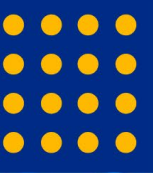


Medical and Surgical Management of Obesity in Down Syndrome

Vibha Singhal, MD, MPH, DABOM
Pediatric Endocrinology and Obesity Medicine
Director, Pediatric Obesity Medicine
Director, FIT for Health Clinic
Associate Professor Pediatrics



 **ANNUAL**
symposium



Disclosures

Site PI for Eli Lilly and NovoNordisk Studies

Consultant Advarra

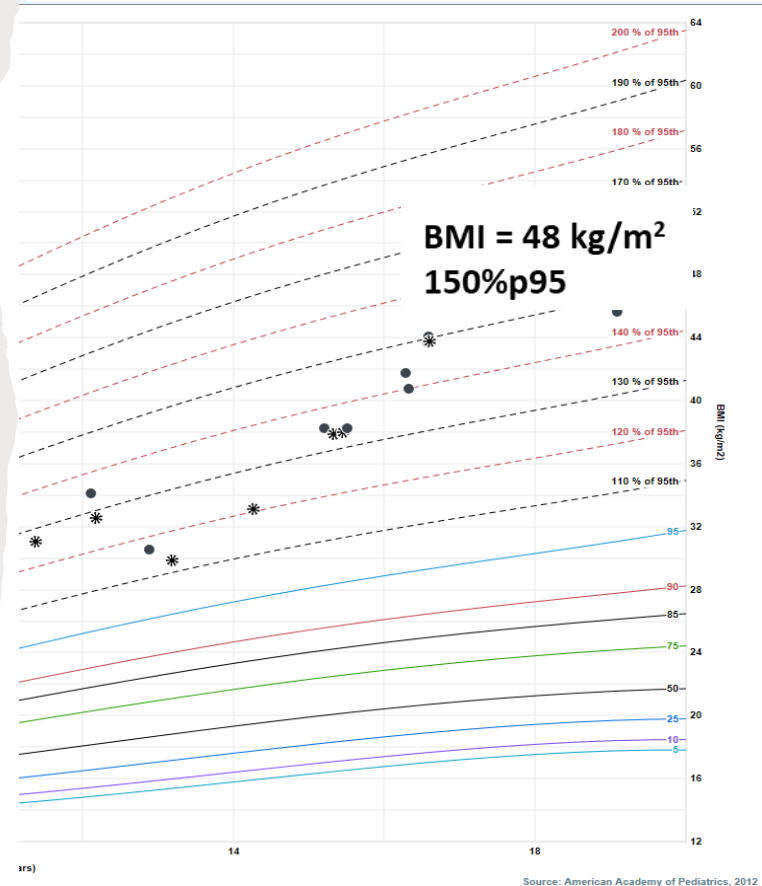
I will be discussing medications that have no DS specific data yet

AI was used in creating some graphics



Real Life Situation

- RH is a 17-year-old female with Trisomy 21, stable CHD, hypothyroidism, and weight struggles
- Increasing BMI especially since puberty
- Severe Sleep Apnea – using CPAP
- Family history of T2D and obesity

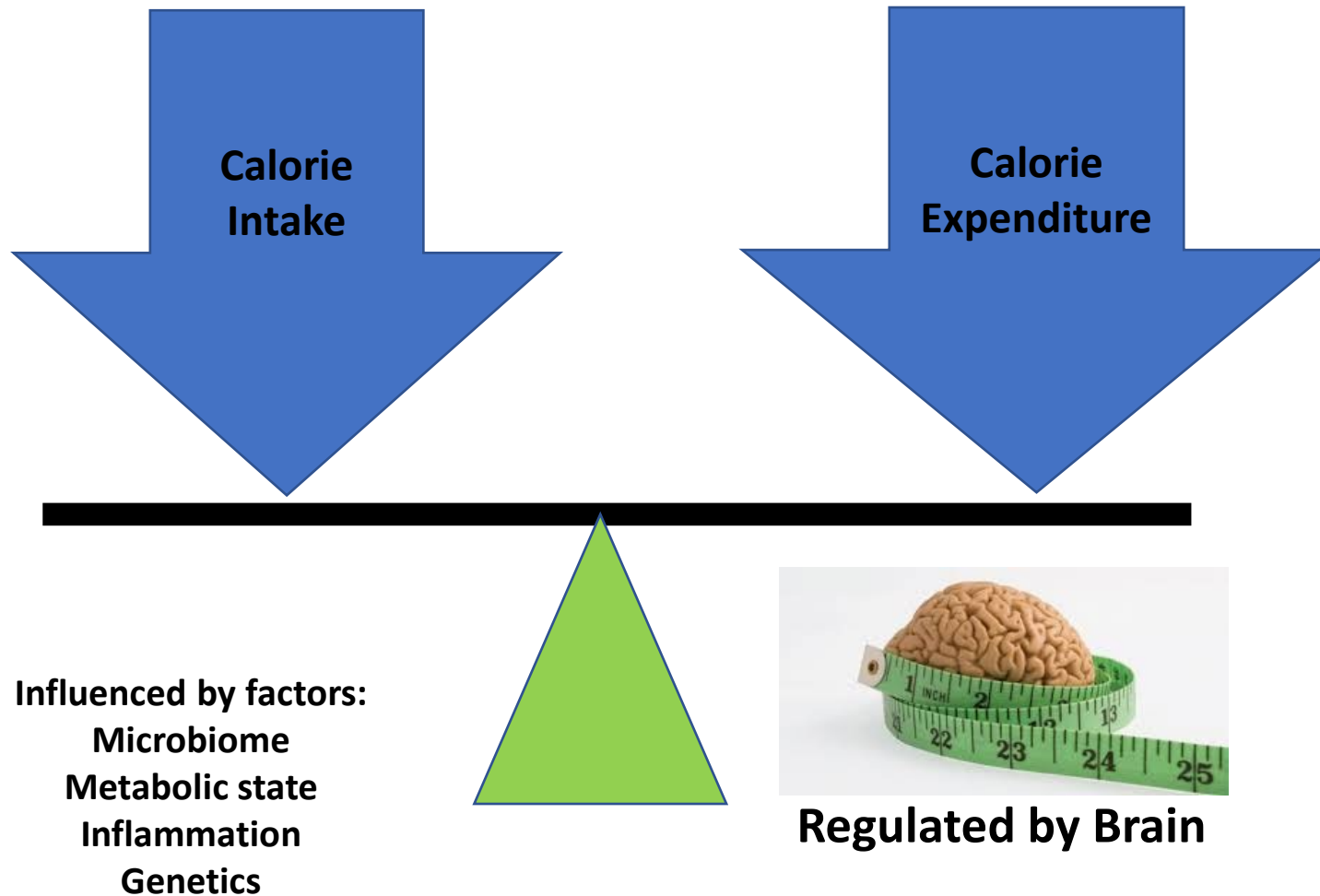


Objectives



- Describe the medical consequences of obesity for people with Down syndrome.
- Review the available anti-obesity medications and emerging research in Down syndrome.
- Describe potential challenges for medically-supervised weight loss for individuals with Down syndrome.

Pathophysiology of Obesity – Caloric Imbalance +++



calories



Tiny creatures that live in your closet and sew your clothes a little bit tighter every night.

Control of Food Intake and Appetite

- **Homeostatic**

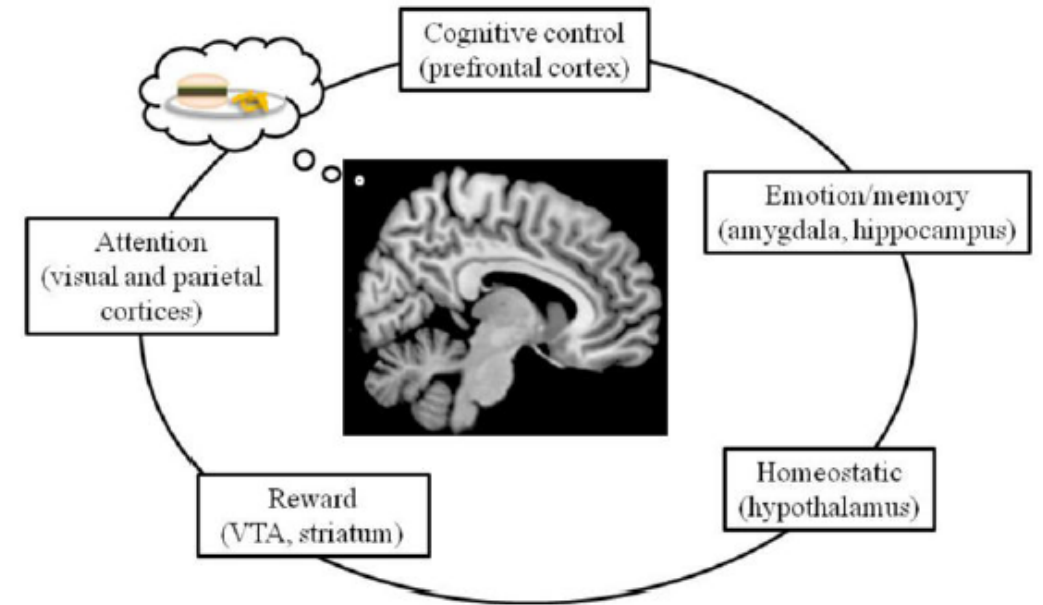
- Response to Energy Requirement
- Mainly under hypothalamic control
- The system is very sensitive to negative energy balance but comparatively tolerant of positive energy balance

