Pediatric (Ages 2-18) Obesity Algorithm

Universal Assessment at Well-Child or Obesity Visit

Obtain height, weight, blood pressure (BP), body mass index (BMI), and review age and sex specific CDC growth chart for 2-18 years.

Focus history and exam on risk factors (TABLE C), complications, and healthy behaviors/attitudes.
Assess Social Determinants of Health

Overweight	Obese	Severe Obesity
BMI 85-94%ile Z-Score +1-1.99 SD	BMI ≥95%ile Z-Score +2-2.99 SD	BMI ≥120% of the 95%ile Z-Score > +3 SD

Appropate Lab Testing

Evaluation	Overweight <10y	Overweight ≥10 y	Obesity <10y	Obesity ≥10 y
Fasting Lipid Panel	No	Yes	If risk factors present **TABLE C	Yes
FPG, OGTT, or Hgb A1C & ALT	No	If risk factors present *TABLE C	No	Yes

If labs abnormal, additional testing may be recommended. If labs within normal range, may repeat testing in 2 years or sooner if changes in exam or risks

Treatments

Intensive Behavioral Interventions – ages 6 years and older

Refer to pediatric weight management program or consider recommendations below when no program available

Utilize motivational interviewing (MI) techniques (TABLE A) to encourage nutrition, physical activity behavior, and lifestyle changes	Increase number of touch-points and decrease time between contacts. Aim for 26 contact hours or more in 3-12 months. Consider virtual touch-points.	Partner with and connect patients to community resources and programs.	Refer to additional clinicians including dietitian, physical therapy, health educator, and behavioral health specialist. *(when available)*

Pharmacotherapy – offer to ages 12 years and older with obesity

Use in adjunct with health behavior, diet, and lifestyle treatment.

Drug classes include: Anorexiants, Biguanides, Intestinal Lipase Inhibitor, GLP-1, Stimulants.
See TABLE B for full list of medications

Surgical Interventions – offer to ages 13 years and older with severe obesity

Refer to accredited metabolic and bariatric surgery center with experience and expertise in treatment of pediatrics.

Weight Criteria:
-Class 2 Obesity: BMI ≥ 35 or 120% of the 95%ile; whichever is lower PLUS comorbid condition+
OR
-Class 3 Obesity: BMI ≥ 40 or 140% of the 95%ile; whichever is lower. Comorbid condition+ not required.

+ *Comorbid conditions include: type 2 diabetes, obstructive sleep apnea, hypertension, dyslipidemia, GERD, NASH*

Non-stigmatizing Approach to Care

Obesity Treatment Principles

Obesity is a chronic medical condition which is complex, multifactorial, and requires a multidisciplinary approach

The American Academy of Pediatrics (2023) outlines that:

- "Evidence-based obesity treatment is effective and does not cause harm
- Treat patients with overweight and obesity promptly, using the most intensive obesity treatment available.
- Treat obesity concurrently with any comorbidities.
- Use a non-stigmatizing approach to treatment and shared decision making.
- Evidence-based treatment strategies include: motivational interviewing (MI), interdisciplinary approach to lifestyle treatment, pharmacotherapy, and surgery."

Talking Points

- Ask patient and family permission to talk about BMI and/or weight
- Use person-first language to avoid labeling
- Use language that is viewed as non-offensive, such as unhealthy weight and gaining too much weight for age/height/health.

Communicate Diagnosis to Patient and Family

American Academy of Pediatrics (2023) recommends the following verbiage:

- "There is nobody more important to the health of your child than you; I want to partner with you to help [patient name] work towards improved health
- I am concerned that [patient's name] weight might be having an impact on their physical body and their emotional well-being.
- The good news is we have many treatment options that can help [patient name]
- One of the ways I can best help you and [patient name] understand the impact [overweight/obesity] is having on their body is to get [labs and/or diagnostic test].
- Together, with information from the labs, tests, and key information from your family, we can work to develop a treatment plan specific to [patient's name].
- If it okay with you, I would like for us to meet again in a month to develop a treatment plan that we can collectively work on over this next year."

