HEALTH SYSTEM
UNIVERSITY OF MICHIGAN

DEPARTMENT OF SURGERY

DIVISION OF ENDOCRINE SURGERY

ENDOCRINE SURGERY ROTATION
GENERAL SURGERY BLUE (SGB)

University Hospital
C.S Mott Children's Hospital
Cardiovascular Center
Von Voigtlander Women's Hospital
East Ann Arbor Surgery Center
Livonia Surgery Center

House Officer I
House Officer II
House Officer III
House Officer IV
House Officer V

Curriculum/Rotation Goals and Objectives for
Surgery Residents

Endocrine Surgery Service (Blue Service)

House Officer I

Goal: The goal of the HO I rotation in Endocrine Surgery is to build on the resident's overall general surgical knowledge and clinical experience and provide more concentrated exposure in diverse endocrine surgical diseases and techniques to treat affected patients. Learning opportunities will include thyroid disease, parathyroid disease, adrenal disease, and neuroendocrine tumors of the pancreas and gastrointestinal tract. Additionally, HO I residents will have opportunities to learn about pre-operative selection and operative techniques for inguinal hernias, peri-anal disease, and hidradenitis suppurativa when working with Dr. Burney.

Learning Objectives:

Patient Care: By the end of the Endocrine Surgery rotation, the HO I resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding thyroid nodules, goiter, hyperthyroidism, hyperparathyroidism, adrenal tumors or dysfunction, and endocrine tumors of the pancreas and GI tract
3. Demonstrate the ability to take a thorough family history and delineate potential components of familial endocrinopathies
4. Perform a thorough physical examination and be familiar with signs of hormone excess (examples contingent on diagnosis such as hirsutism, striae, acne, facial changes, clitoral hypertrophy, flushing, etc.)
5. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
6. Palpate and describe a thyroid nodule and/or goiter
7. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
8. Use information technology effectively to support patient care decisions and patient education
9. Assist and perform portions of operative cases (under supervision) such as parathyroidectomy, thyroid lobectomy, hernia repairs, hemorrhoidectomy, resection of hidradenitis suppurativa, and skin grafting
10. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the endocrine surgery patient which includes interactions with medical endocrinology, pathology, radiology, nuclear medicine, radiation oncology, and mid-level providers from the clinic and inpatient services

Medical Knowledge: By the end of the Endocrine Surgery rotation, the HO I resident will be able to:
1. Thyroid Disease
a. Diagram normal thyroid anatomy including the gland, its vascular supply and venous drainage, the parathyroid glands, recurrent laryngeal nerves and the surrounding muscles b. Describe normal variants in recurrent laryngeal nerve anatomy c. Explain normal thyroid embryogenesis and descent

d. Outline normal thyroid embryogenesis and descent
e. Outline the normal thyroid hormone synthetic pathway including iodine metabolism and feedback mechanisms
f. Describe the impact of specific medications on the thyroid hormone synthetic pathway and thyroid function
g. Outline appropriate thyroid function testing and interpret predicted test results for thyroid nodule, goiter, hyperthyroidism, hypothyroidism
h. Develop an algorithm that includes pertinent history, examination findings, and diagnostic evaluation of a palpable thyroid nodule, and a non-palpable thyroid nodule discovered incidentally on ultrasound
i. Describe the recognition, evaluation, and management of early post-operative complications of thyroidectomy such as hematoma and hypocalcemia
j. Describe the outpatient management of post-operative thyroid hormone replacement, post-operative hypocalcemia, and post-operative voice changes

2. Parathyroid Disease

a. Diagram and demonstrate normal parathyroid anatomy including typical gland locations, blood supply, and relationship to the recurrent laryngeal nerves and other adjacent structures
b. Describe normal parathyroid embryogenesis and descent and how this affects ectopic gland location
c. Outline the normal calcium metabolic pathway including vitamin D metabolism, parathyroid hormone production and regulation, and calcitonin production and regulation
d. Describe the impact of specific medications and medical conditions on serum calcium and calcium metabolism
e. Outline the evaluation and treatment of life-threatening hypercalcemia
f. Outline the appropriate evaluation for these clinical scenarios including interpretation of expected test results:
   - Primary hyperparathyroidism
   - Secondary hyperparathyroidism
   - Tertiary hyperparathyroidism
   - Hypercalcemia of malignancy
   - Hypercalcemia associated with medications
g. Develop an algorithm that includes pertinent history, examination findings, and initial diagnostic evaluation of:
   - Asymptomatic primary hyperparathyroidism
   - Symptomatic primary hyperparathyroidism
h. Describe the recognition, evaluation, and management of post-operative complications:
   - Hematoma
   - Hypocalcemia
   - Voice changes

