

Pediatric Obesity Treatment with Pharmacotherapy

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Objectives

- Identify many factors contributing to making obesity a progressive, chronic, and complex disease
- Describe anti-obesity medications for pediatric obesity
- Explain monitoring, side effects, and contraindications for anti-obesity medications

Case

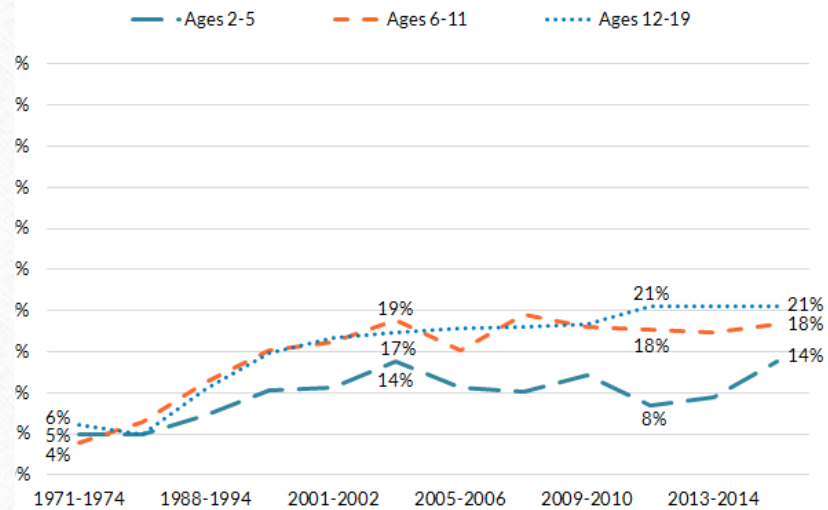
- 16 yo male had been coming to Wellness Works for almost 2 years
- He has been working on healthy lifestyle changes – drinking more water, going to the gym 2-3 times/week, weight-lifting but trying to do more cardio
- Reports he doesn't eat a lot during meals but snacks throughout the day
- Admits he eats when he is bored at home – currently summer, trying to stay busy
- Doesn't feel he eats large amounts of food, no guilt associated with eating
- Sleeping 11p/12a-9am, +snoring, good energy level during the day
- No symptoms of anxiety, depression, or ADHD

Case Continued

- Blood Pressure: 117/89, 118/77
- BMI: 170% of 95th percentile (Class III obesity)
- HbA1c 5.8 – prediabetes range
- ALT 52 - elevated
- Lipid panel normal

- Patient and his mother are interested if there is any medication that he could take to help with weight loss.

Percentage of Children Ages 2 to 19 Who Are Obese, by Age: Select Years, 1971-2016



Source: Data for 1971-2014: Fryar, C. D., Carroll, M. D., & Ogden, C. L. (2016). Prevalence of overweight and obesity among children and adolescents aged 2-19 years: United States, 1963-1965 through 2013-2014. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. Retrieved from https://www.cdc.gov/nchs/data/hestat/obesity_child_13_14/obesity_child_13_14.pdf.
Data for 2015-2016: Hales, C. M., Carroll, M. D., Fryar, C. D., & Ogden, C. L. (2017). Prevalence of obesity among adults and youth: United States, 2015-2016 (NSCH Data Brief No. 288). Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. Retrieved from <https://www.cdc.gov/nchs/products/databriefs/db288.htm>.
childtrends.org

Public Health Concern

- NHANES data from 2017-2018 reported prevalence of 19.3% in youth and severe obesity as high as 6%
 - 12-19 years old 21.2%
 - 25.6% in Hispanic youth; 26.9% Mexican American youth; 24.2% non-Hispanic Black youth
- Children with obesity are 5 times more likely to have obesity as adults than children without obesity
- Obesity is a **chronic & progressive disease**.

CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care

American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

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

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Treatment Experience of Obesity as a Chronic Disease