TABLE A

Motivational Interviewing (MI)

Engaging	Empathic reflections, open-ended questions, nonjudgmental graphics, affirmations, empathic reflections
Focusing	Readiness ruler, healthy habits survey, elicit-provide-elicit, identifying/ responding to change talk and sustain talk
Evoking	Values statement, double-sided and amplifies reflections
Planning	Readiness ruler, summarization, action relections, SMART goals, teach back

Evidence-based Behavioral Strategies to Explore with MI and lifestyle treatment

- Limit sugar-sweetened beverages
- Nutrition education and coaching
- 60 minutes of physical activity daily
- Limit sedentary time
- Age-appropriate number of hours of sleep

TABLE B

Pharmacotherapy

Medication and Efficacy	Dosing	Indications	Possible side effects
Metformin XR Expected weight loss: 1 BMI unit or <5% BMI	Oral: Initial: 500 mg once daily with dinner for 2 weeks; increase to 1,000 mg once daily for 2 weeks, and then 2,000 mg once daily; may slow titration if adverse gastrointestinal effects	T2DM in children 10 years and older. *Not FDA approved for weight loss.*	Nausea, bloating, gas, loose stools, lactic acidosis
Orlistat Expected weight loss: 2-3% BMI unit	Oral: 120 mg 3 to 4 times daily with each meal that contains fat.	Weight loss for children 12 years and older	Steatorrhea, gas, fecal urgency. *Side effects limit tolerability.*
Exenatide XR (GLP-1) Expected weight loss: 0.9-1.18 BMI unit	Bydureon SUBQ once weekly: 2 mg once weekly without regard to meals.	T2DM (in combination with lifestyle modifications) in children 10 years and older. *Not FDA approved for weight loss.*	Nausea, vomiting, slight increased risk of medullary thyroid cancer in pt with family history of multiple endocrine neoplasia syndrome type 2 *Side effects limit tolerability.*
Liraglutide (GLP-1) Expected weight loss: 4.5 kg of body weight or 5% BMI	Saxenda SUBQ daily: Initial: 0.6 mg once daily for 1 week; increase as tolerated by 0.6 mg/day increments at weekly intervals to a target dose of 3 mg once daily. Discontinue if the 2.4 mg dose is not tolerated	Weight loss in children 12 years and older	Nausea, vomiting, slight increased risk of medullary thyroid cancer in pt with family history of multiple endocrine neoplasia syndrome type 2 *Side effects limit tolerability.*
Semaglutide (GLP-1) Expected weight loss: 16.1% BMI	Wegovy SUBQ once weekly: *Week 1- 4 :* 0.25 mg weekly Week 5-8: 0.5 mg weekly Week 9-12: 1 mg weekly Week 13-16: 1.7 mg weekly Week >17: 2.4 mg weekly If maintenance dose of 2.4 mg is not tolerated, decrease to 1.7 mg once weekly	Weight loss in children 12 years and older under brand name Wegovy	Nausea, vomiting, fatigue, headache, pancreatitis, slight increased risk of medullary thyroid cancer in pt with family history of multiple endocrine neoplasia syndrome type 2 *Side effects limit tolerability.*
Phentermine Expected weight loss: 5% BMI	Oral: *Recommended starting dose:* 7.5 mg, 15 mg. May increase to 30 mg or 37.5 mg. Take with breakfast. May be split into 2 doses if needed.	Short term therapy for weight loss (3 months) in children 16 and older *Effectiveness does not always increase with increased dosage	Elevated blood pressure, dizziness, headache, tremor, dry mouth, and abdominal pain.
Phentermine-Topiramate Expected weight loss: 10.44% BMI (high dose) 8.11% BMI (mid dose)	Qsymia Oral: *Initial:* 3.75 mg phentermine/23 mg topiramate once daily for 14 days, then increase to - *Mid dose*: 7.5 mg phentermine/46 mg topiramate once daily. *High Dose:* 15 mg phentermine/ 92mg topiramate	Weight management in children 12 and older	Elevated blood pressure, dizziness, headache, tremor, dry mouth, and abdominal pain. Cognitive slowing which can interfere with schoolwork. Teratogen, requires reliable birth control.
Lisdexamfetamine Expected weight loss: No data available to demonstrate efficacy	Vyvanse oral: Initial: 20 to 30 mg once daily in the morning; may increase in increments of 10 mg/day or 20 mg/day until optimal response is obtained; maximum daily dose: 70 mg/day	ADHD in children 6 years and older. Binge eating disorder in children 18 and older. *Not FDA approved for weight loss.*	Increased blood pressure, increased heart rate, slowed growth, aggressive behavior, increased suicidal thoughts, insomnia