3. Adrenal Disease

a. Describe the embryology, histology, and physiology of the adrenal gland and distinguish differences in the cortex and medulla
b. Describe the anatomy of the adrenal gland including the arterial supply, venous drainage, and relationship to surrounding structures
c. Outline the biosynthesis and physiologic effects of glucocorticoids, mineralocorticoids, and adrenal sex steroids
d. Outline the catecholamine synthetic pathway
e. Identify the etiologies, common signs and symptoms, and clinical presentations of Cushing's syndrome
f. Outline the diagnostic evaluation of hypercortisolism
g. Describe the protocol for perioperative steroid use in a patient taking exogenous steroids
h. Outline the etiologies, clinical presentation, evaluation and management of adrenal insufficiency
i. Describe the signs, symptoms, and evaluation of primary hyperaldosteronism
j. Describe the general attributes of adrenocortical carcinoma
k. Describe the physiology, clinical presentation, treatment and preoperative preparation of pheochromocytoma

l. Locate and describe the adrenal glands on a CT scan

4. Pancreatic and Gastrointestinal Neuroendocrine Tumors

a. Describe the site of synthesis, mechanism of action, and normal physiologic effects of the following GI hormones:
   - Gastrin
   - Insulin
   - Glucagon
   - Vasoactive Intestinal Polypeptide
   - Somatostatin

b. Describe the different cell types of the endocrine pancreas, their synthetic products, stimuli, and inhibitors to these products, and distribution in the pancreas

c. Describe the symptoms and syndromes associated with the hypersecretion of the following GI hormones:
   - Gastrin
   - Insulin
   - Glucagon
   - Vasoactive Intestinal Polypeptide
   - Somatostatin

d. Describe the typical presentation of carcinoid tumors

e. Describe the sites of occurrence of carcinoid tumors including their frequency and propensity for developing carcinoid syndrome

f. Describe the pathophysiology of carcinoid syndrome

Systems-Based Practice:

By the end of the Endocrine Surgery rotation, the HO I resident will be able to:

1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Practice-Based Learning and Improvement:

By the end of the Endocrine Surgery rotation, the HO I resident will be able to:

1. Analyze patient care experience and perform practice-based improvement activities using a systematic methodology (discussed in QI curriculum)
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given endocrine surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Use information technology to manage information, access on-line medical information; and support their own education

Professionalism:

By the end of the Endocrine Surgery rotation, the HO I resident will be able to:

1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and

society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the endocrine surgery patient population, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of general surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the Endocrine Surgery rotation, the HO I resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient, especially the newly-diagnosed cancer patient

Endocrine Surgery Service (Blue Service)

House Officer II

Goal: The goal of the HO II rotation in Endocrine Surgery is to build on the resident's overall general surgical knowledge and clinical experience and provide more concentrated exposure in diverse endocrine surgical diseases and techniques to treat affected patients. Knowledge and skills for head and neck ultrasound will increase. Operative learning opportunities will include thyroid disease, parathyroid disease, adrenal disease, and neuroendocrine tumors of the pancreas and gastrointestinal tract.

Learning Objectives:

Patient Care: By the end of the Endocrine Surgery rotation, the HO II resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding thyroid pathology, hyperparathyroidism, adrenal tumors or dysfunction, endocrine tumors of the pancreas and GI tract, perianal disease, or hernias
3. Demonstrate the ability to take a thorough family history and delineate potential components of familial endocrinopathies
4. Palpate and describe a thyroid nodule and/or goiter
5. Perform a fine needle aspiration biopsy of a thyroid nodule with ultrasound guidance
6. Perform a thorough physical examination and be familiar with signs of hormone excess (examples contingent on diagnosis such as hirsutism, striae, acne, facial changes, clitoral hypertrophy, flushing, etc.)
7. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
8. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
9. Use information technology effectively to support patient care decisions and patient education
10. Assist and perform portions of operative cases (under supervision) such as parathyroidectomy, thyroid lobectomy, total thyroidectomy, neck dissections, open adrenalectomy, laparoscopic adrenalectomy, and resection of intestinal carcinoid tumors
11. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the endocrine surgery patient which includes interactions with medical endocrinology, pathology, radiology, nuclear medicine, radiation oncology, and mid-level providers from the clinic and inpatient services

