resources
- Future training

Why **Severe** Obesity **IS** a Disease

- It is associated with impaired body function
- It is associated with a substantial burden of morbidity and premature death

Causes

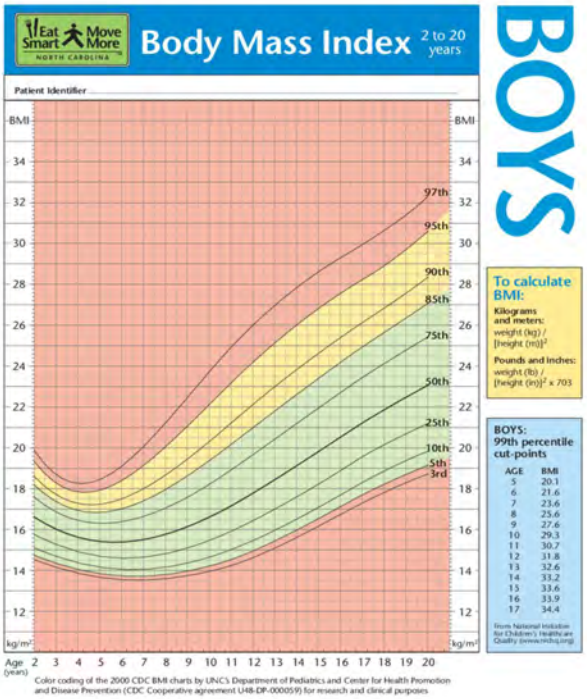
Obesity results from a failure of normal weight and energy regulatory mechanisms



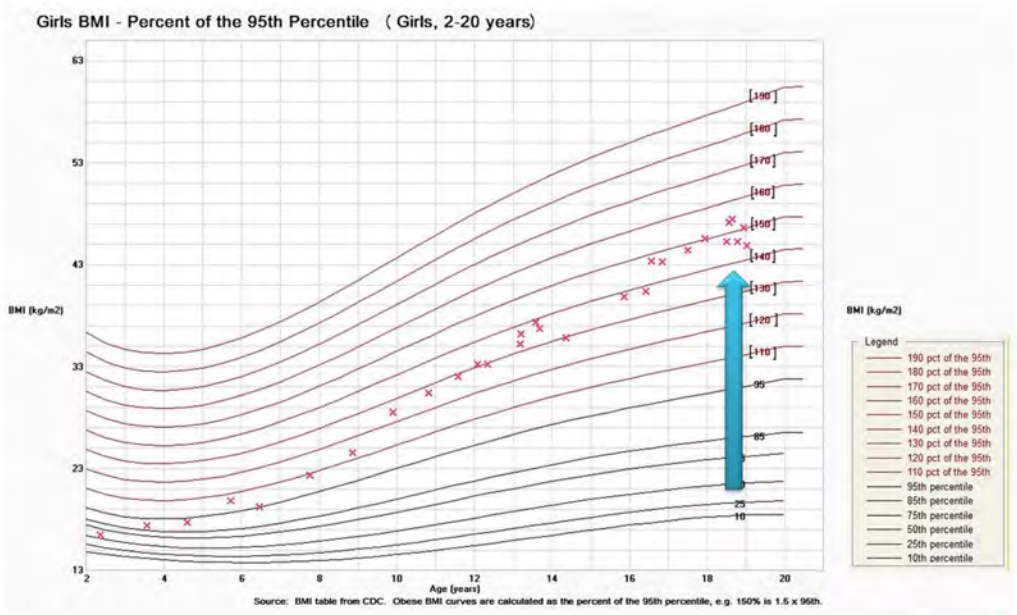
Recent data from the NHANES (2014–2016) report the prevalence of severe obesity in youth at 7.9% overall, 9.7% in 12- to 15-yearolds, and 14% in 16- to 19-year-olds. These numbers represent a near doubling since 1999 and equate to 4.5 million children in the United States affected by severe obesity

Skinner AC, Ravanbakht SN, Skelton JA, Perrin EM, Armstrong SC. Prevalence of obesity and severe obesity in US children, 1999-2016. Pediatrics. 2018; 141(3):26

LIVE LIGHT
LIVE RIGHT

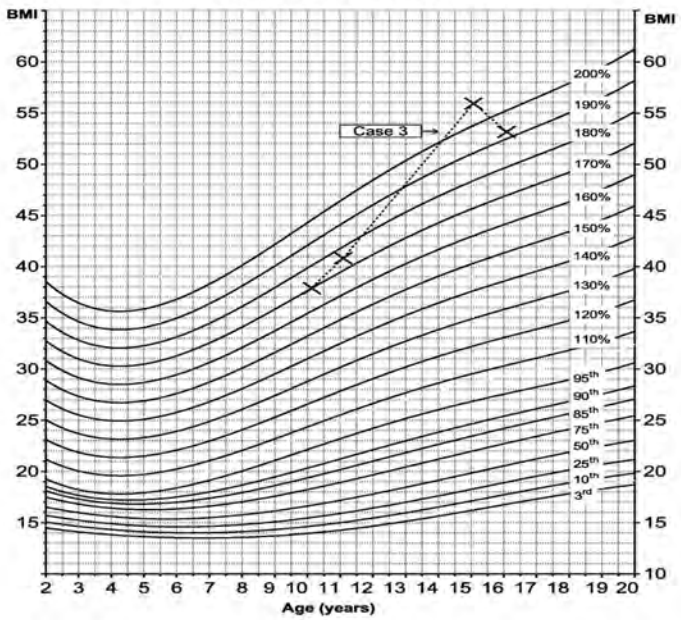


LIVE LIGHT
LIVE RIGHT



LIVE LIGHT
LIVE RIGHT

Assessment

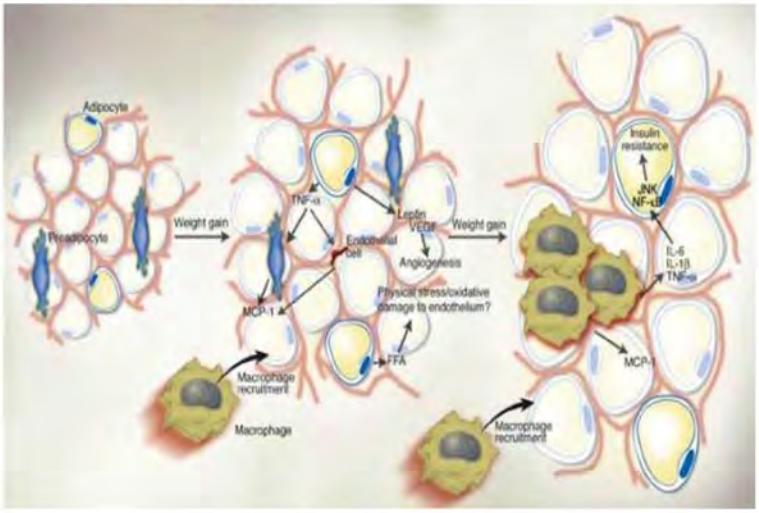


LIVE LIGHT
LIVE RIGHT

LIVE LIGHT
LIVE RIGHT

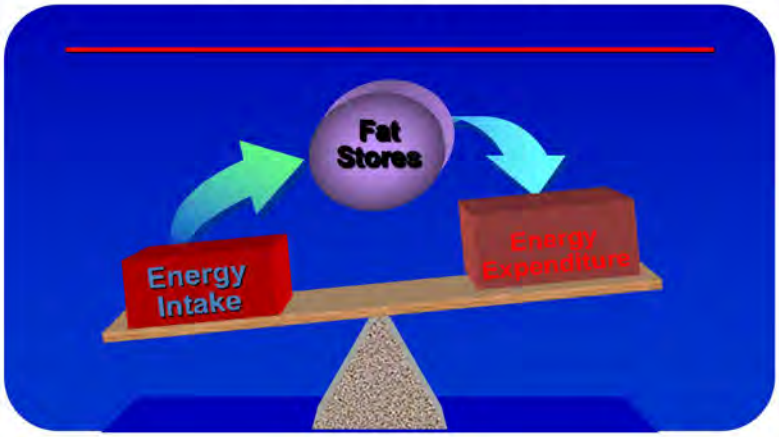
How We Store Fat ?

Physically Obese
Metabolically Obese



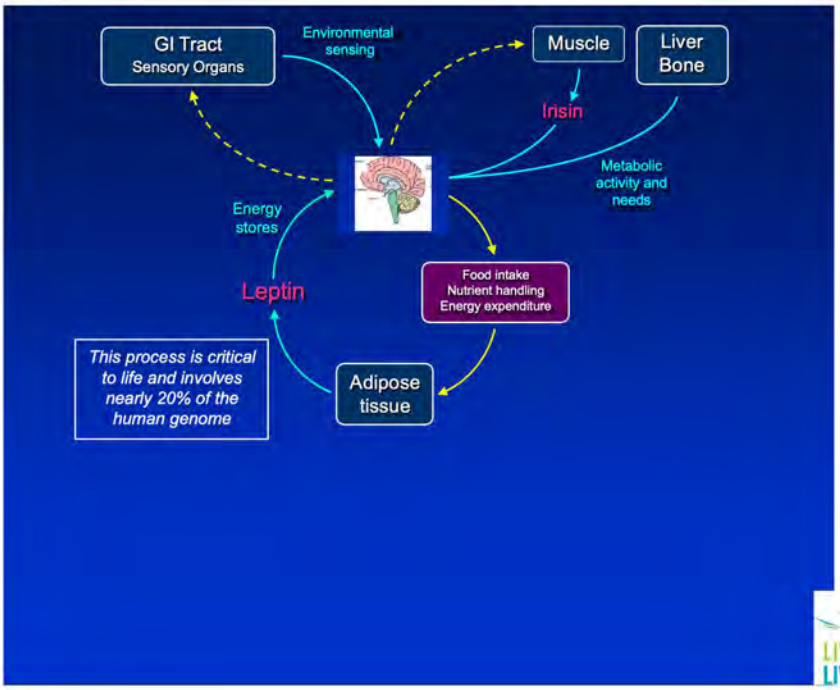
LIVE LIGHT
LIVE RIGHT

Obesity Is Caused by Long-Term Positive Energy Balance



LIVE LIGHT
LIVE RIGHT

Feedback Regulation of Energy Metabolism

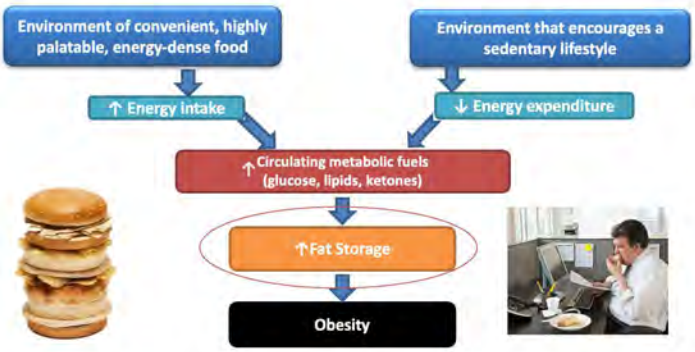


LIVE LIGHT
LIVE RIGHT

Heritability of Obesity

LIVE LIGHT
LIVE RIGHT

Prevailing Model — Developing Obesity



LIVE LIGHT
LIVE RIGHT

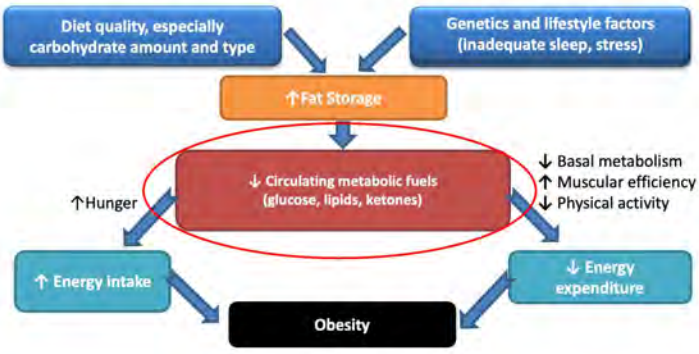
Environment Availability

LIVE LIGHT
LIVE RIGHT

Sedentary Lifestyle

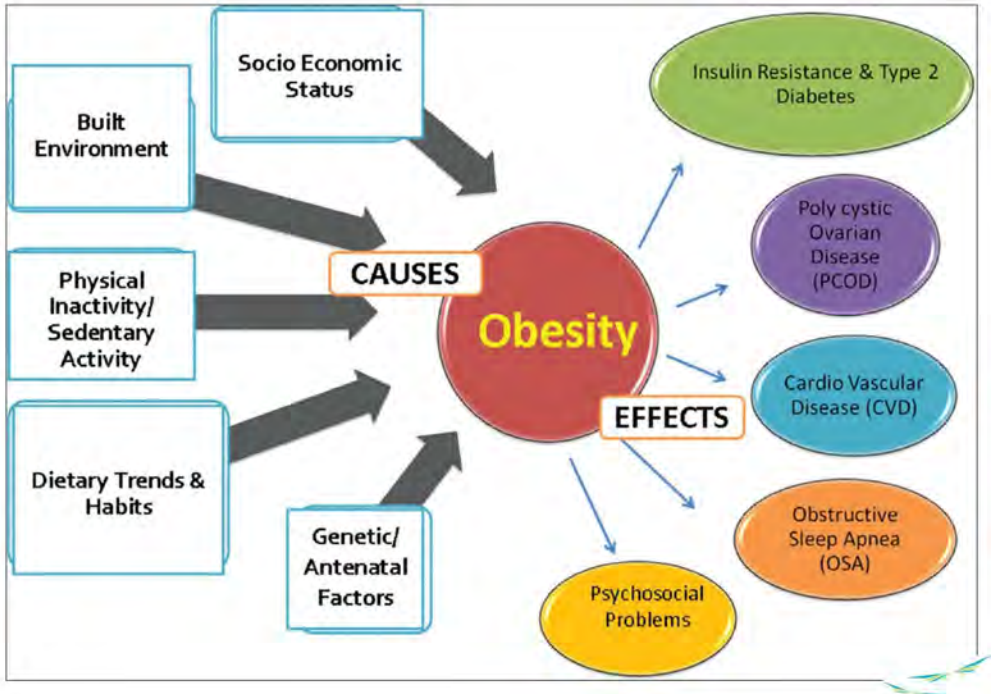
LIVE LIGHT
LIVE RIGHT

Alternative Model



Consequence or Cause of Overeating?
David S. Ludwig, MD, PhD[1,2]; Mark I. Friedman, PhD[3]
Author Affiliations Article Information
JAMA. 2014;311(21):2167-2168.

LIVE LIGHT
LIVE RIGHT



LIVE LIGHT
LIVE RIGHT

Obesity Treatment Strategy

Staged Approach to Obesity Treatment

Stage	Treatment Strategy	Location
Stage 1	**Prevention Plus**	Primary Care Office
Stage 2	**Structured Weight Management** • Family Visits with Health Professional Trained in Weight Management •Monthly Visits- Individual or Group	Primary Care Office with Support (RD involvement with advanced training)
Stage 3	**Comprehensive, Multidisciplinary Intervention** •Multidisciplinary Team with Childhood Obesity Experience •Weekly Visits- 8-12 weeks	Pediatric Weight Management Center (MD, RD, behavioral counselor, and exercise specialist)
Stage 4	**Tertiary Care Intervention** •Medications •Very Low Calorie Diets (VLCD) •Weight Loss Surgery	Tertiary Care Center (MD, RD, behavioral counselor, and exercise specialist)

Multidisciplinary Comprehensive Care

- LLLR is an independent 5013C organization designed to improve the health outcomes and 'Quality of Life' of overweight children and their families. Over 85% children served are severely obese

LIVE LIGHT
LIVE RIGHT

Pediatric Obesity Clinic

- The Pediatric Obesity Clinic provides Intervention
- Tertiary care model (Stage 3 and 4 treatment)

Open Access Program: available intensive program vs. follow-up based on the family's needs and social situation

"One size fits all" does not work

- Comprehensive medical evaluation
- Individual nutritional counseling
- Behavior modification counseling and evaluation
- Referral to our free or subsidized exercise programs
- Follow-up care by physicians, nutritionists, and care coordinator

LIVE LIGHT
LIVE RIGHT

Weekly Exercise & Cooking Classes

Ebony Harris

Chef Nico

LIVE LIGHT
LIVE RIGHT

WEEKLY EXERCISE &
COOKING CLASSES

With Ebony Harris & Chef Nico Jones

Evaluation of a Childhood Obesity Program Serving a High-Need Population in Brooklyn, New York Using Survival Analysis

LIVE LIGHT
LIVE RIGHT

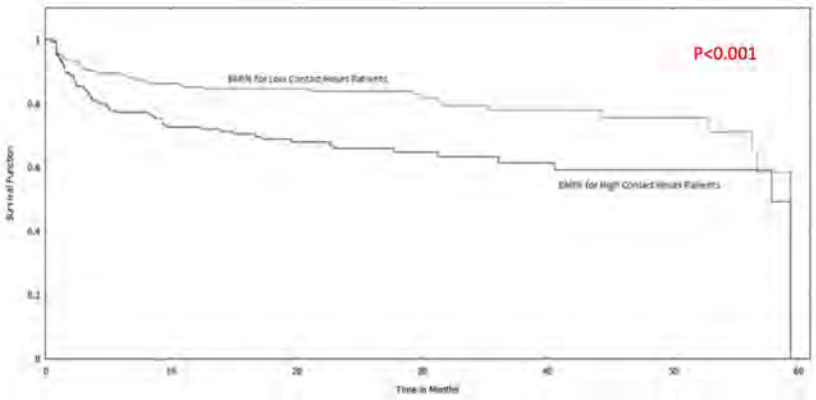
1

Our study utilized the method of survival analysis to conduct a real-world evaluation of Live Light Live Right (LLLR), a pediatric obesity program serving a high-need, hard to reach, severely obese population in Brooklyn, New York.