- **Hedonic**

- Role of Pleasure in Eating/ Reward
- Corticolimbic Pathways

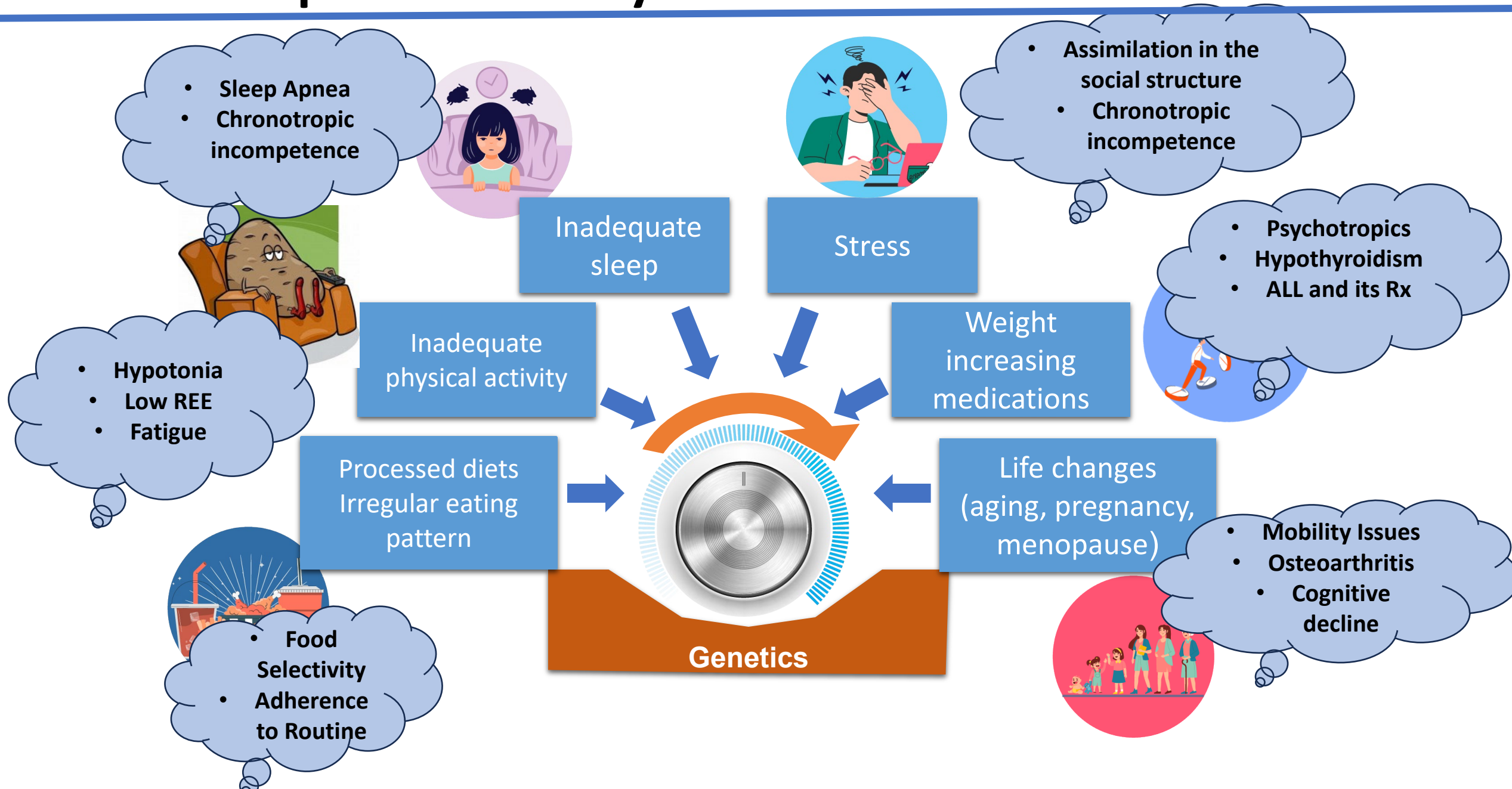
- **Cognitive**

- Prefrontal Cortex

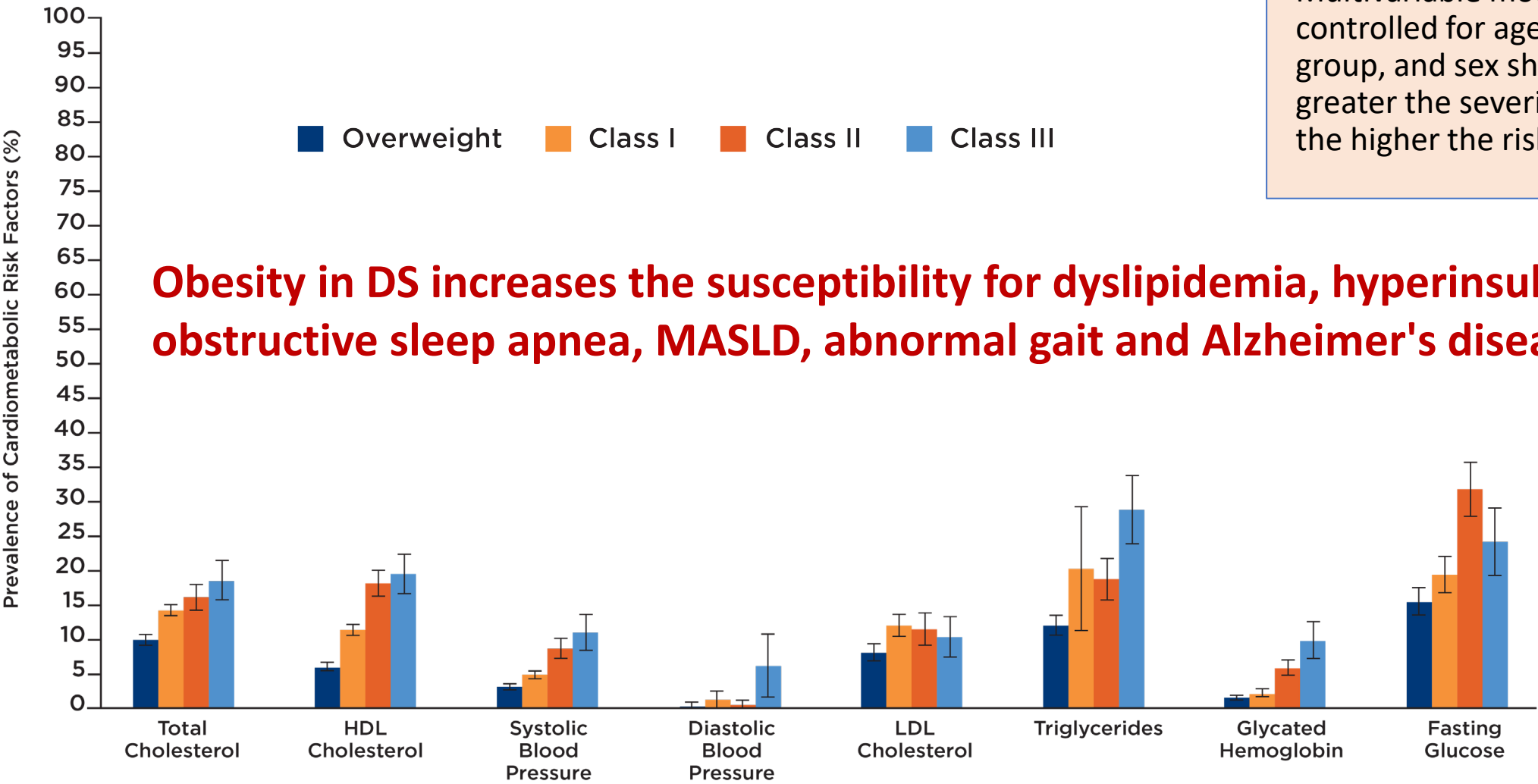


In a food replete modern world, cognitive and emotional factors can overpower energy balance regulation

Factors Unique to Down Syndrome



Prevalence of Cardiometabolic Risk Factors by Weight Status in non-DS Children and Adults



Multivariable models that controlled for age, race or ethnic group, and sex showed that the greater the severity of obesity, the higher the risks.

Obesity in DS increases the susceptibility for dyslipidemia, hyperinsulinemia, obstructive sleep apnea, MASLD, abnormal gait and Alzheimer's disease

AAP 2023 OBESITY GUIDELINES SUMMARY

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

American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN®

1 EVALUATE

Obesity is a chronic disease that requires evaluation and treatment.



SCREEN

Annual BMI assessment for all children and adolescents 2–18 years.

- Calculate BMI and assess weight status using age- and sex-specific CDC charts
- Identify obesity: BMI $\geq 95^{\text{th}}$ percentile for age and sex

2 TREAT

Offer evidence-based treatment tailored to the child's needs.



Use a family-centered, non-stigmatizing approach that is developmentally appropriate and culturally responsive.

3 INTENSIVE HEALTH BEHAVIOR & LIFESTYLE TREATMENT (IHBLT)



Provide or refer children 6 years and older with obesity to IHBLT programs.



Recommended: ≥ 26 contact hours over 3–12 months (ideally ~ 75 hours over 6 months)



Focus on nutrition, physical activity, behavior strategies, and family involvement



Greater contact hours are associated with greater improvements in BMI and health outcomes

4 CONSIDER PHARMACOTHERAPY

Offer weight-loss pharmacotherapy as an adjunct to IHBLT for adolescents 12 years and older with obesity.



- Use FDA-approved medications for obesity
- Assess risks, benefits, and adverse effects
- Monitor response and adjust as needed
- Continue emphasis on healthy lifestyle behaviors

5 CONSIDER METABOLIC & BARIATRIC SURGERY

Offer referral for evaluation for adolescents 13 years and older with severe obesity.



- Class 2 obesity (BMI $\geq 120\%$ of the 95th percentile or ≥ 35 kg/m²) with a significant comorbidity
- Class 3 obesity (BMI $\geq 140\%$ of the 95th percentile or ≥ 40 kg/m²)
- Surgery should be performed at centers with multidisciplinary teams and expertise in adolescent care

6 KEY PRINCIPLES



Obesity is a complex, chronic disease – not the result of willpower or personal failure.



Use a respectful, non-stigmatizing, and weight-inclusive approach.



Engage and empower the whole family.



Address social determinants of health and access to resources.



Monitor progress and adjust the treatment plan over time.



Collaborate with multidisciplinary teams when available.

7 EVALUATE COMORBIDITIES

Evaluate for obesity-related comorbidities, including:



Abnormal glucose metabolism (prediabetes, type 2 diabetes)



Dyslipidemia



Hypertension



Nonalcoholic fatty liver disease (NAFLD)



Obstructive sleep apnea



Depression, anxiety, and psychosocial concerns



Polycystic ovary syndrome (PCOS) in adolescents



Early identification and comprehensive, family-centered treatment can improve health and quality of life for children and adolescents living with obesity.

Source: Reproduced from the AAP Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity. *Pediatrics*. 2023;151(2):e2022060640.

USPSTF 2018 OBESITY GUIDELINES SUMMARY – ADULTS

Screening and Interventions for Obesity in Adults



RECOMMENDATION STATEMENT: The USPSTF recommends clinicians **screen for obesity** in adults and **offer or refer** them to comprehensive, intensive behavioral interventions.

WHO



Adults 18 years and older



SCREEN

- Screen for obesity by calculating body mass index (BMI).
- Use standard BMI cutoffs.

Obesity: BMI ≥ 30 kg/m²

USPSTF RECOMMENDATIONS

Population	Recommendation	Grade
 Adults 18 years and older with obesity (BMI ≥ 30 kg/m ²)	OFFER OR REFER TO BEHAVIORAL INTERVENTIONS Offer or refer adults with obesity to comprehensive, intensive behavioral interventions.	B Recommended
 Adults 18 years and older without obesity (BMI < 30 kg/m ²)	INSUFFICIENT EVIDENCE The evidence is insufficient to assess the balance of benefits and harms of screening for obesity in adults without obesity or offering or referring them to behavioral interventions.	I Statement

COMPREHENSIVE, INTENSIVE BEHAVIORAL INTERVENTIONS

Interventions for adults with obesity should be:



Comprehensive

Address multiple aspects of the individual's lifestyle (e.g., nutrition, physical activity, behavior) and involve the family or other support.



Intensive

Include ≥ 12 contact hours over 6 months (ideally ~ 26 hours over 6–12 months).



Behavioral

Use behavior-change techniques such as goal setting, self-monitoring, problem solving, and positive reinforcement.



Delivered by Trained Personnel

Tailored to the individual's needs and preferences.

GRADE DEFINITIONS

B

High certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.

I

Evidence is insufficient to assess the balance of benefits and harms.

KEY POINTS



Obesity is a chronic disease associated with significant health risks.



Effective behavioral interventions can improve weight, health, and quality of life.



Support from family and the health care team improves outcomes.



Interventions should be accessible, equitable, and tailored to individual needs and preferences.

Source: U.S. Preventive Services Task Force. *Screening for Obesity in Adults*. U.S. Preventive Services Task Force Recommendation Statement. JAMA. 2018;320(11):1132-1138.

For the full recommendation statement, visit www.uspreventiveservicestaskforce.org.

AMA 2023 OBESITY GUIDELINES SUMMARY

Guidelines for the Evaluation and Treatment of Obesity in Adults



Physicians
leading the way
in medicine



OVERARCHING GOAL: Improve health and well-being, not just weight. Obesity is a chronic disease that requires comprehensive, compassionate, and long-term management.

1 RECOGNIZE OBESITY AS A CHRONIC DISEASE



- Obesity is a chronic, relapsing, treatable disease.
- Stigma and bias can harm patients and hinder care.
- Use person-first, non-stigmatizing language.
- Assess for drivers, complications, and impact on health-related quality of life.

2 PERFORM A THOROUGH EVALUATION



- Measure: height, weight, calculate BMI, waist circumference.
- Assess medical history, mental health, social determinants, and family history.
- Evaluate for obesity-related complications and comorbidities.
- Consider medications that may contribute to weight gain.
- Determine readiness to change and patient goals.

3 DEFINE TREATMENT GOALS



- Goals should be individualized, realistic, and patient-centered.
- Focus on improving health, function, quality of life, and reducing obesity-related risks.
- Weight loss is one means to achieve health goals—not the only one.

4 IMPLEMENT A COMPREHENSIVE, STAGE-BASED TREATMENT PLAN

Use a stepwise approach and intensify treatment as needed.



NUTRITION



PHYSICAL
ACTIVITY



BEHAVIOR
CHANGE



MEDICATION



METABOLIC &
BARIATRIC
SURGERY

Evidence-based interventions should be offered. Treatment should be escalated based on response and patient preference.

5 USE EVIDENCE-BASED PHARMOTHERAPY



- Offer anti-obesity medications as an adjunct to lifestyle treatment for eligible individuals.
- Consider medications for BMI ≥ 30 kg/m², or BMI ≥ 27 kg/m² with weight-related comorbidity.
- Discuss benefits, risks, side effects, and costs.
- Continue medication if meaningful benefits are achieved.

6 CONSIDER METABOLIC & BARIATRIC SURGERY



- Consider for BMI ≥ 40 kg/m², or BMI ≥ 35 kg/m² with obesity-related comorbidities.
- Surgery is the most effective evidence-based treatment for substantial and sustained weight loss.
- Provide comprehensive pre- and post-operative evaluation and follow-up.

7 PROVIDE ONGOING SUPPORT AND FOLLOW-UP

- Obesity requires long-term management.

KEY PRINCIPLES ACROSS ALL STEPS



PATIENT-CENTERED CARE

Engage patients in shared



EQUITY AND ACCESS

Address social determinants of health and ensure



MULTIDISCIPLINARY APPROACH

Collaborate with a team



ONGOING REVIEW AND ADAPTATION

Reassess regularly and



SAFETY AND QUALITY

Use high-quality evidence, monitor for adverse

Medical Management of Down Syndrome — JAMA 2020

Obesity Section Summary

JAMA® The Journal of the American Medical Association



Key Guidance: People with Down syndrome (DS) have a high prevalence of overweight and obesity. Clinicians should monitor growth carefully and provide early, consistent, family-centered obesity prevention and treatment.

