Pediatric Endocrinology
Consult and referral guidelines

Introduction

We care for children and teens from birth to 18 years. The most common reasons patients are referred include:

- Diabetes
- Short stature or failure to thrive
- Tall stature
- Obesity
- Precocious puberty
- Early childhood breast development in girls
- Delayed puberty
- Premature menses
- Congenital hypothyroidism
- Acquired hypothyroidism
- Acquired hyperthyroidism (Grave's Disease)
- Goiter/thyromegaly
- Calcium disorders
- Hypoglycemia
- Adrenal insufficiency

We want to make referrals easy, fast and efficient for primary care providers. This tool was developed to help create productive visits for you and your patient.

Each guideline includes three sections: suggested workup and initial management, when to refer and information needed. Suggested workups may not apply to all patients, but these are studies we generally consider during office visits.

Feedback regarding these guidelines is encouraged. Please contact HDVCH Direct to share feedback.

For access to all pediatric guidelines, visit **helendevoschildrens.org/guidelines**

Appointment priority guide

Immediate	Call HDVCH Direct and/or send to the closest emergency department. Contact HDVCH Direct at 616.391.2345 and ask to speak to the on-call endocrinologist.
Urgent	Likely to receive an appointment within 2 days. Call HDVCH Direct and ask to speak to the on-call endocrinologist regarding an urgent referral.
Routine	Likely to receive an appointment within 14 days. Send referral via Epic Care Link, fax completed referral form to 616.267.2401 or send referral through Great Lakes Health Connect.

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Diabetes: New Onset Referral *Urgent referral recommended* *New diagnosis education is offered 7 days a week* *Not all patients are admitted – we will assist with inpatient or outpatient management* *Call HDVCH Direct*	History and exam: • Height, weight, BMI • Symptoms: history of excessive thirst or urination, weight loss, vomiting, abdominal pain, fatigue or other significant history Labs: • HbA1c • Urine and/or serum ketones • Blood glucose (fasting, random)	HbA1c ≥ 6.5% Positive urine or blood ketones Fasting blood sugar ≥ 126 Random blood sugar ≥ 200 with symptoms of diabetes	Growth chart Relevant lab studies Previous physician notes
Diabetes: Transfer Referral *Patients transferring diabetes care to Helen DeVos Children's Hospital*	History and exam: • Height, weight, BMI • Last known insulin regimen Labs: • HbA1c • Ketones • Blood sugar (fasting, random)	Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovarian syndrome)	Growth chart Relevant lab studies Previous physician notes

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Short Stature or Failure to Thrive *Note: Linear growth is better evaluated after age 2* *Please consider a referral to Nutritional Services or Intensive Feeding Program in a child with poor weight gain in the face of normal linear growth (exceptions are infants with midline abnormalities or males with hypospandias or cryptorchidism)*	History and exam Labs: • TSH • Free T4 • CMP • CBC, ESR • IGF-1 • IGFBP3 • Karyotype for Turner's, 30 cell count (in all girls) • Transglutaminase IgA • IgA level Radiology: • Bone age	Strongly recommend referral if child is > 2 years and growth velocity < 4 cm a year for more than a year If after age 3, crossing centile downward Child is growing more than 2 centile lines below mid-parental height*, with a delayed bone age Child is less than 3rd percentile in height **Boy mid-parental height in inches = (mother's height + father's height)/2 + 2.5* *Girl mid-parental height in inches = (mother's height + father's height)/2 – 2.5*	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests
Tall Stature	History and exam Labs: • TSH • Free T4 • CMP • CBC • IGF-1 Radiology: • Bone age	Child is > 2 years and is greater than 97th percentile for height and greater than 2 centile lines above mid-parental height* Child is > 2 years and progressively crossing centiles for height **See line above for mid-parental height calculations*	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Obesity *We recommend a referral to endocrinology for children with BMI greater than 99th percentile and < 3 years* *For children 3-17 years, consider a referral to Helen DeVos Children's Hospital Healthy Weight Center. The clinic can be reached at 616.391.7999* *Before referral to the Healthy Weight Center, please follow American Academy of Pediatrics guidelines for stage I and stage II obesity treatment*	History and physical Labs: • Fasting CMP • HbA1c • UA • Fasting lipid panel or non-fasting total and HDL cholesterol • See co-management guidelines for lipids, screening of T2DM and PCOS • *Not recommended: isolate fasting insulin* Formal nutritional consultation: • 3- to 5- day diet diary evaluation and calorie count • Ongoing continuity of care and follow-up with a nutritionist Establishment of a regular exercise regime	Highly suspected endocrine disorder Secondary complications of endocrine disorder Clear evidence of insulin resistance: HbA1c, acanthosis nigricans Secondary causes of obesity–genetic syndromes such as Prader-Willi–are evident or strongly suspected Poor linear growth or short stature in comparison with excessive weight gain Short history (< 12 months) of marked weight gain History of brain injury, brain tumor, CNS disease Suggestive phenotypic features: developmental delay, significant obesity beginning before 3 years When an obesity-related complication is confirmed	Prior growth data/chart Relevant lab studies Pertinent medical records Results of any additional tests