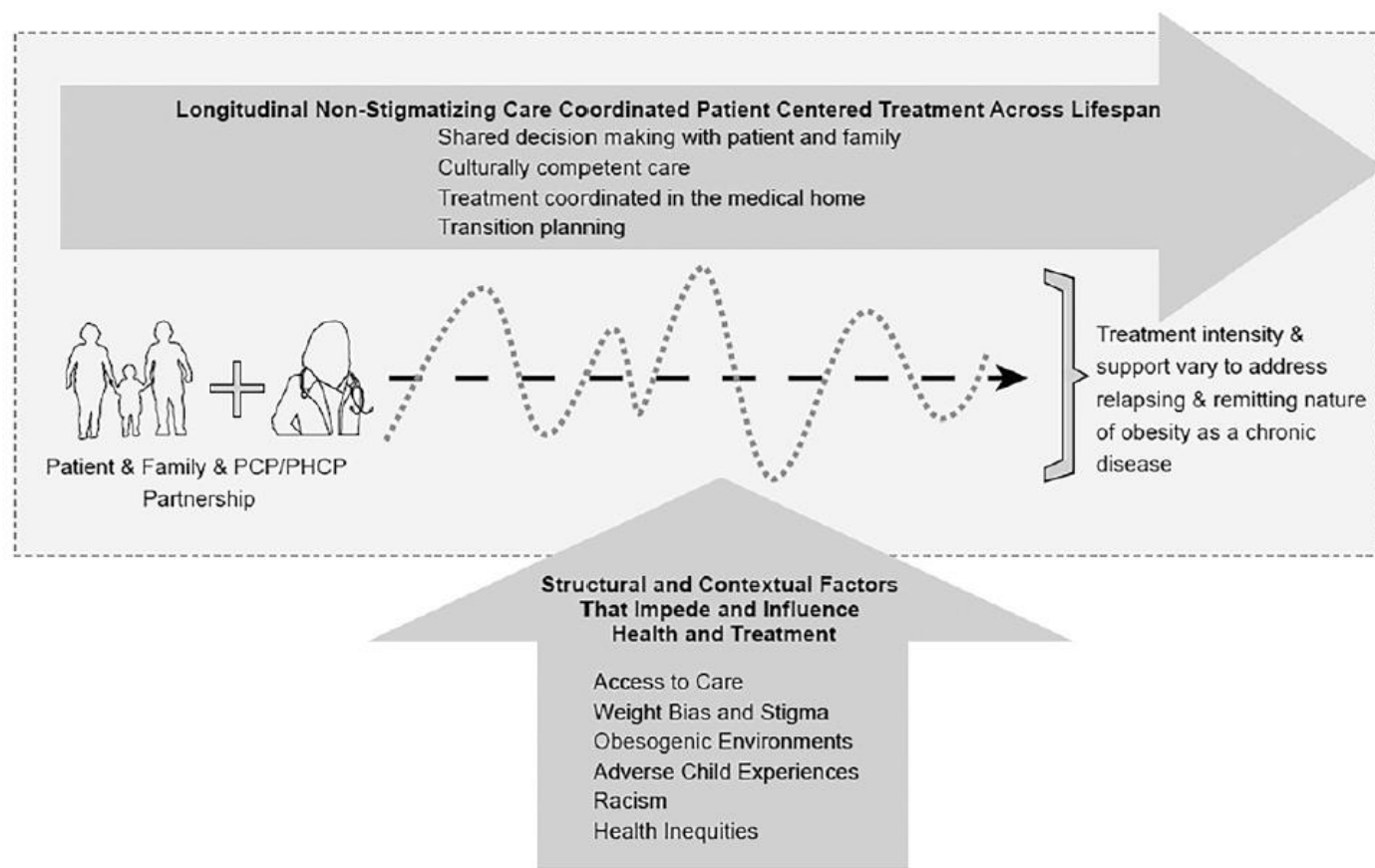


FIGURE 1

Treatment experience of obesity as a chronic disease (this figure illustrates how longitudinal care is important to help address this chronicity and to address and buffer the social and contextual factors that influence a person's health).

