

Endocrinology Rotation Educational Goals & Objectives

Endocrinology involves the evaluation and management of disorders of the body's glands, hormonal secretions, and resultant changes in body metabolic activity. The Endocrine rotation will provide the resident with experience diagnosing and treating conditions commonly seen in outpatient primary care, such as diabetes, hyperlipidemia, menopausal symptoms, osteoporosis, thyroid disease and obesity. Inpatient care will be limited but will provide some exposure via in-hospital consultation to life threatening acute conditions, such as diabetic ketoacidosis and adrenal crises. The goal is to familiarize residents with basic pathophysiology, clinical manifestations, diagnostic strategies and treatment. Depth of exposure should be such that they can develop competency in disease prevention, management of common diseases, and appropriate indications for referral.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

- I. All residents must be able to provide compassionate, culturally-sensitive, and appropriate care for patients to prevent and treat endocrine diseases.
 - PGY2s should seek appropriate subspecialty or surgical consultation when necessary to further patient care.
 - PGY3s should supervise and ensure seamless transitions of care between primary and consulting teams and between inpatient and outpatient care.

- II. Residents will demonstrate the ability to take a pertinent history and perform a focused physical exam. PGY1s should be able to differentiate between stable and unstable patients and elicit the following historical details:
 - pertinent symptoms (e.g. fatigue, polyuria, polydipsia, or weight change)
 - history of growth and development in younger patients and gynecologic history
 - risk factors for diabetes and osteoporosis
 - complete medication history, including steroids, herbs, and supplements; and compliance

PGY2s should be able to collect additional historical information from electronic and/or outside records, elicit a more thorough history, and recognize how acute and chronic illnesses affect the endocrine system.

PGY3s should be able to independently obtain the above details for patients with a history of complex endocrine disease and multiple comorbid conditions.

- III. Residents should be to perform the physical exam with increasing confidence and independence, with focus on
 - cardiovascular exam for BMI, metabolic syndrome, and evidence of vascular disease
 - diabetic foot exam for neuropathy and ulcers
 - genital exam for development

- musculoskeletal exam for Charcot joint and kyphosis
 - neurologic exam for peripheral neuropathy
 - exam for exophthalmous
 - skin exam for acne, changes of myxedema, e. nodosum, hair loss patterns, hirsutism, and striae
 - thyroid exam for goiter and nodules
- IV. Residents will understand the indications, contraindications, complications, limitations, and interpretation of following procedures, and become competent in the their safe and effective use:
- PGY1s: monofilament exam
 - PGY2s: thyroid fine needle aspiration (optional)
 - PGY3s will independently order and interpret laboratory and diagnostic tests appropriate to the patient's condition

Medical Knowledge

- I. PGY1s will develop an understanding of the basic pathophysiology of and initial approach to the following signs and symptoms:
- Abnormal electrolytes, including calcium, phosphorus, potassium, and sodium
 - Amenorrhea
 - Change in menstrual function
 - Change in sexual function
 - Fatigue or generalized weakness
 - Galactorrhea
 - Gender dysphoria
 - Goiter
 - Heat and cold intolerance
 - Hirsutism and virilization
 - Hot flashes
 - Hyperglycemia
 - Hyperlipidemia
 - Hyperpigmentation
 - Infertility
 - Obesity or weight loss
 - Orthostatic hypotension
 - Osteopenia
 - Polydipsia
 - Polyuria
 - Premenstrual syndrome
 - Refractory hypertension
 - Sweating

PGY2s will also develop an understanding of the pathophysiology, clinical presentation, and therapy for the following endocrine conditions:

- Acromegaly
- Adrenal insufficiency
- Congenital adrenal hyperplasia
- Cushing's syndrome
- Diabetes insipidus
- Diabetes mellitus
- Hyperaldosteronism
- Hypogonadism
- Hypovitaminosis D
- Insulinoma
- Osteomalacia
- Osteoporosis
- Paget's Disease
- Panhypopituitarism
- Parathyroid and thyroid dysfunction
- Pheochromocytoma
- Polycystic ovarian disease
- SIADH
- Thyroid cancer