WHY IT MATTERS	SCREENING & MONITORING	MANAGEMENT STRATEGIES	SPECIAL CONSIDERATIONS IN DS	
 Obesity is common in DS and increases risk for multiple medical problems.  Contributes to obstructive sleep apnea, worsening behavior and cognition.  Increases risk for cardiometabolic disease (hypertension, dyslipidemia, insulin resistance, type 2 diabetes).  Associated with lower mobility, decreased quality of life, and earlier onset of disability.	 Measure height and weight at every health supervision visit. Use standard CDC/WHO BMI-for-age growth charts.  Assess BMI percentile and track trends over time.  If overweight/obese, screen for obstructive sleep apnea with polysomnography.  Obtain fasting lipid profile and consider diabetes screening in adolescents with obesity or additional risk factors.	 Healthy eating - Emphasize nutrient-dense, portion-controlled diet (fruits, vegetables, lean proteins, whole grains). - Limit sugar-sweetened beverages and energy-dense, processed foods.  Increase physical activity - Aim for ≥60 minutes/day of moderate to vigorous activity. - Encourage daily movement and reduce prolonged sedentary time.  Family-centered, structured plan - Set realistic, individualized goals. - Involve caregivers, school, and community programs.  Address barriers - Use behavior supports and routines. - Adapt strategies to developmental level and functional abilities.	 Unique risk factors - Hypotonia and low muscle tone - Lower resting energy expenditure - Developmental and behavioral factors - Feeding and sensory differences  Tailor interventions - Use simple, concrete, visual instructions. - Build habits through routine and positive reinforcement. - Include whole family and school team  Promote inclusion - Encourage participation in adaptive sports and community activities. - Focus on long-term, sustainable, enjoyable lifestyle changes.	
TAKE-HOME POINTS				
 Monitor BMI at every visit	 Screen for sleep apnea in those with overweight or obesity	 Promote healthy eating and daily physical activity early and consistently	 Use individualized, family-centered, and developmentally appropriate approaches	 Goal: improve overall health, mobility, and quality of life for people with Down syndrome

“Obesity prevention and treatment are essential to optimize the health and well-being of individuals with Down syndrome.”

— JAMA, 2020

"Obesity prevention and treatment are essential to optimize the health and well-being of individuals with Down syndrome."

— JAMA, 2020

Source: Bull MJ, et al. Health Supervision for Children and Adults With Down Syndrome. JAMA. 2020;324(15):1543-1556.

JAMA®

The **Global Down Syndrome Foundation** recommends that adults with Down syndrome and obesity follow the **USPSTF behavioral intervention recommendations** to prevent obesity-related morbidity and mortality.  AFP Key considerations include:

- **Obesity and diabetes** are more common in adults with Down syndrome; diabetes rates are four times those of unaffected adults younger than 30 years and twice those of unaffected adults 30 years and older.  AFP
- **Diabetes screening** should begin with HbA1c every 3 years at age 30 in those without obesity, but at **age 21 in those with obesity**, and earlier if other risk factors are present.  AFP
- Common **physiologic differences** — including lower heart rate and blood pressure, joint hyperflexibility, hypotonia, and balance issues — can limit physical activity and should be accounted for in weight management planning.  AFP

Global Down Syndrome Foundation (AAFP Summary)

Medical Care for Adults With Down Syndrome: Guidelines From the Global Down Syndrome Foundation.

Bunt CW, Bunt SK. American Family Physician. 2022;105(4):436-437.

Real Life Situation



- Trying hard
- Dancing every day as a family
- Mom cooking at home and monitoring her food
- Still no weight loss
- Sleep apnea is a concern – does not keep the mask on- mom states that she has not slept a full night in years



Commonly Used Anti-Obesity Medication Options

A shared decision-making guide for clinicians, families and individuals with Down syndrome

Updated 2026

Medications (Class)	Form	Indications and Comorbidities	Side effects	Contra-indications/Caution (all are contra-indicated in pregnancy and allergic reaction)
Metformin (Biguanide)		FDA approved (age 10+) for insulin resistance, PCOS, diabetes type 2; Off label for anti-psychotic induced weight gain, obesity	Diarrhea, abdominal discomfort	GFR<45ml/min; ketoacidosis
Semaglutide (GLP-1) (weekly injection)		FDA approved (age 12+) for diabetes type 2, obesity without diabetes	Nausea, vomiting, constipation, diarrhea, abdominal pain	Medullary thyroid cancer, multiple endocrine neoplasia syndrome 2, pancreatitis, gallbladder disease,
Semaglutide (GLP-1) (daily oral tablet)		FDA approved (age 18+) for diabetes type 2, obesity without diabetes	Nausea, vomiting, diarrhea	Medullary thyroid cancer, multiple endocrine neoplasia syndrome 2, pancreatitis, gallbladder disease, celiac disease, inflammatory bowel disease
Phentermine (appetite suppressant)		FDA approved (age 16+); Helpful for injection averse, insurance coverage	Increased heart rate, high blood pressure, insomnia, restlessness, and potential dependence	Uncontrolled hypertension, hyperthyroidism, serious cardiovascular disease, glaucoma, within 14 days of MAO inhibitor
Topiramate (appetite suppressant)		FDA approved (age 2+) for seizures, headaches; Off label for anti-psychotic induced weight gain, obesity; Helpful for injection aversity and insurance coverage	Fatigue, paresthesia, dizziness, suicidal thoughts, blurred vision, nausea, diarrhea, cognitive impairment	Glaucoma, acute porphyria, metabolic acidosis, nephrolithiasis
Phentermine/ Topiramate		FDA approved (age 12+) for seizures, headaches. Off label for anti-psychotic induced weight gain, obesity; Helpful for injection averse, insurance coverage	Increased heart rate, high blood pressure, insomnia, restlessness, and potential dependence	Uncontrolled hypertension, hyperthyroidism, serious cardiovascular disease, glaucoma, within 14 days of MAO inhibitor
Liraglutide (GLP-1) (daily injection)		FDA approved (age 12+) for obesity and (age 10+) for diabetes type 2	Nausea, vomiting, constipation, fatigue, diarrhea, abdominal pain, injection site reactions	Medullary thyroid cancer, multiple endocrine neoplasia syndrome 2, pancreatitis, gallbladder disease

(Unpublished Work)

Practically-



- Side Effect Profile
- Average Efficacy
- Dual Benefit

Anti Obesity Medication: Metformin

- Mechanism: activation of AMP protein kinase; decreased gluconeogenesis
- FDA approved ≥ 10 y/o for diabetes
- Efficacy: 3.3 kg placebo-subtracted weight loss
- Preferred if:
 1. Antipsychotic induced weight gain
 2. Associated PCOS
 3. Prediabetes
- Adverse effects :
 1. GI including bloating, diarrhea (slow titration with meals)
 2. Lactic acidosis is very rare
 3. Monitor Vitamin B12 levels after prolonged use

Anti Obesity Medication: Phentermine

- Class IV controlled substance, follow local regulations
- Mechanism: sympathomimetic and increasing NE in hypothalamus
- FDA approved >16 y/o for short term use
- Relative Contraindications:
 - ***History of congenital heart disease***
 - Uncontrolled Hypertension
 - Uncontrolled Thyroid Disease
 - High dose SSRIs or SNRIs
 - Renal impairment
 - History of drug abuse or active depression
- 8, 15, 30 or 37.5 mg dose (Slow Titration Up)

Phentermine : Safety and Side Effects

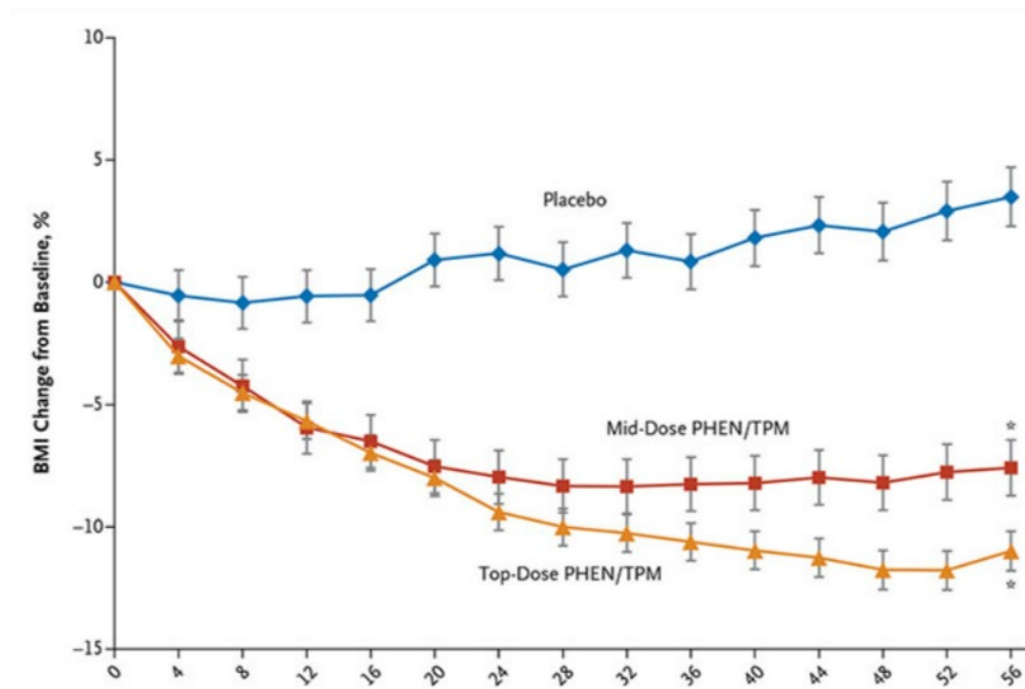
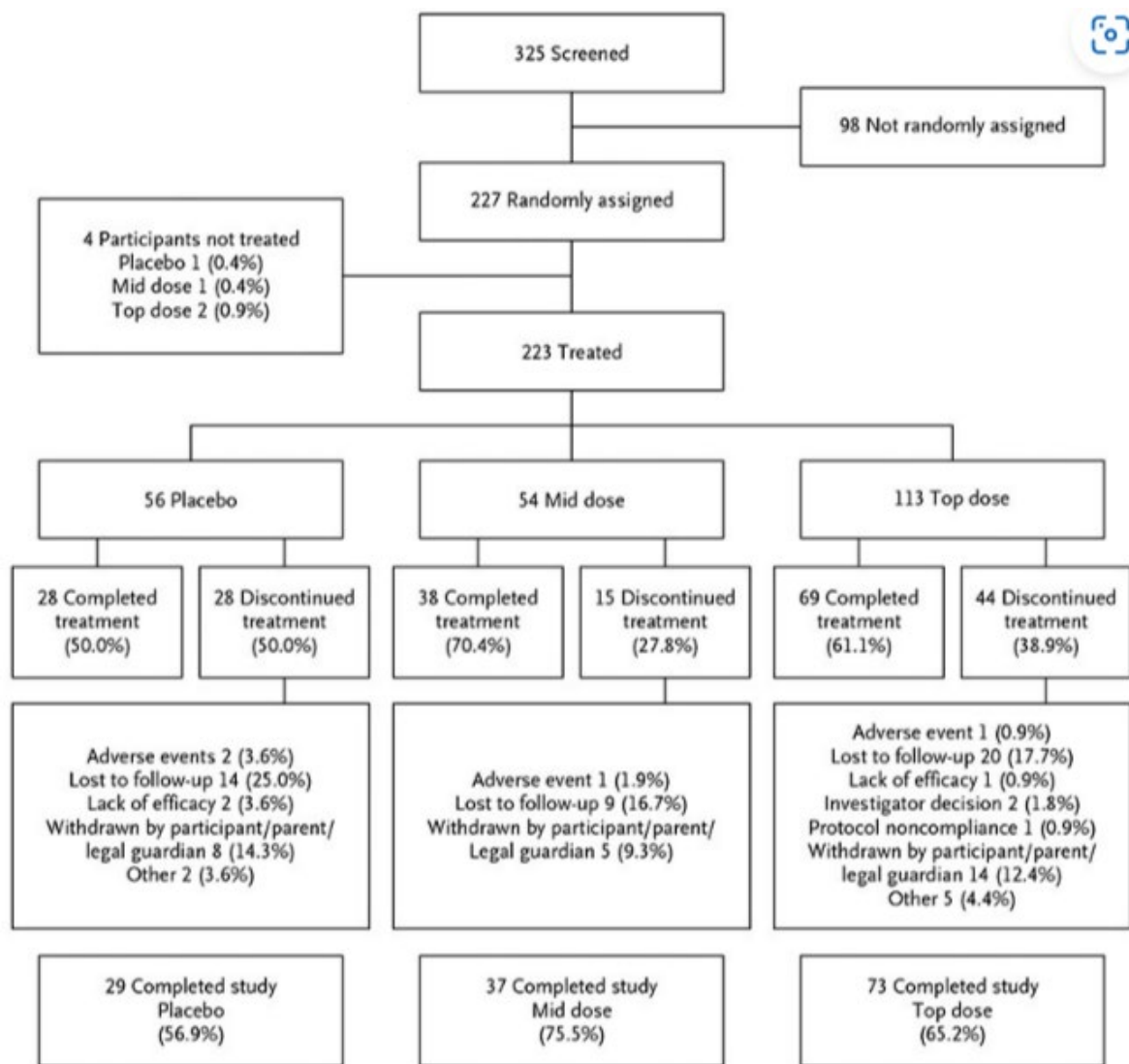
- Check for murmur, BP, HR
- At each visit (every 6-8 weeks), review SE with patient and family
 - Increase in HR/BP, palpitations
 - Anxiety, jitteriness, agitation
 - Dry mouth, constipation
 - Headaches