Managing Obesity in Primary Care

- Top 3 chronic conditions of childhood

asthma - 8.3%

ADHD – 9.8%

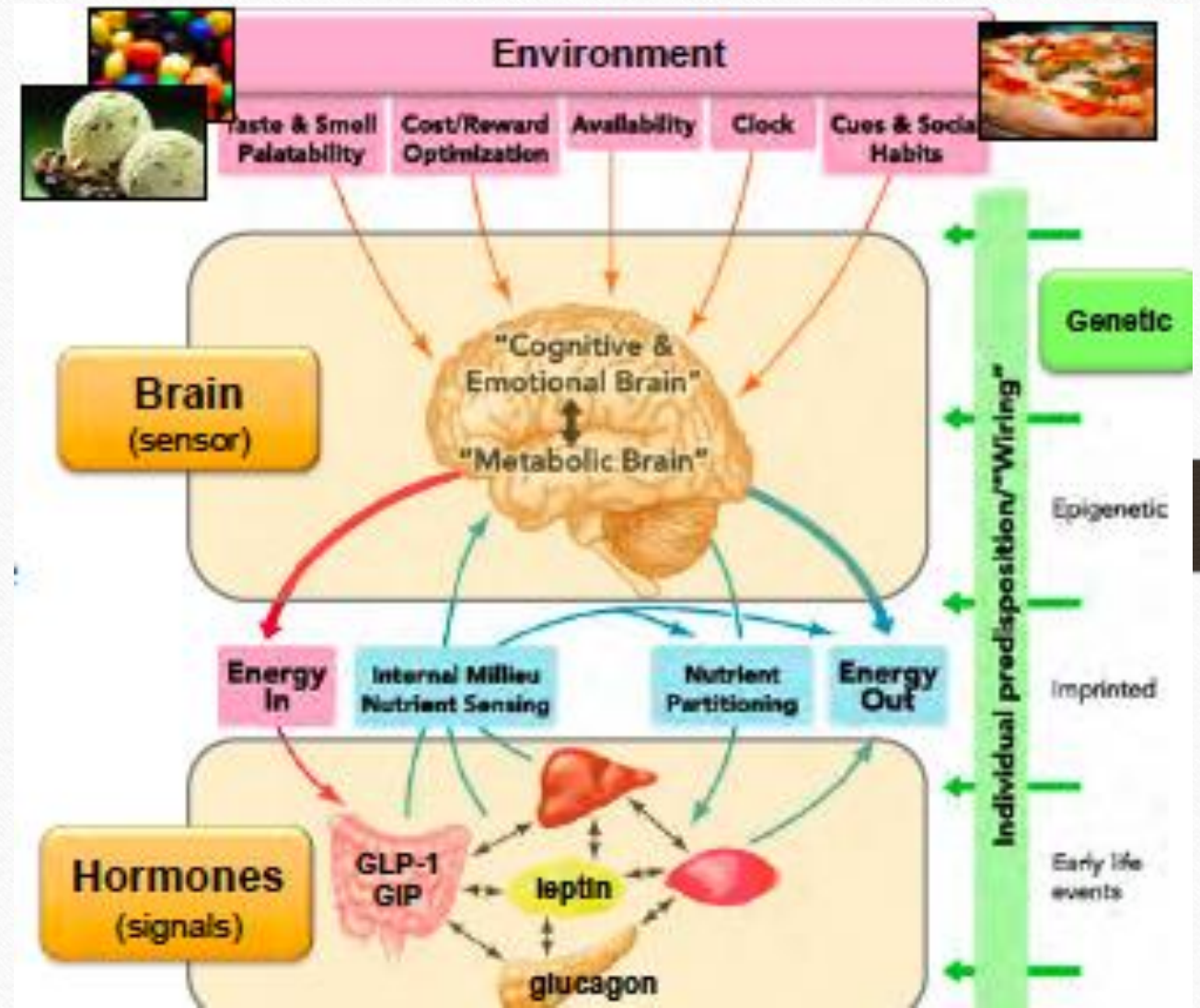
Obesity – 19%

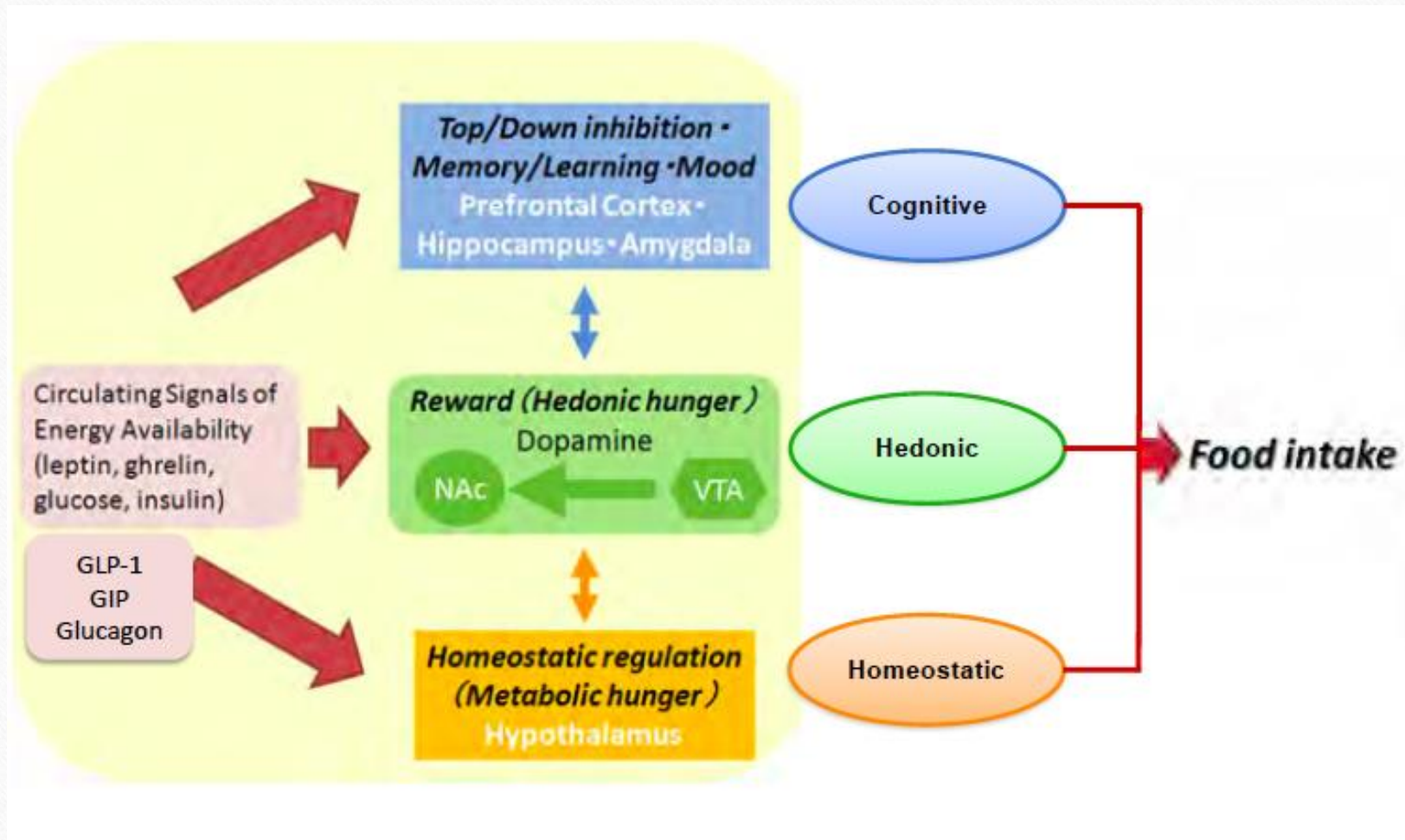
Need to dispel many myths of obesity.

- **Children will not outgrow obesity due to so many prevalent risk factors.**
- **Obesity is a disease, not a lifestyle choice.**

It's not so simple!

- Fat mass – our body's defense against starvations
- Brain/body defends the fat mass set point
- Fat mass set point is regulated by the brain





Jania Jastreboff, Weill-Cornell Obesity Medicine course, 2022.



- Genetics
- Socioeconomic Status/Food Insecurity
- Sleep
- Early-life risk factors
- Microbiome
- Children with special healthcare needs
- Psychosocial stress/Mental Health