PGY3s will

- develop an understanding of pathophysiology, clinical presentation, and therapy for the above conditions, with attention to differences in patient populations where appropriate
- become familiar with other hormone producing neoplasms (carcinoid, MEN, gastrinoma, small cell cancer) and paraneoplastic syndromes
- recognize the association of other diseases with endocrine disease, such as Celiac Disease and Diabetes mellitus I

II. Residents will be able to recognize, appropriately triage, and treat endocrine emergencies with increasing levels of independence, including:

- Adrenal crisis
- Diabetic ketoacidosis
- Hyperosmolar coma
- Hypoglycemia
- Severe hypo- or hypercalcemia
- Thyroid storm and myxedema coma

III. PGY1s will be able to understand the indications for ordering and the interpretation of the following laboratory values and diagnostic studies:

- ACTH stimulation test
- Alkaline phosphatase (Paget's disease)
- DEXA scan

- Electrolytes
- Fasting and postprandial glucose and home blood glucose monitoring
- Follicle-stimulating hormone and luteinizing hormone
- Glucose tolerance test
- Glycohemoglobin
- Insulin and c-peptide
- Lipids
- Microalbuminuria
- PTH
- Serum and urine ketones
- Serum metanephrines and urine metanephrines, VMA, and total catecholamines
- Serum prolactin
- Serum total and free testosterone
- Thyroid function tests
- Thyroid ultrasound
- Urine calcium phosphate
- Uric acid excretion
- Urinary sodium and potassium excretion
- Urine HCG

PGY2s will also demonstrate knowledge of the indications for ordering and the interpretation of:

- Dexamethasone suppression test
- MRI hypothalamus/pituitary
- Plasma renin and aldosterone
- PTH-related peptide
- Thyroid function tests in sick patients
- Thyroid scan
- Visual field testing

PGY3s will independently, appropriately order the above studies and be able to interpret results within the context of patient comorbidities, pretest probability of disease, and patient values.

- IV. Residents should understand the principles of diabetic care, including use of oral hypoglycemic agents, transition to insulin, titration of treatment regimens, coordination of regular formal ophthalmologic exams and foot care, compliance with diabetic diet, and use of glucose monitoring devices and insulin pumps.
- V. Residents should become familiar with the initiation, use, and tapering of steroids in various clinical settings as well as acute and chronic side effects.
- VI. Residents should become familiar with endocrine treatment of gender-dysphoric/gender-incongruent persons.

- VII. Residents should become fluent in issues of health maintenance relevant to endocrine disorders and be able to counsel patients appropriately on
- dietary management of disease, including diabetes and hypoglycemia, hyperlipidemias, hypertension, and obesity
 - use of alternative and complementary therapies to treat symptoms of endocrine disease
 - use of medic alert bracelets

Practice-Based Learning and Improvement

- I. All residents should be able to access current national guidelines to apply evidence-based strategies to patient care (e.g. American Association of Clinical Endocrinologists <https://www.aace.com/>)
- II. PGY2s should develop progressive independence in evaluating new studies in published literature through Journal Club and independent study.
- III. PGY2s should learn to coordinate patient care as part of a larger team, including midlevel providers, nurses, pharmacist, dietician, and social worker to optimize patient care.
- IV. All residents should participate in case-based therapeutic decision-making, involving the primary care provider, endocrinologist, and other specialists as appropriate with PGY3s taking a leadership role.
- V. All residents should respond with positive changes to feedback from members of the health care team.

Interpersonal and Communication Skills

- I. **PGY1s must demonstrate organized verbal communication skills that build rapport with patients and families and convey information to other health care professionals regarding diagnosis and treatment.**
- II. PGY2s must also develop interpersonal skills that facilitate collaboration with patients, their families, and other health professionals.
- III. PGY3s should demonstrate leadership skills to build consensus and coordinate a multidisciplinary approach to patient care.
- IV. PGY3s must be able to elicit information or agreement in situations with complex social dynamics, for example, identifying the power of attorney or surrogate decision maker, dealing with a “difficult” patient, and resolving conflict among family members with disparate wishes.