Insurance Coverage

- Qsymia
 - Website: <https://qsymiaengage.com/register>
 - Cost:\$98 per month
- Phentermine
 - On average price range is \$10-\$25 with a good Rx coupon depending on Pharmacy location

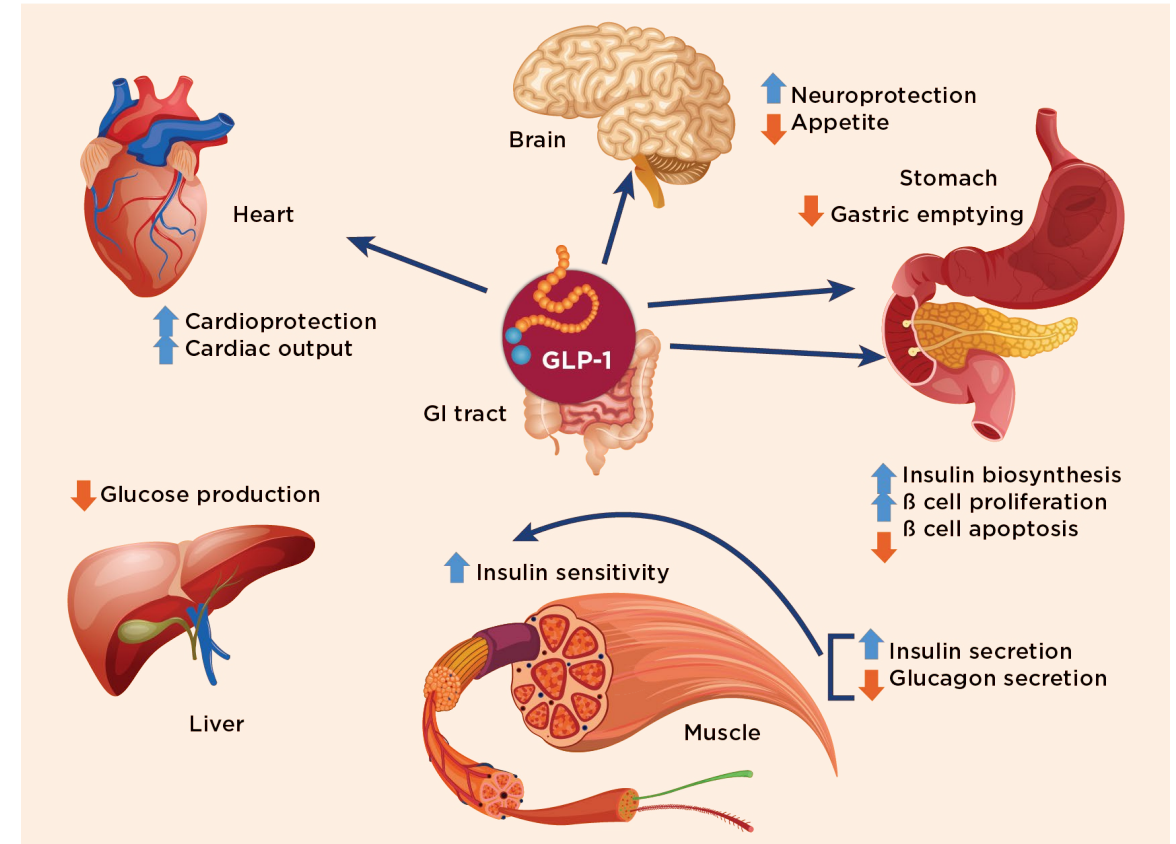
Anti Obesity Medication: Qsymia

56-week, randomized, double-blind trial enrolled adolescents 12 to less than 17 years of age with obesity



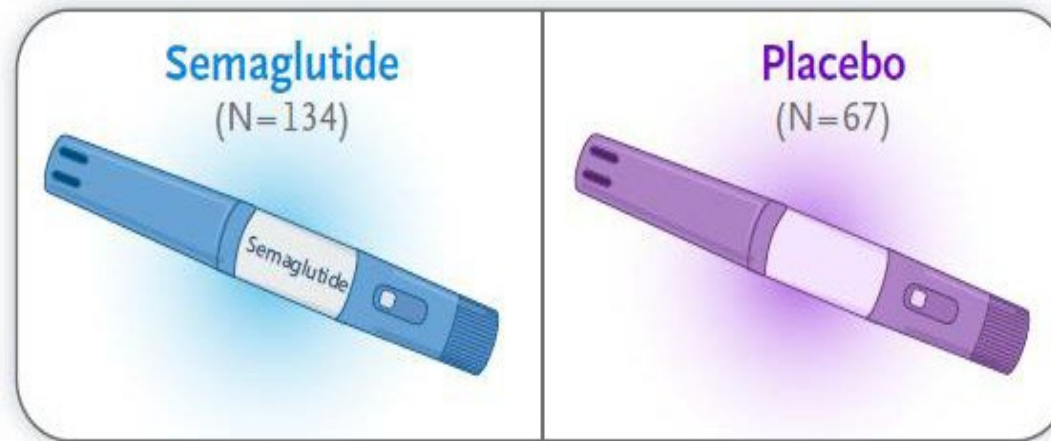
Anti-Obesity Medication – Glucagon Like Peptide-1 Analogs

- Mechanism of action:
 - Reduces hunger
 - Increases satiety
 - Decreases gastric emptying
 - Central effect on hypothalamus
- FDA approved in children after 12 years for obesity and after 10 years for T2D
- Side effects:
 - Nausea/Vomiting
 - Headaches
 - Pancreatitis
- Thyroid C-cell tumors in rodents
(Contraindication if personal/family history of MEN)



Efficacy of Semaglutide – RCT in Adolescents With Obesity

Adolescents
BMI $\geq$ 95th percentile
or
BMI $\geq$ 85th percentile and $\geq$ 1 weight-related coexisting condition



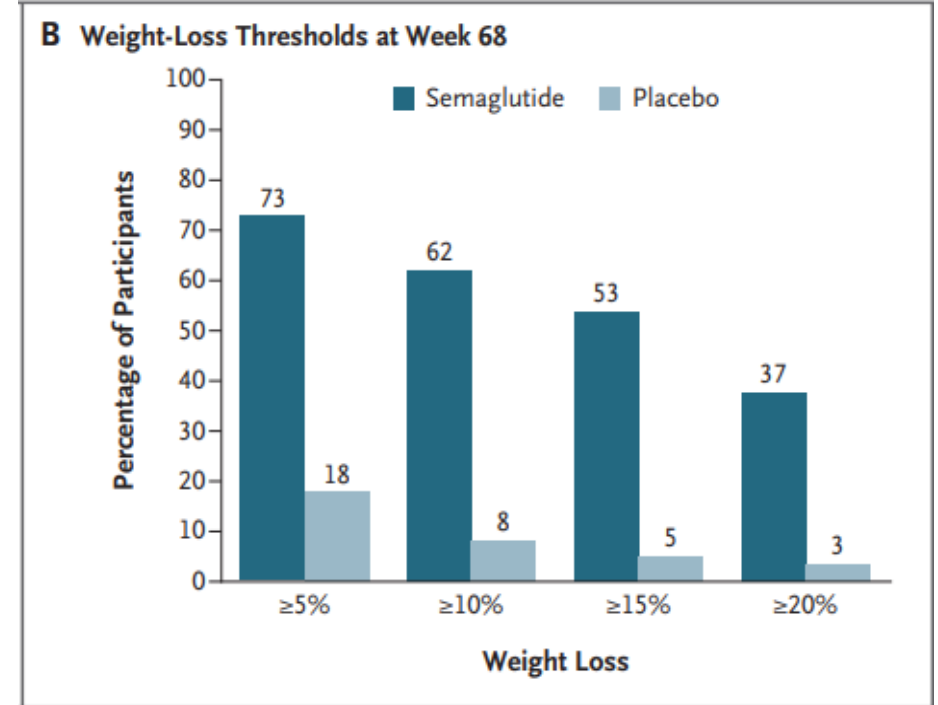
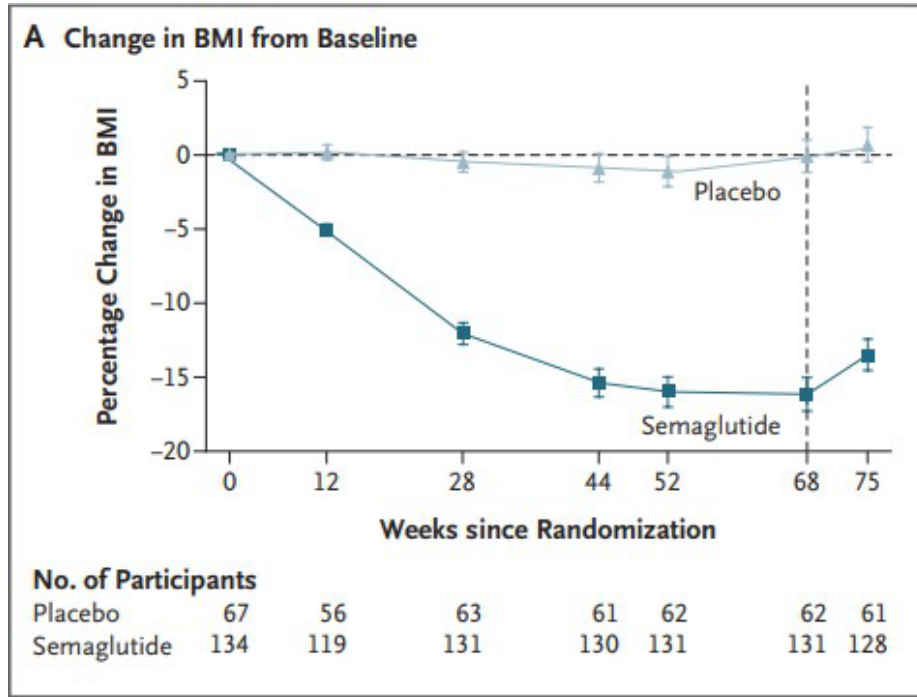
Double-blind,
parallel group,
randomized,
placebo-
controlled trial