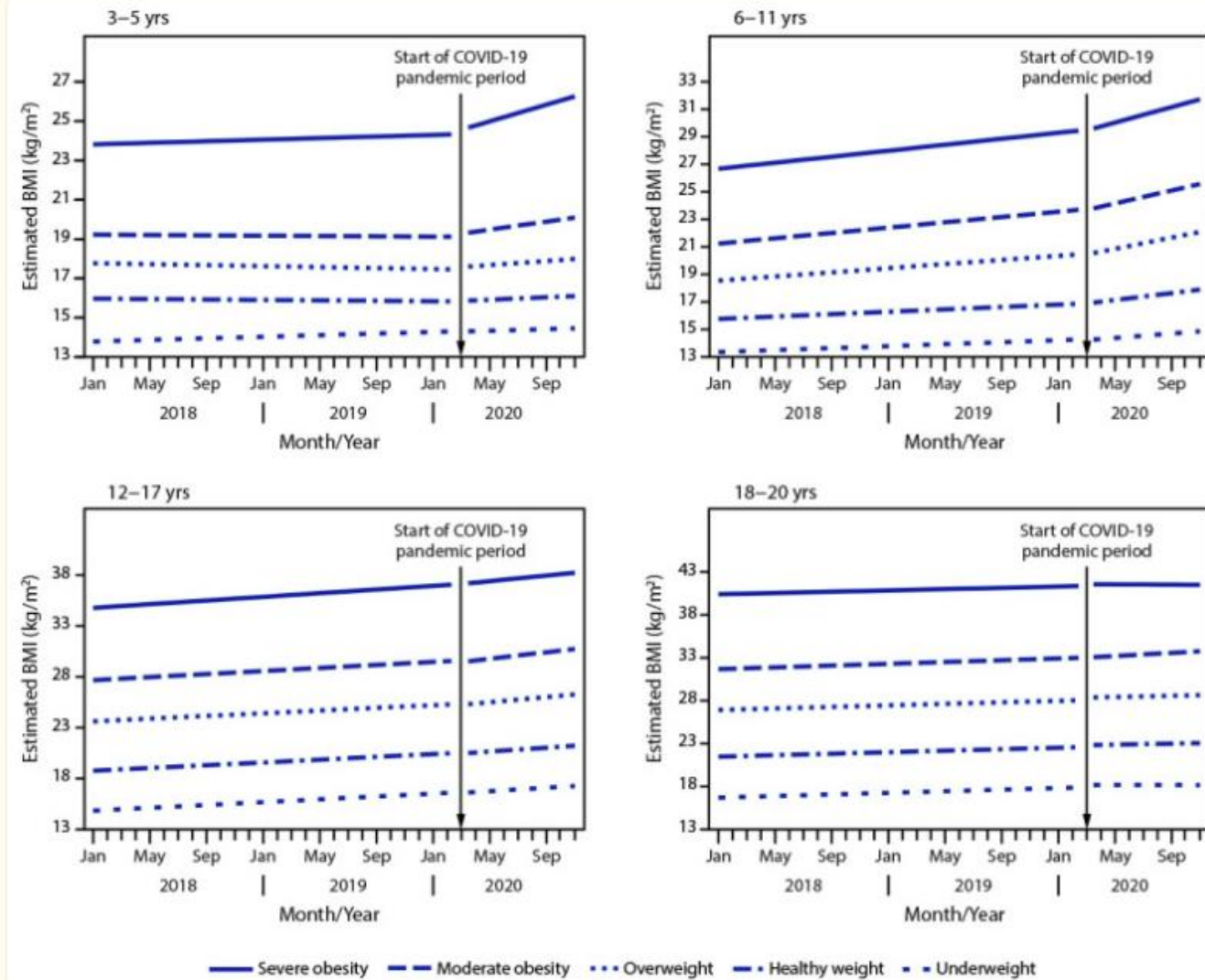
KAS 2: Pediatricians and other PHCPs should evaluate children 2 to 18 y of age with overweight (BMI \geq 85th percentile to $<$ 95th percentile) and obesity (BMI \geq 95th percentile) for obesity-related comorbidities by using a comprehensive patient history, mental and behavioral health screening, SDoH evaluation, physical examination, and diagnostic studies.

Obesity & Covid

- COVID disrupted children and adolescents structured routines.
- Families who were disproportionately affected by obesity pre-pandemic were more likely to experience an impact on income, food, and other social determinants of health
- The estimated proportion of persons aged 2-19 years old with obesity was 19.3% in August 2019 and 22.4% in August 2020
- The monthly rate of increase in BMI nearly doubled during the COVID-19 pandemic compared with a pre-pandemic period
- 6-11 year old children experienced largest increase in rate of BMI change; pandemic rate was 2.5 times as high as pre-pandemic rate

