Pediatric Endocrinology
Consult and referral guidelines

Helen DeVos Children's Hospital
Outpatient Center
35 Michigan Street NE

Outreach locations:
Lansing, Muskegon, St. Joseph, Traverse City

Healthy Weight Center at HDVCH
Phone: 616.391.7999
Fax: 616.391.8750
devoschildrens.org/healthyweightcenter

About Pediatric Endocrinology

We care for children and teens from birth to age 18.

Most common referrals

- 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

Resources
Fit Kids 360 | fitkids360.org
A comprehensive, healthy lifestyle program developed to fight childhood obesity, combining basic education about nutrition, behavior and exercise with a wide range of physical activities.

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

Nutrition websites: eatright.org | kidshealth.org | nutrition.gov | myplate.gov

Pediatric Endocrinology Appointment Priority Guide

Immediate	Contact HDVCH Direct at 616.391.2345 and ask to speak to the on-call endocrinologist and/or send to closest emergency department.
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/Symptom	Suggested Workup/Initial Management	When to Refer	Information Needed
Diabetes: New Onset Referral *Immediate referral recommended* *New diagnosis education is offered 7 days a week* *Not all patients are admitted; we will assist with inpatient or outpatient management*	History and exam: • Height, weight, BMI • Symptoms: history of excessive thirst or urination, weight loss, vomiting, abdominal pain, fatigue or other significant history HbA1c, urine and/or serum ketones, blood glucose (fasting, random)	• HbA1c ≥6.5% • Positive urine or blood ketones • In this case will often need lab work (HC03) • 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 HDVCH*	History and exam: • Height, weight, BMI • Last known insulin regimen HbA1c, ketones, blood sugar (fasting, random)	• Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovarian syndrome) • Previous DX T1/T2DM	• Growth chart • Relevant lab studies • Previous physician notes
Short Stature or Failure to Thrive *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 *Note: Linear growth is better evaluated after age 2* TSH, Free T4, CMP, CBC, ESR, IGF-1, IGFBP3, Karyotype for Turners, 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

Diagnosis/Symptom	Suggested Workup/Initial Management	When to Refer	Information Needed
Tall Stature	History and exam TSH, Free T4, CMP, CBC, IGF-1, Karyotype 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 previous entry 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
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 HDVCH Health Optimization Center (616.391.7999)* *Before referral, please follow American Academy of Pediatrics guidelines for stage I and stage II obesity treatment.*	History and physical Fasting CMP, HbA1c, UA, fasting lipid panel or non-fasting total and HDL cholesterol, • See co-management guidelines for lipids, T2DM and PCOS • Not recommended: fasting insulin Formal nutritional consultation: • 3-5 day diet diary evaluation and calorie count • Ongoing continuity of care and follow-up with a nutritionist Establishment of a regular exercise regimen	• 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/Symptom	Suggested Workup/Initial Management	When to Refer	Information Needed
Precocious Puberty	History and exam (please include Tanner staging) 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 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
Delayed Puberty *Chronic illness should be considered*	History and physical exam 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 ccs, 2.5 cms) • 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 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

Diagnosis/Symptom	Suggested Workup/Initial Management	When to Refer	Information Needed
Congenital Hypothyroidism *Urgent referrals recommended* *Appointments within 24 hours*	History and exam 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 (616.391.2345) to be connected to on-call endocrinologist	• Thyroid function tests, including results from State of Michigan newborn screening program and any other labs obtained • Birth history, gestational age, weight and height
Acquired Hypothyroidism *If thyromegaly, please see referral guidelines for goiter below*	History and exam 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 labs in 3-6 months • If normal TSH 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 (Grave's Disease) *Goiter is not always present* *Appointments available within 24 hours*	History and exam 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 Thyroid function (include TSH and Free T4; Total T3 may be helpful if TSH 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/Symptom	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 CMP, ionized calcium, phosphorus, magnesium, PTH, 25-OH Vitamin D, 1,25 OH Vitamin D, urine Ca/Cr, skeletal survey for Rickets	• Low or elevated calcium • Elevated phosphorus • Evidence of Rickets with a normal or elevated 25 OH Vitamin D *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 *Note: The definition of hypoglycemia in infants and children continues to be controversial*	History and exam 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*	History and exam CMP, glucose, morning cortisol and ACTH (before 9am); 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