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Precocious Puberty	History and exam–please include Tanner staging Labs: • FSH • Testosterone (males and virilized females) • Estradiol • TSH • Free T4 • DHEAS, 17 OH progesterone Radiology • Bone age	Breast development or pubic hair in girls < 8 years Testicular enlargement (3 cc or > 2.5 cm), increased penile size or pubic hair in boys < 9 years Linear growth increasing, with advanced bone age	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests
Early Childhood Breast Development in Girls *Palpable breast buds in girls less than 24 months is not uncommon and usually not of concern*	History and exam Labs: • FSH • Estradiol • TSH • Free T4 • LH	Progressing over time Accelerated growth, linear velocity Vaginal bleeding Café au lait spots on physical exam (possible McCune-Albright syndrome)	Prior growth data/charts Relevant lab studies Pertinent medical records Results of any additional tests

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Delayed Puberty *Chronic illness should be considered*	History and physical exam Labs: • CBC, ESR, CMP • TSH • Free T4 or T4 total • Prolactin • LH, FSH • Estradiol • Testosterone: morning read (male) • Celiac screen Radiology: • Bone age	For boys: no testicular enlargement by 14 years (4 cc, 2.5 cm) For girls: no breast development by 13 years, or no menses by 16 years, or no menses ≥ 4 years after onset of breast development More than 6 months without a menstrual cycle	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests
Premature Menses *Consider vaginal foreign body or trauma*	History and exam Labs: • FSH • Prolactin • Estradiol • TSH • Free T4 Radiology: • Pelvic ultrasound • Bone age	Vaginal bleeding in girls < 10 years Vaginal bleeding in any girls without signs of puberty	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests
Congenital Hypothyroidism *Urgent referrals recommended* *Appointments within 24 hours* *Call HDVCH Direct*	History and exam Labs: • Thyroid Function (TSH and Free T4)	Abnormal newborn screen Please follow instructions of the State of Michigan newborn screening program For questions, please call HDVCH Direct to be connected to the endocrinologist on call	Thyroid function tests, including results from State of Michigan newborn screening program and any other labs obtained Birth history, gestational age, weight and height