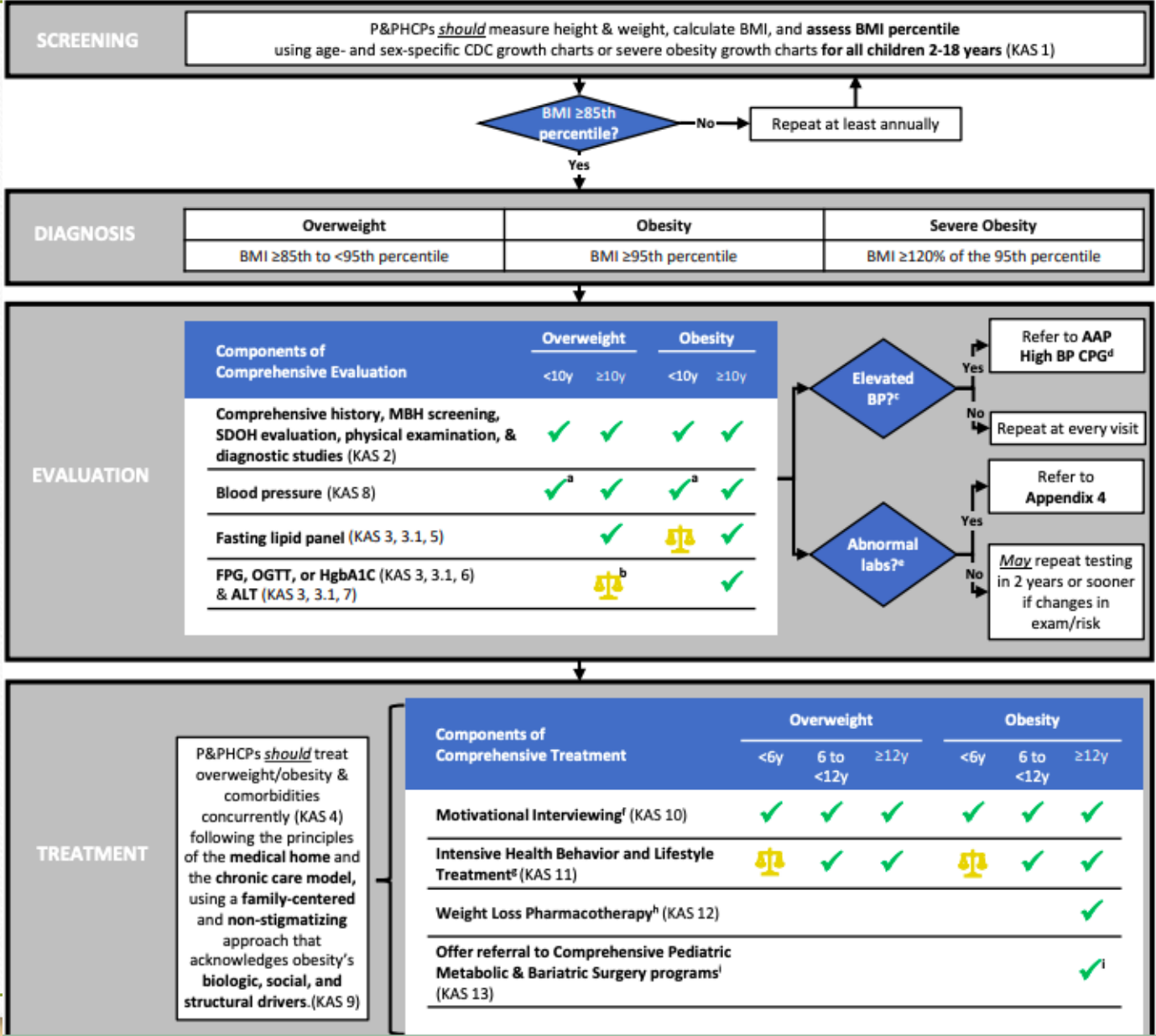


Lange, et al, MMWR,2021



Estimated Body Mass Index Before and During the COVID-19 Pandemic Jan 2018 – November 2020, Lange, MMWR, 2021 . Lange, MMWR, 2021.

APPENDIX 1 Algorithm for Screening, Diagnosis, Evaluation, and Treatment of Children and Adolescents with Obesity



Treatment of Pediatric Obesity

Refer early to Intensive Health Behavior & Lifestyle Treatment, no watchful waiting

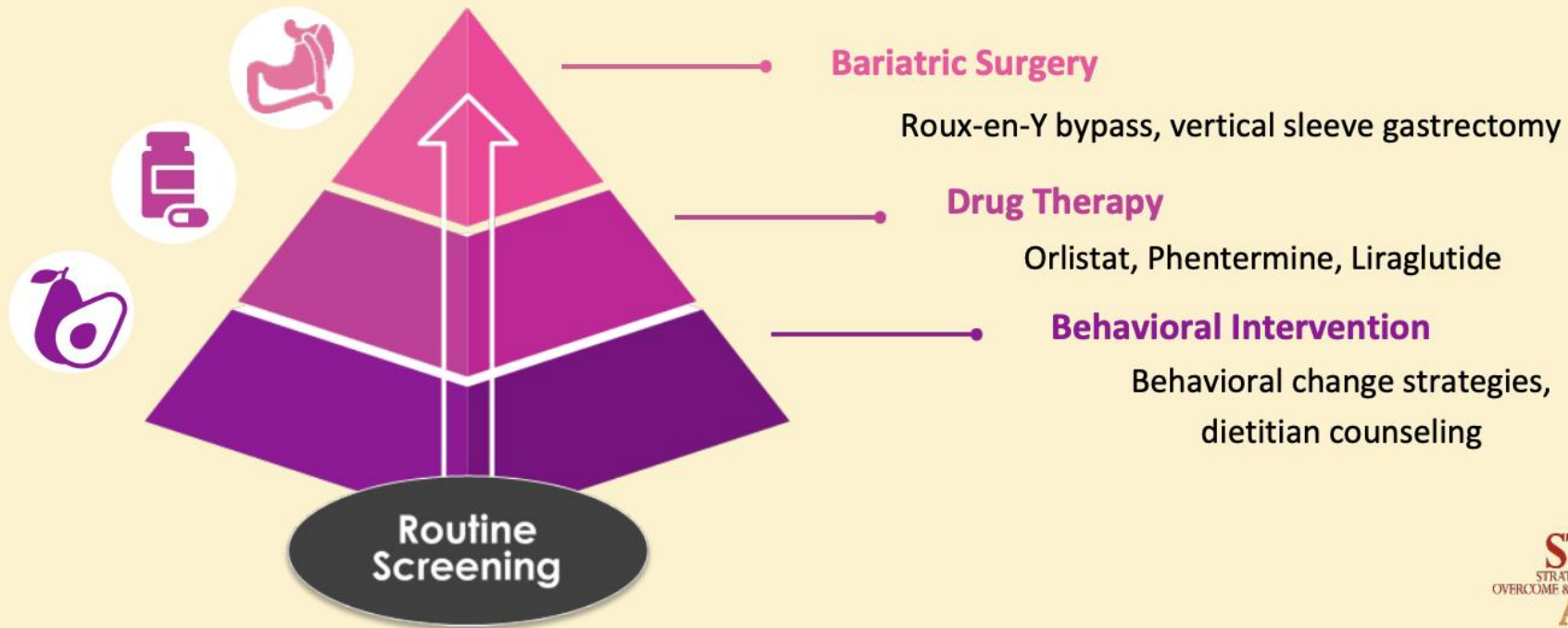
3% reduction in BMI in 1 month
predicted 5% reduction in BMI in
1 year

USPSTF ≥ 26 contact hours of
behavioral interventions over 12
months

Wellness Works Program

- 2-21 years old
- Offer visits in Mount Pleasant, North Charleston, Summerville, and virtual visits throughout South Carolina, also available with School-based Health Program
- Dietician visits every month and physician visit every 3-6 months, Physical Therapist, & Psychologist too!
- Exercise sessions everyday
- Group sessions once/week
- Curriculum includes individual sessions on healthy eating, safe exercising, reading food labels, limiting tempting foods and screen time, goal setting, self-monitoring, rewards, and problem solving
- Place referral to Heart Health in epic

KAS 11: Pediatricians and other PHCPs should provide or refer children 6 y and older (Grade B) and may provide or refer children 2 through 5 y of age (Grade C) with overweight (BMI \geq 85th percentile to $<$ 95th percentile) and obesity (BMI \geq 95th percentile) to intensive health behavior and lifestyle treatment. Health behavior and lifestyle treatment is more effective with greater contact hours; the most effective treatment includes 26 weeks of face-to-face family-based treatment with 2 to 12 sessions.