Medical Knowledge: By the end of the Endocrine Surgery rotation, the HO II resident will be able to:
1. Thyroid Disease
a. Outline algorithms for evaluation and treatment of well differentiated thyroid cancer (concordant with NCCN and ATA guidelines) b. Outline algorithms for evaluation and treatment of medullary thyroid carcinoma (concordant with NCCN and ATA guidelines) c. Describe risk factors for well-differentiated thyroid cancer, medullary thyroid cancer, thyroid lymphoma, and anaplastic thyroid cancer d. Outline algorithms for evaluation and treatment of hyperthyroidism due to Graves' disease,

toxic nodule, medications, and pregnancy
e. Describe the clinical presentation of thyroid storm and outline treatment
f. Explain an algorithm for the evaluation and management of non-toxic multinodular goiter, including substernal goiter with and without airway involvement
g. Explain the pathophysiology of multinodular goiter, Graves' disease, and thyroid cancer
h. Describe operative approaches to thyroid pathology
i. Outline the staging schemes and prognostic factors for thyroid cancer
j. Recognize and treat post-operative complications such as hematoma, hypocalcemia, thyroid storm, and voice changes

2. Parathyroid Disease

a. Demonstrate in the operating room typical locations for ectopic parathyroid glands
b. Delineate consensus guidelines for surgical treatment of asymptomatic primary hyperparathyroidism patients including initial evaluation, selection for surgery, and recommendations for follow up
c. Interpret bone mineral density examinations
d. Outline follow up after parathyroidectomy
e. Explain an algorithm for preoperative localization of parathyroid adenoma and discuss the rationale, sensitivity, and accuracy of the various localizing tests
f. Outline an algorithm for intraoperative confirmation of successful parathyroidectomy during bilateral neck exploration and during targeted parathyroidectomy (i.e. operative findings and interpretation of IOPTH monitoring)
g. Outline the prevention, recognition, and management of hungry bone syndrome after parathyroidectomy
h. Outline a diagnostic and treatment pathway for patients with non-MEN familial hyperparathyroidism

3. Adrenal Disease

a. Outline the diagnostic pathway of ACTH dependent vs. ACTH independent Cushing's syndrome, including the low and high dose dexamethasone suppression test
b. Demonstrate understanding of normal ranges and those expected for suppression of cortisol and demonstrate familiarity with the utility and role of salivary, venous, and urinary cortisol measurements
c. Describe the localization studies available for adrenal tumors including adrenal protocol CT scanning, MRI, PET/CT, MIBG
d. Distinguish bilateral hyperplasia vs. unilateral disease in Cushing's syndrome and primary hyperaldosteronism
e. Describe the diagnostic algorithm for primary hyperaldosteronism
f. Describe the treatment and outcome for primary hyperaldosteronism in patients treated for adenoma vs. bilateral adrenal hyperplasia
g. Outline the diagnostic evaluation and treatment of adrenocortical carcinoma
h. Outline the diagnostic pathway for pheochromocytoma and review the treatment modalities and recommendations
i. Describe the evaluation and treatment of an adrenal incidentaloma
j. Explain the etiology, diagnosis, and treatment of adrenal cystic disease
k. Explain the appropriate and inappropriate use of FNA in evaluation of adrenal tumors
l. Describe the operative approaches for adrenal surgery including laparoscopic trans- and extra-peritoneal approaches and anterior, lateral, and posterior open approaches
m. Explain technique of adrenal vein sampling, the role of ACTH stimulation, and interpretation of results
n. Understand the algorithm and dosing for preoperative preparation/blockade before surgical treatment of pheochromocytoma (e.g. phenoxybenzamine, nicardipine, beta blockers, etc.)
o. List medications that can alter interpretation of catecholamine measurements

4. Pancreatic and Gastrointestinal Neuroendocrine Tumors

a. Describe the site of synthesis, mechanism of action, and normal physiologic effects of the following GI hormones:
   - Gastrin
   - Insulin

- Glucagon
- Vasoactive Intestinal Polypeptide
- Somatostatin

b. Describe the different cell types of the endocrine pancreas, their synthetic products, stimuli, and inhibitors to these products, and distribution in the pancreas
c. Describe the symptoms and syndromes associated with the hypersecretion of the following GI hormones:
   - Gastrin
   - Insulin
   - Glucagon
   - Vasoactive Intestinal Polypeptide
   - Somatostatin
d. Describe the typical presentation of carcinoid tumors
e. Describe the sites of occurrence of carcinoid tumors including their frequency and propensity for developing carcinoid syndrome
f. Describe the pathophysiology of carcinoid syndrome