2

We evaluated whether contact hours intensity is associated with a reduction in time to improvement of, and prolonged improvement in BMI metrics over a 5-year follow-up period.

Survival curves for low vs. high contact hours patients with BMI%$_{95}$ as a risk factor



LIVE LIGHT
LIVE RIGHT

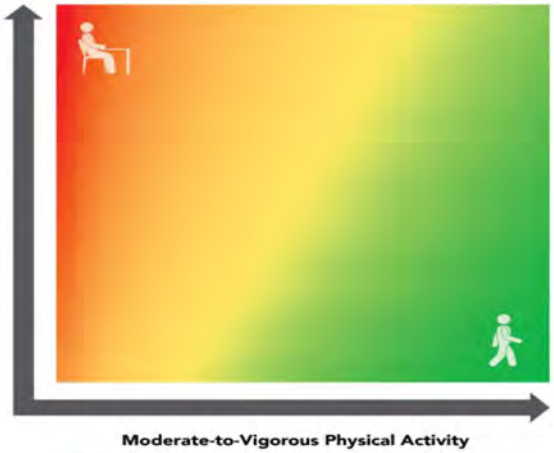
Nutritional counseling

LIVE LIGHT
LIVE RIGHT

Physical Activity

LIVE LIGHT
LIVE RIGHT

Figure D-2. Relationship Among Moderate-to-Vigorous Physical Activity, Sitting Time, and Risk of All-Cause Mortality



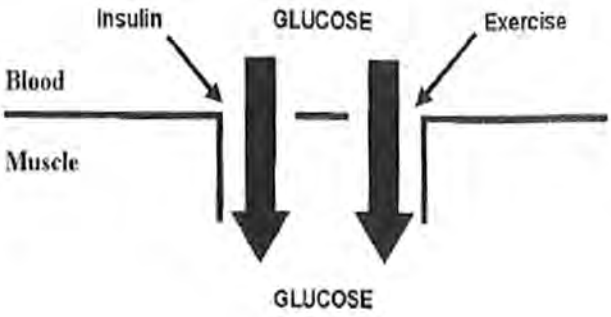
Risk of all-cause mortality decreases as one moves from red to green.

Source: Adapted from data found in Ekelund et al., 2016.[1]

LIVE LIGHT
LIVE RIGHT

Effects of Exercise

Figure 14–9. Clearance of glucose from the blood into skeletal muscle in healthy individuals.



Principles of Motivational Interviewing

- Engage the patient
- Focus the patient
- Evoke a response
- Plan with the patient

Summary of FDA and Commonly Prescribed Medications for Weight Loss in the Pediatric Population

Drug Name	Mechanism of Action
FDA-APPROVED (orlistat, phentermine)	
Orlistat	pancreatic and gastric lipase inhibitor
Phentermine	sympathomimetic amine
NOT FDA-INDICATED FOR OBESITY (metformin, topiramate, exenatide, liraglutide, lisdexamfetamine)	
Metformin*	activation of protein kinase pathway
Topiramate*	modulation of various neurotransmitters
Exenatide*	GLP-1 agonist
Liraglutide*	GLP1-agonist
Lisdexamfetamine§	central nervous system stimulant
NO PEDIATRIC DATA (lorcaserin, naltrexone/bupropion SR)	
Lorcaserin	5-Hydroxytriptamine receptor 2C agonist
naltrexone/bupropion SR	blockage of opioid-receptor-mediated POMC auto-inhibition (naltrexone) and Selective inhibition of reuptake of dopamine and noradrenaline (bupropion)
PENDING NEW FDA-APPROVAL (setmelanotide)	
Setmelanotide	melanocortin-4-receptor agonist

Clinical Considerations Regarding the Use of Obesity Pharmacotherapy in Adolescents with Obesity
Gitanjali Srivastava, MD et al.

LIVE LIGHT LIVE RIGHT

From the American Academy of Pediatrics Policy Statement

Pediatric Metabolic and Bariatric Surgery: Evidence, Barriers, and Best Practices

Sarah C. Armstrong, Christopher F. Bolling, Marc P. Michalsky, Kirk W. Reichard and SECTION ON OBESITY, SECTION ON SURGERY
Pediatrics December 2019, 144 (6)

Pediatricians should

Advocate for increased access for pediatric patients of all racial, ethnic, and socioeconomic backgrounds to multidisciplinary programs that provide high-quality pediatric metabolic and bariatric surgery.

LIVE LIGHT LIVE RIGHT

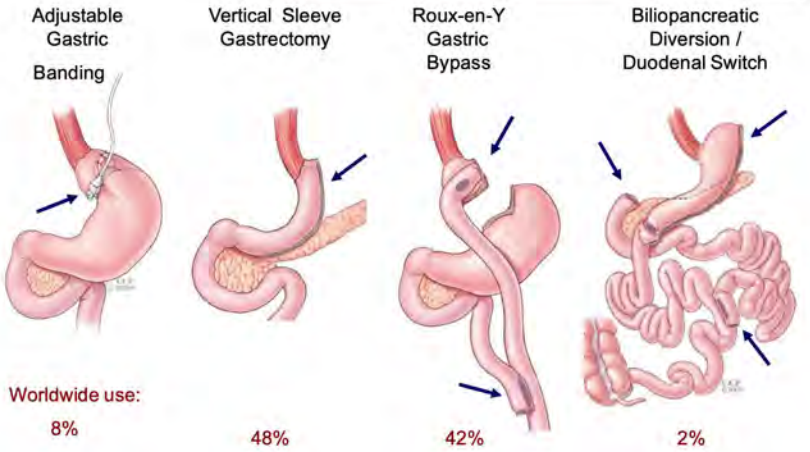
Wt Criteria	Comorbid Conditions
Class 2 obesity, BMI ≥35, or 120% of the 95th percentile for age and sex, whichever is lower	Clinically significant disease, including obstructive sleep apnea (AHI >5), T2DM, IIH, NASH, Blount disease, SCFE, GERD, and hypertension
Class 3 obesity, BMI ≥40, or 140% of the 95th percentile for age and sex, whichever is lower	Not required but commonly present

- **TABLE 1**
- Indications and Contraindications for Adolescent Metabolic and Bariatric Surgery
- AHI, Apnea-Hypopnea Index; GERD, gastroesophageal reflux disease; IIH, idiopathic intracranial hypertension; NASH, nonalcoholic steatohepatitis; SCFE, slipped capital femoral epiphysis; T2DM, type 2 diabetes mellitus.

LIVE LIGHT LIVE RIGHT

Metabolic Surgery

Weight-independent Metabolic Benefits



LIVE LIGHT LIVE RIGHT

LIVE LIGHT
LIVE RIGHT

Summary

- Summary
  - Understand the complex pathophysiology of body weight regulation
  - Interindividual variation in response to treatment
  - Early Identification and prevention
  - Escalate treatment strategies as needed including need for medications and referral for Bariatric surgery

LIVE LIGHT
LIVE RIGHT

Lessons Learned

- Summary of Lessons Learned to Date
  - Obesity is a Chronic Relapsing Disease and needs multidisciplinary teamwork
  - Challenges :
  - Follow up and engagement
  - limited success of lifestyle interventions and weight regain
  - reimbursement and time commitment
  - Need Multiple stakeholders and support staff , training for pediatricians, access to quality nutrition and exercise programs and adolescent Bariatric programs

Live Light Live Right Team

Contact Information

Name Sarita Dhuper
Founder and Executive Director

Organization : Live Light Live Right Program
1162 Eastern Parkway , Brooklyn , NY 11213
Suny Downstate, 450 Clarkson Avenue, 4th Floor

Email : Sdhuper@livelight.org
Phone 718-221-1598/718-270-4714

Eating Disorder Presentation in Children and Adolescents

Eve Khlyavich Freidl, MD

Medical Director, Eating and Weight Disorders Program
Associate Professor of Psychiatry
Department of Psychiatry
Icahn School of Medicine at Mount Sinai
New York City

Mount Sinai

Purpose and Objectives

PURPOSE

Review screening for eating disorder pathology in primary care and provide guidelines for treatment that is mindful of eating disorder vulnerabilities in children and adolescents

OBJECTIVES

- Objective 1: Screening for eating disorder symptoms in primary care settings
- Objective 2: Recognize medical concerns for low weight patients
- Objective 3: Recognize medical concerns for eating disorder symptoms in healthy weight patients (Atypical Anorexia)
- Objective 4: Guidelines to counsel patients about nutritional changes being mindful of risk of restrictive dieting

FINANCIAL DISCLOSURE

No financial disclosures.

Mount Sinai

Agenda

- Review diagnostic criteria
  - Anorexia Nervosa
  - Bulimia Nervosa
  - Avoidant/Restrictive Food Intake Disorder
- Review assessment of medical complications
- Guidance for nutritional counseling

Mount Sinai

- Icahn School of Medicine at Mount Sinai
  - Child and Adolescent Psychiatry
    - Eating and Weight Disorder Program
      - Outpatient care
      - Research Studies with treatment
  - Psychiatry Clerkship
    - Assistant Director, Medical Student Education

Mount Sinai

Anorexia Nervosa

EPIDEMIOLOGY

- It is estimated that approximately **0.5% of adolescent girls** in the United States have AN

CRITERIA

- A. Restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Significantly low weight is defined as a weight that is less than minimally normal, **or, for children and adolescents, less than that minimally expected.**
- B. Intense fear of gaining weight or becoming fat, **or persistent behavior that interferes with weight gain,** even though at a significantly low weight.
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or **persistent lack of recognition of the seriousness of the current low body weight**

Mount Sinai

Bulimia Nervosa

EPIDEMIOLOGY

- Approximately **1% to 2% of adolescents** meet diagnostic criteria for BN
- Commonly begins in early adolescence but often does not present until late teens

CRITERIA

- A. Recurrent episodes of binge eating
- B. Recurrent inappropriate compensatory behavior to prevent weight gain
- C. The binge eating and inappropriate compensatory behaviors both occur, on average, at least **once per week for 3 months.**

Mount Sinai

Avoidant/Restrictive Food Intake Disorder (ARFID)

- Avoidant and/or restrictive eating associated with:
  - Low weight or failure to achieve expected weight gain or faltering growth
  - Significant nutritional deficiency.
  - Dependence on enteral feeding or nutritional supplements.
  - Interference with psychosocial functioning
- Not anorexia or bulimia nervosa

Mount Sinai

Screening Tools

SCOFF

S - Do you make yourself SICK (vomit) because you feel uncomfortably full? (YES or NO)

C - Do you worry that you have lost CONTROL over how much you eat? (YES or NO)

O - Have you recently lost more than ONE stone (15 pounds) in a 3-month period? (YES or NO)

F - Do you believe yourself to be FAT when others say you are thin? (YES or NO)

F - Would you say that FOOD dominates your life? (YES or NO)

* One point for every 'yes'; a score of ≥2 indicates potential anorexia or bulimia nervosa

Eating Disorder Screen for Primary Care (ESP)

Are you satisfied with your eating patterns? (YES or NO)

Do you ever eat in secret? (YES or NO)

Does your weight affect the way you feel about yourself? (YES or NO)

Have any members of your family suffered with an eating disorder? (YES or NO)

Do you currently suffer with or have you ever suffered in the past with an eating disorder? (YES or NO)

* A 'no' on question 1, and 'yes' on questions 2-4 are considered 'abnormal' responses

Ottawa Disordered Eating Screen – Youth Version (ODES-Y)

Over the past 3 months, has your weight and/or shape influenced how you think about (judge) yourself as a person? (YES or NO)

Over the past 6 months, have you fasted (skipped at least 2 meals in a row) or eaten what other people would regard as an unusually large amount of food (e.g. a quart of ice cream) given the circumstance and experienced a loss of control (felt like you couldn't stop eating or control how much you were eating)?(YES or NO)

* A 'yes' on both questions indicates a positive screen

Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *Bmj, 319*(7223), 1467-1468.

Cotton, M. A., Ball, C., & Robinson, P. (2003). Four simple questions can help screen for eating disorders. *Journal of General Internal Medicine, 18*(1), 53-56.

Obeid, N., Norris, M. L., Buchholz, A., Hadjiyannakis, S., Spettigue, W., Flament, M. F., ... & Goldfield, G. S. (2019). Development of the Ottawa Disordered Eating Screen for Youth: The ODES-Y. *The Journal of pediatrics, 215*, 209-215.

Mount Sinai

Assessment for Stability

- Physical exam, including:
- Vital signs: height, gown weight, orthostatic vitals (BP + Pulse, lying and standing)
- Cardio, HEENT, Skin, Abdominal

- Laboratory evaluation including:
- Urinalysis
- Complete Blood Count with differential
- Comprehensive Metabolic Panel with Calcium, Phos, Magnesium & Liver Function Tests
- Thyroid Panel (TSH, T3, T4)
- Hormone Panel (serum LH, FSH, estradiol, prolactin)
- 25-Hydroxy Vitamin D

Mount Sinai

Admission Criteria for AN

would also apply to low weight ARFID

- < 75% ideal body weight or ongoing weight loss despite intensive management
- Refusal to eat
- Body fat < 10%
- Heart rate < 50 BPM daytime, < 45 BPM nighttime
- SBP < 90 mmHg
- Orthostatic changes in pulse (> 20 BMP) or BP (> 10 mmHg)
- Temperature < 96 F
- Arrhythmia or prolonged QTc
- Failure to responds to outpatient treatment

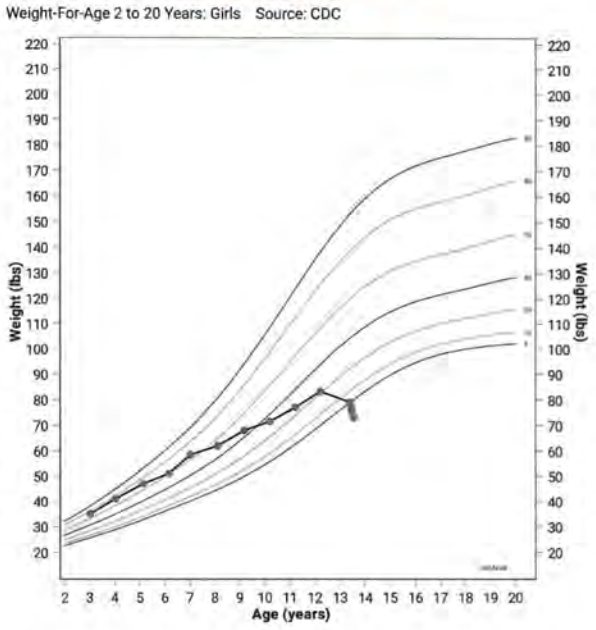
Mount Sinai

Admission Criteria for BN

- Bulimia Nervosa
- Syncope
- Serum potassium < 3.2 mmol/L
- Serum chloride < 88 mmol/L
- Arrhythmia or prolonged QTc
- Esophageal tears or hematemesis
- Temperature < 96 F
- Intractable vomiting
- Failure to responds to outpatient treatment

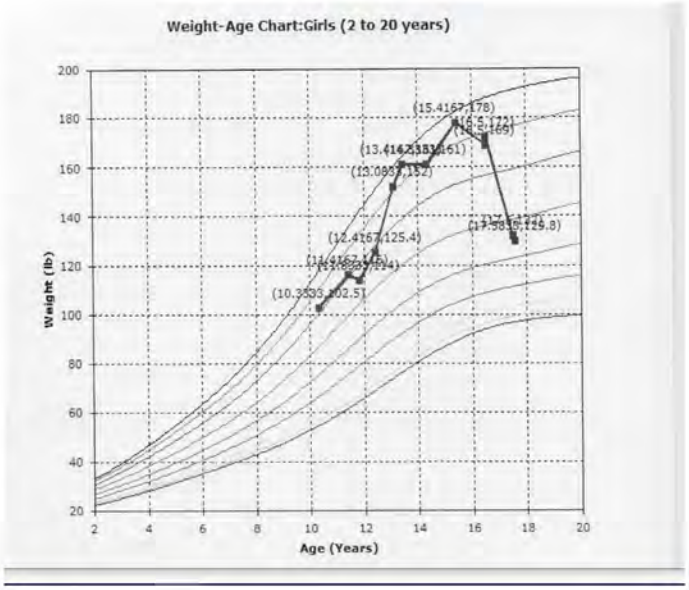
Mount Sinai

Growth Charts!