Anti-Obesity Pharmacotherapy

- There haven't been many options until recently
- Offer all treatment at once, no need to wait
- New FDA approved medications is the dawn of a new era
- Remember: obesity is a chronic disease. Treat obesity like you would treat any other chronic disease.

KAS 12: Pediatricians and other PHCPs should offer adolescents 12 y and older with obesity (BMI \geq 95th percentile) weight loss pharmacotherapy, according to medication indications, risks, and benefits, as an adjunct to health behavior and lifestyle treatment

Weight Promoting Medications:

Antihistamines
Steroids
Amitriptyline
Paroxetine
Sertraline
Carbamazepine
Gabapentin
Valproate
Aripiprazole
Clozapine
Haloperidol
Mirtazapine
Olanzapine
Quetiapine
Risperidone
Ziprasidone
Propranalol

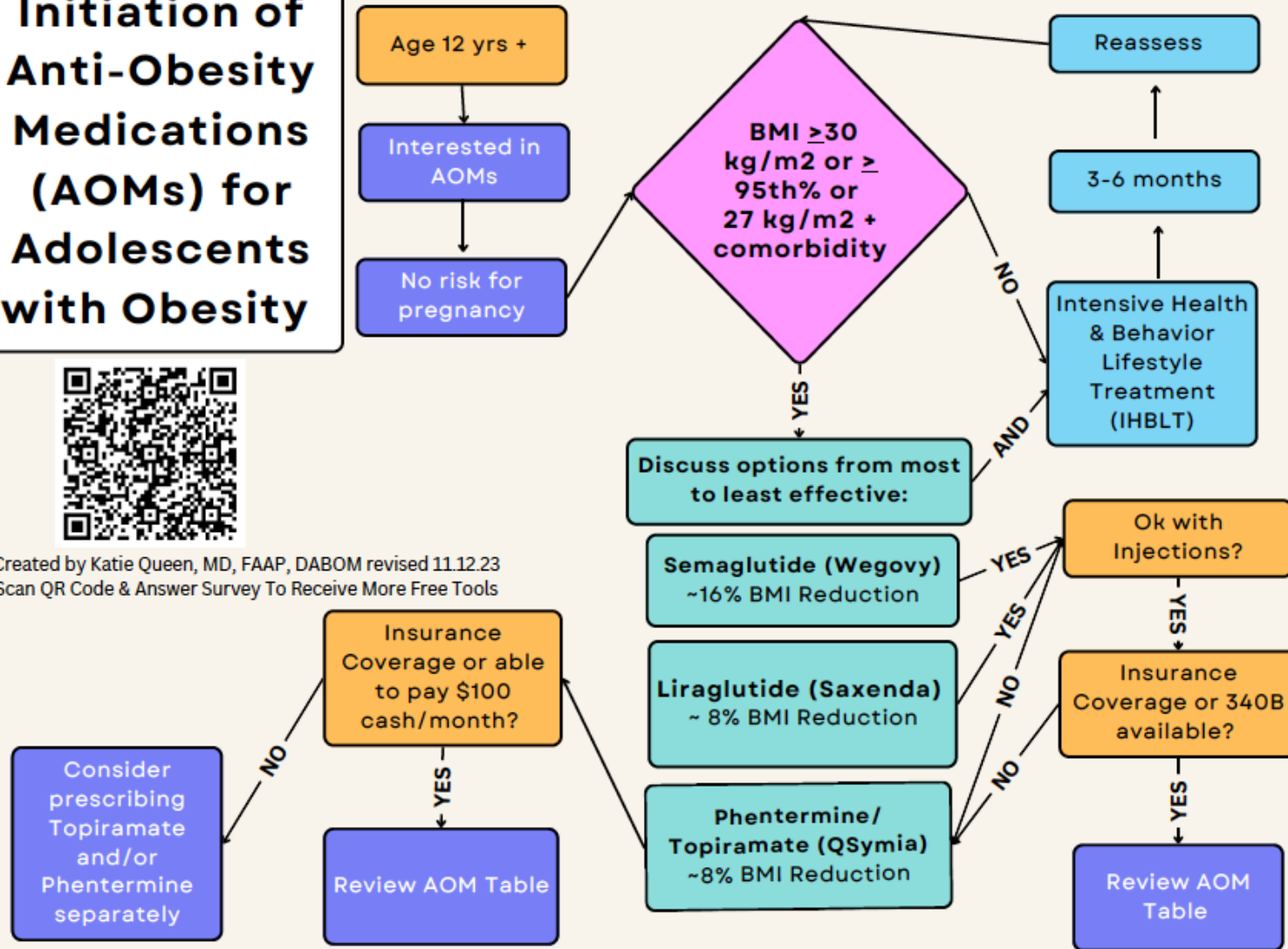
Weight Neutral Medications:

Inhaled nasal steroids
Montelukast
Bupropion
Buspirone
Citalopram
Trazadone
Venlafaxine
Escitalopram
Fluoxetine
Lamotrigine
Topiramate
Levetiracetam
Zonisamide
Amphetamine
Methylphenidate