Primary end
point:
percentage
change in BMI
from baseline to
week 68

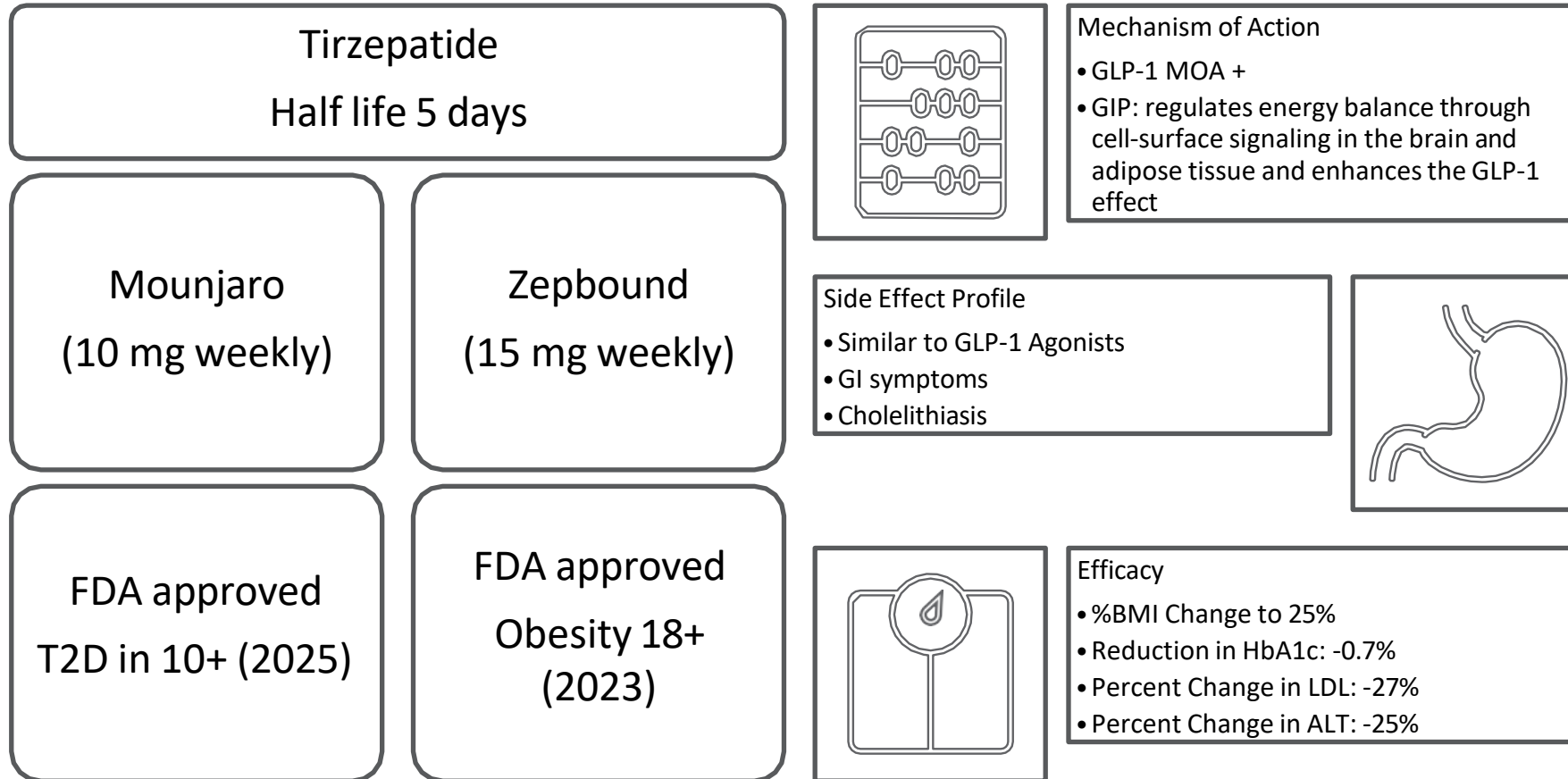
Secondary end
point: weight
loss of at least
5% at week 68

Efficacy of Semaglutide – RCT in Adolescents With Obesity

- RCT with 68-wk treatment and a 26-wk follow-up
- 201 randomized- 180 completed the study (90%)
- Mean initial BMI: $37 \pm 6 \text{ kg/m}^2$



Tirzepatide: GLP-1/GIP RA

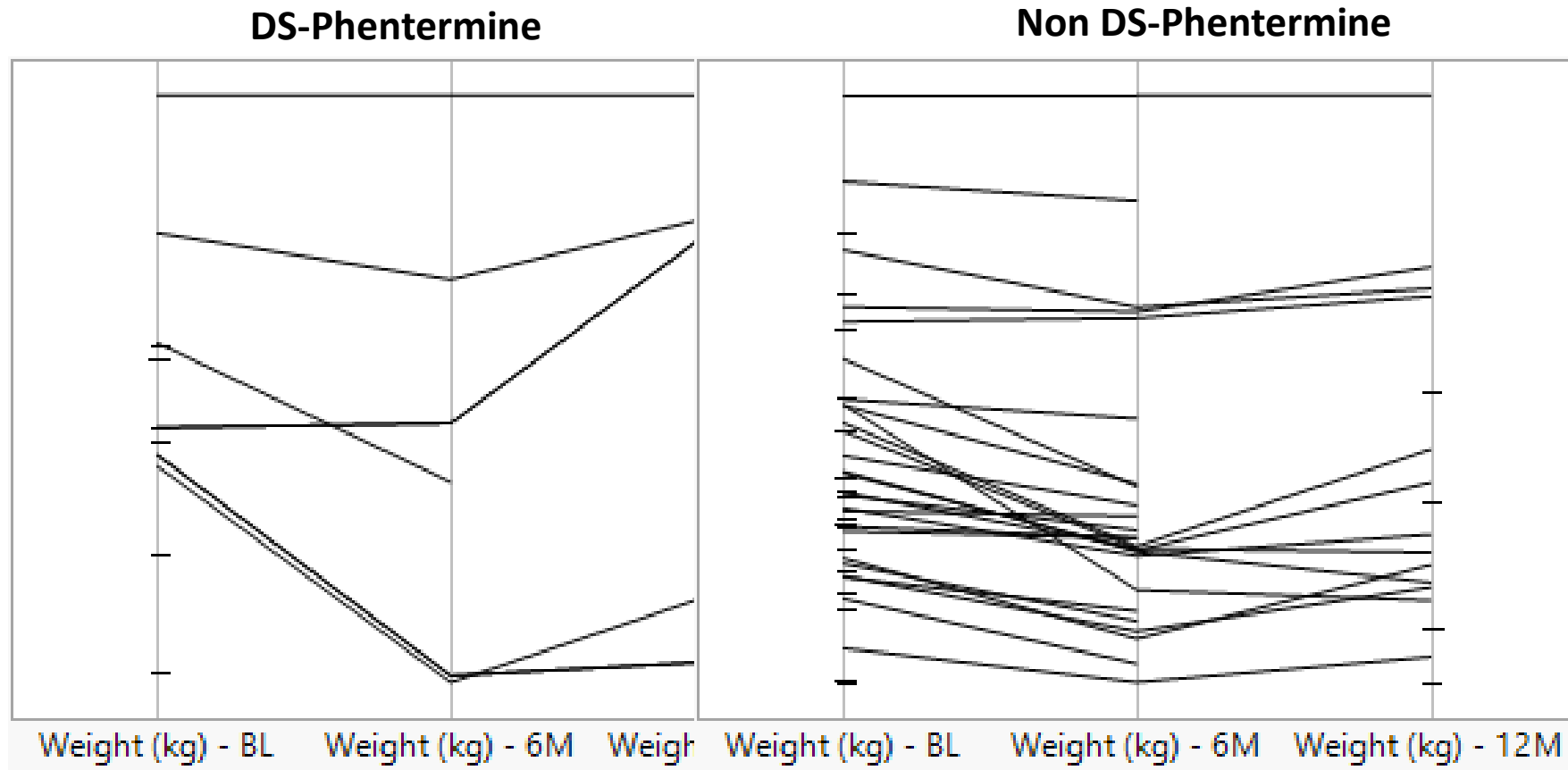


Efficacy of Phentermine in DS as compared with non-DS

Single center Electronic Chart review of 95 Individuals with and without who have obesity between 2015-2023

	DS-GLP1 (n=37)	DS-Phen (n=14)	Non DS-Phen (n=44)
Age (years)	38.0 (25.0-43.0)	27.0 (22.8-41.5)	24.5 (23.0-26.0)
Female n (%)	24.0 (64.9%)	9.0 (64.3%)	35.0 (79.5%)
Weight (kg)	92.2 (76.5-104.4)	77.7 (74.6-86.2)	105.5 (94.0-122.0)
Height (cm)	149 (145.3-154.9)	149.2 (142.9-154.3)	165.1 (160.0-170.2)
BMI (kg/m ²)	40.1 (35.5-44.1)	34.5 (32.6-42.7)	40.0 (35.8-43.8)
A1c (%)	5.3 (5.0-6.0)	5.1 (4.7-5.6)	

Efficacy of Phentermine in DS as compared with non-DS



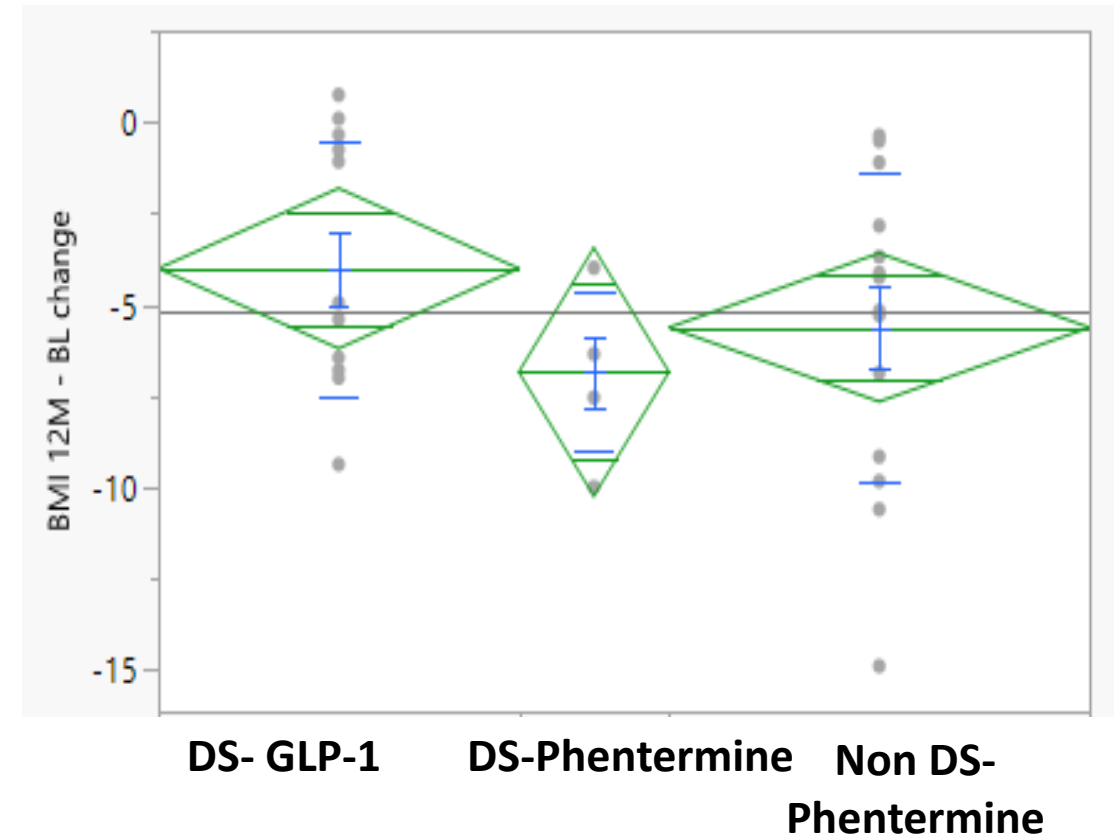
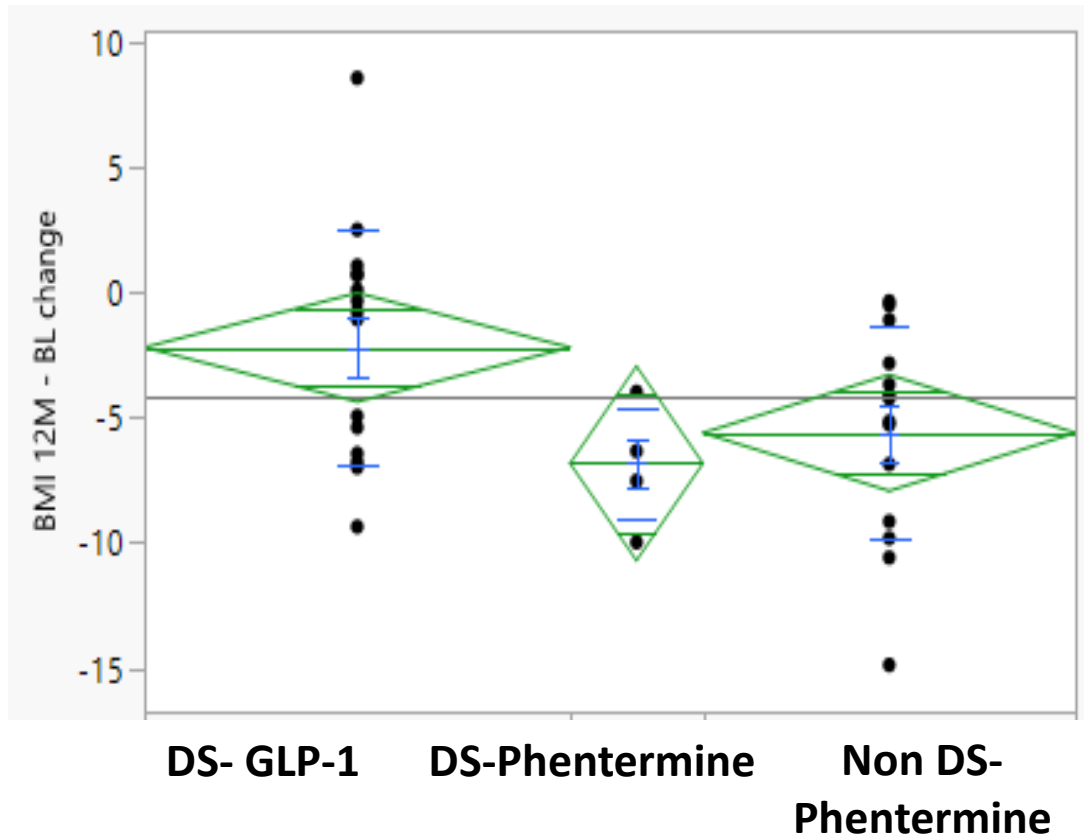
Mean weight loss of 10.28 (+/- 3.98) kg