Mount Sinai

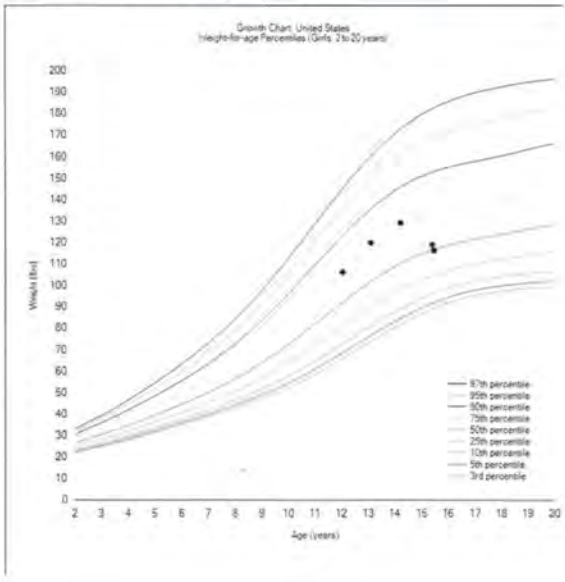
Growth Charts!



Mount Sinai

Growth Charts!

CDC GIRLS (2-20 YEARS) - Weight-for-age



Mount Sinai

Concerns with My Plate?

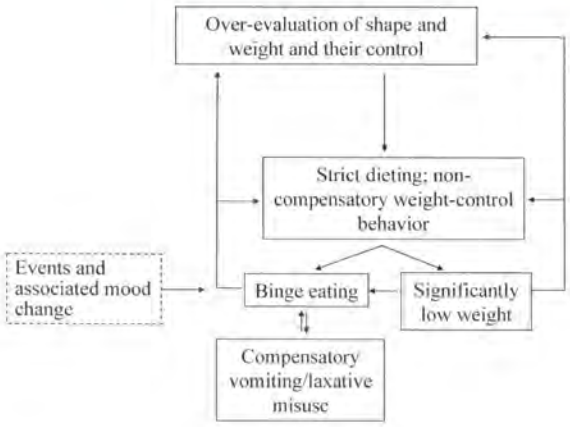
Mount Sinai

More veggies?

From The Institute for Family Health

Mount Sinai

Maintenance Model of Eating



Fairburn, C. G., Cooper, Z., Shafran, R., & Wilson, G. T. (2008). Eating disorders: A transdiagnostic protocol.

Mount Sinai

Guidance from American Academy of Pediatrics

1. Discourage dieting
2. Promote positive body image
3. Encourage more frequent family meals
4. Encourage families not to talk about weight
5. Inquire about history of mistreatment in overweight and obese teenagers
6. Carefully monitor weight loss in adolescent who needs to lose weight to ensure medical complication of semistarvation

- Golden, N. H., Schneider, M., & Wood, C. (2016). Preventing obesity and eating disorders in adolescents. Pediatrics, 138(3).

Mount Sinai

Lessons Learned

- Ask direct questions
- Review growth charts!!!
- Weight loss across weight ranges can pose risk to children and adolescents

Mount Sinai

Summary

- Healthy guidelines
  - Counsel patients to eat regular meals and a wide variety of foods
  - Be mindful of language that support positive body image

Mount Sinai

Contact Information

Name: Eve Khlyavich Freidl

- Title: Medical Director, Eating and Weight Disorders Program Associate Professor of Psychiatry

Organization: Icahn School of Medicine at Mount Sinai

Email: eve.freidl@mssm.edu

Phone : 212.659.8724

Mount Sinai

Diagnosis and Management of Type 2 Diabetes in Pediatrics

Vivian L. Chin, MD
Assistant Professor of Pediatrics
Pediatric Endocrinology
SUNY Downstate Health Sciences University
May 7, 2021

Purpose and Objectives

PURPOSE

The goal of this is to describe to primary care practitioners the diagnosis and management of children with type 2 diabetes.

OBJECTIVES

Objective 1: Discuss when to screen children for type 2 diabetes and diagnostic criteria.
Objective 2: Discuss how to manage pre-diabetes and diabetes.
Objective 3: Discuss management of insulin resistance.
Objective 4: Discuss when children should be referred to specialists

FINANCIAL DISCLOSURE

None

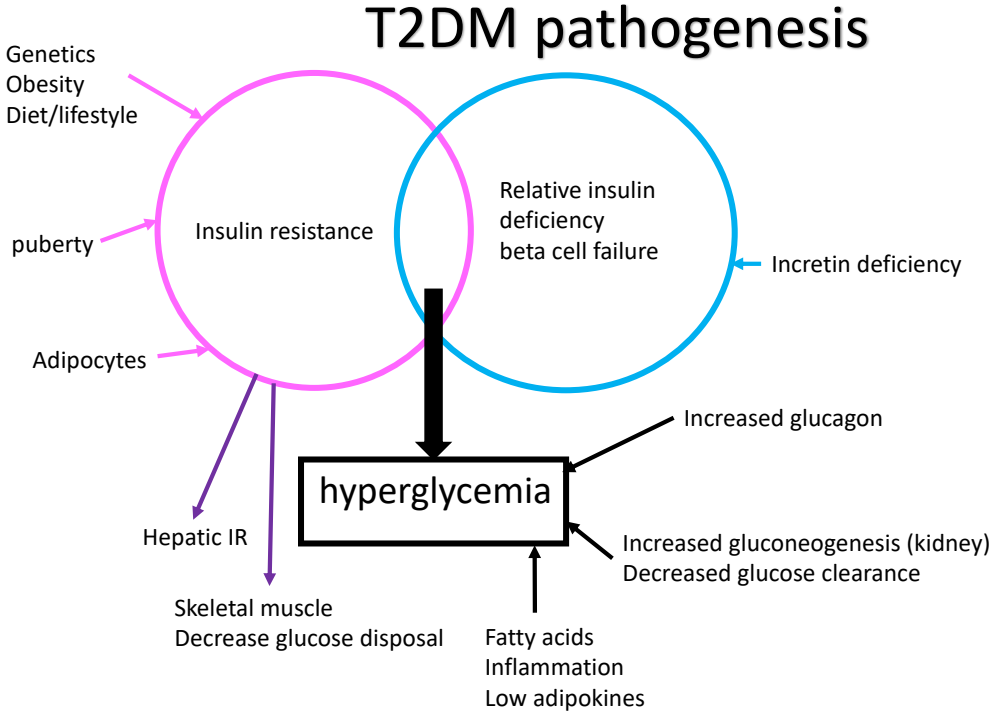
SUNY Downstate Health Sciences University

- The **Department of Pediatrics** offers a full range of services for children and adolescents in both general pediatrics and various subspecialties.
- The **Division of Pediatric Endocrinology** provides comprehensive care to children with endocrine disorders:
  - Growth, thyroid, calcium and bone metabolism, sexual development and differentiation, adrenal, pituitary
  - Diabetes (using the most advanced technologies such as pumps and sensors), diabetes nurse educator, access to nutritionist, social worker, psychologist and obesity program

3

Epidemiology

- **Type 2 diabetes** in youth has increased over the past 20 years, and recent estimates suggest an incidence of 5,000 new cases per year in the US
- Annual increase of 2.3% per year
- Compared to adults, children have more rapid +progressive decline in beta-cell function and accelerated development of diabetes complications
- Occurs more commonly in ethnic minority
- Risk factors: adiposity, family history of diabetes, females, and low socioeconomic status



Screening Overweight (BMI≥85th%ile) and Obese (BMI ≥95th%ile)

- Risk-based screening for **pre-diabetes** and/or **type 2 diabetes** after the onset of puberty or 10 years of age, whichever occurs earlier, who have one or more additional **risk factors** for diabetes:
  - Maternal history of diabetes or GDM during the child's gestation
  - Family history of T2DM in first- or second-degree relative
  - Race/ethnicity (Native American, African American, Latino, Asian American, Pacific Islander)
  - Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome, or SGA birth weight)

Diagnostic Criteria for Diabetes

- Fasting plasma glucose ≥126 mg/dL* or
- 2-hour plasma glucose ≥200 mg/dL during OGTT (75 grams glucose)* or
- A1C ≥6.5%* or
- In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL.

- In the absence of unequivocal hyperglycemia, diagnosis requires two abnormal test results from the same sample or in two separate test samples
- caveat: A1c must be checking with standardized assay, free of interfering substances, and is unreliable in those with anemia/high red cell turnover like in hemoglobinopathies (even in sickle cell trait, A1c is lowered by 0.3%), pregnancy 2nd and 3rd trimester, transfusions, erythropoietin therapy

Diagnostic Criteria for Prediabetes

- A1c 5.7-6.4%
- **Impaired fasting glucose**: Fasting plasma glucose 100-125 mg/dL
- **Impaired glucose tolerance**: 2-hour glucose 140-199 mg/dL on OGTT

- High risk A1c 6-6.4%

Classification of Diabetes Mellitus in Children and Adolescents

- **Type 1 DM**: autoimmune destruction of the pancreatic beta cells, leading to absolute insulin deficiency, typically present with polyuria, polydipsia and 1/3 in DKA
  - Overweight and obesity are common in children with type 1 diabetes
- **Type 2 DM**: Obesity and insulin resistance, polyuria and polydipsia
- Should send **autoimmune pancreatic antibodies** to rule out type 1 DM
  - 6% can present with DKA and/or HHS
  - Less common in those <10 years or prepubertal
- **Other types**: genetic syndromes and monogenic diabetes (MODY), drug induced DM (antipsychotics, steroids, tacrolimus), pancreatic disease (pancreatitis or Cytic Fibrosis)

Diabetic Emergencies

- Should start insulin drip immediately if diagnosed with DKA (diabetic ketoacidosis) or HHS (Hyperosmolar Hyperglycemic Syndrome) and manage fluids aggressively
- PICU management

	DKA			HHS
	Mild (plasma glucose >250 mg/dl)	Moderate (plasma glucose >250 mg/dl)	Severe (plasma glucose >250 mg/dl)	Plasma glucose >600 mg/dl
Arterial pH	7.25–7.30	7.00 to <7.24	<7.00	>7.30
Serum bicarbonate (mEq/l)	15–18	10 to <15	<10	>18
Urine ketone*	Positive	Positive	Positive	Small
Serum ketone*	Positive	Positive	Positive	Small
Effective serum osmolality†	Variable	Variable	Variable	>320 mOsm/kg
Anion gap‡	>10	>12	>12	Variable
Mental status	Alert	Alert/drowsy	Stupor/coma	Stupor/coma

*Nitroprusside reaction method. †Effective serum osmolality: 2[measured Na^+ (mEq/l)] + glucose (mg/dl)/18. ‡Anion gap: $(Na^+) - [(Cl^- + HCO_3^-$ (mEq/l)].

New Onset Labs

- Before treatment, send:
  - Insulin
  - C-peptide
  - glucose
  - Insulin Antibody
  - GAD65 Antibody
  - Islet cell Antibody
  - A1c
  - Complete metabolic panel
- If suspecting DKA (abdominal pain, vomiting, kussmaul breathing, dehydration, mental status change, weight loss with polyuria, polydipsia): obtain additional VBG, ketones
- If suspecting HHS (blood glucose >600), obtain additional serum osmolality, CPK

Treatment

- Glycemic targets: A1c < 7% without hypoglycemia (or 7.5%)
- Management of comorbidities such as obesity, dyslipidemia, hypertension, and microvascular complications

lifestyle management	diabetes self-management education	pharmacologic treatment
counseling for healthful nutrition and physical activity changes such as eating a balanced diet, achieving and maintaining a healthy weight, and exercising regularly	multidisciplinary diabetes team, including a physician, diabetes care and education specialist, registered dietitian nutritionist, and psychologist or social worker, is essential. -checking BGs 3 times daily if on insulin -at least 2x daily if only on metformin -administering medications	Depends on diabetes control, initial A1c and presenting symptoms First line: metformin Second line: insulin vs liraglutide

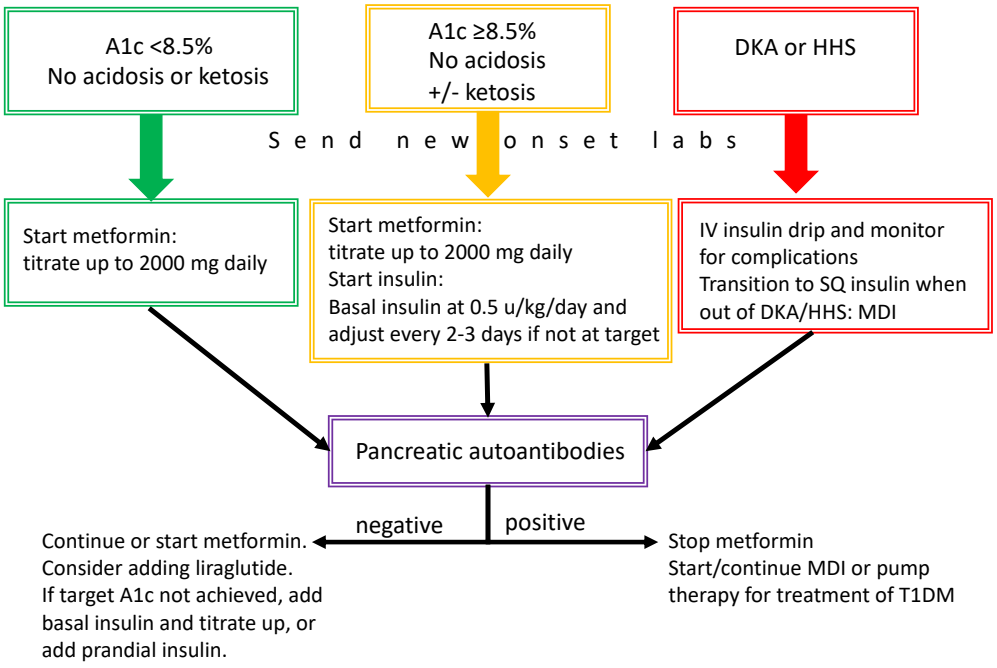
Metformin

- Approved T2DM for ages 10+
- Bisubstituted, short-chain hydrophilic guanidine derivative
- Improves insulin sensitivity
- Reduces gluconeogenesis
- Weight loss due to anorectic effect or enhancement of glucose clearance, and reduction in fasting hyperinsulinemia
- Side effects: GI (nausea, pain, diarrhea) and lactic acidosis (not in children), B12 deficiency
- Titrate up to max 2000 mg daily
- Should start at 500 mg daily with food, increasing bi-weekly by 500 mg increment, until 1000 mg bid or highest dose tolerated by monitoring GI side effects

Prediabetes considerations/treatment

- Recommend 60 min of moderate to vigorous physical activity daily
- Decrease sedentary behavior
- Nutrition counseling
- **There is no consensus on frequency of monitoring or pharmacologic treatment**
  - Some studies show that A1c will improve on own after puberty due to resolution of insulin resistance with hormonal changes
  - Studies in children on metformin are small and benefits were very short-term
- Repeat A1c in 3-6 months or sooner if BMI increases, or symptoms develop or to monitor A1c progression
- After 6 months of lifestyle changes, if A1c remains high (6-6.4%) or increases, may consider treatment with metformin

Magge et.al **Evaluation and Treatment of Prediabetes in Youth, J Peds** Volume 219, P11-22, 4/1/20

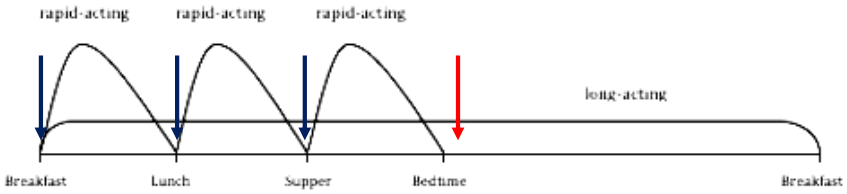


Adapted from ADA Standards of Care 2021

Liraglutide

- GLP1 agonist, in 2019 newest class of drug approved for T2DM in youth (10 years+)
- Reduces A1c by 1%
- Incretin: causes delayed gastric emptying and prandial insulin release
- Recommended use as adjunct to diet and exercise
- Daily injection sq 1.2 mg or 1.8 mg PENS (start with 0.6 mg first then titrate up)
- **most common side effects** may include nausea, diarrhea, vomiting, decreased appetite, indigestion, and constipation
- Side effects: pancreatitis, gallbladder disease, hypoglycemia
- Contraindicated if patient or family history of MTC or Multiple Endocrine Neoplasia syndrome type 2 (MEN 2) or allergy to liraglutide or any of the ingredients

Insulin- Multiple Daily Injections (MDI)



Long Acting	Rapid Acting
Start at 0.5 u/kg/day	Dosing every meal based on carb counting (carb ratio) and corrections (ISF)
No peak Daily injection Lasts 24 hours Onset of action: 1-2 hours	Peaks 30 min-1 hour Inject 3-4 times daily Lasts 3-5 hours Onset of action: 15 mins
Basaglar, detemir	Lispro, aspart

How to start MDI doses

- Patient's weight = 50 kg
- Total daily dose: 0.5-1.0 u/kg/day
- TDD = 0.5 x 50 = 25 units/day

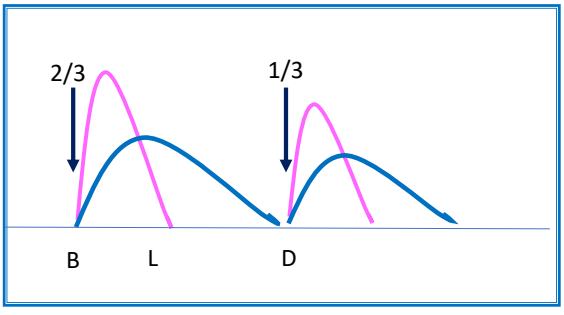
- Basal is half of TDD= 25/2= **12.5 units glargine daily**
- ISF or insulin sensitivity factor = 1800/TDD =1800/25= **72**
  - **For every 72 mg/dl glucose above target, 1 unit of insulin is given**
- Target **120** (fixed)
- Carb ratio = 500/TDD = 500/25 = **20**
  - **For every 20 grams of carbohydrates eaten, 1 unit of insulin is given**

How to calculate insulin doses each time (rapid insulin)

- Check blood glucose prior to each meal.
- To calculate dose for correction:
  - Dose of insulin = (glucose- target) divided by ISF
  - Example: glucose is 250
  - Dose of insulin = 250 (glucose) – 120 (target) = 130 points over target, divide by 72 (ISF) =1.8 units
- To calculate dose for carbohydrates to be eaten:
  - Dose of insulin =carbohydrates counted divided by Carb ratio
  - Example: eating 50 grams for lunch
  - Dose of insulin = 50/20 (carb ratio) = 2.5 units
- Final step: add both doses of insulin to administer together
  - Final dose of insulin = 1.8 + 2.5 units = **4.3 units** (round to 4 units)

Twice Daily injections

- Novolog 70/30 (aspart protamine and aspart mix)
- Humalog 75/25 (lispro protamine and lispro mix)
- Do not get confused with Novolin 70/30 or Humalin 75/25 mix (combination of NPH and regular insulin)



Screening for Type 2 DM Comorbidities

- Check A1c every 3 months
- Lipid profile should be obtained, preferably fasting after diagnosis (but after glycemic control is well established)
- Lipid profiles should be repeated at least every two years if lipids are at target levels, or more frequently if levels are above targets.