Initiation of Anti-Obesity Medications (AOMs) for Adolescents with Obesity



Created by Katie Queen, MD, FAAP, DABOM revised 11.12.23
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Currently FDA Approved Adolescent Anti-Obesity Medication (AOM) Table

Created by Katie Queen, MD, FAAP, DABOM katiequeen3@gmail.com, revised 10.7.23

| Medication & Dosing | Mechanism of action | Mean BMI Reduction | Contraindications | Precautions | Good Choice For: | Side effects |
|--|---|------------------------|--|--|--|---|
| <p>Semaglutide (Wegovy) - 0.25 mg weekly x 1 month 0.5 mg weekly x 1 month 1 mg weekly x 1 month 1.7 mg weekly x 1 month 2.4 mg weekly</p> <p>Liraglutide (Saxenda) 0.6 mg daily x 1 week, then 1.2 mg daily x 1 week, then 1.8 mg daily x 1 week, then 2.4 mg daily x 1 week, then 3 mg daily</p> | <p>GLP1 Class: - Binds and activates GLP-1 receptors in brain, gut, pancreas, heart - Reduces hunger and cravings - Improves satiety - Improves insulin sensitivity</p> | <p>~16%</p> <p>~8%</p> | <p>~ Personal or FHx MEN2, medullary thyroid cancer ~ Pregnancy ~ Nursing</p> | <p>- Pancreatitis - Gallbladder Dz - Insulin - GERD</p> | <p>- Prediabetes/Diabetes - Strong hunger & cravings (hungry brain) - Poor Satiety (hungry gut) - NAFLD</p> | <p>- Nausea/Vomiting - Diarrhea/Constipation - Headaches - Dyspepsia/GERD - Abd Pain - Fatigue/Dizziness - Injection site rxn</p> |
| <p>Phentermine/Topiramate (Qsymia)</p> <ul style="list-style-type: none"> • 3.75 mg Ph/23 mg T QAM • Increase to 7.5 mg Ph/46 mg T after 2 weeks • If <3 % wt loss at 3 months, increase to 11.25 mg Ph/69 mg T x 2 wks then • Max 15 mg Ph/92 mg T | <p>- Sympathomimetic, - GABA receptor modulation - Controlled Substance (class IV) - Carbonic anhydrase inhibition - Reduces hunger and cravings - Improved satiety - Can NOT stop abruptly, must wean off higher doses or seizures can occur</p> | <p>~8-10%</p> | <p>- Cardiovascular Dz - Uncontrolled HTN - MAOI Use - Hyperthyroid - Glaucoma - Hx Drug Abuse - Agitated State - Pregnancy - Nursing - Hypersensitivity Hx</p> | <p>- Insomnia - Other stimulant use - SSRIs - Insulin - Renal impairment - HTN (controlled) - Alcohol Use - Kidney stones - Metabolic acidosis - Poor cognitive function, academic problems - Developmental Delay - Severe Depression/Anxiety</p> | <p>- Strong Hunger & Cravings (hungry brain) - Poor Satiety (hungry gut) - Low Energy (slow burner)</p> <p>- Binge eating symptoms - Atypical anti-psychotic wt gain - Migraines/Headaches - Night eating - Hx seizures</p> | <p>- HTN - Tachycardia - Insomnia - Dry Mouth, - unpleasant taste</p> <p>- Paresthesias - Fatigue, Dizziness - Constipation - Cognitive challenges - Depression/Anxiety - Arthralgias, - Ligament sprain</p> |

Semaglutide (Wegovy)

- GLP-1 agonist, enhances glucose-dependent insulin secretion, suppresses glucagon secretion, slows gastric emptying, improved glucose control, decreased food intake and enhanced satiety

5-16% decrease in BMI

- FDA approved for children 12 years and older with obesity
- Weekly injections, Start at low dose and titrate up as tolerated
- Month 1: 0.25mg/Month 2: 0.50mg/Month 3: 1.0mg/Month 4: 1.7mg/Month 5: 2.4mg



Liraglutide (Saxenda)

- GLP-1 agonist, enhances glucose-dependent insulin secretion, suppresses glucagon secretion, slows gastric emptying, improved glucose control, decreased food intake and enhanced satiety
- 8% decrease in BMI
- FDA approved children 12 years and older
Daily injections
- Dosing Increases each week – 0.6mg, 1.2mg, 1.8mg, 2.4mg, 3.0mg



Semaglutide (Wegovy)/Liraglutide (Saxenda)

- Side effects: n/v/constipation, abdominal pain
watch for signs of pancreatitis, gallbladder disease, hypoglycemia, and depression
- Contraindications: Patients with aversion to needles, history of pancreatitis, personal or family history of medullary thyroid cancer or MEN type 2
- Contraception
- Insurance coverage is an issue
- Encourage high protein diet

Phentermine/ Topiramate ER (Qsymia)

- Norepinephrine reuptake inhibitor
- Modulation of GABA receptors
- 8-10% decrease in BMI
- FDA approved for adolescents 12 years and older with obesity
- Dosing: 3.75mg/23mg, 7.5mg/46mg, 11.25mg/69mg, 15mg/92mg



Phentermine/Topiramate ER (Qsymia)

- At 12 weeks after escalating to top dose: discontinue if patient hasn't experienced a reduction of at least 5% of baseline BMI
- Discuss contraception
- Insurance

Phentermine



- Schedule IV medication; ADHD stimulants are schedule II medications
- FDA approved for 16 years and older for short-term use (12 weeks), approved in 1959!
- Dosing: 8mg, 15mg, 37.5mg
- Side effects: Dry mouth, increased heart rate and blood pressure, insomnia, anxiety
- Contraindications: Cardiovascular disease, uncontrolled HTN, glaucoma, anxiety