Professionalism

- I. All residents must demonstrate strong commitment to carrying out professional responsibilities as reflected in their conduct, ethical behavior, attire, interactions with colleagues and community, and devotion to patient care.
- II. PGY1s should be able to educate patients and their families in a manner respectful of gender, age, culture, race, religion, disabilities, national origin, socioeconomic status, and sexual orientation on choices regarding their care.

- III. PGY2s should be able to counsel patients and families on diagnostic and treatment decisions.
- IV. PGY2s should be able to use time efficiently in the clinic to see patients and discuss diagnosis and treatment.
- V. PGY3s should be able to provide constructive criticism and feedback to more junior members of the team.

Systems-Based Practice

- I. PGY1s must have a basic understanding that their diagnostic and treatment decisions involve cost and risk and affect quality of care.
- II. PGY2s must be able to discuss alternative care strategies and the cost and risks involved in current quality issues in endocrinology, such as the role of thyroid replacement therapy in subclinical hypothyroidism.
- III. PGY2s should recognize emotional and psychological needs of patients dealing with chronic disease and be aware of resources available in our community to meet those needs.
- IV. PGY3s should learn how to facilitate treatment within the parameters of available system resources and insurance restrictions.
- V. PGY3s must demonstrate an awareness of and responsiveness to established quality measures, risk management strategies, and cost of care within our system.

Teaching Methods

- I. Supervised patient care primarily in outpatient setting with limited inpatient consultation
 - Residents will initially be directly observed with patients, to facilitate the acquisition of excellent history taking and physical exam skills.
 - As residents become more proficient, they will interact independently with patients and present cases to faculty.
 - Initial emphasis will be on diagnosis and basic management.
 - When residents have mastered these skills, focus will be on medical decision-making, and residents will work with supervising physicians to finalize a care plan.
- II. Conferences
 - Specialty-specific didactics
- III. Independent study
 - Journal and textbook reading
 - *Endocrine Reviews* <https://academic.oup.com/edrv>
 - Online educational resources
 - American Association of Clinical Endocrinologists www.aace.com
 - American Diabetes Association DiabetesPro Professional Resources Online <http://professional.diabetes.org/>
 - Annals of Internal Medicine In the Clinic series and NEJM <http://www.nejm.org/medical-specialties>

- Reconsidering the use of race correction in clinical algorithms:
<https://www.nejm.org/doi/full/10.1056/NEJMms2004740>
- The Endocrine Society <https://www.endocrine.org/>
- The Stanford 25 Thyroid Exam <http://stanfordmedicine25.stanford.edu/>
- Trans and gender diverse resources:
 - <https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2021/03/health-care-for-transgender-and-gender-diverse-individuals>
 - <https://academic.oup.com/jcem/article/102/11/3869/4157558>
 - <https://transcare.ucsf.edu/guidelines>
 - <http://transhealth.ucsf.edu/trans?page=guidelines-terminology>
- Up to Date
- Clinical Key

Evaluation

- I. Mini-CEX bedside evaluation tool
- II. Verbal mid-rotation individual feedback
- III. 360 Evaluation
- IV. Attending written evaluation of resident at the end of the month based on rotation observations.

Rotation Structure

- I. Residents should contact the lead endocrinologist the day prior to determine start time and location.
- II. Residents should spend their time in the clinic and hospital, dividing their time as appropriate to achieve the above educational goals.
 - Residents will be involved in discussion of patient presentation, generation of a differential diagnosis, development of a treatment plan, and patient follow up.
 - When possible, residents should follow the same patients during the rotation if they are seen both in the hospital and subsequently in clinic, or if they have more than one visit to clinic during the rotation.
 - Case-based learning is most effective. Nightly reading/study should be based on patients seen during the day.
 - When doing endocrine consults in the inpatient or outpatient setting, the resident should understand the question asked and provide a concise answer.
- III. Residents may be asked to do focused literature searches or presentations during the course of the rotation.
- IV. Call and weekend responsibilities TBD by the attending physician
 - Hours worked must be consistent with ACGME requirements and are subject to approval by the Program Director.
- V. Residents have specialty-specific didactics and should be excused in a timely fashion to attend.