

Obesity referrals to Pediatric Endocrinology

We are happy to see your patient and assist with the medical evaluation for obesity. When making a referral for obesity or overweight, if your laboratory evaluation has been normal to date, please be advised of the following:

- **Insurance companies may not cover a visit to a tertiary care center for the diagnosis of obesity if no comorbidities are found on exam or laboratory evaluation, especially if the evaluation completed before referral was normal.**
 - For this reason, we suggest that families contact their insurance carrier to determine if a prior authorization is needed before the visit can be covered.
- **The Endocrinology service does not conduct a weight loss or lifestyle modification clinic.**
 - We do not have the support of a dedicated dietitian, behavioral therapist or exercise physiologist.
 - We do not provide clinical follow-up to monitor effectiveness of weight loss and lifestyle intervention programs offered elsewhere.
- **For children referred for obesity, overweight or “rapid” weight gain, our focus will be to assess for endocrine causes and complications of obesity, and to provide general counseling and literature about lifestyle modifications. In the event that an endocrine cause or complication is identified, we are happy to prescribe treatment and follow-up for the patient.**

We hope that this information will allow patients and families to have reasonable expectations surrounding the consultation. Additional clinical information:

Endocrine causes of obesity account for < 1% of all childhood obesity. Such causes include cortisol excess (Cushing syndrome), Prader-Willi Syndrome, hypothyroidism, growth hormone deficiency and pseudohypoparathyroidism. The weight gain seen with these conditions is usually fairly mild. Importantly, these endocrine causes of obesity are **accompanied by a deceleration in linear growth and are thus extremely unlikely if the height velocity is normal or increased for age**. The vast majority of obesity is multifactorial and is unmasked by exogenous factors such as inactivity and excessive caloric intake. There is no FDA-approved effective pharmacologic intervention for exogenous obesity in children and teens.

Endocrine complications of obesity include the spectrum of insulin resistance from prediabetes to type 2 diabetes mellitus and significant dyslipidemia in all children, and polycystic ovary syndrome in post-menarchal females. Insulin resistance, as seen with acanthosis nigricans and elevated fasting insulin levels, is not classically treated with medications unless there is an associated disturbance in glucose tolerance (impaired fasting glucose or type 2 diabetes).

Pearls in the evaluation of obesity and overweight:

- **Studies over the past several years have shown that there is no diagnostic utility in fasting or non-fasting insulin levels unless the patient is known to have diabetes and there is a need to differentiate type 1 from other types of diabetes.**
 - Insulin levels are not diagnostic for diabetes and do not serve as a marker for severity of insulin resistance or likelihood of becoming diabetic.
 - If the child is obese and has normal blood sugars, an elevated insulin level is common and often appropriate.
 - Pharmacologic treatment decisions are rarely based on an insulin level.
 - Clinically, acanthosis nigricans occurs because of insulin resistance and does not require biochemical confirmation (instead, patient may require screening for type 2 diabetes mellitus – see guidelines below).



- **Screening for hypothyroidism as part of an obesity evaluation is typically unwarranted and can lead to false positive results.**
 - Clinically significant hypothyroidism is very unlikely in a child with normal growth velocity and lack of any other symptoms of hypothyroidism.
 - Mildly elevated TSH (as high as 7-8 uIU/mL) with normal T4 levels are commonly seen in obese children and teens.
 - This is a consequence, not a cause, of being overweight.
 - Possible reasons include diffuse TSH resistance or the body's attempt to up-regulate metabolism to regain a more appropriate body weight.
 - Treatment with thyroid hormone replacement does not result in weight loss or symptomatic improvement.
 - The TSH will often normalize with weight loss.
 - Recommended follow-up for mildly elevated TSH with a normal thyroxine level is to repeat TSH and T4 with thyroid autoantibodies (antithyroglobulin and anti-thyroid peroxidase) in 3-6 months.
 - Referral to Pediatric Endocrine Clinic is warranted if T4 is low and/or TSH > 10 uIU/mL, especially if the thyroid antibodies are positive.
- **The diagnosis of polycystic ovary syndrome is made when there is a history of irregular menses AND clinical or biochemical evidence of hyperandrogenism. Referral to Pediatric Endocrine Clinic is warranted for the symptoms/concerns listed below.**
 - Clinical evidence of hyperandrogenism (hirsutism, excessive acne)
 - Biochemical evidence of hyperandrogenism (elevated free testosterone level)
 - Clinical evidence of insulin resistance (acanthosis nigricans)
- **AAP guidelines exist for dyslipidemia screening and during an endocrine evaluation would be helpful**
- **Screening for type 2 diabetes mellitus is based on guidelines released annually by the American Diabetes Association (ADA).**