Systems-Based Practice:

By the end of the Endocrine Surgery rotation, the HO II resident will be able to:

1. Apply their knowledge of systems in delivering optimal health care, including inferring how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Describe how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Define cost-effective health care and discuss how to address issues of resource allocation without compromising quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Practice-Based Learning and Improvement:

By the end of the Endocrine Surgery rotation, the HO II resident will be able to:

1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. When given online resources, conduct an effective literature search about a given endocrine surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Outline the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations
6. Evaluate experimental design and interpret results in published literature (or planned research), including true randomization, sampling error, blinded studies, prospective versus retrospective evaluations, and the advantages and weaknesses of each; knows the distinction between dependent and independent variables under evaluation and knows the meaning of confidence intervals or "P" value in suggesting statistical significance

Professionalism:

By the end of the Endocrine Surgery rotation, the HO II resident will be able to:

1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the endocrine surgery patient population, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of general surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the Endocrine Surgery rotation, the HO II resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient, especially the newly-diagnosed cancer patient

Endocrine Surgery Service (Blue Service)

House Officer III

Goal: The goal of the HO III rotation in Endocrine Surgery is to build on the resident's overall general surgical knowledge and clinical experience and provide more concentrated exposure in diverse endocrine surgical diseases and techniques to treat affected patients. Operative learning opportunities will include thyroid disease, parathyroid disease, adrenal disease, and neuroendocrine tumors of the pancreas and gastrointestinal tract. Complex operations and laparoscopic approaches are introduced to the HO III surgery resident.

Learning Objectives:

Patient Care: By the end of the Endocrine Surgery rotation, the HO III resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding thyroid pathology, hyperparathyroidism, adrenal tumors or dysfunction, endocrine tumors of the pancreas and GI tract, perianal disease, or hernias
3. Palpate and describe a thyroid nodule and/or goiter
4. Perform a fine needle aspiration biopsy of a thyroid nodule with ultrasound guidance
5. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
6. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
7. Use information technology effectively to support patient care decisions and patient education
8. Assist and perform portions of operative cases (under supervision) such as parathyroidectomy, thyroid lobectomy, total thyroidectomy, neck dissections, open adrenalectomy, laparoscopic adrenalectomy, and resection of intestinal carcinoid tumors
9. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the endocrine surgery patient which includes interactions with medical endocrinology, pathology, radiology, nuclear medicine, radiation oncology, and mid-level providers from the clinic and inpatient services

Medical Knowledge: By the end of the Endocrine Surgery rotation, the HO III resident will be able to:
1. Thyroid Disease
a. Outline algorithms for evaluation and treatment of well differentiated thyroid cancer (concordant with NCCN and ATA guidelines) b. Outline algorithms for evaluation and treatment of medullary thyroid carcinoma (concordant with NCCN and ATA guidelines) c. Describe risk factors for well-differentiated thyroid cancer, medullary thyroid cancer, thyroid lymphoma, and anaplastic thyroid cancer d. Outline algorithms for evaluation and treatment of hyperthyroidism due to Graves' disease, toxic nodule, medications, and pregnancy e. Describe the clinical presentation of thyroid storm and outline treatment f. Explain an algorithm for the evaluation and management of non-toxic multinodular goiter,

including substernal goiter with and without airway involvement
g. Explain the pathophysiology of multinodular goiter, Graves' disease, and thyroid cancer
h. Describe operative approaches to thyroid pathology
i. Outline the staging schemes and prognostic factors for thyroid cancer
j. Recognize and treat post-operative complications such as hematoma, hypocalcemia, thyroid storm, and voice changes

2. Parathyroid Disease

a. Demonstrate in the operating room typical locations for ectopic parathyroid glands
b. Delineate consensus guidelines for surgical treatment of asymptomatic primary hyperparathyroidism patients including initial evaluation, selection for surgery, and recommendations for follow up
c. Interpret bone mineral density examinations
d. Outline follow up after parathyroidectomy
e. Explain an algorithm for preoperative localization of parathyroid adenoma and discuss the rationale, sensitivity, and accuracy of the various localizing tests
f. Outline an algorithm for intraoperative confirmation of successful parathyroidectomy during bilateral neck exploration and during targeted parathyroidectomy (i.e. operative findings and interpretation of IOPTH monitoring)
g. Outline the prevention, recognition, and management of hungry bone syndrome after parathyroidectomy
h. Outline a diagnostic and treatment pathway for patients with non-MEN familial hyperparathyroidism