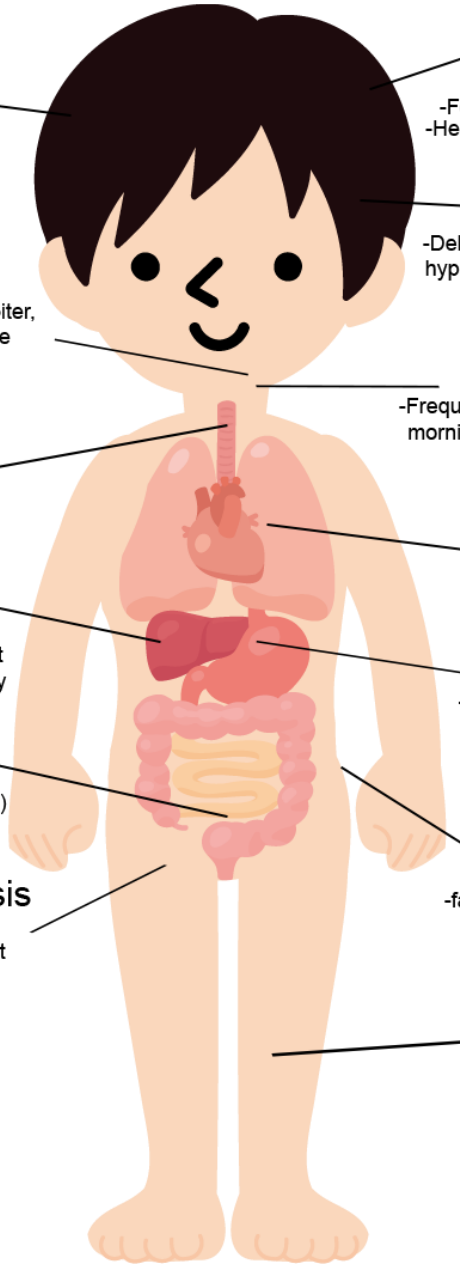
Dosing Information Resource: UptoDate and Hampl et al., 2023. Study Data, Indications, Side Effects Resource: Hampl et al., 2023

TABLE C

Obesity Associated Conditions and Risk Factors

***risk factors for indications for impaired fasting glucose labs**

****risk factors for lipid panel labs**



Depression
-Irritability, fatigue, excessive sleeping, poor school performance, family conflict, sadness, anhedonia, flat affect, substance abuse

Hypothyroidism
-Declining growth, short stature, delayed puberty, goiter, poor school performance, lethargy, cold intolerance

Gastroesophageal Reflux Disease
-Heartburn, regurgitation, epigastric pain, nausea, dysphagia, cough

Nonalcoholic Fatty Liver Disease
-Male sex, over 10 years old, co-morbidities present
-Asymptomatic vague abdominal pain, hepatomegaly

Polycystic Ovarian Syndrome
-Menstrual irregularities 2 years after menarche
-Signs of androgen excess (hirsutism, acne, alopecia)

Slipped Capital Femoral Epiphysis
-Male sex, rapid growth
-Lower extremity pain, limited hip ROM, uneven gait

Idiopathic Intracranial Hypertension
-Female of child-bearing age, hormone disorder
-Headaches, tinnitus,visual changes, papilledema

Prader Willi Syndrome
-Delayed development, slow growth, short stature, hyperphagia, behavior issues, learning disabilities

Obstructive Sleep Apnea
-Frequent snoring, daytime sleepiness, distrubed sleep, morning headaches, learning problems, large tonsils,

Hypertension
-Obstructive sleep apnea, physical inactivity

*Prediabetes / Diabetes
-Polydipsia, polyphagia, polyuria, nocturia, enuresis,acanthosis nigricans, blurred vision, fatigue

**Dyslipidemia
-family history of ASCVD, DM (I or II), HTN, smoke exposure, nicotine use

Blount Disease
-Lower leg bowing
-Ambulation before 12 months

References

American Academy of Pediatrics. (2023). *Algorithm for Screening, Diagnosis, Evaluation and Treatment of Pediatric Overweight and Obesity.* https://downloads.aap.org/AAP/PDF/Obesity/CPG-Obesity%20Algorithm%2011.17.pdf

American Academy of Pediatrics. (2023). *Obesity Treatment and Approach in the Primary Care Office.* https://downloads.aap.org/AAP/PDF/Obesity/Treatment%20Flow_12.19.22.pdf

American Academy of Pediatrics Institute for Health Childhood Weight. (2023). *Evaluation and treatment of children and adolescents with overweight and obesity: Coding quick reference card.* https://downloads.aap.org/AAP/PDF/Obesity/Coding%20Reference%20Sheet_12.19.22.pdf

Hampl, S. E., Hassink, S. G., Skinner, A. C., Armstrong, S. C., Barlow, S. E., Bolling, C. F., Avila Edwards, K. C., Eneli, I., Hamre, R., Joseph, M. M., Lunsford, D., Mendonca, E., Michalsky, M. P., Mirza, N., Ochoa, E. R., Sharifi, M., Staiano, A. E., Weedn, A. E., Flinn, S. K., Lindros, J., … Okechukwu, K. (2023). Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity. *Pediatrics*, *151*(2), e2022060640. https://doiorg.ezproxy.lib.ndsu.nodak.edu/10.1542/peds.2022-060640

Lexicomp (n.d.). Drug information. *UpToDate.* Retrieved August 16, 2023, from https://www.uptodate.com/contents/table-of-contents/drug-information