  Targeted goals for lipid levels are:
  - LDL-C <100 mg/dL
  - HDL-C >35 mg/dL
  - TG <150 mg/dL
- Abdominal exam for hepatomegaly and monitoring of serum aminotransferase concentrations to screen for liver disease should be done routinely (GI referral if abnormal)
- OSA (pulmonology) and PCOS screening

Nephropathy Screening

- BP monitoring at each clinic visit
- At diagnosis and yearly monitoring of urinary albumin-to-creatinine ratio, estimated GFR and K
- Renal referral if:
  - BP greater than 90th%ile, or ≥120/80 after 6 months of lifestyle changes, antihypertensive therapy should be initiated.
  - If hypertension (BP ≥95th%ile or ≥140/90 mm Hg) is confirmed, start antihypertensives
  - Urine protein/creatinine ≥ 30 mg/g (confirmed 2-3 times)
  - Treatment: Enalapril or ace-inhibitor

Neuropathy Screening

- At diagnosis and annually, examine feet
- Exam should include inspection, assessment of foot pulses, pin-prick and 10-g monofilament sensation tests, testing of vibration sensation using a 128-Hz tuning fork, and ankle reflex tests.
- Prevention should focus on achieving glycemic targets.
- Podiatry referral may be warranted

Retinopathy Screening

- Ophthalmology referral
- Dilated fundoscopy or retinal photography at diagnosis or soon after diagnosis and annually thereafter.
- Optimizing glycemia is recommended to decrease the risk or slow the progression of retinopathy.
- Less frequent examination (every 2 years) maybe considered if there is adequate glycemic control and a normal eye exam

Summary

- Type 2 diabetes is becoming more prevalent in youth and we need to be able to recognize and make the correct diagnosis
- There are overlapping features of type 1 and type 2, so all youth with new onset diabetes should have antibodies sent at diagnosis.
- Yearly screening with A1c, fasting plasma glucose or OGTT can be used in those with risk factors are overweight/obese
- Lifestyle changes must be instituted early, especially in those with obesity, prediabetes
- Treatment depends on the severity of presentation and A1c and glycemic control
- Metformin is first line, but insulin is often used if A1c over 8.5%. Newest medication liraglutide is weight neutral and may be used as second line.
- Complications of type 2 diabetes must be monitored and treated

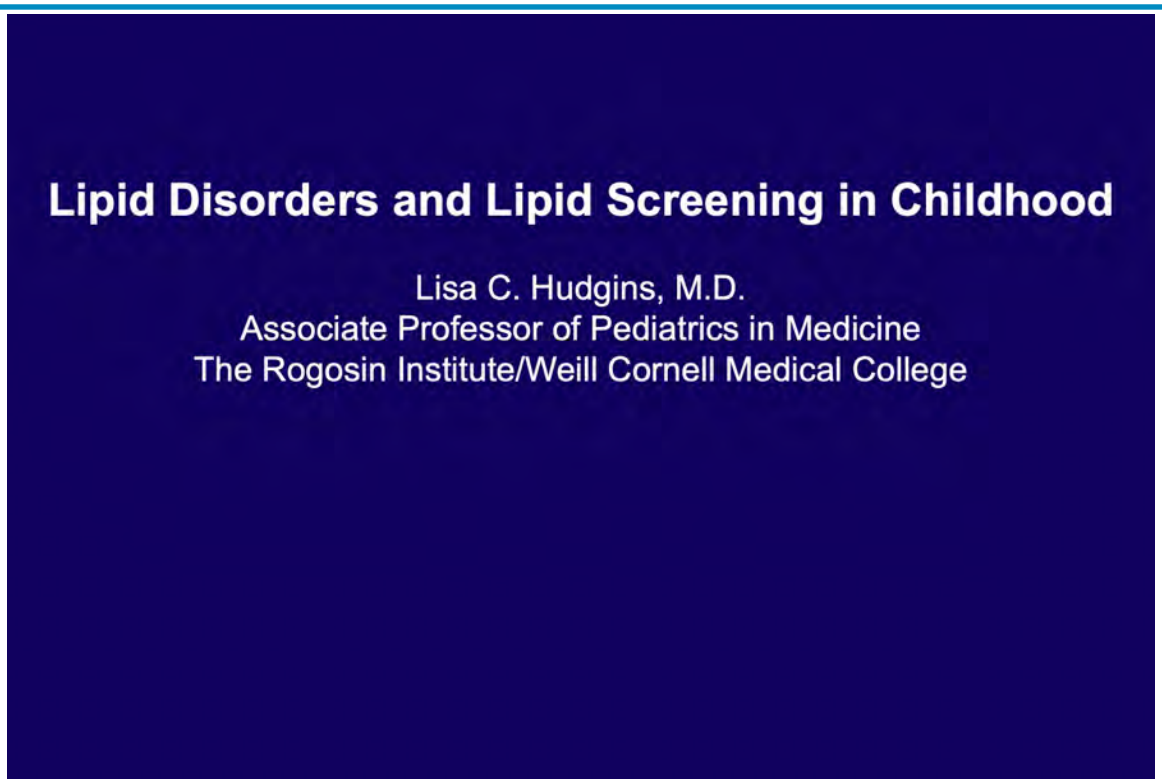
25

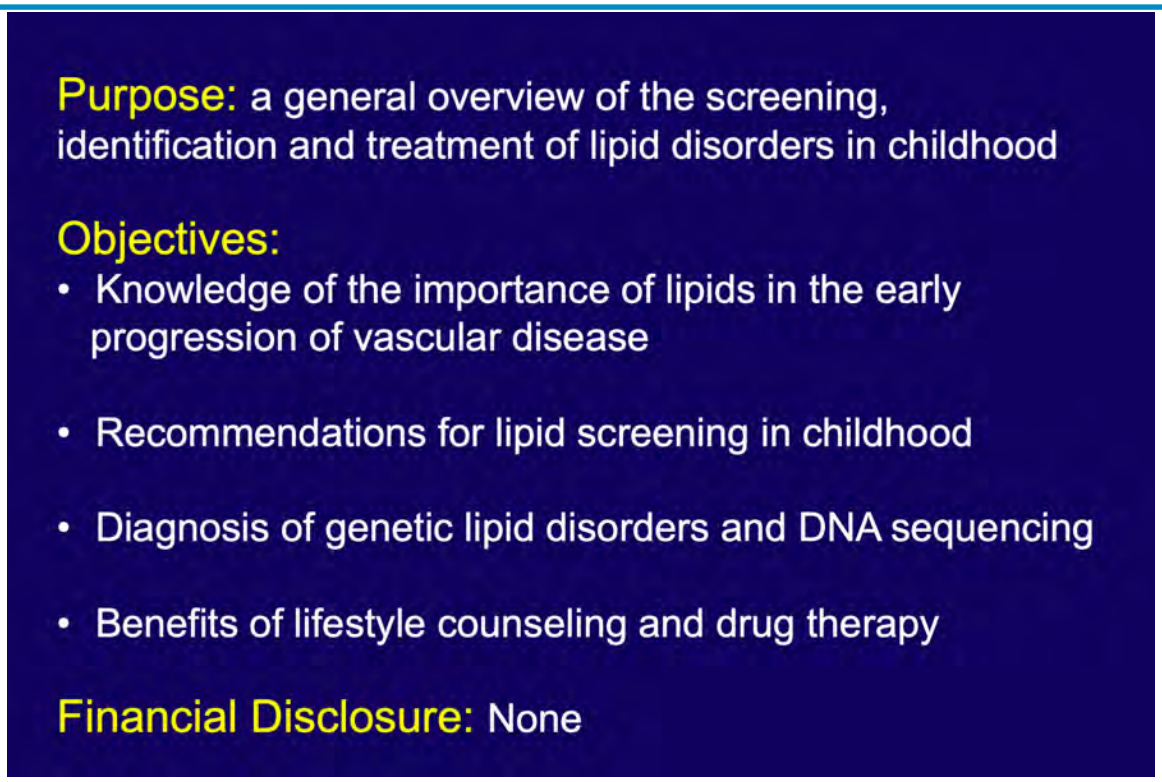
Thank you

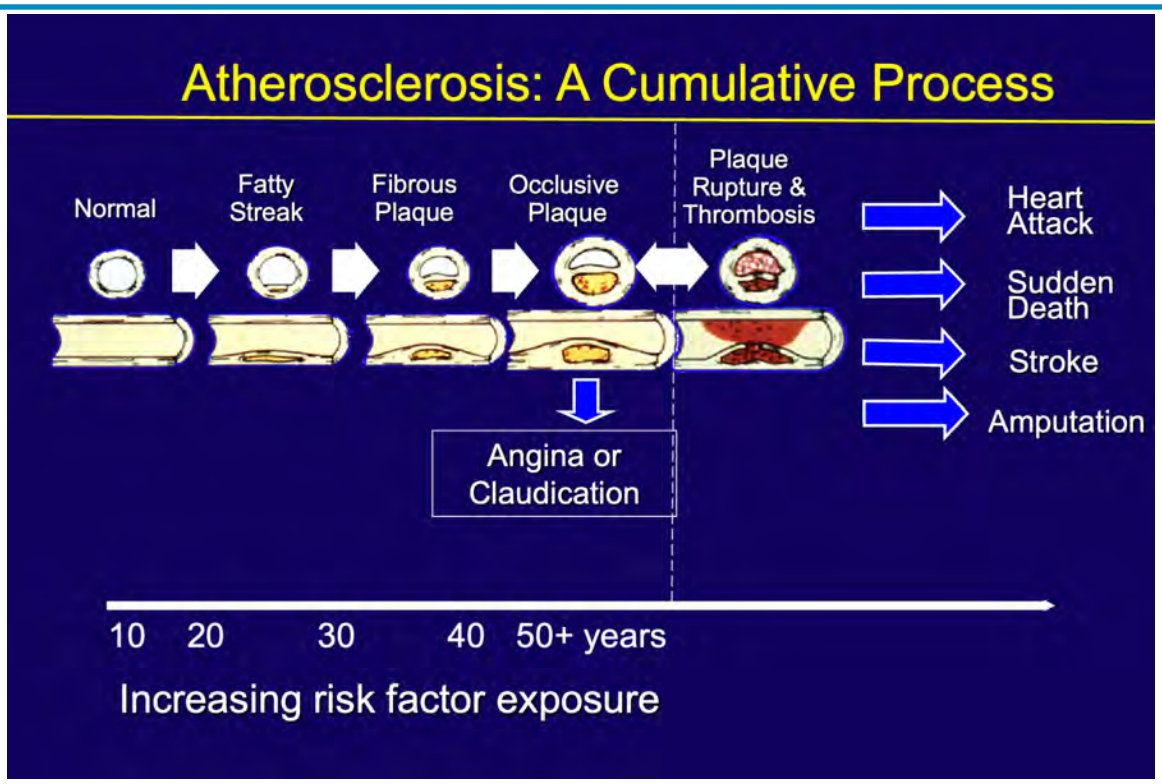
My contact information:

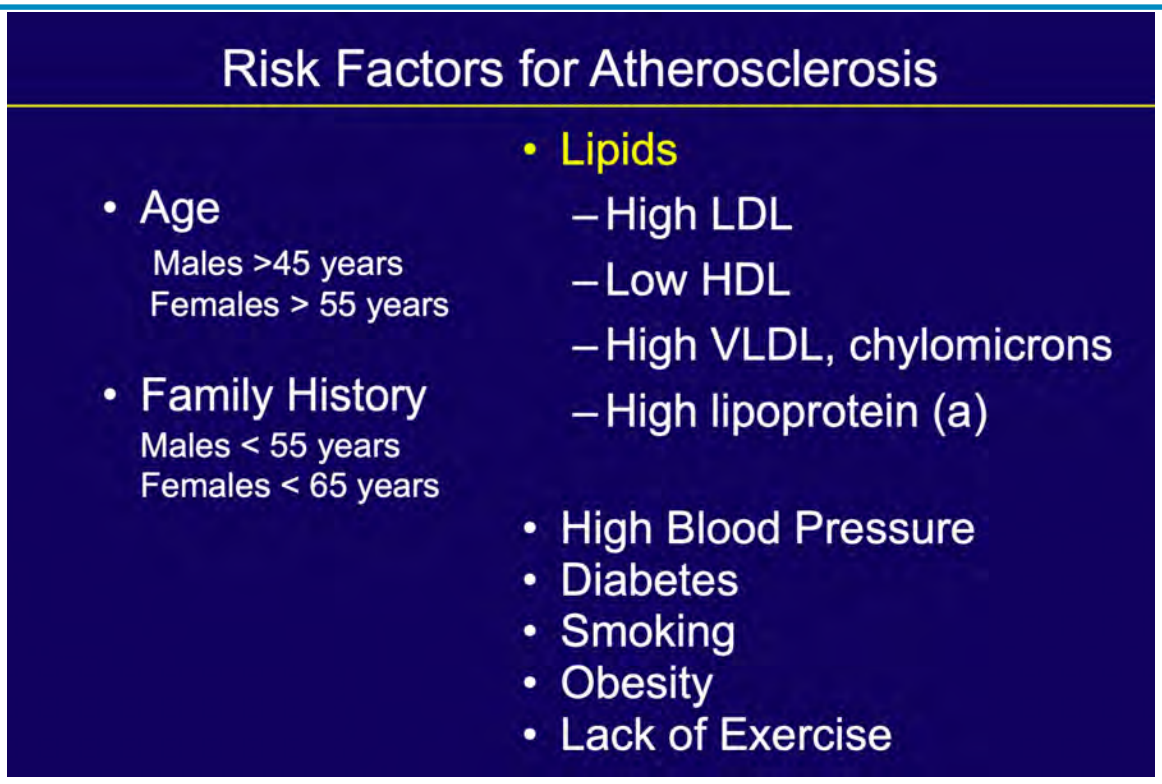
Vivian L. Chin, MD
Assistant Professor of Pediatrics, Pediatric Endocrinology
SUNY Downstate
vivian.chin@downstate.edu
718-270-4714 office
718-613-8607 direct

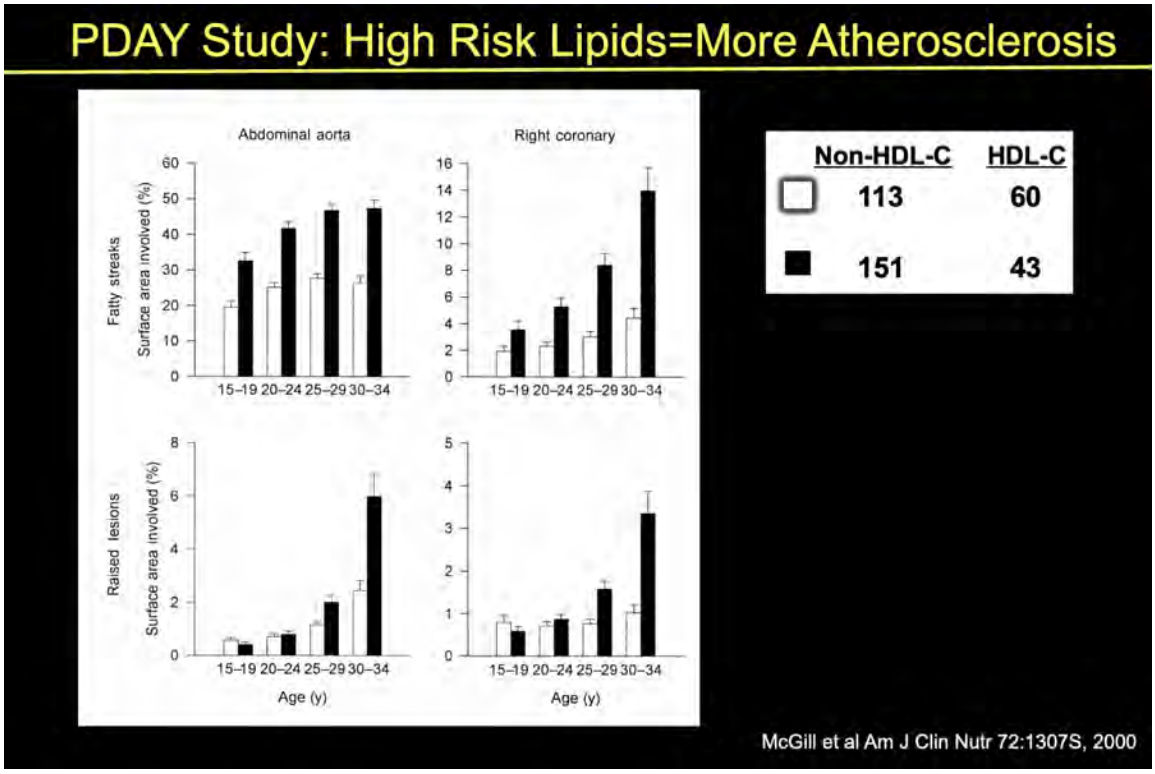
SUNY DOWNSTATE Health Sciences University

