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Evaluation & Management of Patients with Thyroid and Parathyroid Tumors

Description of the Activity	Surgical oncologists are expected to evaluate and manage patients who present with signs and symptoms of benign and malignant thyroid and parathyroid disorders. Surgical oncologists must be able to accurately and cost-effectively diagnose, treat, and provide appropriate surveillance for adult patients with benign and malignant thyroid and parathyroid disorders and recognize complex disease that requires multidisciplinary treatment.
Functions	❖ Nonoperative/Preoperative ➢ Synthesize essential information from a patient's records, medical and family history, physical examination, and initial diagnostic evaluations to develop a differential diagnosis. ➢ Complete a cost-effective, age-appropriate, evidence-based diagnostic or staging evaluation, including biochemical testing, imaging studies, and image-guided biopsy as indicated. ➢ Communicate a diagnosis and potential treatment options to the patient/caregiver(s) and consultants. Use shared decision-making to develop a treatment plan consistent with a patient's goals and beliefs. ➢ Succinctly identify treatment goals, including curative intent, comorbidity optimization, life prolongation without curative option, palliation, or end-of-life care. Communicate sympathetically in a culturally appropriate manner when de-escalation of care is appropriate because of a poor prognosis or based on the patient/caregiver's goals of care. ➢ Use current evidence-based literature to develop the correct sequence of oncologic treatment of primary, recurrent, or metastatic disease, including surgery, neoadjuvant or adjuvant chemotherapy, radiation, radioisotope therapy, immunotherapy, and other treatments as necessary. ➢ Select a treatment approach based on disease presentation, comorbid conditions, genetic predisposition, and patient preferences. ➢ Describe patient and tumor characteristics for which active surveillance of papillary thyroid cancer can be considered. ➢ Use preoperative vocal cord assessment as indicated ➢ Interpret thyroid nodule imaging, and describe the indications for ultrasound-guided fine-needle aspiration (FNA) biopsy. ➢ Interpret FNA cytology results, and communicate the risk of malignancy for each reporting category. ➢ Describe the indicated use of molecular testing. ➢ Use FNA results, molecular markers, patient-specific risk factors (eg, radiation exposure, family history, hereditary endocrinopathy), and staging imaging to determine the extent of thyroidectomy and nodal dissection. ➢ Describe when and what surgical intervention is indicated for anaplastic thyroid cancer or lymphoma. ➢ Describe indications for operative intervention in primary, secondary, tertiary, and persistent/recurrent hyperparathyroidism and the differences in the extent of resection. ➢ Describe clinical factors suspicious for parathyroid carcinoma and the extent of resection. ➢ Describe differences in the operative approach for sporadic primary hyperparathyroidism versus syndromic hyperparathyroidism. ➢ Debate the advantages and disadvantages of focused parathyroidectomy versus bilateral cervical exploration. ➢ Use localization imaging to guide decisions for focused parathyroidectomy versus bilateral cervical exploration. ➢ Manage multidisciplinary treatment of the disease, including a preoperative discussion with the anesthesia team for airway difficulties and coordinated surgical specialties (eg, thoracic surgery, vascular surgery).

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- Participate in a multidisciplinary conference or discussion regarding treatment plans.
- Collaborate with other specialties to manage comorbidities that will affect treatment, such as hyperthyroidism, hypercalcemia, hereditary endocrine syndromes, chronic anticoagulation, cardiac disease, and immunosuppression.
- Educate the patient/caregiver(s) about postoperative recovery after thyroidectomy and parathyroidectomy, including pathways for potential urgent evaluation of complications.
- Obtain informed consent with cultural humility.
  - Describe the indications, risks, benefits, alternative therapies, and potential complications (recurrent laryngeal nerve injury, neck hematoma, postoperative hypocalcemia/hypoparathyroidism) of the planned procedure, and incorporate a discussion of the goals of care.
  - Ensure patient/caregiver comprehension using applicable language services and audio/visual aids as necessary.
  - Ensure that the patient/caregiver(s) can ask questions and address any expressed concerns, taking patient/caregiver preferences into account.
  - Discuss potential limitations in the desire for resuscitation (eg, do-not-resuscitate order) and how this will be addressed in the perioperative period.
  - Document the consent discussion.