3. Adrenal Disease

a. Outline the diagnostic pathway of ACTH dependent vs. ACTH independent Cushing's syndrome, including the low and high dose dexamethasone suppression test
b. Demonstrate understanding of normal ranges and those expected for suppression of cortisol and demonstrate familiarity with the utility and role of salivary, venous, and urinary cortisol measurements
c. Describe the localization studies available for adrenal tumors including adrenal protocol CT scanning, MRI, PET/CT, MIBG
d. Distinguish bilateral hyperplasia vs. unilateral disease in Cushing's syndrome and primary hyperaldosteronism
e. Describe the diagnostic algorithm for primary hyperaldosteronism
f. Describe the treatment and outcome for primary hyperaldosteronism in patients treated for adenoma vs. bilateral adrenal hyperplasia
g. Outline the diagnostic evaluation and treatment of adrenocortical carcinoma
h. Outline the diagnostic pathway for pheochromocytoma and review the treatment modalities and recommendations
i. Describe the evaluation and treatment of an adrenal incidentaloma
j. Explain the etiology, diagnosis, and treatment of adrenal cystic disease
k. Explain the appropriate and inappropriate use of FNA in evaluation of adrenal tumors
l. Describe the operative approaches for adrenal surgery including laparoscopic trans- and extra-peritoneal approaches and anterior, lateral, and posterior open approaches
m. Explain technique of adrenal vein sampling, the role of ACTH stimulation, and interpretation of results
n. Understand the algorithm and dosing for preoperative preparation/blockade before surgical treatment of pheochromocytoma (e.g. phenoxybenzamine, nicardipine, beta blockers, etc.)
o. List medications that can alter interpretation of catecholamine measurements

4. Pancreatic and Gastrointestinal Neuroendocrine Tumors

a. Describe the site of synthesis, mechanism of action, and normal physiologic effects of the following GI hormones:
   - Gastrin
   - Insulin
   - Glucagon
   - Vasoactive Intestinal Polypeptide
   - Somatostatin

b. Describe the different cell types of the endocrine pancreas, their synthetic products, stimuli, and inhibitors to these products, and distribution in the pancreas
c. Describe the symptoms and syndromes associated with the hypersecretion of the following GI hormones:
   - Gastrin
   - Insulin
   - Glucagon
   - Vasoactive Intestinal Polypeptide
   - Somatostatin
d. Describe the typical presentation of carcinoid tumors
e. Describe the sites of occurrence of carcinoid tumors including their frequency and propensity for developing carcinoid syndrome
f. Describe the pathophysiology of carcinoid syndrome

5. Familial Endocrinopathies

a. Describe the components of each of the following multiple endocrine neoplasia (MEN) syndromes, their mode of inheritance, and the frequency of expression of each component:
   - MEN 1
   - MEN 2A
   - MEN 2B
b. Outline the diagnostic approach for each of the MEN syndromes
c. Describe the treatment (including timing of operative approach) for each component of the following MEN syndromes:
   - MEN 1
   - MEN 2A
   - MEN 2B
d. Outline recommended genetic testing for patients suspected of having one of the MEN syndromes
e. Outline recommended screening for the kindred of patients with the different MEN syndromes
f. Outline recommended follow up of patients with the different MEN syndromes
g. Describe the typical prognosis for patients with each of the MEN syndromes

Systems-Based Practice:

By the end of the Endocrine Surgery rotation, the HO III resident will be able to:

1. Apply their knowledge of systems in delivering optimal health care, including inferring how "system problems" contribute to quality problems
2. Apply systems knowledge to demonstrate how patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Compare and contrast different medical practice and delivery systems, including differing methods of controlling health care costs and allocating resources
4. Demonstrate responsible, cost-effective health care and discuss how to address issues of resource allocation without compromising quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Practice-Based Learning and Improvement:

By the end of the Endocrine Surgery rotation, the HO III resident will be able to:

1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. When given online resources, conduct an effective literature search about a given endocrine surgery

topic
4. Design a systematic approach to evaluate the results of one's own practice
5. Summarize the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations
6. Evaluate experimental design and interpret results in published literature (or planned research), including true randomization, sampling error, blinded studies, prospective versus retrospective evaluations, and the advantages and weaknesses of each; knows the distinction between dependent and independent variables under evaluation and knows the meaning of confidence intervals or "P" value in suggesting statistical significance
7. Apply their knowledge information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the Endocrine Surgery rotation, the HO III resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the endocrine surgery patient population, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of general surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the Endocrine Surgery rotation, the HO III resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient, especially the newly-diagnosed cancer patient

Endocrine Surgery Service (Blue Service)

House Officer IV

Goal: The goal of the HO IV rotation in Endocrine Surgery is to build on the resident's overall general surgical knowledge and previous robust clinical experience in endocrine surgery and to provide ongoing concentrated exposure in diverse endocrine surgical diseases and techniques to treat affected patients. Operative learning opportunities will include thyroid disease, parathyroid disease, adrenal disease, and neuroendocrine tumors of the pancreas and gastrointestinal tract. Residents will take a more active surgeon role in complex endocrine surgery operations and lead multi-disciplinary care interactions.

Learning Objectives:

Patient Care: By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding thyroid pathology, hyperparathyroidism, adrenal tumors or dysfunction, endocrine tumors of the pancreas and GI tract, perianal disease, or hernias
3. Obtain, describe, and interpret thyroid and parathyroid ultrasound images and indicate ultrasound findings concerning for thyroid malignancy
4. Perform safely and effectively a fine needle aspiration biopsy of a thyroid nodule with ultrasound guidance
5. Assess vocal cord function with flexible transnasal videoendoscopy
6. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
7. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
8. Use information technology effectively to support patient care decisions and patient education
9. Assist and perform portions of operative cases (under supervision) such as parathyroidectomy, thyroid lobectomy, total thyroidectomy, parathyroid autotransplantation, neck dissections, open adrenalectomy, laparoscopic adrenalectomy, and resection of intestinal carcinoid tumors
10. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the endocrine surgery patient which includes interactions with medical endocrinology, pathology, radiology, nuclear medicine, radiation oncology, and mid-level providers from the clinic and inpatient services

Medical Knowledge: By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:
1. Thyroid Disease
a. Outline the complete evaluation and management of patients with thyroid cancer (papillary, follicular, medullary, anaplastic) including: • Pre-operative evaluation including radiographic studies • Operative approaches including discussion of lobectomy vs. total thyroidectomy • Indications for and extent of neck dissection (both central and lateral) • Incidental finding of cancer in resected specimen • Metastatic thyroid cancer

- Large remnant in patient with thyroid cancer
- Tracheal invasion
- Esophageal invasion
- Post-operative treatment, surveillance, and monitoring

b. Outline the complete evaluation and management of non-toxic multinodular goiter and substernal goiter
c. Describe approaches for re-operative thyroid surgery
d. Describe the management of intraoperative recurrent laryngeal nerve injury

2. Parathyroid Disease

a. Outline the complete evaluation and management of patients with parathyroid cancer including preoperative evaluation and radiographic studies, operative approaches, extent of resection, and post-operative treatment and surveillance
b. Describe different techniques of targeted parathyroidectomy including mini-incision open, radioguided, and endoscopic approaches
c. Outline the complete evaluation and management of recurrent or persistent hyperparathyroidism including interpretation of imaging studies and selective venous sampling
d. Describe regional anesthesia for targeted parathyroidectomy
e. Describe the treatment algorithm for MEN 1 and MEN 2A including the order in which the different manifestations should be treated

3. Adrenal Disease

a. Describe and explain congenital adrenal hyperplasia
b. Describe surgical approaches to adrenal and extra-adrenal pheochromocytoma
c. Review surgical options/approaches for adrenalectomy and indications for each
d. Describe intraoperative management of patients with pheochromocytoma during surgery regarding anesthetic management, surgical technique, and pre- and post-operative care
e. Identify the distinguishing characteristics of extra-adrenal pheochromocytomas
f. Describe the evaluation and treatment of the MEN 2 patient with adrenal lesion(s)
g. Describe the treatment options for a patient with malignant pheochromocytoma
h. Identify key steps for a safe and effective right and left laparoscopic transabdominal adrenalectomy
i. Identify key steps for a safe and effective subtotal adrenalectomy for selected patients
j. Describe the diagnosis and treatment of paragangliomas
k. Demonstrate knowledge of the common complications of adrenalectomy and explain how to avoid them
l. Explain physiologic dosing of steroids and florinef following bilateral adrenalectomy and delineate dosing conversion factors between specific steroid preparations