Mean weight loss of 14.4 (+/- 2.98) kg

P=0.39 between groups

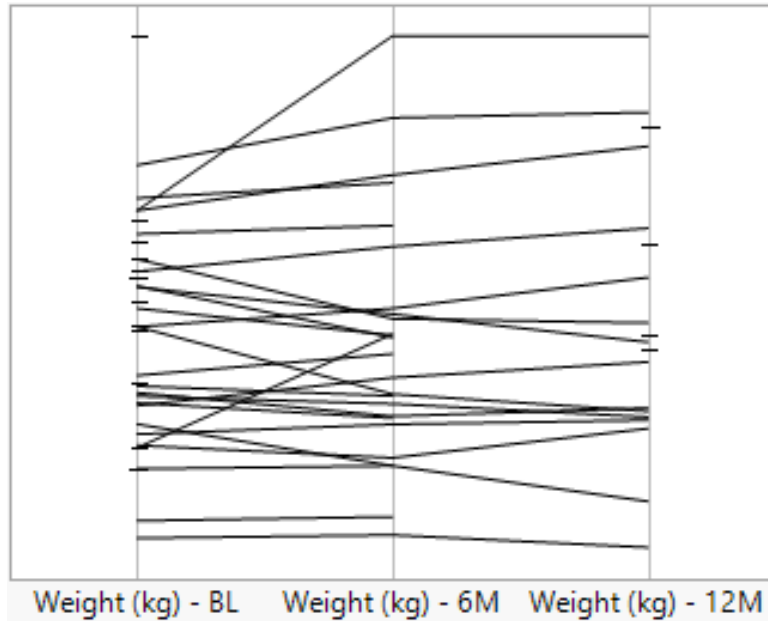
Unpublished Data

Efficacy of GLP-1 and Phentermine in DS



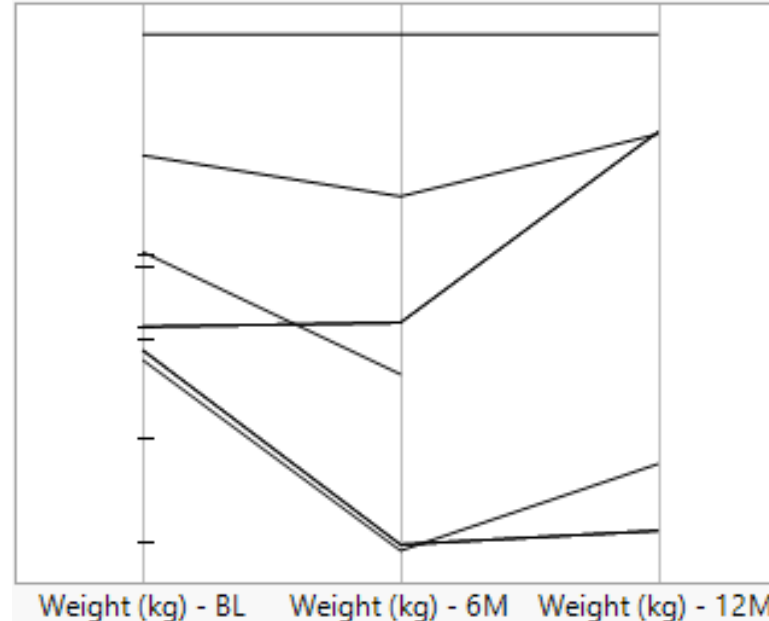
Efficacy of Phentermine in DS as compared with non-DS

DS- GLP-1



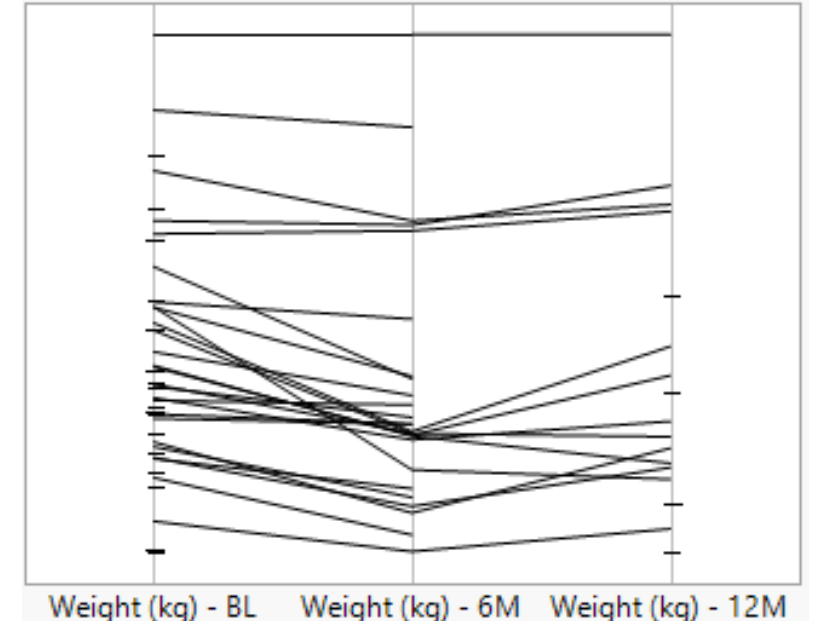
Mean weight loss of
3.84 (+/- 2.42) kg

DS-Phentermine



Mean weight loss of
10.28 (+/- 3.98) kg

Non DS-Phentermine



Mean weight loss of
14.4 (+/- 2.98) kg

P=0.39 between groups

EVIDENCE → TO PRACTICE

>>> Real-Life & Special Considerations in Down Syndrome

What the guidelines don't always tell us...



REAL PEOPLE.
Real Lives.



INDIVIDUAL NEEDS.
Individualized Care.



CONTEXT MATTERS.
Family. Community.
Resources.



PARTNERSHIP.
Empower. Include.
Collaborate.



Modify GLP-1 GI Effects

Eat smaller meals and eat slower

Avoid constipation

Take about 15 – 20 minutes to eat your meal

Slow titration

Add fruits, vegetables, whole grains and lean proteins to meals

Limit foods that are spicy, greasy or fried

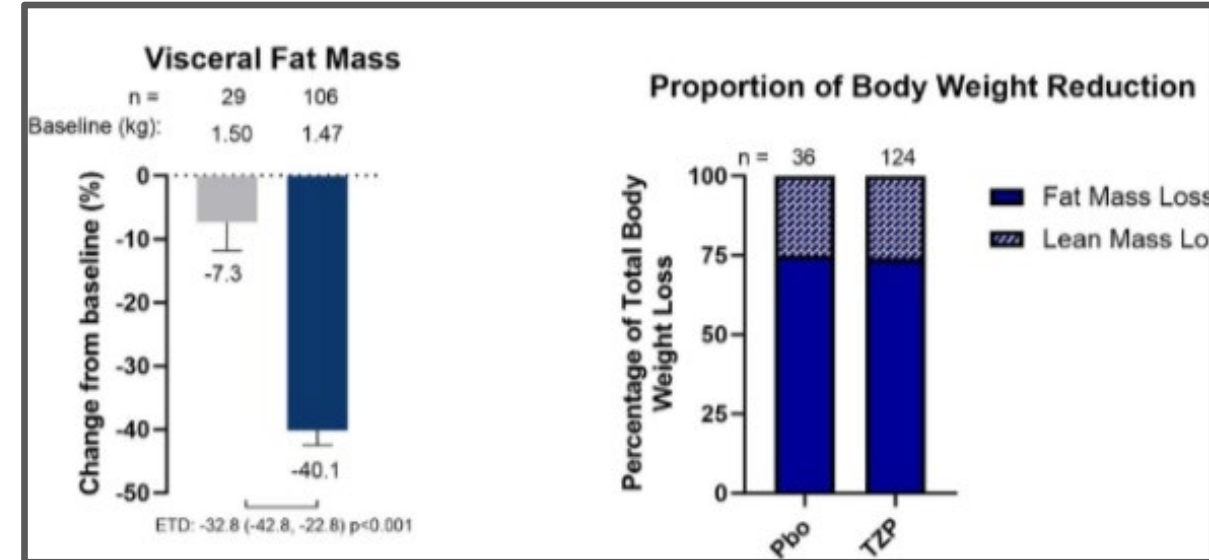
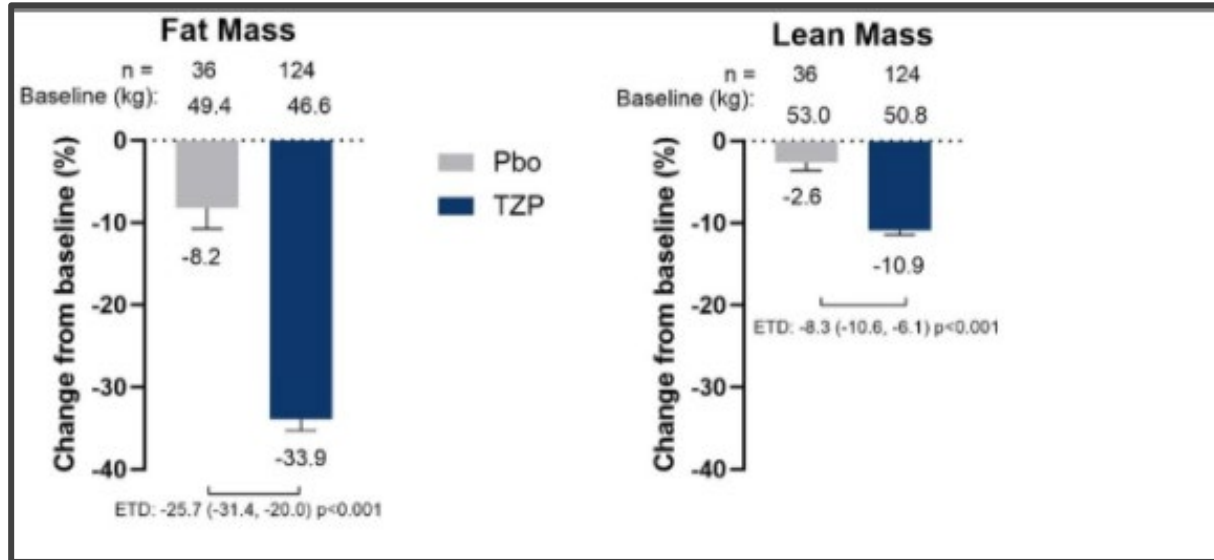
Drink water instead of sweet drinks

Attention to Nutrition and Exercise with GLP-1

Strength/Resistance Exercise	Cardiovascular/Aerobic Exercise
2-3 Sessions per week	150 minutes per week (moderate or higher intensity)
Resistance training helps with muscle growth, retention and bone density	Cardiovascular exercise helps with endurance, heart health, and weight management
30-60 minutes per session	Daily activity is best, 10-30 minutes per session
8-10 different exercises per session	Individuals with DS have a blunted response to cardiovascular exercise
2-3 sets of 8-12 reps per exercise	Individuals with DS have a lower heart rate
Can use bodyweight, machines, free weights, resistance bands	To calculate target heart rate, use the DS specific formula: $181.81 - 0.665 \times \text{age}$
Start slow and progress as your body adapts to exercise and medication	Use DS-specific target heart rate for heart rate zones