Screening for type 2 diabetes mellitus

- Considered in children and adolescents who are overweight (BMI > 85th percentile) and who have two or more of the following additional risk factors:
 - Family history of type 2 diabetes in first- or second-degree relative
 - 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 during the child's gestation
- Initiate screening at 10 years of age or at onset of puberty if puberty occurs at younger age.
- Frequency: every 3 years
- Recommend a fasting glucose and hemoglobin A1c as screening tests.
 - A hemoglobin A1C and random (fed) glucose may be easier for families and providers to obtain in a clinic setting and is also a decent screen for type 2 diabetes mellitus.

Diagnostic criteria for prediabetes and type 2 diabetes mellitus spectrum

- Diagnosis of type 2 diabetes itself requires that either two criteria are met or one lab criterion plus obvious clinical symptoms (polyuria, polydipsia, weight loss).
- Categories of increased risk for diabetes (prediabetes) include impaired fasting glucose, impaired glucose tolerance and an modestly elevated hemoglobin A1C.

	Fasting glucose (mg/dL)	Random or 2-hr post glucose challenge glucose (mg/dL)	Hemoglobin A1C
Type 2 diabetes mellitus	≥ 126 mg/dL	≥ 200 mg/dL	≥ 6.5%
Categories of increased risk for diabetes (prediabetes)			
Impaired fasting glucose	101-125 mg/dL		
Impaired glucose tolerance		140-199 mg/dL	
HbA1C criteria			5.7-6.4%

- **Individuals meeting diagnostic criteria for type 2 diabetes require prompt evaluation and initiation of diabetes medications and education. For these patients, please contact the endocrinologist on call by calling the Physician Referral and Consultation line at (414) 266-2460.**
- **For individuals with prediabetes:**
 - We are happy to see these patients, but please know that pharmacologic intervention (metformin) is of unclear benefit in reducing the progression to type 2 diabetes in children and teens.
 - The decision to start metformin is often impacted by individual provider practice along with clinical information.
 - Repeat surveillance for conversion to type 2 diabetes will be performed annually or more frequently.
 - Visits typically focus on lifestyle modification counseling (weight loss and increased physical activity), a frank discussion of increased risk of developing type 2 diabetes and minimizing other risk factors, such as hypertension and PCOS.
- **For individuals with normal screening labs but isolated signs of insulin resistance (acanthosis nigricans and/or an elevated fasting insulin level):**
 - Continued screening per ADA guidelines at a frequency of at least every year

After your patient is evaluated, we will send you a letter with our recommendations for future obesity-related screening or other referrals that may be helpful (sleep medicine or gastroenterology) and our plan for any follow-up within the Pediatric Endocrinology Clinic.

We hope you do not hesitate to call us at (414) 266-6750 Ext #5 if you have questions or concerns. We are glad to offer recommendations and to discuss whether a Pediatric Endocrinology consult is likely to be helpful.

References:

Barlow, SE and the Expert Committee. Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report. Pediatrics Vol 120 No. Supplement 4 December 1, 2007; pp: S164-192
Standards of Medical Care in Diabetes – 2013. Diabetes Care. November 2013, 36 (11).