❖ Intraoperative

- Manage the perioperative environment, including room setup, equipment check (eg, intraoperative nerve monitoring, intraoperative parathyroid hormone assays), availability of imaging, preprocedural time-out, specimen processing, counts, wound classification, and debriefing functions.
- Develop a safe anesthetic approach for the clinical situation in collaboration with in-office staff or the anesthesiology team, depending on the environment selected for the procedure (eg, avoidance of paralytic agents when using nerve monitoring).
- Create and maintain an intraoperative environment that promotes safety and patient-centered care.
- Position the patient to expose the operative field, taking precautionary measures to prevent iatrogenic injury (prevention of neck overextension, padding of nerve pressure points).
- Perform the procedures required to manage benign and malignant thyroid and parathyroid disease, including, but not limited to, total thyroidectomy, thyroid lobectomy, central neck lymph node dissection, lateral neck lymph node dissection, parathyroidectomy, reoperative parathyroidectomy, and resection of recurrent thyroid cancer.
- Demonstrate techniques for the identification and preservation of recurrent and superior laryngeal nerve function.
- Adapt the operative steps and plan to information discovered intraoperatively, calling consulting services as necessary (eg, intraoperative frozen assessment, modifying extent of surgery according to nodal disease burden, intraoperative parathyroid hormone results, intrathoracic dissection, visceral or vascular invasion).
- Assess the parathyroid glands for ischemia and the need for autotransplantation.

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	❖ Postoperative ➢ Oversee postoperative care, including postoperative calcium and thyroid hormone supplementation. ➢ Manage common early and late complications related to thyroidectomy, parathyroidectomy, and nodal dissection procedures, including: ▪ Chyle leak ▪ Hematoma ▪ Hypocalcemia/hypoparathyroidism ▪ Spinal accessory, phrenic, mandibular marginal nerve palsy ▪ Unilateral and bilateral recurrent laryngeal nerve injury ➢ Communicate a postencounter plan with a patient/caregiver(s) and other health care team members that considers intraoperative and pathologic findings, future treatment needs (radioactive iodine, radiation therapy, adjuvant targeted therapy), postencounter needs, outcome expectations, and follow-up. ➢ Coordinate care with other specialties and ancillary care as needed, such as endocrinology, physical therapy, speech pathology, rehabilitation, nutrition services, and genetic counseling. ➢ Review intraoperative and pathologic findings in a multidisciplinary tumor board, and modify the treatment plan, if indicated. ➢ Develop a plan for surveillance after the initial treatment of thyroid or parathyroid cancer.
Scope	❖ In scope ➢ Diagnoses ▪ High-risk and genetic predisposition scenarios ▪ Thyroid mass or nodule ▪ Thyroid cancer ● Differentiated ● Poorly differentiated ● Medullary ● Thyroid lymphoma ● Anaplastic ▪ Primary hyperparathyroidism ● Adenoma ● Multiglandular disease ● Parathyroid carcinoma ▪ Secondary hyperparathyroidism ▪ Tertiary hyperparathyroidism ▪ Recurrent primary hyperparathyroidism ▪ Benign thyroid conditions ● Graves disease ● Hashimoto thyroiditis

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- Solitary toxic nodule or toxic multinodular goiter
- ➢ Recurrent or metastatic thyroid cancer

- ➢ Procedures
  - Total thyroidectomy
  - Thyroid lobectomy
  - Central neck lymphadenectomy
  - Lateral neck lymphadenectomy
  - Parathyroid exploration
    - Minimally invasive
    - Subtotal parathyroidectomy
    - Total parathyroidectomy with autotransplantation
  - Thyroid ultrasound and ultrasound-guided FNA

- ➢ Populations
  - Adult and pediatric patients
  - Pregnant patients

- ❖ Out of scope
  - ➢ Diagnoses
    - Thyroglossal duct cyst

  - ➢ Procedures
    - Remote access thyroidectomy/parathyroidectomy
    - Surgical airway
    - Thyroid ablation