4. Pancreatic and Gastrointestinal Neuroendocrine Tumors

a. Describe the diagnostic approach including biochemical evaluation, ancillary studies, and recommended localization methods for the following tumors:
   - Gastrinoma
   - Insulinoma
   - Glucagonoma
   - VIPoma
   - Somatostatinoma
   - Non-functioning Pancreatic Endocrine Tumors (PETs)

b. Describe the indications for surgery, operative approaches, and expected outcomes for the following tumors:
   - Gastrinoma
   - Insulinoma
   - Glucagonoma
   - VIPoma
   - Somatostatinoma
   - Non-functioning Pancreatic Endocrine Tumors (PETs)

c. Outline an algorithm for surgical management of carcinoid tumors based on site, size, and presence of carcinoid syndrome
d. Outline the follow up of patients who have undergone resection of carcinoid tumors

e. Outline the management of liver metastases of neuroendocrine tumors

5. Familial Endocrinopathies

a. Describe the mode of inheritance of familial medullary thyroid cancer (FMTC)
b. Outline the diagnostic evaluation (including genetic testing) for FMTC
c. Outline the recommended treatment including the role of prophylactic thyroidectomy for FMTC
d. Outline the recommended screening for the kindred of patients with FMTC
e. Outline the recommended follow up of patients with FMTC
f. Describe the typical prognosis for patients with FMTC
g. Compare and contrast the evaluation and management of FMTC with sporadic medullary thyroid cancer
h. Describe the diagnostic criteria for familial papillary thyroid cancer (FPTC)
i. Describe the mode of inheritance of FPTC
j. Outline recommended screening for FPTC
k. Outline the recommended treatment for FPTC
l. Outline the recommended follow up of patients with FPTC
m. Describe the typical prognosis for patients with FPTC
n. Compare and contrast the evaluation and management of FPTC with sporadic papillary thyroid cancer
o. Describe the diagnostic criteria for familial non-MEN hyperparathyroidism (PHPTH)
p. Describe the mode of inheritance of FHPTH
q. Outline recommended screening for FHPTH
r. Compare and contrast the evaluation and management of FHPTH with sporadic primary hyperparathyroidism

Systems-Based Practice:

By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:

1. Apply their knowledge of systems in delivering optimal health care, including inferring how "system problems" contribute to quality problems
2. Integrate systems knowledge to understand how aspects of the health care context, i.e., the health care organization, the larger society, affect their own practice
3. Evaluate how different medical practice and delivery systems play a role in health care systems, including differing methods of controlling health care costs and allocating resources
4. Demonstrate responsible, cost-effective health care and discuss how to address issues of resource allocation without compromising quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Practice-Based Learning and Improvement:

By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:

1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. When given online resources, conduct an effective literature search about a given endocrine surgery topic
4. Design a systematic approach to evaluate the results of one's own practice
5. Summarize the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations
6. Evaluate experimental design and interpret results in published literature (or planned research), including true randomization, sampling error, blinded studies, prospective versus retrospective evaluations, and the advantages and weaknesses of each; knows the distinction between dependent

and independent variables under evaluation and knows the meaning of confidence intervals or "P" value in suggesting statistical significance
7. Apply their knowledge information technology to manage information, access on-line medical information; and support their own education

Professionalism: By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:
1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the endocrine surgery patient population, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of general surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Interpersonal and Communication Skills: By the end of the Endocrine Surgery rotation, the HO IV resident will be able to:
1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate and employ effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Work effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient, especially the newly-diagnosed cancer patient

Endocrine Surgery Service (Blue Service)

House Officer V

Goal: The goal of the HO V rotation in Endocrine Surgery is to build on the resident's overall general surgical knowledge and previous robust clinical experience in endocrine surgery and to provide ongoing concentrated exposure in diverse endocrine surgical diseases and techniques to treat affected patients. Operative learning opportunities will include thyroid disease, parathyroid disease, and an increased emphasis on adrenal disease and neuroendocrine tumors of the pancreas and gastrointestinal tract. Residents will a leadership role in more complex endocrine surgery operations and lead multi-disciplinary care interactions.