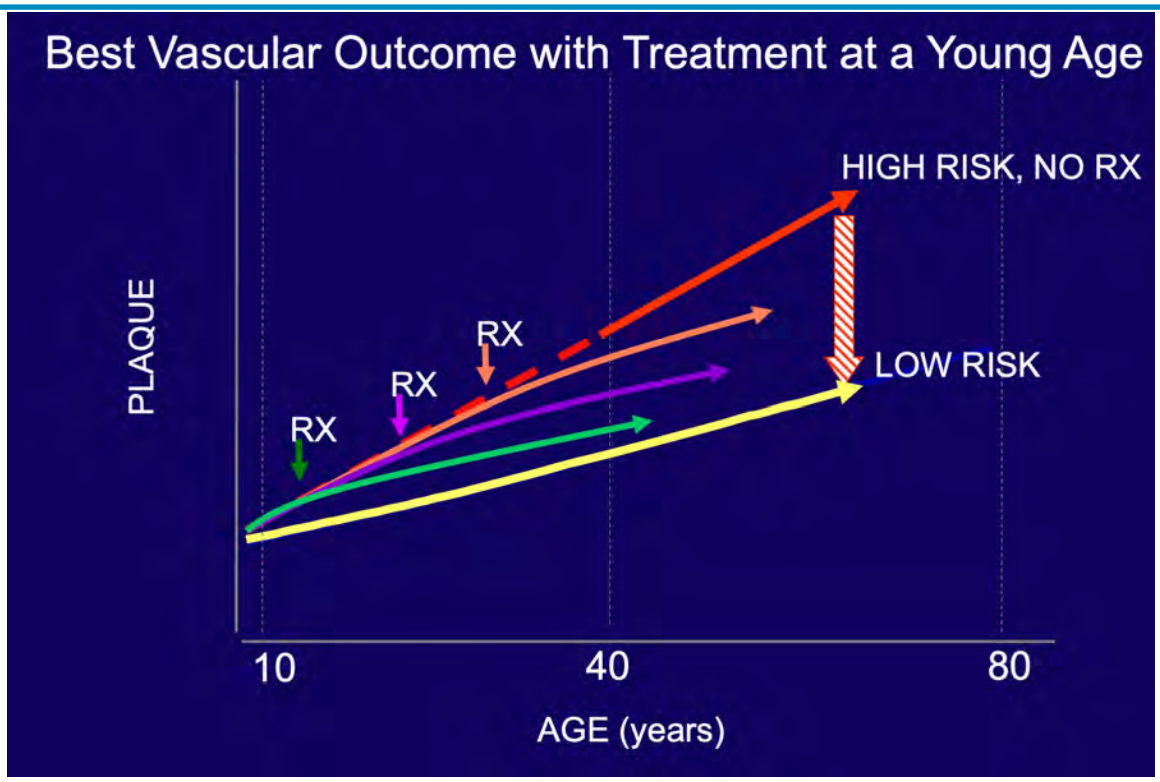

Lipid Disorders and Lipid Screening in Childhood
Lisa C. Hudgins, M.D.
Associate Professor of Pediatrics in Medicine
The Rogosin Institute/Weill Cornell Medical College


Purpose: a general overview of the screening, identification and treatment of lipid disorders in childhood
Objectives:
• Knowledge of the importance of lipids in the early progression of vascular disease
• Recommendations for lipid screening in childhood
• Diagnosis of genetic lipid disorders and DNA sequencing
• Benefits of lifestyle counseling and drug therapy
Financial Disclosure: None


Atherosclerosis: A Cumulative Process
Normal
Fatty Streak
Fibrous Plaque
Occlusive Plaque
Plaque Rupture & Thrombosis
Heart Attack
Sudden Death
Stroke
Amputation
Angina or Claudication
10
20
30
40
50+ years
Increasing risk factor exposure


Risk Factors for Atherosclerosis
• Age
Males >45 years
Females > 55 years
• Family History
Males < 55 years
Females < 65 years
• Lipids
– High LDL
– Low HDL
– High VLDL, chylomicrons
– High lipoprotein (a)
• High Blood Pressure
• Diabetes
• Smoking
• Obesity
• Lack of Exercise


PDAY Study: High Risk Lipids=More Atherosclerosis
Abdominal aorta
Right coronary
Fatty streaks
Surface area involved (%)
Raised lesions
Surface area involved (%)
15–19 20–24 25–29 30–34
Age (y)
Non-HDL-C
HDL-C
113
60
151
43
McGill et al Am J Clin Nutr 72:1307S, 2000


Best Vascular Outcome with Treatment at a Young Age
HIGH RISK, NO RX
LOW RISK
RX
RX
RX
PLAQUE
10
40
80
AGE (years)

RECOMMENDED AGE TO SCREEN FOR LIPID DISORDERS

American Academy of Pediatrics
NATIONAL INSTITUTES OF HEALTH
nla NATIONAL LIPID ASSOCIATION
American Heart Association Learn and Live
U.S. Preventive Services Task Force

	LOW RISK	HIGH RISK
	9-11, 17-21	≥2
	≥35 (males only)	≥20

www.uspreventiveservicetaskforce.org
Kavey et al Pediatrics 2011:128 supp 6

Rationale for Universal Lipid Screening in Childhood

- Identifies individuals at high cumulative risk and at the early stages of atherosclerosis.
- Best discrimination between those with and without inherited dyslipidemias.

  Universal screening detects 90% of FH children 1-9 years of age while selective screening misses 30-60% of such children.
- Family history is inaccurate, incomplete or not updated.
- Cascade testing will identify affected parents and relatives of index case.

Kavey et al Pediatrics 2011:128 supp 6

Abnormal Lipid Levels in Childhood (~95th percentile)

NIH, AAP, NLA December, 2011:

	Abnormal (mg/dL)
Cholesterol	>200
LDL cholesterol	>130
HDL cholesterol	< 40
Triglycerides	>100-150
Non-HDL cholesterol	>145

If non-fasting non-HDL cholesterol is abnormal, repeat fasting.

Kavey et al Pediatrics 2011:128 supp 6

Prevalence of Lipid Disorders in Childhood

Country-wide NHANES Survey 1999-2006,
3,125 teens, ages 12-19 (32% overweight or obese)

Twenty percent with one or more of following:

LDL-C ≥130 mg/dL
Triglycerides ≥150 mg/dL
HDL-C ≤35 mg/dL

- Normal weight: 14%
- Overweight: 22%
- Obese: 43%

www.cdc.gov/mmwr,Jan 2010
Ford, Circulation 2009

Severe Familial Lipid Disorders (~1-2%)

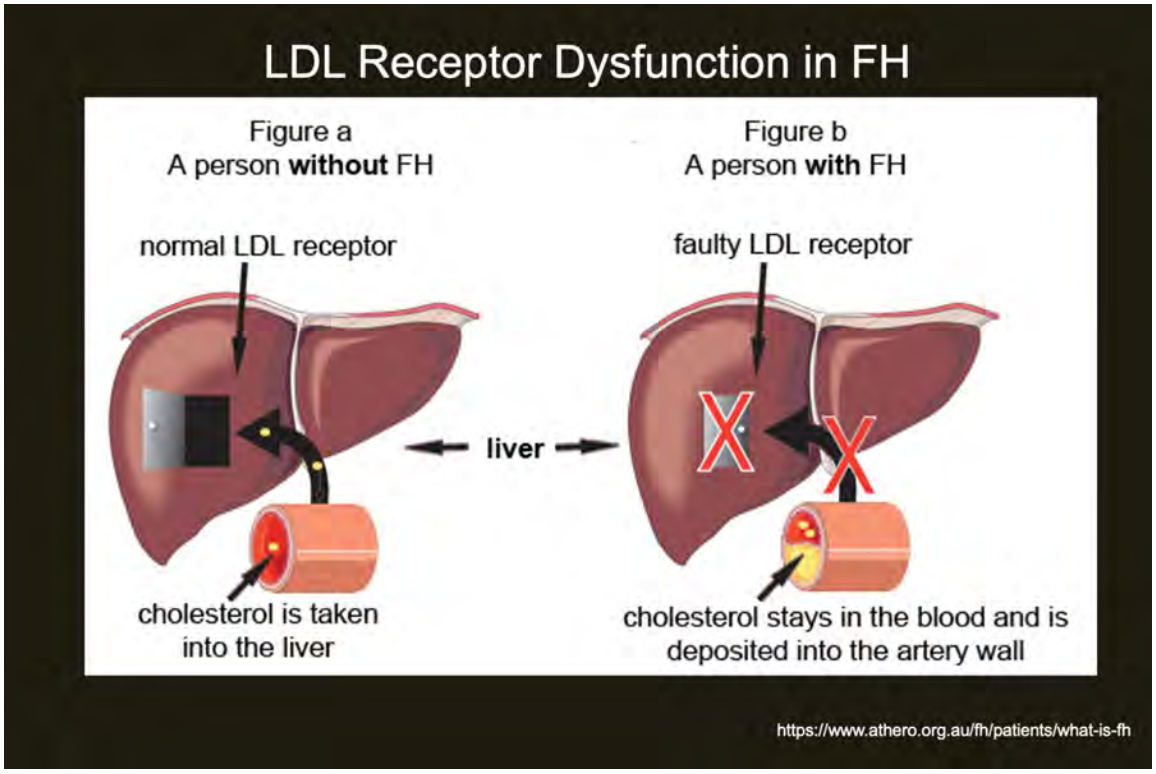
↑ CHOLESTEROL (high LDL)
Familial Hypercholesterolemia
Sitosterolemia

↑ CHOLESTEROL ± ↑ TRIGLYCERIDES
Familial Combined Hyperlipidemia (LDL & VLDL)
Familial Dysbetalipoproteinemia (VLDL remnant,apoE2/E2)
Lipoprotein Lipase Deficiency (chylomicrons)
Cholesterol ester storage disease (LDL & VLDL, large liver)

Familial Hypercholesterolemia (FH)

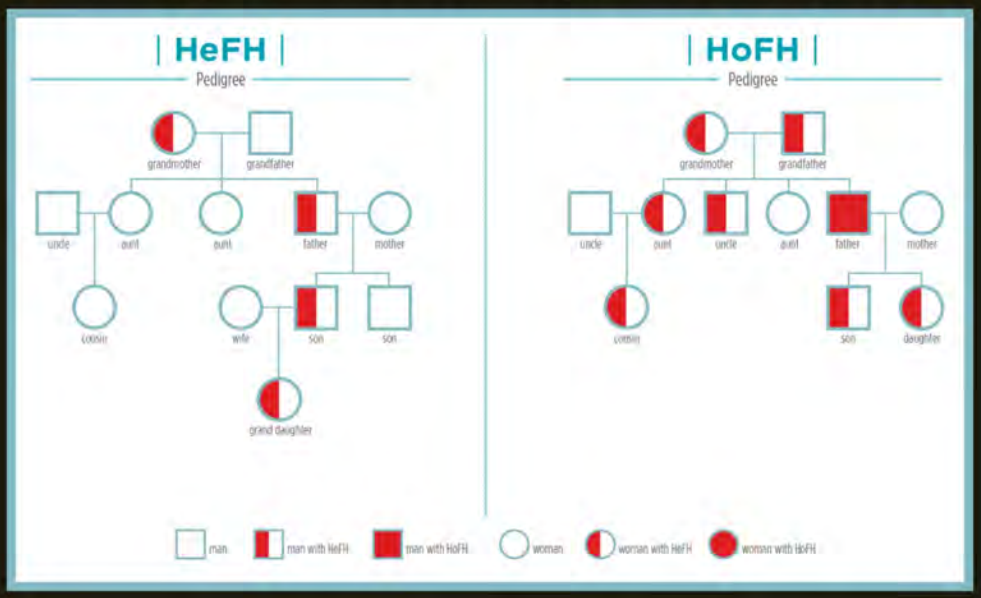
Autosomal dominant disorder of LDL clearance:

- Present at birth, usually diet resistant
- Heterozygotes: LDL-C 200-500 mg/dL, ~1/250
- Homozygotes: LDL-C 500-1,000 mg/d, ~1/300,000
- Skin xanthomas
- Premature coronary artery and aortic valve disease


LDL Receptor Dysfunction in FH
Figure a
A person without FH
Figure b
A person with FH
normal LDL receptor
faulty LDL receptor
liver
cholesterol is taken into the liver
cholesterol stays in the blood and is deposited into the artery wall
https://www.athero.org.au/fh/patients/what-is-fh


Xanthomas

Heterozygous and Homozygous Family Trees



www.thefhfoundation.org

Diagnosis of Familial Hypercholesterolemia

Adults:
LDL>=190 mg/dL

Children:
LDL>=160 mg/dL

AND

- Family history of high cholesterol and/or premature vascular disease
- Skin or tendon xanthomas
- Exclusion of secondary causes of hypercholesterolemia

NLA guidelines, J. Clin. Lipid. 2011

Secondary Hyperlipidemia

-obesity
-thyroid disease
-kidney disease
-liver disease
-diabetes mellitus
-low growth hormone
-collagen vascular disease
-glycogen storage disease
-pregnancy
-HIV infection and other infections
-lipodystrophy

Drugs:
-prednisone
-Accutane
-estrogen
-anti-psychotics
-protease inhibitors
-growth hormone

Screening labs: liver enzymes, creatinine, plasma glucose, TSH, free T4, HbA1C if obese

DNA sequencing for FH may be useful to:

- distinguish FH and other genetic lipid disorders from secondary hyperlipidemia
- diagnose FH when family history is missing or inconsistent
- screen relatives with cascade testing
- test couples suspected to have heterozygous FH and offer reproductive counseling
- predict response to therapy for drugs that target specific gene products (e.g. antibody to PCSK9)

Untreated Familial Hypercholesterolemia

Homozygotes:

Myocardial infarction or sudden death by teens (as early as infancy)

Heterozygotes:

- 100 fold increased risk of coronary disease in young adults

Myocardial infarction or sudden death in
- 50% of males by age 50
- 30% of females by age 60

(as early as the twenties)

Treatment of Pediatric Hyperlipidemia

- Diet

  Registered dietitian
  60 min 1st visit,
  30 min follow-up visits every 1-3 months
- Physical Activity

Lipid specialist:

- Prescription medications: (<1%) statin, ezetimibe, bile acid sequestrants, omega 3 ethyl esters, fibrates
- LDL- or plasmapheresis (hoFH)
- Liver transplant (hoFH)

Dietary Changes That Improve Lipid Profiles

- To lower LDL:

Limit saturated and trans fats: whole milk, cheese, ice cream, stick butter or margarine, red meat, skin on chicken, pastries, fried food, coconut milk

- To lower triglycerides:

In addition to above, limit sugar and refined starch: soda, fruit juice, sports drinks, alcohol, pastries, candy, large portions of rice, pasta, potatoes, white bread, fruit (<3 /d)

- To lower both: increase unsaturated fats and fiber:

olive oil, nuts, peanut butter, avocado, vegetables, beans, salads, whole grain cereals, fruit, avocado, fish, and shellfish

Drug Treatment of High LDL Cholesterol

Consider medication if age 8-10 and:

	LDL cholesterol mg/dl
1. NO OTHER RISK FACTORS	≥ 190
2. OTHER RISK FACTORS	≥ 160
3. DIABETES	≥ 130

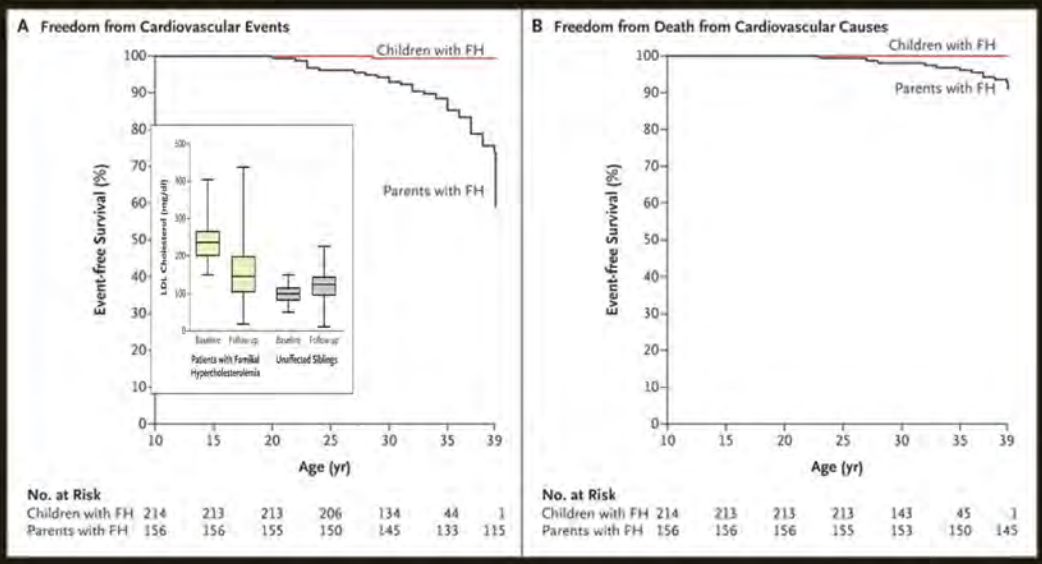
Kavey et al Pediatrics 2011:128 supp 6

Early Atherosclerosis is Reversible

- 214 statin-naïve children with heterozygous FH, 8-18 years of age, mean LDL-C 240 mg/dL
- Randomized to pravastatin 20-40 mg/d or placebo for 2 years
- LDL change from baseline: -24.1% vs. +0.3%
- Carotid wall thickness (IMT) by ultrasound
  pravastatin: regression
  placebo: progression

Wiegman, JAMA, 2004

20 Year Follow-up of Statin Therapy in FH Children



Luirink,et al NEJM 2019

Summary

- Prevention of atherosclerotic cardiovascular disease in adulthood must include treatment of children with risk factors.
- In order to treat, children at risk need to be identified with lipid screening and potentially DNA testing.
- Children with severe familial lipid disorders, such as FH, should be referred to a lipid specialist for optimal diet and drug therapy.