Diagnosis/symptoms	Suggested work-up/initial management	When to refer	Information needed
Acquired Hypothyroidism *If thyromegaly, please see referral guidelines for goiter (below)*	History and exam Labs: • TSH • If elevated TSH, TPO will provide autoimmune study • Free T4 Please see co-management guidelines for details regarding lab-level decision-making	If TSH is elevated and free T4 is normal, please see co-management guidelines Refer if free T4 is low No referral is necessary; • If TSH and free T4 are normal–even if thyroid antibodies are positive–but, consider repeating TFTs q3-6 months • If normal TSW and elevated TPO	Prior growth data/charts Pertinent medical records Relevant lab studies, including thyroid peroxidase antibody, if obtained Thyroid scan and ultrasound is not needed, but please provide if obtained Results of any additional tests
Acquired Hyperthyroidism (Graves' Disease) *Goiter is not always present* *Appointments available within 24 hours* *Call HDVCH Direct*	History and exam Labs: • TSH • Free T4 • Total T3 • Thyroid Stimulating Immunoglobulin • Thyroid Binding Inhibitory Radiology • Thyroid scan • Ultrasound	Suppressed TSH Elevated T4: Total or Free Elevated T3: Total or Free	Prior growth data/charts Pertinent medical records Relevant lab studies Results of any additional tests
Goiter/Thyromegaly	History and exam Labs: • Thyroid function: include TSH and free T4--Total T3 may be helpful if TSW is suppressed and free T4 is normal • Thyroid peroxidase antibody	Abnormal thyroid function tests Palpable nodules or asymmetry Increasing in size Causing discomfort	Prior growth data/charts Pertinent medical records Relevant lab studies Results of any additional tests

Diagnosis/symptoms	Suggested workup/initial management	When to refer	Information needed
Calcium Disorders *Consider urgent referral for symptomatic hypocalcemia, hypercalcemia, total calcium < 7mg/dL or > 12 mg/dL, ionized calcium < 0.9 mmo/L or > 1.6 mmo/L*	History and exam Labs: • CMP • Ionized calcium • Phosphorus • Magnesium • PTH • 25OH Vitamin D • 1,25 OH Vitamin D • Skeletal survey for Rickets	Low or elevated calcium Elevated phosphorus Evidence of rickets with a normal or elevated 25 OH Vitamin D *Please note: nutritional rickets is a common disorder that can be managed by the primary care provider. No referral or DEXA scan is required. We are available to assist with questions or concerns.*	Prior growth data/charts Relevant lab studies Ask patient's family to bring bone age X-ray to clinic, if completed Pertinent medical records Results of any additional tests
Hypoglycemia *The definition of hypoglycemia in infants and children continues to be controversial*	History and exam Labs: • Serum glucose • If possible, obtain the following critical sample at the time of hypoglycemia: venous serum glucose (not POC), insulin level, c-peptide, beta hydroxybutyrate, cortisol, growth hormone, free fatty acids, lactate, urine ketones	Documented hypoglycemia (plasma glucose < 50 mg/dL)	Prior growth data/charts Relevant lab studies Pertinent medical records Results of any additional tests
Adrenal Insufficiency *Urgent appointments available for new diagnosis and positive newborn screen* *Call HDVCH Direct*	History and exam Labs: • CMP • Glucose • Morning cortisol and ACTH (before 9 a.m.) If primary adrenal disease is suspected, consider also obtaining renin and aldosterone	Low morning cortisol level	Prior growth data/charts Relevant lab studies Pertinent medical records Results of any additional tests

HDVCH Direct phone: 616.391.2345

Resources

Healthy Weight Center
Helen DeVos Children's Hospital
Phone: 616.391.7999
Fax: 616.391.8750
www.devoschildrens.org/healthyweightcenter

Fit Kids 360
www.fitkids360.org
Fit Kids 360 is a healthy lifestyle program developed to fight childhood obesity. This comprehensive program combines basic education about nutrition, behavior and exercise with a wide range of physical activities.

Nutrition counseling
Spectrum Health phone: 616.391.1875
Saint Mary's Health Services phone: 800.639.6366
University of Michigan Metro Health phone: 616.252.4461
Services are offered in locations throughout West Michigan. A physician referral is required. Insurance coverage varies.

Websites
www.eatright.org
www.kidshealth.org
www.nutrition.gov
www.choosemyplate.gov

Helen DeVos Children's Hospital developed these referral guidelines as a general reference to assist referring providers. Pediatric medical needs are complex, and these guidelines may not apply in every case. Helen DeVos Children's Hospital relies on its referring providers to exercise their own professional judgment with regard to the appropriate treatment and management of their patients. Referring providers are solely responsible for confirming accuracy, timeliness, completeness, appropriateness and helpfulness of this material and making all medical, diagnostic and prescription decisions.