ALGORITHM FOR ASSESSMENT AND MANAGEMENT OF

Childhood Obesity in Patients 2 Years and Older

Assess Behaviors

Assess healthy eating and active living behaviors

Provide Prevention Counseling

5 fruits and vegetables, 2 hours or less of screen time, 1 hour or more of physical activity, 0 sugary drinks, every day

Determine Weight Classification

Accurately determine weight and height, calculate and plot body mass index (BMI) and determine BMI percentile

Healthy Weight
BMI 5-84%ile

- FAMILY HISTORY
- REVIEW OF SYSTEMS
- PHYSICAL EXAM

Risk Factors Absent

Overweight
BMI 85-94%ile

AUGMENTED (obesity-specific)*
- FAMILY HISTORY
- REVIEW OF SYSTEMS
- PHYSICAL EXAM

Determine Health Risk Factors**

Obesity
BMI ≥95%ile

AUGMENTED (obesity-specific)*
- FAMILY HISTORY
- REVIEW OF SYSTEMS
- PHYSICAL EXAM

Risk Factors Present

ROUTINE CARE

- Provide ongoing positive reinforcement for healthy behaviors
- If **healthy weight,** check non fasting lipid profile between ages **9-11** and **18-21**
- If **overweight,** obtain a lipid profile
- Maintain weight velocity
- Reassess annually, consider sooner follow-up if crossing two percentiles or overweight
- Document the appropriate BMI Z68 code and other associated diagnoses

OBESITY-SPECIFIC ROS AND EXAM FINDINGS:

- Sleep habits, snoring/sleep apnea, fatigue
- Wheezing/asthma, exercise intolerance, chest pain/palpitations
- Abdominal pain, reflux/heartburn, constipation, central obesity
- Headache, dizziness, visual disturbances
- Musculoskeletal pain, limping, bowing of limbs
- Polyuria/polydipsia, cold/heat intolerance, thyroid size, height
- If female: menarche, regularity
- Skin infections, acne, hirsutism, acanthosis nigricans, striae
- Bullying, body image, binging/purging, emotional eating, depression, anxiety

LAB SCREENING

- Labs only if **≥10 years old*****
- Fasting glucose, HgbA1c, or oral glucose tolerance test
- Fasting lipid profile (non-fasting lipid profile is acceptable)
- ALT and AST
- Optional: 25-OH Vitamin D, thyroid panel

Insulin resistance/prediabetes/diabetes screening

HgbA1c	**< 5.7**	Recheck every 2 years, more frequently if weight gain accelerates or symptomatic
	5.7-6.5	Insulin resistance/prediabetes, recheck every year, more frequently if symptomatic
	> 6.5	Diabetes, refer to Endocrinology
Post prandial glucose	**< 140**	Recheck every 2 years
	> 140	Check HgbA1c
	> 200	Diabetes, check HgbA1c and refer to Endocrinology
Fasting glucose	**< 100**	Recheck every 2 years
	100-125	Insulin resistance/prediabetes, recheck in 1 year, consider checking HgbA1c
	≥ 126	Diabetes, check HgbA1c and refer to Endocrinology

Hyperlipidemia screening (nonfasting labs)

LDL	**<110**	Recheck every 5 years
	110-129	Recheck in 1 year
	130-159	Review FHx, low cholesterol diet, recheck in 1 year
	≥ 150 AND 2 or more risk factors* OR comorbidity; OR any LDL ≥ 200**	Confirm with fasting lipids and refer to Lipid Clinic
HDL	**≥ 40**	Recheck every 2 years, more frequently if weight gain accelerates
	<40	Increase physical activity, omega 3 fatty acids, decrease sugar intake, recheck in 1 year
Triglycerides	**<200**	Recheck every 2 years, more frequently if weight gain accelerates
	200-499	Increase omega 3 fatty acids, decrease saturated fat and sugar, recheck in 1 year
	≥ 500	Confirm with fasting lipids and refer to Lipid Clinic

**Risk factors: HDL <45, BP >95th %ile, smoking, insulin resistance, FHx of premature CVD*
***Comorbidity: DM, CKD, SLE, HIV, organ transplant*

Non-Alcoholic Fatty Liver Disease (NAFLD) screening

ALT or AST	**Normal**	Recheck every 2 years, more frequently if weight gain accelerates
	>1.5 normal	Refer to GI Fatty Liver Clinic (imaging to be ordered by specialist)
	≥ 200 at anytime	Obtain ultrasound and refer to GI