CONTACT INFORMATION

The Rogosin Institute Comprehensive Lipid Control Center was established in 1984 to diagnose and treat children and adults with lipid disorders. The Center also conducts lipid research, including clinical trials and registries. It is fully affiliated with Weill Cornell Medical College and New York Presbyterian Hospital at Cornell.

For further information, contact:

Lisa C. Hudgins, M.D. (children)
lih2013@nyp.org
(212) 746-6972

Bruce R. Gordon, M.D. (adults)
brgordon@nyp.org
(212) 746- 1554

Adolescent Obesity Surgery-

Jeffrey L. Zitsman MD, Director, Center for Adolescent Bariatric Surgery

Childhood Nutrition, Feeding, and Weight Management in the Primary Care Setting

SUNY Downstate Health Sciences

May 7, 2021

NewYork-Presbyterian Morgan Stanley Children's Hospital

Columbia University Medical Center

Purpose and Objectives

PURPOSE

A discussion of bariatric and metabolic surgery in adolescents with obesity

OBJECTIVES

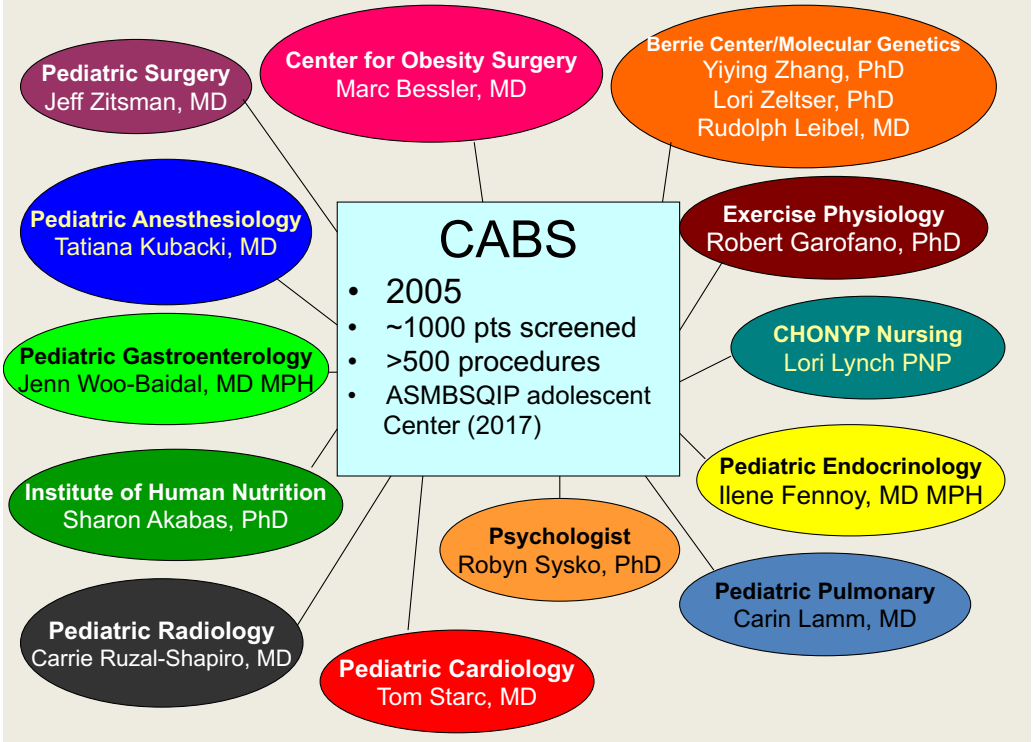
- Objective 1: Discuss the scope of obesity in children and adolescents
- Objective 2: Review current data of weight loss surgery outcomes in this population
- Objective 3: Identify challenges facing adolescents with obesity seeking surgery

FINANCIAL DISCLOSURE

none

Objectives

- Update: childhood and adolescent obesity
- Why children gain weight
- Current status of weight loss surgery for young people
- Outcomes
- Access to care

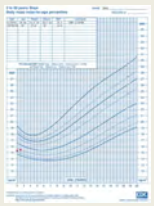


Definition of obesity: excess body fat

(children and pre-puberty)

- Based on body mass index (BMI) for age and sex growth charts

normal	<85th %ile
overweight	≥85th %ile but < 95th %ile
obese	≥ 95th %ile
(most surgical candidates ≥ 99th %ile)	
severe obesity	≥ 120% of 95th %ile

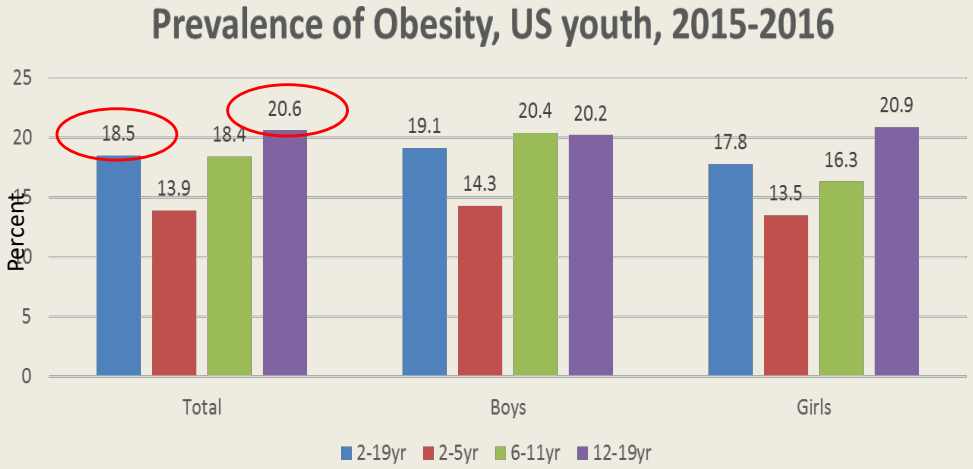


The Epidemic (updated)

- Overweight and obesity are the result of "caloric imbalance"—too few calories expended for the amount of calories consumed—and are affected by various genetic, behavioral, and environmental factors.
- The percentage of children aged 2–19 years in the United States who were obese increased from 7% in 1980 to nearly 18.5% in 2016. Similarly, the percentage of adolescents aged 12–19 years who were obese increased from 5% to nearly 21% over the same period.
- In 2012, more than one third of children and adolescents were overweight or obese

[1]Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *Journal of the American Medical Association* 2014;311(8):806-814.
[2]National Center for Health Statistics. Health, United States, 2011: With Special Features on Socioeconomic Status and Health. Hyattsville, MD; U.S. Department of Health and Human Services; 2012.

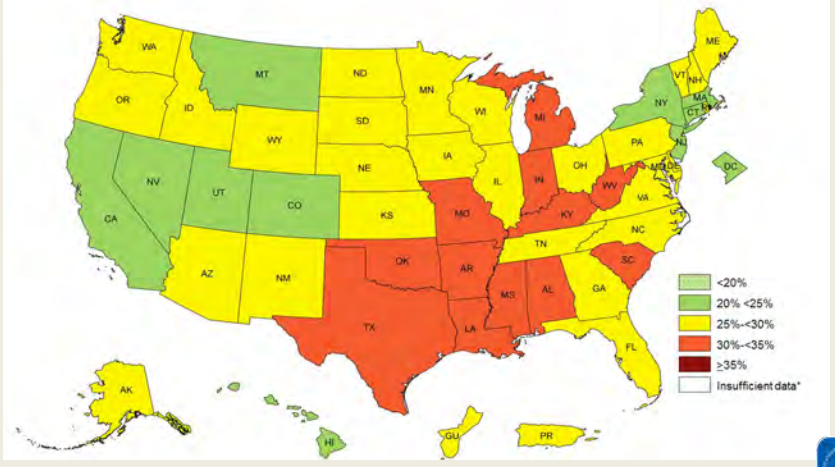
Obesity Statistics, NHANES



Hales CM, Carroll MD, Fryar CD, Ogden CL. NCHS Data Brief No. 288, October 2017.

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2011

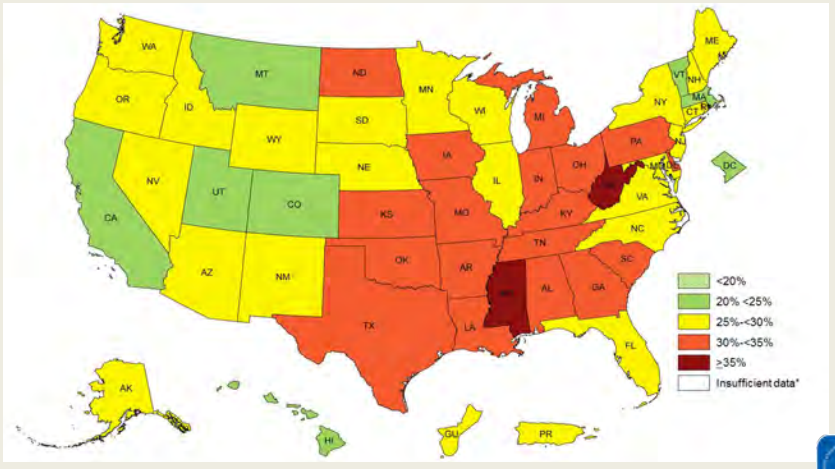
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2013

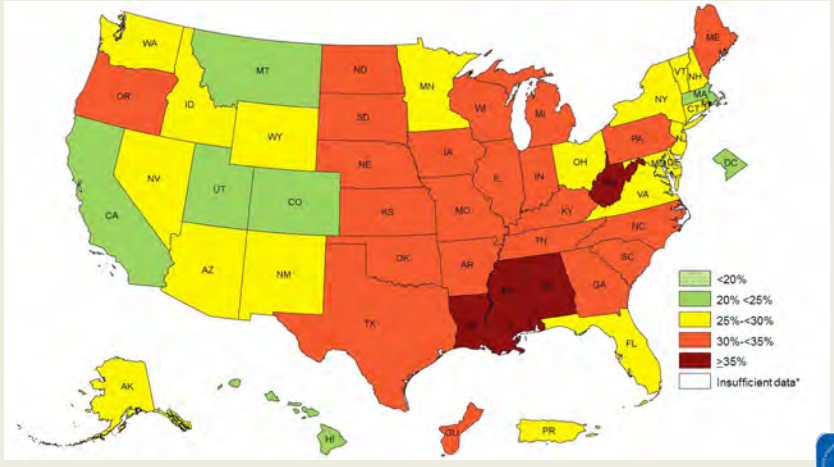
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2015

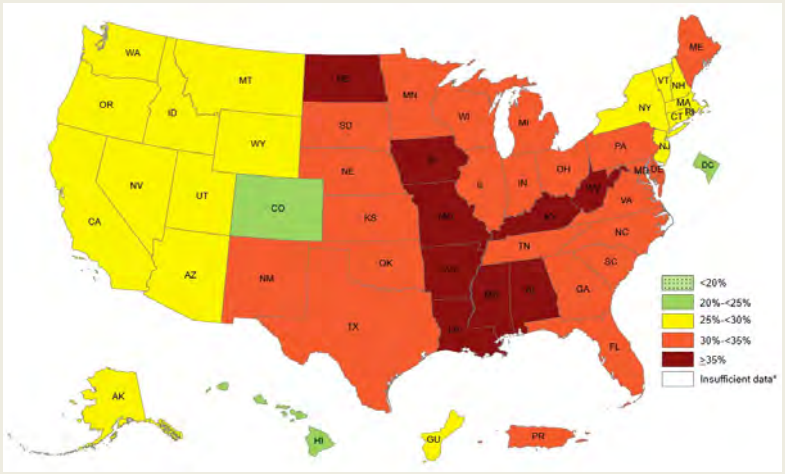
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2018

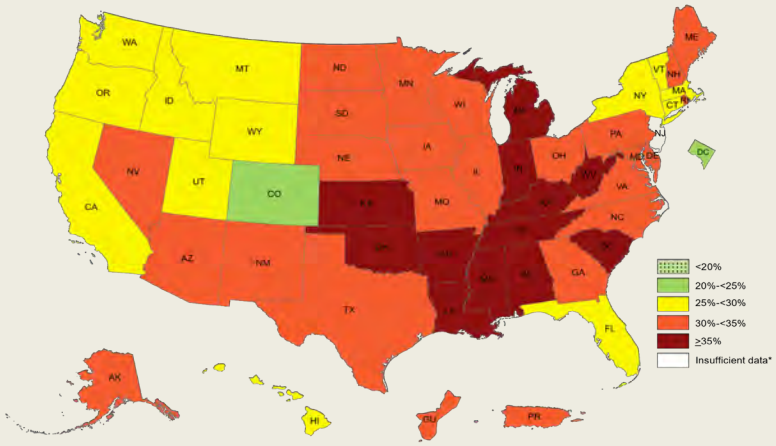
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50 or the relative standard error (dividing the standard error by the prevalence) ≥ 30%.

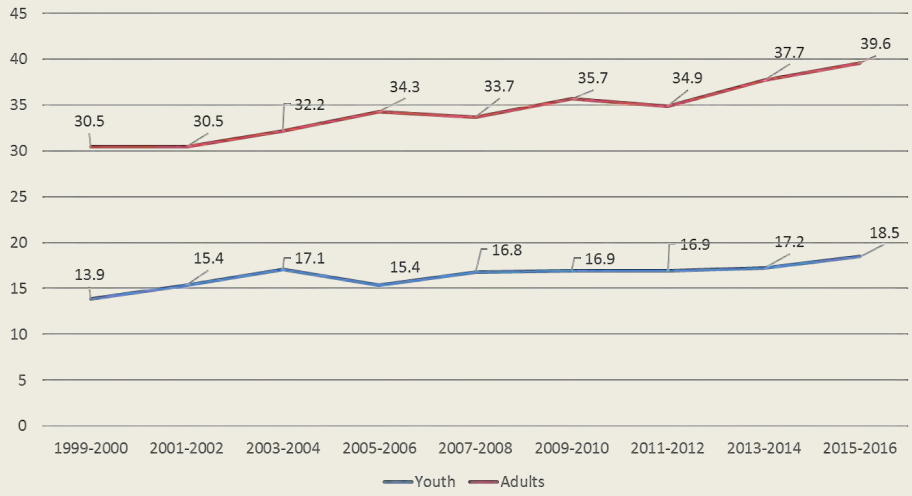
Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2019

¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



*Sample size <50, the relative standard error (dividing the standard error by the prevalence) ≥30%, or no data in a specific year.