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1 **Limited Participation** Demonstrates understanding of information and has very basic skills **Framework:** Performs at the general surgery resident level, lower than expected for a typical residency graduate. Has some experience with simple cases but has been an observer of complex cases.	• Synthesizes information from a patient's records, medical and family history, physical examination, and initial diagnostic evaluations to develop a differential for thyroid disease • Interprets thyroid nodule imaging and describes indications for ultrasound-guided FNA biopsy • Describes indications for operative intervention in primary, secondary, tertiary, and recurrent hyperparathyroidism and the differences in the extent of resection • Describes how FNA results, molecular markers, and patient-specific risk factors (radiation exposure, family history, hereditary endocrinopathy) are used in risk assessment of thyroid nodules and cancer • Describes basic information about thyroid cancer, including subtypes and associated tumor markers • Describes basic information about familial endocrinopathy syndromes and their thyroid/parathyroid associations • Records information in a patient's record but may omit some important information or include some extraneous information; requires correction or augmentation of	• Positions the patient to expose the operative field, taking precautionary measures to prevent iatrogenic injury (prevention of neck overextension, padding of nerve pressure points) • Sets up RLN monitoring equipment if used • Lists potential intraop findings (eg, central neck nodal involvement, invasion into adjacent structures) but is unable to articulate how this would change the surgical plan • Describes the use of ioPTH but needs assistance to use this information to guide the extent of parathyroidectomy • Demonstrates limited skill in tissue-handling of the thyroid/parathyroids and needs prompting to find the correct planes • Describes normal thyroid and parathyroid anatomy, including the course of RLN and the external branch of SLN • Creates a basic operative note, omitting some important information; may need prompting for timeliness	• Writes postop orders, provides PACU staff with contact information, and reviews postop lab studies • Demonstrates knowledge of and manages routine postop care following thyroid and parathyroid surgery • Recognizes that the final pathology report has implications for further treatment (completion thyroidectomy/adjuvant therapy) • Recognizes that pathology and biochemical information are needed for surveillance and treatment after initial and reoperative parathyroid surgery • Documents postop care but may omit nuances of progress or minor complications; may choose an inappropriate means of communication (paging for minor details or email for urgent issues)

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	documentation of services; may need prompting for timeliness		
2 **Direct Supervision** Manages cases at the level of a newly graduated general surgery resident. Manages less complicated cases independently but needs active guidance for complex cases. **Framework:** The learner can manage simple or straightforward cases. The learner may require guidance in managing multidisciplinary care (eg, planning neoadjuvant treatment or postoperative chemotherapy). During surgery, the attending gives active help throughout the case	• Completes a cost-effective, evidence-based diagnostic or staging evaluation, including biochemical testing, imaging studies, and image-guided biopsy as indicated • Uses preop vocal cord assessment as indicated • Debates the advantages and disadvantages of focused parathyroidectomy vs bilateral cervical exploration • Uses localization imaging to guide decisions on focused parathyroidectomy vs bilateral cervical exploration • With assistance, interprets FNA results, molecular markers, and patient-specific risk factors (eg, radiation exposure, family history, hereditary endocrinopathy) to determine if additional testing or staging information is needed • Demonstrates comprehensive knowledge of thyroid and parathyroid cancer biology, genetic mutations, and clinical implications • Demonstrates comprehensive knowledge of familial endocrinopathy syndromes and their thyroid/parathyroid associations • Demonstrates organized diagnostic and therapeutic reasoning through notes in a	• Needs assistance to assess parathyroids for ischemia and the need for autotransplantation • With assistance, recognizes injury to the RLN as indicated by visible damage or loss of nerve signal • Identifies intraop findings that require refinement of the preop plan for thyroidectomy or parathyroidectomy (eg, extrathyroidal extension, nodal metastases) but requires assistance when encountering unanticipated intraop findings • With limited guidance, uses ioPTH testing to guide the extent of parathyroidectomy • Identifies correct planes around the thyroid/parathyroid with guidance and occasional correction • Needs direct assistance with identification and dissection of the RLN • Describes surgically relevant anatomic variations (eg, ectopic/supernumerary parathyroid glands, non-RLN) and alters patient management accordingly • Creates an operative note with a complete description of the procedure	• Demonstrates management of routine postop care, including common complications (eg, RLN injury, postop hypocalcemia, postop bleeding requiring reoperation) but needs assistance to recognize and manage a complex postop complication • Applies details of pathologic findings to therapeutic decisions in the postop management of thyroid cancer • Applies pathology results and postop biochemical testing to determine cure or the need for ongoing surveillance or further treatment after initial and reoperative parathyroid surgery • Thoroughly documents postop progression and the presence of any complications within the plan of management