***Currently, there are no guidelines on when to start laboratory testing for patients with obesity. Consider screening patients < 10 years of age if risk factors or symptoms/exam findings are present.**

* Barlow S, Expert Committee. Expert committee recommendations regarding prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics.* 2007;120(4):S164-S192

**Based on behaviors, family history, review of systems, and physical exam, in addition to weight classification.

CONTINUE TO MANAGEMENT AND TREATMENT

Management and Treatment Stages

FOR PATIENTS WITH **OVERWEIGHT** OR **OBESITY**

PRIMARY CARE PROVIDER

- Patients should start at the least intensive stage and advance through the stages based upon the response to treatment, age, BMI, health risks and motivation.
- After 3-6 months if the BMI/weight status has not improved, consider advancing to the next management and treatment stage.
- An empathetic and empowering counseling style, such as motivational interviewing, should be employed to support patient and family behavior change.
- For added support and counseling in stages 1 and 2 consider partnering with a dietician, social worker, athletic trainer, physical therapist, psychologist/therapist or other community resources.
- Document the appropriate BMI Z68 code and other associated diagnoses.

Target weight loss maximum:
Children age 2–5 years old who have obesity should not lose more than 1 pound/month
Older children and adolescents with obesity should not lose more than an average of 2 pounds/week

STAGE 1 – Prevention Plus
Primary Care Office/Primary Care Provider

Healthy Habit Follow-up:
at least monthly
for 3-6 months

What:
Planned follow-up themed visits focusing on behaviors that resonate with the patient, family and provider.
Set and document realistic goals together.

Goals:
Positive behavior change.
Weight maintenance or a decrease in BMI velocity.

STAGE 2 – Structured Weight Management
Primary Care Office/Primary Care Provider with Training

Healthy Habit Follow-up:
every 2-4 weeks
for 3-6 months

What:
Stage 1 plus more intense support and structure to achieve healthy behavior change.
Set and document realistic goals together.

Goals:
Positive behavior change.
Weight maintenance or a decrease in BMI velocity.

STAGE 3 – Comprehensive Multi-disciplinary Intervention
Pediatric Weight Management Clinic/Multi-disciplinary Team

Follow-up:
weekly or at least every 2-4 weeks for 3-6 months

What:
Structural behavior modification program including increased intensity of behavior changes, frequency of visits, and specialists involved.

Goals:
Positive behavior change.
Weight maintenance or a decrease in BMI velocity.

STAGE 4 – Tertiary Care Intervention
Pediatric Weight Management Center/Providers with expertise in treating childhood obesity

Follow-up:
determined based on patients motivation, medical center, and the treatment protocol.

What:
Recommended for children BMI ≥ 95% and significant comorbidies if unsuccessful with Stages 1-3. Also for children > 99% who have shown no improvement under Stage 3. Intensive nutrition and activity counseling with consideration of use the of meds/surgery.

Goals:
Positive behavior change.
Weight maintenance or a decrease in BMI velocity.

This algorithm was developed based on the American Academy of Pediatrics Institute for Healthy Childhood Weight

CODING FOR OBESITY AND RELATED COMORBIDITIES

Z68.51 BMI pediatric, less than 5th percentile for age
Z68.52 BMI pediatric, 5th percentile to less than 85th percentile for age
Z68.53 BMI pediatric, 85th percentile to less than 95th percentile for age
Z68.54 BMI pediatric, greater than or equal to 95th percentile for age

Z71.3 Counseling, dietary and surveillance
Z71.89 Counseling, other specified (exercise, parent-child problems)

E03.9 Hypothyroidism
E28.2 PCOS (polycystic ovary syndrome)
E55.9 Vitamin D insufficiency
E66.01 Morbid (severe) obesity due to excess calories
E66.9 Obesity, unspecified
E78.00 Hypercholesterolemia
E78.1 Hypertriglyceridemia
E78.5 Hyperlipidemia

F54 Psychological factor affecting physical condition
G47.30 Sleep disordered breathing
I10 Hypertension

K76.0 Non-alcoholic hepatosteatosis
L83 Acquired acanthosis nigricans
N92.6 Irregular menstrual periods
R03.0 Elevated BP without diagnosis of hypertension
R63.5 Abnormal weight gain
R63.4 Loss of weight
R68.89 Exercise intolerance (Poor conditioning)
R73.09 Elevated hemoglobin A1c
R74.8 Low HDL

Atrium Health Levine Children's