Trends in adult and childhood obesity



1Significant increasing linear trend from 1999–2000 through 2015–2016.
NOTES: All estimates for adults are age adjusted by the direct method to the 2000 U.S. census population using the age groups 20–39, 40–59, and 60 and over.
Access data table for Figure 5 at: https://www.cdc.gov/nchs/data/databriefs/db288_table.pdf#5.
SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2016

Lots of Obese Teens

- Obesity affects >18% of children & adolescents
- 12.7 million teens with obesity
- Prevalence of obesity** 20.5%
- Severe obesity 4-5%
- Est. 1.2 million severely obese teens
- *Number of operations to date: est.* ***< 10,000***

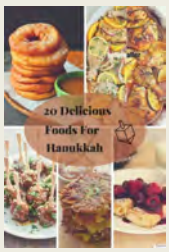
Age-adjusted BMI %ile ≥ 85*
Age adjusted BMI %ile ≥ 95**

Ogden CL et al, Prevalence of Overweight Among Children and Adolescents: United States, 2011-2012.
JAMA 2014;311:806-814

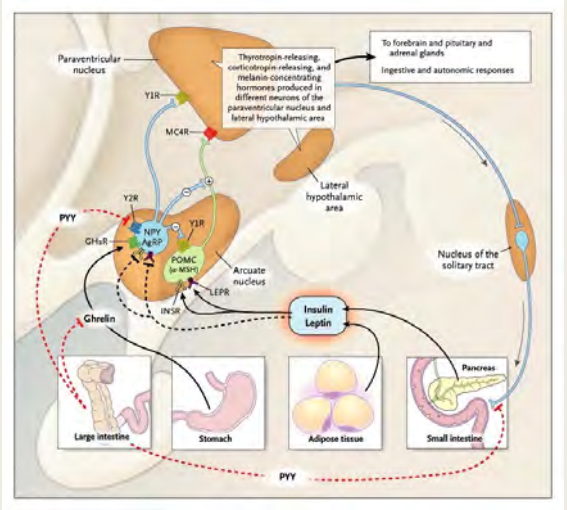
Why do people eat?

- Hunger
- Anxiety
- Depression
- Cultural
- Festive
- Sociability
- Schedule




To Eat or Not to Eat — How the Gut Talks to the Brain



Korner and Leibel
N Engl J Med 2003; 349:926-928

Courtesy of Dr. Kelly Brownell

Subtle weight gain:

(103 X 365) = 37,595

37,595/3800 = 9.9

Translation: If a person drinks a cup of milk (103 calories) each day (365) over the course of a year with no other change in diet or exercise they will gain approximately **10 lbs**.

What it means to have obesity

Medical Implications:

- Diabetes mellitus
- sleep apnea
- hypertension
- hyperlipidemia
- asthma
- Cardiomyopathy / MI
- GERD
- stress incontinence
- low back pain / DJD
- infertility problems
- cancer (uterus, breast, colon, pancreas, prostate)

Slipped Femoral Epiphyses
Benign Intracranial Hypertension

Psychosocial implications

What does it *really* mean to be obese?

Social Implications:

- Unable to
  - go to movies
  - sit on bus or theater
  - use seat belt
  - fit through turnstile
  - play with children
  - maintain adequate hygiene
  - buy stylish clothes

- depression
- low self esteem
- self-conscious
- uncomfortable in gyms
- victim of bullying
- lack intimacy
- do not participate
- conflict with parents

Of 206 adolescents interviewed for our program, 31 (15%) reported suicidal ideation or suicidal behavior

McPhee J, Khylavich-Freidl E, Eicher J, Zitsman JL, Devlin MJ, Hildebrandt T, Sysko R. Suicidal Ideation and Behaviors among Adolescents Receiving Bariatric Surgery: A Case-Control Study. *Eur Eat Disord Rev.* 2015, Sept. available as epublication.

Children are not small adults…

But obese adolescents are teenagers aging prematurely

Plenty in Common

- Adult Diseases
- Hypertension
- Diabetes
- Dyslipidemia
- Obstructive Sleep Apnea
- GERD

- Obese Teen Diseases
- Hypertension
- Diabetes
- Dyslipidemia
- Obstructive Sleep Apnea
- GERD

Telomeres

- Believed to "protect" the ends of the chromosome
- With successive mitoses the telomeres shorten.
- Short telomeres in adults are associated with cardiovascular disease , type 2 diabetes, insulin resistance, impaired glucose tolerance, and hypertension
- ***Shortened telomeres are found in children with obesity***.

Prevalence of comorbidities adolescent vs adult

	Adolescents	Adults	*P* value
Gender	75 F, 25 M	75 F, 25 M	ns
Mean BMI (kg/m^2)	47.7	47.5	ns
Mean age (yr)	16.1	42.7	<.001
Hypertension	6	38	<.0001
Diabetes	6	27	<.007
Dyslipidemia	13	26	<.032
OSA	13	48	<.0001
GERD	1	15	<.0001

Liu, J et al, Obesity Surg, 2020, online Oct 12.

Adult Obesity **Prevention** = Childhood Obesity ***Treatment***

- Diet & Exercise
- Pharmacologics
- Surgery

All weight loss strategies depend upon the individual changing abnormal eating behavior and adopting a healthier life style

Attempted weight loss methods

- Dieting (less fried, smaller portions)
- Nutritional counseling
- Commercial programs
- Self managed diets
- Appetite suppression
- Liquid diets
- Exercise
- Camps
- Residential program

Antiobesity Drugs

- Orlistat (*Xenical*®)
- Sibutrimine (*Meridia*®) – ***off the market***
- Rimonabant (*Acomplia*®) –***not approved in US***
- Fenfluramine/phentermine (*Fen-Phen*®) --***off the market***
- Metformin*(Glucophage®)*—***diabetics***
- Topiramate/phentermine (*Qysima*®) –***not recommended <18yr***

ASMBS Best Practice Guidelines

2018

- *Metabolic and bariatric surgery is a proven, effective treatment for severe obesity disease in adolescents and should be considered standard of care. Pediatricians and primary care providers, should recognize that children with severe obesity require tertiary care and refer early to a metabolic and bariatric surgery center with advanced treatments and support.*

LAGB in severely obese adolescents: a randomized trial

- 25 patients in each group (surgery vs supervised lifestyle intervention) followed for 24 months
- Age = 14-18 yrs

Characteristic	LAGB group (n=25)	Lifestyle group (n=18)	P value
Waist circumference	-28.2cm	-3.5 cm	< .001
Systolic BP	-12.5 mmHg	-20.3 mm Hg	ns*
Diastolic BP	-6.0 mm Hg	-6.9 mm Hg	ns*
HOMA insulin sensitivity, %	89	14.6	= .001
Metabolic Syndrome (pre/post)	9/0	10/4	= .03

*significant change from baseline but not between groups

O'Brien PE, Sawyer SM, Laurie C, et al. Laparoscopic adjustable gastric banding in severely obese adolescents: a randomized trial. JAMA.2010; 303:519-526.

ASMBS Best Practice Guidelines* 2018

- **Class III Obesity**
  - **≥ 140% of BMI 95th %ile by age/gender**
- **Class II Obesity + comorbidity**
  - **≥ 120% of BMI 95th %ile by age/gender**

*Available at https://doi.org/10.1016/j.soard.2018.03.019

ASMBS Best Practice Guidelines*
2018

- **Strong** indications
  - T2DM
  - OSA
  - NAFLD/NASH
  - IIH (pseudotumor)
  - Cardiovascular risk factors
    - HTN
    - Dyslipidemia
    - IR
    - Inflammatory markers

*Available at https://doi.org/10.1016/j.soard.2018.03.019

ASMBS Best Practice Guidelines
2018

- **Relative** indications
  - Blount's Disease
  - SCFE
  - GERD
  - Reduced QoL
- **Not** contraindications
  - Mental health disorders (except psychosis, suicidality, substance abuse)
  - Family dysfunction
  - Hx of maltreatment
  - LOC eating

Additional factors to consider

- Obesity Surgery in family (parents)
- Support system
- Distance from center
- Willingness to commit to dietary changes
- Prader-Willi, brain tumor, retardation
- History of prior weight loss
- Eating history

Necessary Ingredients

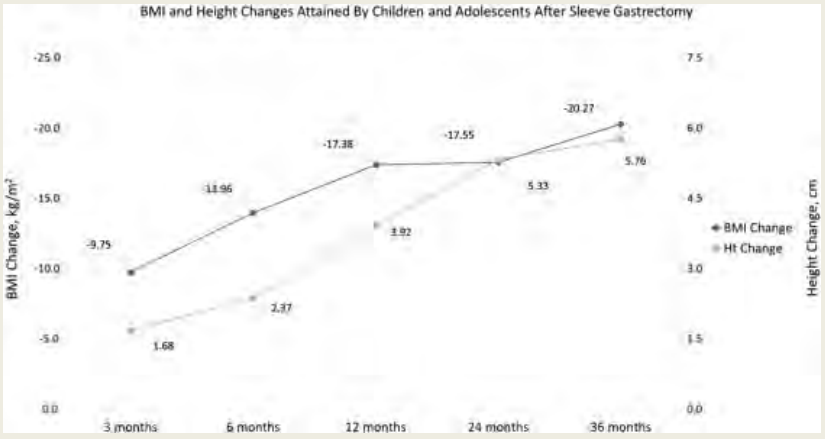
- Multidisciplinary team
  - **Nutritionist**
  - **Nurse**
  - **Coordinator**
  - **Medical Specialist(s)**
  - **Psychologist/Psychiatrist/Social Worker**
  - **Exercise Specialist**
  - **Surgeon**
  - **Anesthesiologist**
- and
  - **Billing/Financial Expert(s)**

Specific Considerations in Children and Adolescents

- Protein/calorie requirements for growth
- Vitamin & minerals
- Compliance
- Diet adherence
- Ethical considerations
- Psychological considerations

Browne AF, Inge T. How young for bariatric surgery in children? Semin Pediatr Surg. 2009 Aug;18:176-85

BMI and height changes attained by children and adolescents post laparoscopic sleeve gastrectomy

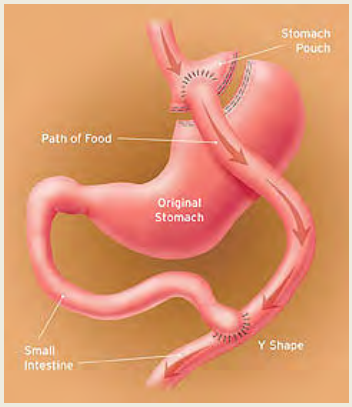


Algahtani AR, Elahmedi MO, Al Qahtani A. Co-morbidity resolution in morbidly obese children and adolescents undergoing sleeve gastrectomy. Surg Obes Relat Dis. 2014;10:842-50.

Protocol - CABS

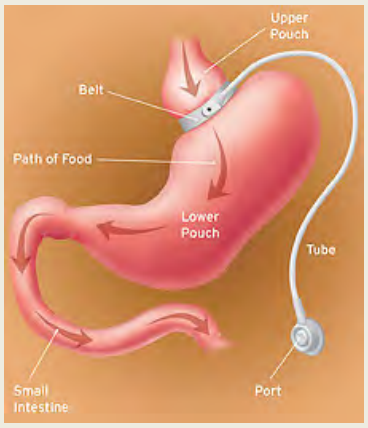
- Initial screening
- Information session and enrollment
- 3-6 month evaluation period
  - Nutritionist 3-6 visits
  - Surgery/PNP 3-6 visits
  - Endocrine 2 visits
  - Psychiatry 1 visit
  - Sleep study/PFT
- Weekly team meeting
- Approval for surgery
- Monthly follow-up with adjustment until stable weight loss
- Labs evaluation q 6mos
- 5 year follow-up
- Transition to adult program

Roux-en Y Gastric Bypass
"stomach stapling"



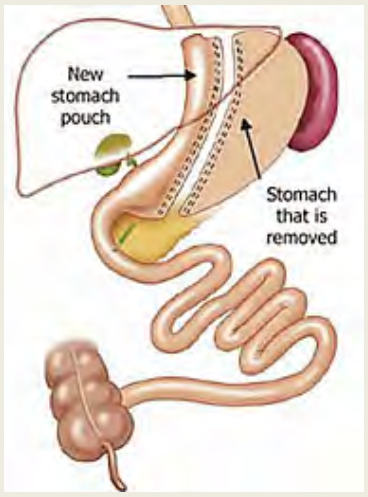
- Small pouch
- 2 anastomoses
- Excellent weight loss
- Some late regain
- Nutritional depletion
- Theoretically reversible, but very difficult

Laparoscopic Gastric Banding
"Lap band"



- Silicone band is placed around the upper part of the stomach
- Shorter operation
- Lower Risk
- Requires adjustments
- May increase heartburn
- Average less and slower weight loss

Sleeve gastrectomy



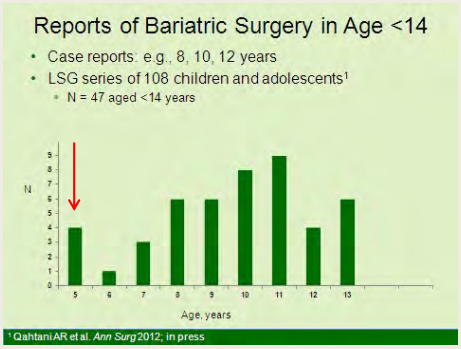
- Stomach converted to tubular "sleeve"
- No adjustments
- Not reversible but can be modified/converted
- May increase heartburn
- Greater weight loss
- No malabsorption

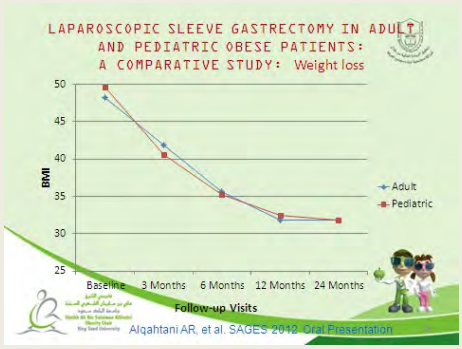
Successful weight loss is directly related to change in abnormal eating behavior

The New England Journal of Medicine
November 18, 2015
Weight Loss and Health Status 3 Years after Bariatric Surgery in Adolescents
Thomas H. Inge, M.D., Ph.D., et al (Teen-LABS consortium

- 242 adolescents (mean age 17±1.6)
- Mean BMI 53 kg/m^2
- Mean weight decrease 27% at 3 years
  - RYGB 28%
  - SG 26%
- Comorbidity resolution:
  - 95% T2DM
  - 76% prediabetes
  - 74% hypertension
  - 66% dyslipidemia
  - Improved QoL
- 57% low Fe
- 13% additional surgery

Alqahtani et al
Annals of Surgery, 2012

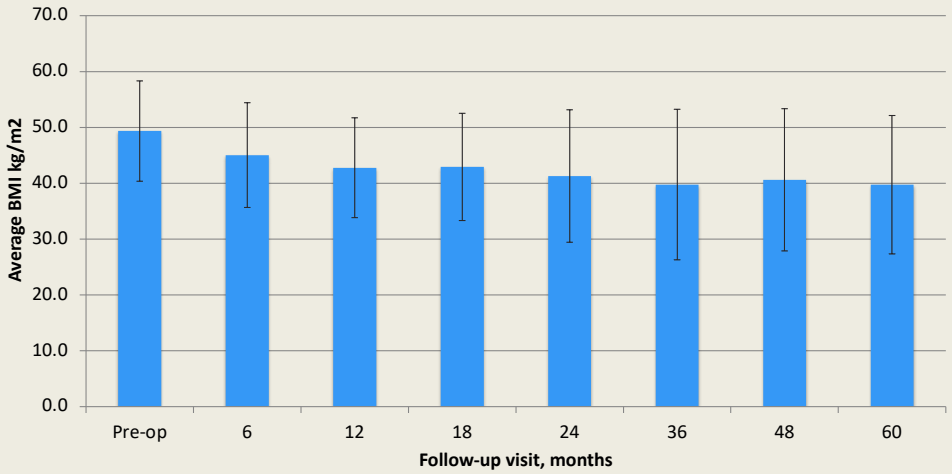




LAGB Results

	Pre-op (N=137)	6mo (N=126)	12mo (N=111)	18mo (N=81)	24mo (N=82)	36mo (N=68)	48mo (N=60)	60mo (N=68)
Wt (lb)	**299.5** (188.0 - 484.0)	**271.5** 158.0-443.0	**261.1** 144.7-430.5	**260.8** 149.2-441.0	**253.1** 133.2-465.0	**245.4** 133.2-465.0	**251.0** 133.2-465.0	**248.0** 133.2-465.0
BMI	**48.4** 33.6-83.6	**43.8** 27.8-79.9	**41.6** 27.0-66.8	**41.5** 27.0-66.8	**40.5** 27.0-67.0	**39.4** 27.0-67.0	**39.6** 27.0-67.0	**39.6** 27.0-67.0
% EWL	-	21.3 86.9- (-24.2)	28.7 83.0- (-15.6)	31.5 83.1- (-24.4)	35.1 101.5 - (-41.4)	40.6 101.5 - (-41.4)	39.6 101.5 - (-41.4)	35.5 101.5 - (-41.4)
Wt loss (lb)		27.3 73.0- (-35.7)	36.2 89.8- (-22.5)	42.9 148.7- (-36.0)	45.4 153.0- (-59.6)	52.6 153.0- (-59.6)	50.5 153.0- (-59.6)	48.1 153.0- (-59.6)

Average BMI (LAGB)



SG results

	Pre-op	6 mo	12 mo	18mo	24mo	36mo	48mo
	N= 250	N= 242	N= 128	N=63	N=59	N=37	N=22
Wt (kg)	**131.1**±27.4	**107.8**±25.7	**97.1**±24.4	**93.9**±21.4	**98.4**±23.5	**96.7**±24.7	**102.3**±24.7
BMI kg/m2	**46.9**±8.7	**38.3**±8.7	**34.8**±9.1	**33.0**±7.5	**35.0**±8.6	**34.9**±9.3	**34.8**±8.8
%EWL		**45.6**±20.2	**64.8**±44.0	**65.3**±24.3	**60.1**±26.0	**61.2**±30.0	**52.4**±29.1
TWL (kg)		**27.3**±11.5	**37.2**±13.9	**39.3**±15.9	**36.5**±17.7	**35.4**±17.3	**33.3**±22.1