Topiramate



- Topiramate is not FDA approved for obesity by itself
- Dosing: 25mg, 50mg, 100mg (target dose is 75-100mg)
- Side effects: Paresthesia, cognitive slowing
- Contraindications: Nephrolithiasis
- If discontinuing, taper dose due to possibility of precipitating seizures with abrupt cessation
- Can take phentermine and topiramate together or separate to help with hunger during different times of the day

Orlistat



- Intestinal lipase inhibitor that blocks fat absorption
- 3% body weight loss or $<1\text{kg}/\text{m}^2$ in BMI reduction
- FDA approved for obesity in adolescents 12 years and older
- Side effects: steatorrhea, fecal urgency, flatulence
- Contraindicated with chronic malabsorption syndrome, cholestasis, liver disease or renal impairment

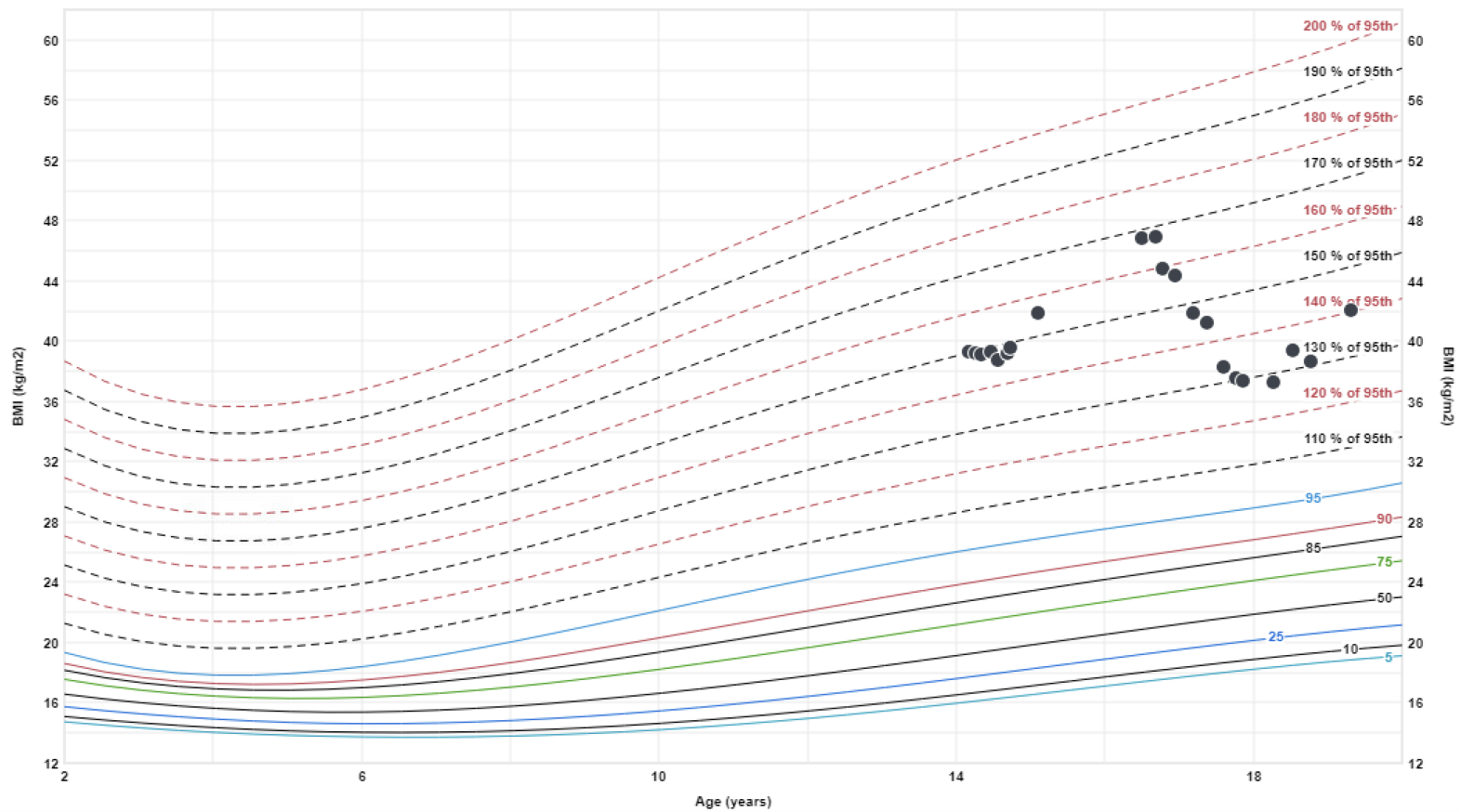
Setmelonotide

- Melanocortin 4 receptor agonist in patients with POMC, PCSK1, leptin receptor deficiency or Bardet-Biedl syndrome
- FDA approved for children 6 years and older with specific genetic mutation
- 8-10% decrease in BMI
- Consider genetic testing in specific patients
- Side effects: Injection site reaction, skin hyperpigmentation, GI symptoms, priapism
- Contraindicated in depression

Metformin & other options

- FDA approved for type 2 DM in patients 10 years and older
- Modest effects on weight loss
- Meta-analysis of 6 studies shows mean BMI reduction of $-0.86\text{kg}/\text{m}^2$
- May add with antipsychotic to help prevent weight gain/diabetes
- Important to screen for mental health concerns including binge eating disorder, anxiety, depression, & ADHD

Back to Our Case



Key Takeaways

- Obesity is a chronic disease. Once medication is started, it is likely needed long term.
- First step of pharmacotherapy is to look at current medications and see if any can be stopped or changed to weight neutral medications.
- Anti-obesity medication is a supplement to healthy lifestyle changes.
- Start low and go slow, one medication at a time, but polypharmacy is likely.

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