



INTRODUCTION

Overweight and obesity are prevalent among the pediatric population and are often associated with endocrine comorbidities such as diabetes mellitus, hyperlipidemia, polycystic ovarian syndrome, vitamin D deficiency and hypothyroidism, as well as other comorbidities such as hypertension, fatty liver disease, depression, joint or hip pain and sleep apnea. Evaluation and management should focus on screening for these comorbidities as well as promotion of healthy lifestyle and weight management.

INITIAL EVALUATION AND MANAGEMENT

The **INITIAL EVALUATION** should include the following:

• All $\geq 85^{\text{th}}$ percentile	Recommend lifestyle changes, weight management program
• 85^{th} - 94^{th} percentile, with 2 or more risk factors present*	Obtain lab testing: Fasting lipids, glucose, AST, ALT, Hemoglobin A1c
• $\geq 95^{\text{th}}$ percentile	Obtain lab testing: Fasting lipids, glucose, AST, ALT, Hemoglobin A1c

*** RISK FACTORS:**

- Family history of type 2 diabetes 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 small-for-gestational-age birth weight)
- Maternal history of diabetes or gestational diabetes mellitus (GDM) during the child's gestation
- Treatment with antipsychotics such as clozapine (Clozaril), olanzapine (Zyprexa), risperidone (Risperdal), quetiapine (Seroquel), aripiprazole (Abilify)

INITIAL MANAGEMENT should include a focus on healthy lifestyle change, i.e. consider identifying a healthy lifestyle or weight management goal with patient and family.

Additional resources: [See APPENDIX below: Weight Management Resources](#)

DEFINITIONS

DIABETES is diagnosed when 2 or more of the following are present

- Fasting glucose ≥ 126 mg/Dl
- Random or 2-hour OGTT glucose ≥ 200 mg/Dl
- Hemoglobin A1c $\geq 6.5\%$

PRE-DIABETES is diagnosed when 2 or more of the following are present

- Fasting glucose: 100 to 125 mg/Dl
- 2-hour OGTT glucose 140 to 199 mg/Dl
- Hemoglobin A1c 5.7 - 6.4%,

WHEN TO REFER

A routine referral to Endocrinology is warranted for:

- patients younger than 2 years of age with a BMI $\geq 95^{\text{th}}$ percentile **OR**
- patients with BMI $\geq 85^{\text{th}}$ percentile if **EITHER** fasting glucose ≥ 126 mg/Dl **OR** Hemoglobin A1c $\geq 6.0\%$

Glucose abnormalities:

- If fasting glucose 100-126 and A1c $< 6.0\%$, please obtain OGTT. (Prefer Quest Lab, code is 35181; includes glucose time at 0 min and 2 hours)
- Refer to endocrinology if:
 - fasting glucose on OGTT is now ≥ 126 mg/dL **OR**
 - 2-hour OGTT glucose ≥ 140 mg/dL
- (If not and BMI percentile does not improve, re-check A1c and fasting glucose again in 3-4 months)

Abnormal fasting lipids:

- LDL-c ≥ 160 with no risk factors, **OR** ≥ 130 with 1 risk factor
- **OR** Triglycerides ≥ 250 mg/Dl

Note: known risk factors for cardiovascular disease:

- HDL < 35 is a risk factor if over age 14 years
- Polycystic Ovarian Syndrome
- Hypertension ($> 95^{\text{th}}$ in BP charts, measured twice with large cuff)
- Systemic Lupus

	<ul style="list-style-type: none"> ○ Any solid organ transplant or any cancer ○ Smoker or passive smoker ○ Parent/grandparent hx of premature cardiovascular disease or stroke (age at diagnosis <55 years) ○ Unknown Family History <p><u>Possible polycystic ovarian syndrome (PCOS)</u></p> <ul style="list-style-type: none"> ● Presence of irregular menses or amenorrhea, acne/hirsutism <p><u>Patients with the following obesity related comorbidities should be referred as follows:</u></p> <ul style="list-style-type: none"> ● Non-alcoholic fatty liver disease (refer to Gastroenterology) ● Hypertension/abnormal blood pressure (refer to Nephrology) ● Sleep apnea/disordered sleep (refer to the Sleep Program)
<p>HOW TO REFER</p>	<p>Endocrinology Department: <i>Online referrals available.</i> Phone: 860.837.6700 Fax: 860.837.6765</p> <p>With referral, please send relevant laboratory studies</p>
<p>WHAT TO EXPECT FROM CT CHILDREN'S VISIT</p>	<ul style="list-style-type: none"> ● Comprehensive physical exam and review of family history ● Review of systems ● Additional laboratory studies as indicated ● Treatment of obesity co-morbidities and/or diabetes as needed

APPENDIX: Weight Management Resources

Internal Resources:

- **Weight Management Program at CT Children's:** (www.connecticutchildrens.org/obesity)
 - If available, please provide copies of any labs done within the previous 6 months of referral: (fasting) glucose, cholesterol (LDL, HDL, triglycerides), ASAT, ALAT, TSH, free T4, insulin (25)OH Vitamin D
 - Click here to access [Weight Management Program Referral Form](#)
- **Nutritional counseling with CT Children's Nutrition** (click [here](#) or call 860-837-6286)

Resource Handouts:

- See [handout](#) for tips on Motivational Interviewing
- See [handout](#) for Healthy Eating Guideline tips

Other Resources:

- **Child Development Infoline**

The United Way of Connecticut's [Child Development Infoline](#) provides education on development, behavior management strategies and programs, makes referrals to services, and provides advocacy and follow-up as needed. For more information, call 1.800.505.7000.
- **American Academy of Pediatrics**

The [American Academy of Pediatrics](#) is a professional membership organization of 60,000 primary care pediatricians, pediatric medical sub-specialists and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents and young adults.
- **Let's Move!**

[Let's Move!](#) is a comprehensive initiative dedicated to solving the problem of obesity within a generation, so that children born today will grow up healthier and able to pursue their dreams.
- **Nourish Interactive**

[Nourish Interactive](#) offers fun nutrition games for kids, interactive nutrition tools and tips for parents and health educators to use to promote healthy living for the whole family.
- **EatRight.org**

The Academy of Nutrition and Dietetics is the United States' largest organization of food and nutrition professionals, and represents over 100,000 credentialed practitioners — registered dietitian nutritionists, dietetic technicians, registered, and other dietetics professionals holding undergraduate and advanced degrees in nutrition and dietetics. [EatRight.org](#) is its go-to resource for providing nutrition information to the public. On the site you can find articles with quick tips to improve nutrition, overall health and stay updated on changes related to nutrition and food. This site also provides a gateway to find Registered Dietitians and other nutrition professionals in your area.
- **ChooseMyplate.gov**

Curious about how to build a healthy plate? [ChooseMyplate.gov](#) provides healthy solutions for everyday life. It provides resources to improve your plate and increase physical activity through different online tools and activities. Provides tips for children, students, adults, seniors and professionals.