SG results

	Pre-op	6 mo	12 mo	18mo	24mo	36mo	48mo
	N= 250	N= 242	N= 128	N=63	N=59	N=37	N=22
Wt (kg)	**131.1**±27.4	**107.8**±25.7	**97.1**±24.4	**93.9**±21.4	**98.4**±23.5	**96.7**±24.7	**102.3**±24.7
BMI kg/m2	**46.9**±8.7	**38.3**±8.7	**34.8**±9.1	**33.0**±7.5	**35.0**±8.6	**34.9**±9.3	**34.8**±8.8
%EWL		**45.6**±20.2	**64.8**±44.0	**65.3**±24.3	**60.1**±26.0	**61.2**±30.0	**52.4**±29.1
TWL (kg)		**27.3**±11.5	**37.2**±13.9	**39.3**±15.9	**36.5**±17.7	**35.4**±17.3	**33.3**±22.1

SG results

	Pre-op	6 mo	12 mo	18mo	24mo	36mo	48mo
	N= 250	N= 242	N= 128	N=63	N=59	N=37	N=22
Wt (kg)	**131.1**±27.4	**107.8**±25.7	**97.1**±24.4	**93.9**±21.4	**98.4**±23.5	**96.7**±24.7	**102.3**±24.7
BMI kg/m2	**46.9**±8.7	**38.3**±8.7	**34.8**±9.1	**33.0**±7.5	**35.0**±8.6	**34.9**±9.3	**34.8**±8.8
%EWL		**45.6**±20.2	**64.8**±44.0	**65.3**±24.3	**60.1**±26.0	**61.2**±30.0	**52.4**±29.1
TWL (kg)		**27.3**±11.5	**37.2**±13.9	**39.3**±15.9	**36.5**±17.7	**35.4**±17.3	**33.3**±22.1

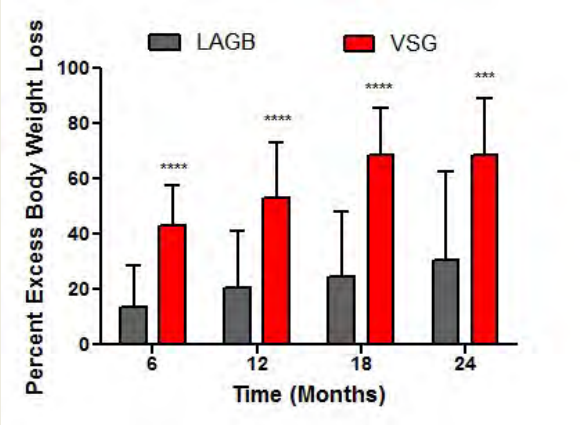
SG results

	Pre-op	6 mo	12 mo	18mo	24mo	36mo	48mo
	N= 250	N= 242	N= 128	N=63	N=59	N=37	N=22
Wt (kg)	**131.1**±27.4	**107.8**±25.7	**97.1**±24.4	**93.9**±21.4	**98.4**±23.5	**96.7**±24.7	**102.3**±24.7
BMI kg/m2	**46.9**±8.7	**38.3**±8.7	**34.8**±9.1	**33.0**±7.5	**35.0**±8.6	**34.9**±9.3	**34.8**±8.8
%EWL		**45.6**±20.2	**64.8**±44.0	**65.3**±24.3	**60.1**±26.0	**61.2**±30.0	**52.4**±29.1
TWL (kg)		**27.3**±11.5	**37.2**±13.9	**39.3**±15.9	**36.5**±17.7	**35.4**±17.3	**33.3**±22.1

SG results

	Pre-op	6 mo	12 mo	18mo	24mo	36mo	48mo
	N= 250	N= 242	N= 128	N=63	N=59	N=37	N=22
Wt (kg)	**131.1**±27.4	**107.8**±25.7	**97.1**±24.4	**93.9**±21.4	**98.4**±23.5	**96.7**±24.7	**102.3**±24.7
BMI kg/m2	**46.9**±8.7	**38.3**±8.7	**34.8**±9.1	**33.0**±7.5	**35.0**±8.6	**34.9**±9.3	**34.8**±8.8
%EWL		**45.6**±20.2	**64.8**±44.0	**65.3**±24.3	**60.1**±26.0	**61.2**±30.0	**52.4**±29.1
TWL (kg)		**27.3**±11.5	**37.2**±13.9	**39.3**±15.9	**36.5**±17.7	**35.4**±17.3	**33.3**±22.1

VSG Significantly Reduces Excess Body Weight Compared to LAGB in Obese Adolescent Patients.



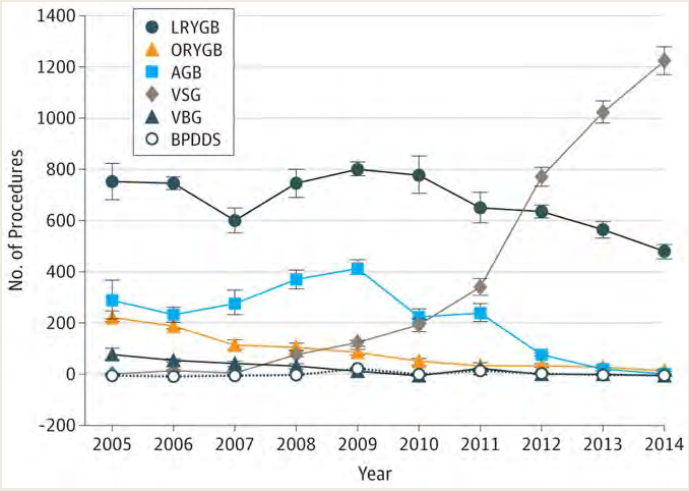
**** P < 0.0001
*** P < 0.001

Pedroso et al, J Pediatr Surg 2015;50: 115-122

Columbia University Medical Center

Morgan Stanley Children's Hospital of NewYork-Presbyterian

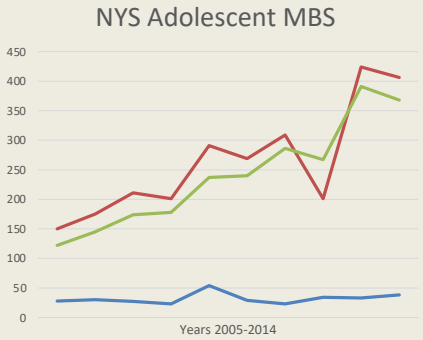
National Trends in MBS Among Pediatric Patients



Griggs CL et al. JAMA Pediatr 2018; 172: 1191-1192

Recent trends of Bariatric Surgery in Adolescent population in the State of New York

Year	Total (n=2737)	12-17 (n=329)	18-21 (n=2408
2005	150	28 (18.7%)	122 (81.3%)
2006	175	30 (17.1%)	145 (82.9%)
2007	211	37 (17.5%)	174 (82.5%)
2008	201	23 (11.4%)	178 (88.6%)
2009	291	54 (18.6%)	237 (81.4%)
2010	269	29 (10.8%)	240 (89.2&)
2011	309	23 (7.4%)	286 (92.6%)
2012	201	34 (11.3%)	267 (88.7%)
2013	424	33 (7.8%)	391 (92.2%)
2014	406	38 (9.4%)	368 (90.6%)
Relative Risk		0.91 (0.86, 0.95	1.01 (1.01, 1.02)
p-value		0.0001	0.0002



Humayon et al, SOARD, 2019; 15:1388-1393

Access to care

- **818 MBSAQIP approved centers (US)**
- **Comprehensive Center with Adolescent**
- N = 86
- **Adolescent Center**
- Boston Children's Hospital
- Children's National Medical Center (DC)
- Lucile Packard Children's Hospital at Stanford
- Nationwide Children's Hospital
- NYP/Morgan Stanley Children's Hospital

https://www.facs.org/quality-programs/mbsaqip

- **Comprehensive Center with Adolescent (NY)**
- Albany Medical Center
- Bellevue Hospital
- New York-Presbyterian Brooklyn Methodist Hospital
- New York-Presbyterian Hospital/Weill Cornell Medical Center
- Northern Westchester Hospital
- NYU Langone Medical Center
- NYU Winthrop Hospital
- St. Charles Hospital
- Stony Brook Medicine
- The Mount Sinai Hospital
- Westchester Medical Center
- **Adolescent Center (NY)**
- NYP/Morgan Stanley Children's Hospital

Patient Selection
who succeeds vs who does not

- Supportive, stable family structure
- Hunger vs emotional eating
- History of successful weight loss
- Family history of successful weight loss surgery
- A life outside the home (sports, arts)
- Access to healthy food
- Early loss of family member (obesity)

Patient Selection
who succeeds vs who does not

- Unstable family structure
- Grazing, emotional eating
- Poor compliance with meds, vitamins
- Significant depression, bipolar disease
- No activities, reclusive
- Food insecurity
- Unwilling to change eating behavior
- ?Geographic barriers to follow-up

LAGB Patient Results

January, 2009

BMI 48.9

August, 2015

BMI 32.0

105 lb weight loss

4 year post-op SG

> 100 lb weight loss

SG 1 yr post-op in 9yo

BMI 27.4 (99th %ile)

BMI 16.2 (34th %ile

Summary

- Preventing obesity is the most effective treatment
- Non-surgical treatment of obesity is largely ineffective for subjects with BMI $\geq$ 40
- LAGB, GSR, and RYGBP are effective weight loss operations in teens
- 5 year data support durability of wt loss
- Any child 10 or older who has a BMI of 40 or >99th %ile should be ***considered*** for surgery

Jeffrey L. Zitsman, MD
email: jlz2@cumc.columbia.edu
212-305-8862

Thank you for attending "2021 Pediatrics Conference: Childhood Nutrition, Feeding, and Weight Management in the Primary Care Setting, provided by SUNY Downstate Health Sciences University and Healthfirst.

COURSE DIRECTORS

Maja Castillo, MD, MHA
Assistant Vice President Medical Director, Pediatric Care Management, Pediatric Medical Director, Healthfirst

Eugene Dinkevich, MD, FAAP, Dipl ABOM
Associate Professor of Clinical Pediatrics, SUNY-Downstate Health Sciences

PLANNING COMMITTEE

Maureen Gelling , MS, FNP
Pediatric Nurse Practitioner, SUNY Out Patient Pediatric Clinic

Elizabeth J. Jean-Jacques, MPA
Director, Healthfirst Partnerships Healthfirst

Richard Jones, Jr., MBA, MPA
Senior Manager, Healthfirst Partnerships Healthfirst

LaToya Norman, MPH
Manager, Partnerships Medical Outcomes Healthfirst

Gail Solomon, PA-C, AE-C
Physician Assistant, Pediatric Asthma Center SUNY Downstate Health Sciences University

FACULTY

Susan Carnell, PhD
Associate Professor, Johns Hopkins University School of Medicine

Vivian L. Chin, MD
Assistant Professor of Pediatrics, Pediatric Endocrinologist, SUNY Downstate Health Sciences University

Sarita Dhuper, MD, FACC
Clinical Associate Professor of Pediatrics, SUNY Downstate Medical Center

Cristina R. Fernández, MD, MPH
Assistant Professor, Division of Child and Adolescent Health, Department of Pediatrics, Columbia University Irving Medical Center

Eve Khlyavich Freidl, MD
Medical Director, Eating and Weight Disorders Program, Icahn School of Medicine at Mount Sinai, Associate Professor of Psychiatry

Marion Groetch, MS, RDN
Assistant Professor of Pediatrics, Division of Allergy & Immunology, Icahn School of Medicine at Mount Sinai

Lisa C. Hudgins, MD
Associate Professor of Pediatrics in Medicine, The Rogosin Institute/Weill-Cornell Medical College

Mary Jo Messito, MD
Clinical Associate Professor, Pediatrics, NYU Grossman School of Medicine

Prantik Saha, MD, MPH
Assistant Clinical Professor of Pediatrics, Vagelos College of Physicians & Surgeons, Columbia University Irving Medical Center

Ellyn Satter, MS, MSSW
Founder and Developmental Editor, Ellyn Satter Institute

Jeffrey L. Zitsman, MD
Director, Center for Adolescent Bariatric Surgery, Morgan Stanley Children's Hospital of NY Presbyterian Columbia University Irving Medical Center

ABOUT HEALTHFIRST

Healthfirst is New York's largest not-for-profit health insurer, earning the trust of 1.6 million members by offering access to affordable healthcare. Sponsored by New York City's leading hospitals, Healthfirst's unique advantage is rooted in its mission to put members first by working closely with its broad network of providers on shared goals. Healthfirst takes pride in being pioneers of the value-based care model, recognized as a national best practice. For more than 25 years, Healthfirst has built its reputation in the community for top-quality products and services New Yorkers can depend on. It has grown significantly to serve the needs of members, offering market-leading products to fit every life stage, including Medicaid plans, Medicare Advantage plans, long-term care plans, qualified health plans, and individual and small group plans. Healthfirst serves members in New York City and Long Island, as well as in Westchester, Sullivan, and Orange counties.

For more information on Healthfirst, visit **healthfirst.org**.

About SUNY Downstate Health Sciences University

Formally known as The State University of New York Health Science Center at Brooklyn, but better known to our patients and Brooklyn neighbors as SUNY Downstate Health Sciences University, we are older than the Brooklyn Bridge. We trace our roots back to 1860, when a school of medicine was founded at the Long Island College Hospital. The new college's faculty revolutionized medical education in this country by bringing the teaching of medicine to the hospital bedside, thus rejecting the idea that physicians should be trained exclusively in university lecture halls.

Today, SUNY Downstate is one of the nation's leading urban medical centers. SUNY Downstate comprises a College of Medicine, School of Health Professions, College of Nursing, School of Graduate Studies, School of Public Health, and University Hospital of Brooklyn.

The quality of our education, research, and patient care programs was confirmed with the awarding of the Nobel Prize in Medicine to Dr. Robert Furchgott, a member of our School of Graduate Studies faculty since 1956. Dr. Furchgott's identification of

nitric oxide as a signalling molecule important in vascular health has revolutionized care for heart, stroke, impotence, and other diseases.

As the only academic medical center in Brooklyn, we serve a large population – over 2.3 million people – and one that is among the most diverse in the world. We are also an engine of opportunity for students interested in pursuing careers in health care. Many of our students are the first in their families to attend college.

More physicians who practice medicine in New York City received their training at our College of Medicine than any other medical center in the country. Nationally, our medical school ranks seventh in the number of graduates who are now engaged in academic medicine. Here in Brooklyn, our impact is even greater. We have trained nearly half of all doctors practicing in a number of specialty areas.

Our School of Health Professions and College of Nursing also play a unique role in the borough and the city. We have the oldest midwifery program in the country, and we recently made history again by establishing a joint program between the two colleges that trains midwives who are not nurses. The College of Nursing is particularly proud of its role in educating minority students. Approximately three-fourths of the students are minority-group members, and many are recent immigrants.

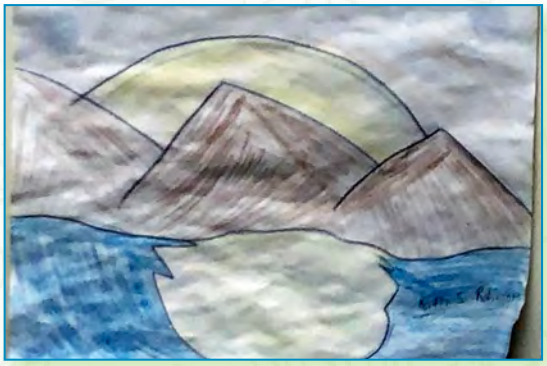
University Hospital of Brooklyn is the borough's only hospital located at an academic medical center. As such, it offers the most advanced and comprehensive care in Brooklyn. Many of its physicians are regularly rated among the best in New York City. Some are known throughout the world.

SUNY Downstate Health Sciences University enters the new century with a renewed dedication to serving the people of Brooklyn through its three-fold mission of education, research, and patient care.

In Memory of
Dr. Madu Rao

This conference is dedicated to Dr. Madu Rao, Pediatric Pulmonologist, Professor Emeritus of Pediatrics at SUNY-Health Sciences University. Dr. Rao has been the longest-serving faculty in the Department of Pediatrics at Downstate Health Sciences University and Kings County Hospital Center with over 50 years of service. During that time, he has made seminal contributions to the fields of pediatric pulmonary medicine and obesity medicine. While he will be remembered for his academic achievements, we will always honor Dr. Rao for his humanism, dedication to teaching, devotion to mentorship, and philanthropy. There are thousands of doctors practicing today who have been trained by Dr. Rao. Even after he retired, Dr. Rao continued to come weekly to offer a seminar in Pediatric Pulmonary Medicine. Along with his wife, Dr. Rao established grants to support research in Pediatric Pulmonology, Public Health, and Community Medicine. Amongst his many accomplishments, Dr. Rao was also known for starting the Downstart Pediatric Healthy Lifestyle Program, a multidisciplinary behavioral modification program for inner-city families interested in leading a healthier, more active lifestyle.

We extend heartfelt condolences to Dr. Rao's family and friends.



Thank you for attending the
2021 Pediatrics Conference: Childhood Nutrition, Feeding, and Weight Management in the Primary Care Setting

healthfirst®
Health Insurance for New Yorkers

SUNY Downstate Health Sciences University

0421-21