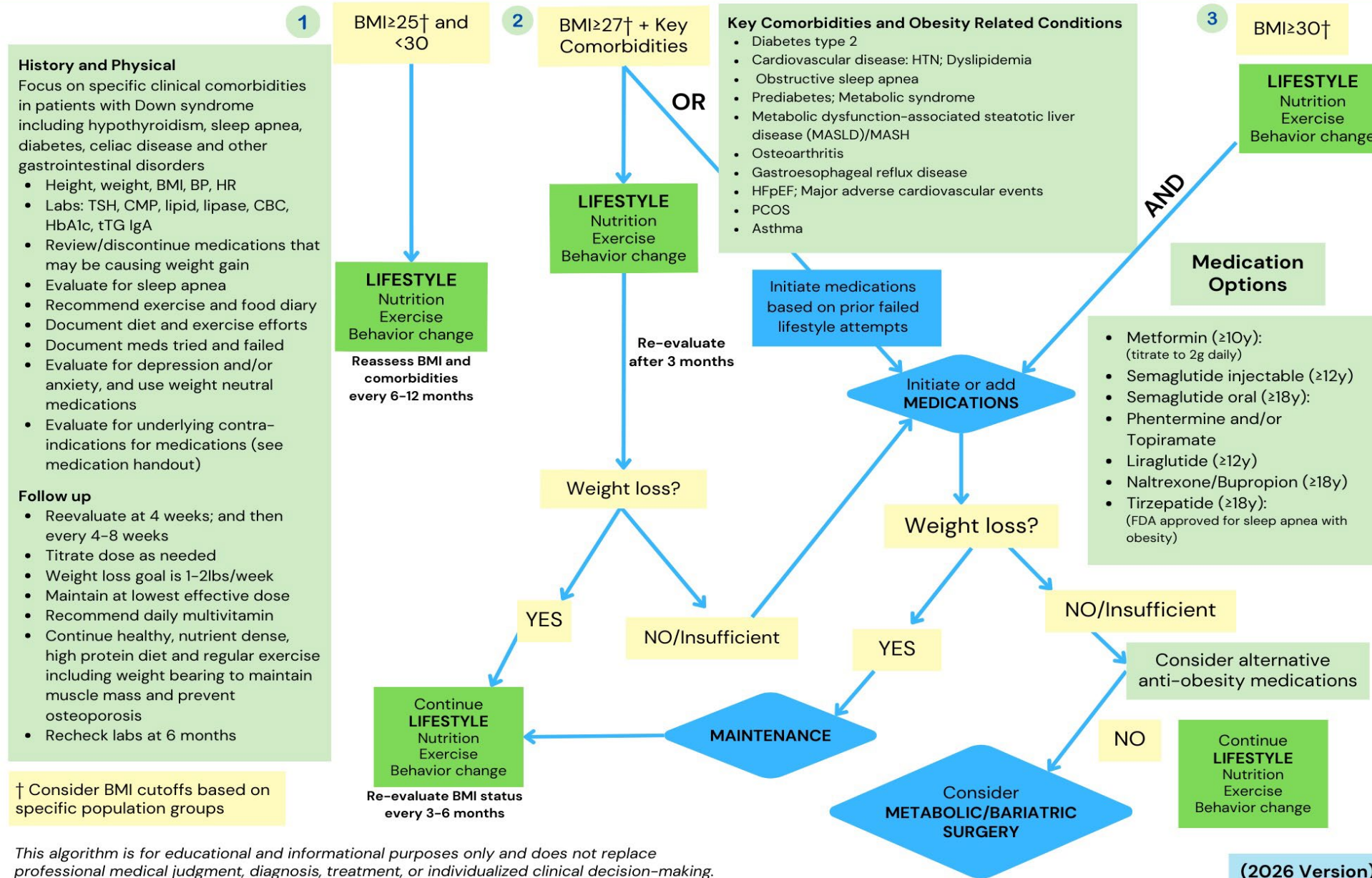
Food Groups to Encourage	Food Groups to Minimize
Fruits	Refined carbohydrates
Vegetables	Sugar-sweetened beverages
Whole grains	Red and processed meats
Dairy	Most fast foods
Lean proteins	Sweets and savory snacks
Nuts and seeds	Fried, greasy foods
Plant fats/oils	
Habits to Encourage	Habits to Minimize
Regular, small meals	Emotional or nighttime eating
Mindful eating	Long periods without meals
Include a protein at every meal	Consumption of large meals
Drink at least 8 cups of water a day	Distracted eating
Take a multivitamin and vitamin D supplements if indicated	

SURMOUNT 1 Trial : Body Composition



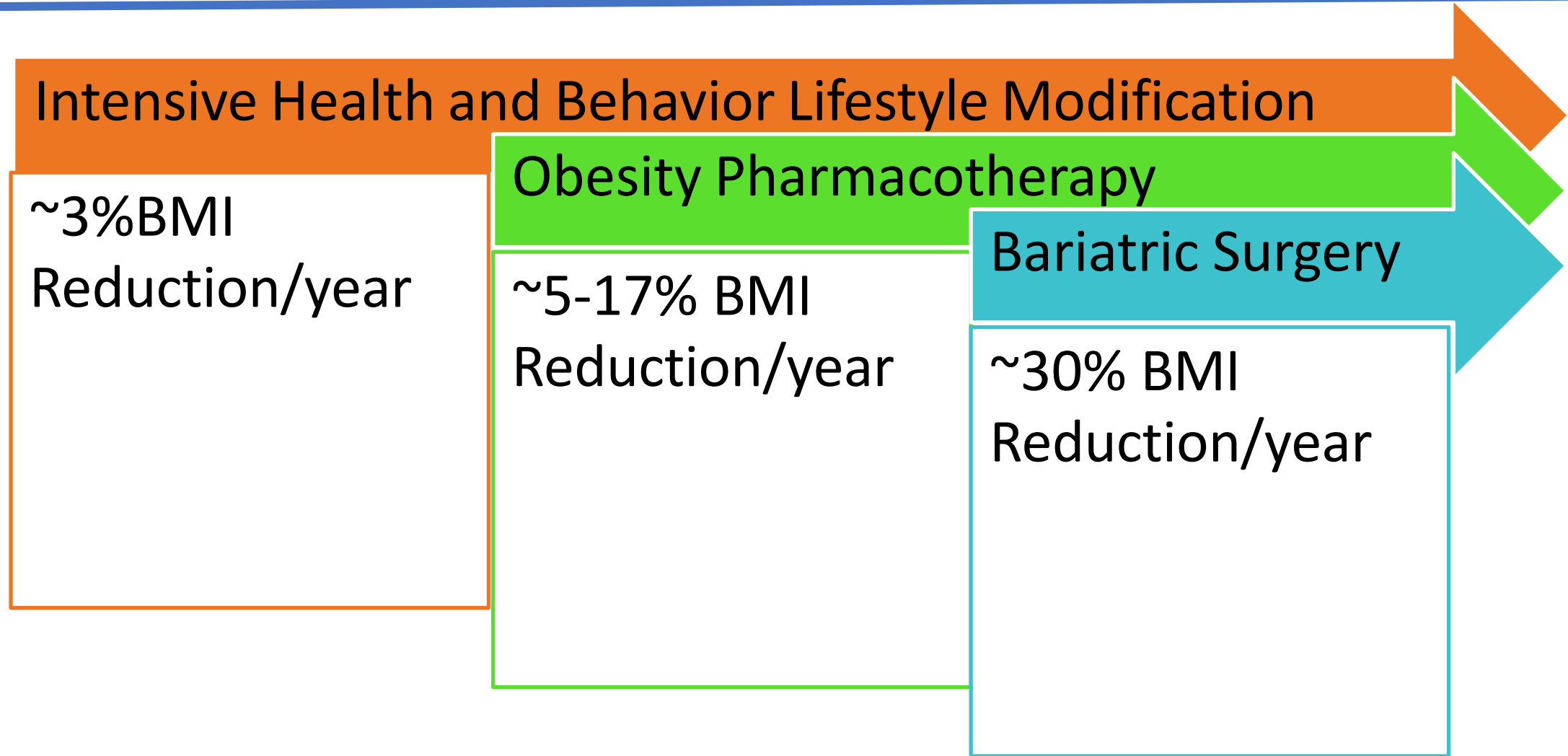
- ✓ Skeletal muscle changes with GLP-1RA treatments may be ADAPTIVE
- ✓ Reductions in muscle volume commensurate with ageing, disease status, and weight loss achieved
- ✓ Improvement in insulin sensitivity and muscle fat infiltration = improved muscle quality & lowering the probability for loss in strength and function

Algorithm for Management of Overweight and Obesity in Adolescents and Adults with Down Syndrome



This algorithm is for educational and informational purposes only and does not replace professional medical judgment, diagnosis, treatment, or individualized clinical decision-making.

Multi-Modal Approach



MBS – Types and Indications

INDICATIONS:

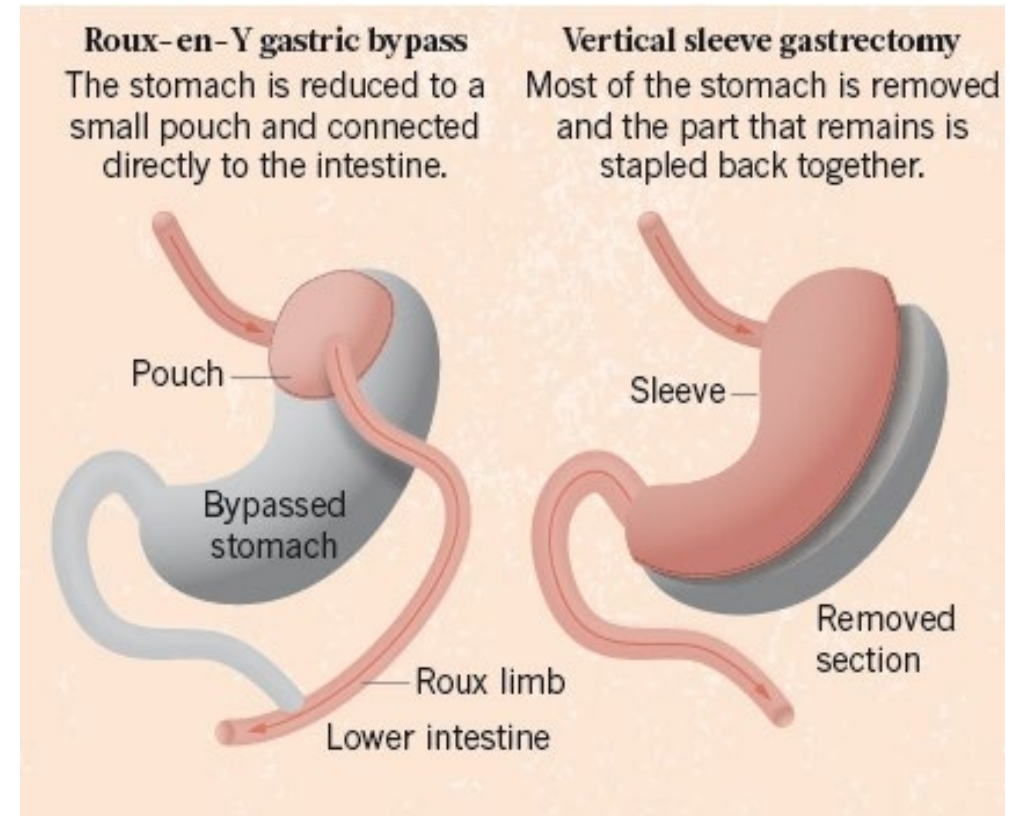
1. BMI ≥ 35 kg/m² or $\geq 120\%$ of the 95th %ile with one comorbid condition

- OSA (AHI > 5 events/h)
- Type 2 diabetes
- NASH
- HTN (on medications)
- PCOS

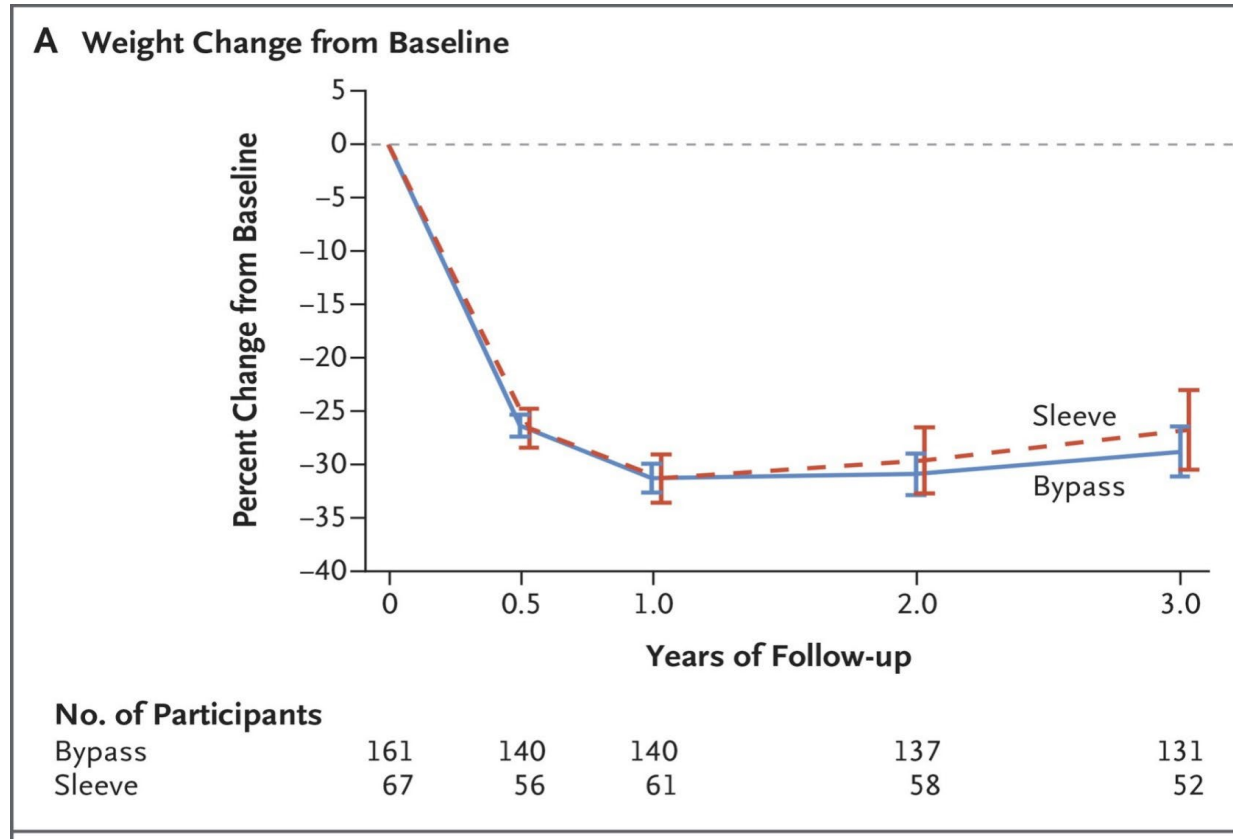
2. BMI ≥ 40 kg/m² or $\geq 140\%$ of the 95th %ile