Learning Objectives:

Patient Care: By the end of the Endocrine Surgery rotation, the HO V resident will be able to:
1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding thyroid pathology, hyperparathyroidism, adrenal tumors or dysfunction, endocrine tumors of the pancreas and GI tract, perianal disease, or hernias
3. Obtain, describe, and interpret thyroid and parathyroid ultrasound images and indicate ultrasound findings concerning for thyroid malignancy
4. Perform safely and effectively a fine needle aspiration biopsy of a thyroid nodule with ultrasound guidance
5. Assess vocal cord function with flexible transnasal videoendoscopy
6. Suggest diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
7. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
8. Use information technology effectively to support patient care decisions and patient education
9. Assist and perform portions of operative cases (under supervision) such as parathyroidectomy, thyroid lobectomy, total thyroidectomy, neck dissections, parathyroid autotransplantation, open adrenalectomy, laparoscopic adrenalectomy, and resection of intestinal carcinoid tumors
10. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the endocrine surgery patient which includes interactions with medical endocrinology, pathology, radiology, nuclear medicine, radiation oncology, and mid-level providers from the clinic and inpatient services

Medical Knowledge: By the end of the Endocrine Surgery rotation, the HO V resident will be able to:
1. Thyroid Disease
a. Outline the complete evaluation and management of patients with thyroid cancer (papillary, follicular, medullary, anaplastic) including: • Pre-operative evaluation including radiographic studies • Operative approaches including discussion of lobectomy vs. total thyroidectomy • Indications for and extent of neck dissection (both central and lateral) • Incidental finding of cancer in resected specimen • Metastatic thyroid cancer

- Large remnant in patient with thyroid cancer
- Tracheal invasion
- Esophageal invasion
- Post-operative treatment, surveillance, and monitoring

b. Outline the complete evaluation and management of non-toxic multinodular goiter and substernal goiter
c. Describe approaches for re-operative thyroid surgery
d. Describe the management of intraoperative recurrent laryngeal nerve injury

2. Parathyroid Disease

a. Outline the complete evaluation and management of patients with parathyroid cancer including preoperative evaluation and radiographic studies, operative approaches, extent of resection, and post-operative treatment and surveillance
b. Describe different techniques of targeted parathyroidectomy including mini-incision open, radioguided, and endoscopic approaches
c. Outline the complete evaluation and management of recurrent or persistent hyperparathyroidism including interpretation of imaging studies and selective venous sampling
d. Describe regional anesthesia for targeted parathyroidectomy
e. Describe the treatment algorithm for MEN 1 and MEN 2A including the order in which the different manifestations should be treated

3. Adrenal Disease

a. Describe and explain congenital adrenal hyperplasia
b. Describe surgical approaches to adrenal and extra-adrenal pheochromocytoma
c. Review surgical options/approaches for adrenalectomy and indications for each
d. Describe intraoperative management of patients with pheochromocytoma during surgery regarding anesthetic management, surgical technique, and pre- and post-operative care
e. Identify the distinguishing characteristics of extra-adrenal pheochromocytomas
f. Describe the evaluation and treatment of the MEN 2 patient with adrenal lesion(s)
g. Describe the treatment options for a patient with malignant pheochromocytoma
h. Identify key steps for a safe and effective right and left laparoscopic transabdominal adrenalectomy
i. Identify key steps for a safe and effective subtotal adrenalectomy for selected patients
j. Describe the diagnosis and treatment of paragangliomas
k. Demonstrate knowledge of the common complications of adrenalectomy and explain how to avoid them
l. Explain physiologic dosing of steroids and florinef following bilateral adrenalectomy and delineate dosing conversion factors between specific steroid preparations

4. Pancreatic and Gastrointestinal Neuroendocrine Tumors

a. Describe the diagnostic approach including biochemical evaluation, ancillary studies, and recommended localization methods for the following tumors:
   - Gastrinoma
   - Insulinoma
   - Glucagonoma
   - VIPoma
   - Somatostatinoma
   - Non-functioning Pancreatic Endocrine Tumors (PETs)

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c. Outline an algorithm for surgical management of carcinoid tumors based on site, size, and presence of carcinoid syndrome
d. Outline the follow up of patients who have undergone resection of carcinoid tumors

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Systems-Based Practice:

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5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance; in particular the multidisciplinary approach to morbid obesity, issues affecting access to care and long-term follow up

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4. Design a systematic approach to evaluate the results of one's own practice
5. Summarize the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations
6. Critically evaluate experimental design and interpret results in published literature (or planned research), including true randomization, sampling error, blinded studies, prospective versus retrospective evaluations, and the advantages and weaknesses of each; knows the distinction

between dependent and independent variables under evaluation and knows the meaning of confidence intervals or "P" value in suggesting statistical significance
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