CONTRAINDICATIONS:

- Pregnant or breast-feeding adolescents
- Unresolved substance abuse, eating disorder
- Untreated psychiatric disorder
- Suicidal attempt in the last year



Weight Loss at 3 Years After Surgery- TEEN Labs



At 3 years:

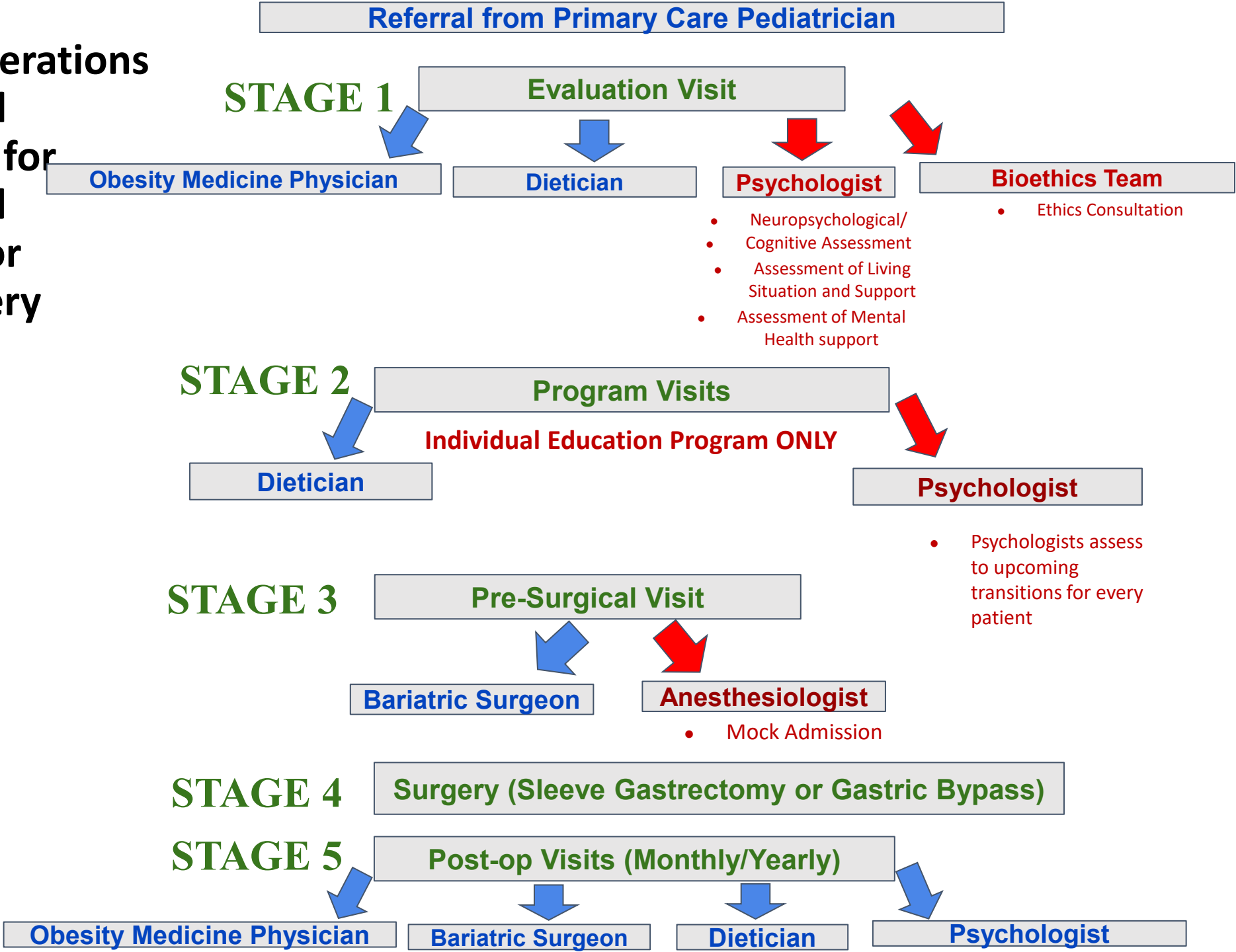
- 26% of the participants no longer had obesity
- 85-90% of participants had a 10% or greater reduction in BMI

Case Series

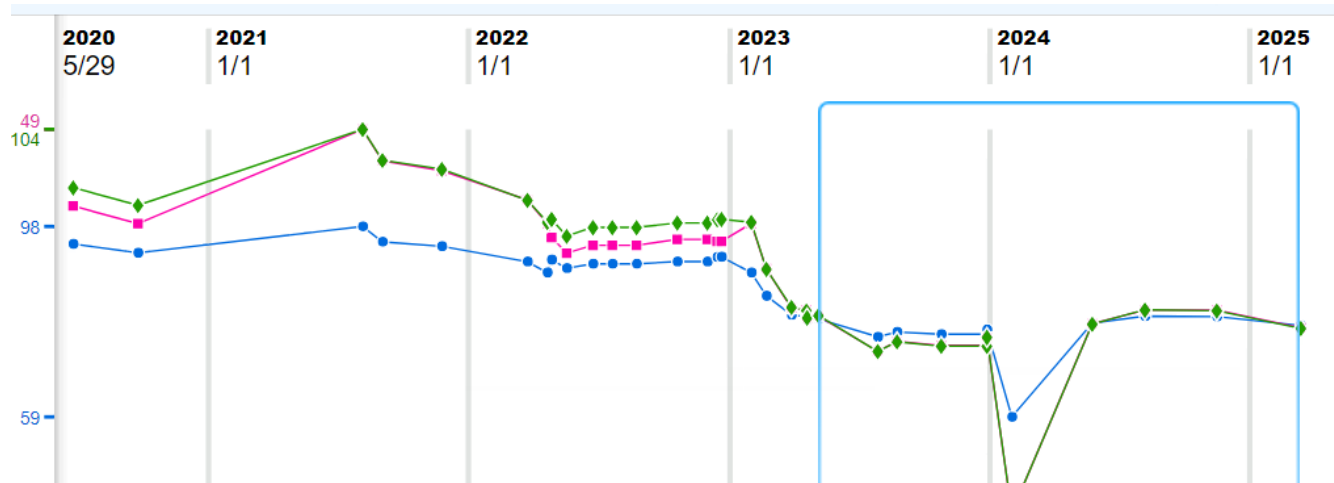
Clinical Findings of Three Neuro-atypical Adolescents with Severe Obesity Who Underwent Bariatric Surgery

Age/Sex	Race	Neuroatypical Diagnosis	Level of Function	Comorbid condition(s)	Initial Weight/BMI (lbs)/(kg/m ²)
14/F	African American	Autism	Severely Impaired	Polycystic Ovarian Syndrome Prediabetes	306/52.8
18/F	African American	Autism and Trisomy 21	Severely Impaired	Obstructive Sleep Apnea Back Pain	270.5 /61
21/F	Asian	Trisomy 21	Mild-moderate impairment	Obstructive Sleep Apnea Prediabetes Hypertriglyceridemia Hyperinsulinemia	216.1/48.43

Special Considerations
and Additional
Requirements for
Neuro-atypical
Adolescents for
Bariatric Surgery



Metabolic and Bariatric Surgery as an Option

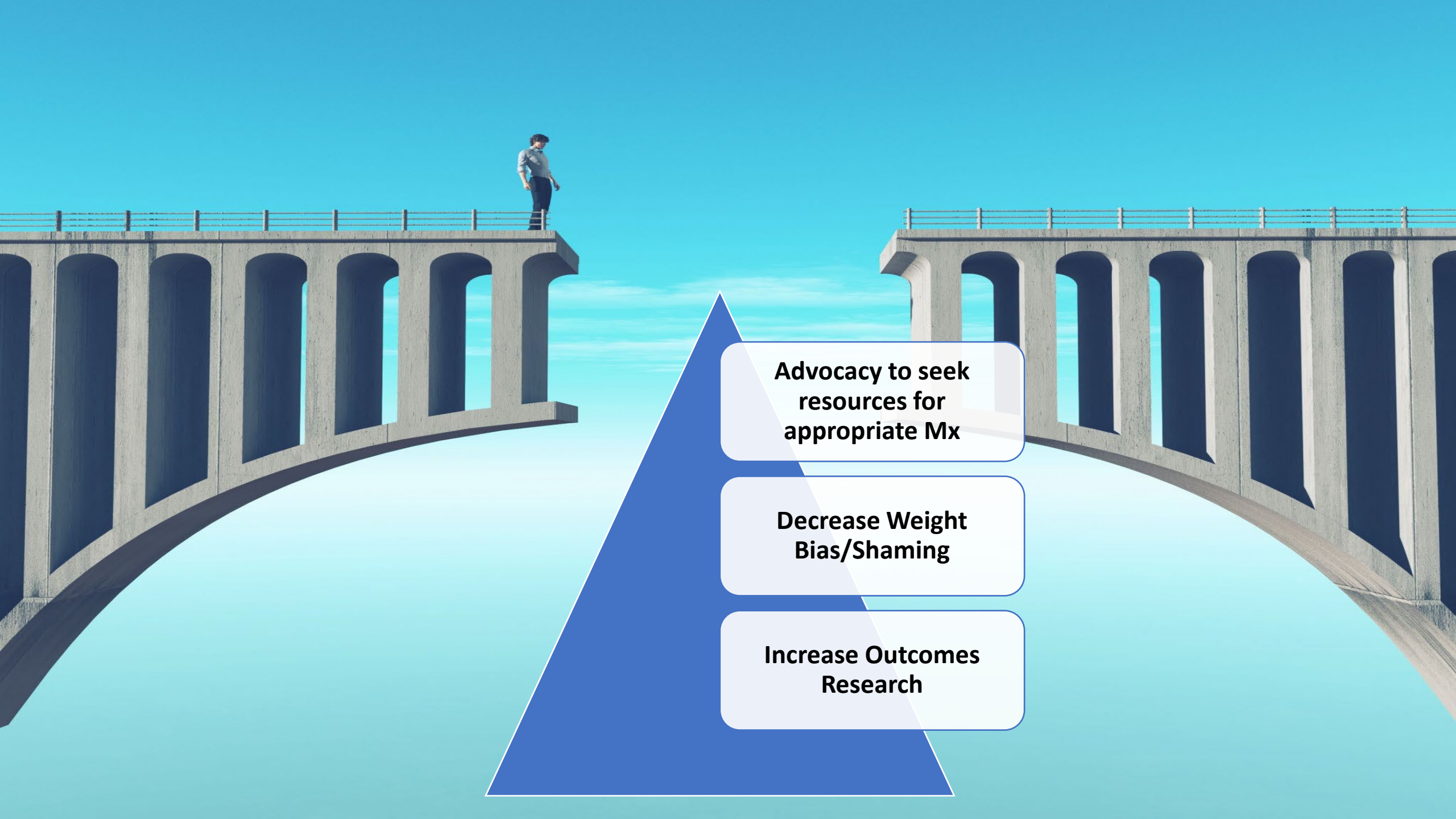


Preop Wt – 202 Lb
Post Op Wt – 172 lb
% TBW Loss about 18%



Take Home Points

- Rates of Obesity are high and associated with complications
- CDC BMI growth charts are preferred for detection of obesity
- Evolving data on the effectiveness and side effects of AOMs in DS population
- Special considerations for nutrition and exercise while using GLP-1s in DS
- MBS may be effective in DS
- We need clinical trials to evaluate the efficacy and safety of weight loss medications and/or surgery in individuals with Down syndrome



**Advocacy to seek
resources for
appropriate Mx**

**Decrease Weight
Bias/Shaming**

**Increase Outcomes
Research**



Thank You

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<https://www.uclahealth.org/departments/pediatrics/singhal-lab>

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