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to maintain forward progression.	patient's record; demonstrates timely and efficient use of the EHR to communicate with the health care team		
3 **<u>Indirect Supervision</u>** Can do a basic operation but will not recognize abnormalities and does not understand the nuances of an advanced case. Manages multidisciplinary care of straightforward cases. Seeks assistance in managing complex cases. **<u>Framework:</u>** The learner can perform the operation in straightforward circumstances. The attending gives passive help. This help may be given while scrubbed for more complex cases or during check-in for more routine cases.	• With assistance, integrates oncologic information with patient-specific factors to design a diagnostic and workup plan; may need assistance to create a multidisciplinary treatment plan • Interprets FNA cytology results and communicates the risk of malignancy for each reporting category • With assistance, integrates FNA results, molecular markers, patient-specific risk factors (eg, radiation exposure, family history, hereditary endocrinopathy), and staging imaging to determine the need for surgery and the extent of thyroidectomy and nodal dissection • With assistance, evaluates a routine parathyroid patient (primary, secondary, or tertiary) and develops an imaging and treatment plan according to the disease; describes differences in the operative approach for sporadic primary hyperparathyroidism vs syndromic hyperparathyroidism • With assistance, applies knowledge of familial endocrinopathy syndromes and	• Assesses parathyroids for ischemia and the need for autotransplantation; performs a parathyroid autograft • Describes techniques for reconstruction of the RLN • With assistance, refines the operative plan for thyroidectomy or parathyroidectomy based on cancer-related findings (eg, extrathyroidal extension, nodal metastases, unresectable disease) • Independently uses ioPTH testing results to guide the extent of parathyroidectomy with limited guidance in most cases • Identifies correct planes and normal anatomy and dissects with minimal tissue trauma • Identifies, dissects, and preserves the RLN in a routine situation • With assistance, identifies surgically relevant anatomic variations (eg, ectopic/supernumerary parathyroid glands, non-RLN) and alters patient management accordingly	• Independently manages complex postop care and complications in most cases (eg, hematoma, hypoparathyroidism, dysphonia, airway compromise) • Identifies patient and tumor-specific factors relevant to postop thyroid cancer therapy per consensus guidelines; follows a guideline-based surveillance plan • Interprets postop parathyroid hormone surveillance in hyperparathyroidism to confirm biochemical cure and, with assistance, formulates a plan in a situation of persistence or recurrence • Appropriately selects direct (telephone, in-person) and indirect (progress notes, secure text messages) forms of communication based on context and urgency

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	their thyroid/parathyroid associations into decision-making for a patient suspected or proven to have such a syndrome • Concisely integrates all relevant data from outside systems and prior encounters and reports diagnostic and therapeutic reasoning in a patient's record	• Creates an operative note with a complete description of the procedure, including key intraop findings; documents anatomic or disease variants in a thorough and understandable way	
4 **Practice Ready** Manages complex disease presentations and performs complex operations independently. Guides a multidisciplinary approach to complex cases. Performs as an expert consultant in surgical oncology. **Framework:** The learner can treat all common variations of the disease and has a strong understanding of surgical and medical options for different presentations. The attending is available at the request of the learner but is not	• Independently guides discussion with a patient regarding the need for and extent of surgery for benign or malignant thyroid disease, taking into account cytology, molecular testing, imaging features, patient-specific factors, and preferences • Independently evaluates a complex parathyroid patient (eg, reoperative, normocalcemic/normohormonal primary hyperparathyroidism) and develops an imaging and treatment plan • Independently recognizes imaging features and biochemical test results that increase suspicion for parathyroid cancer • Independently integrates biopsy findings, molecular testing, and staging information to formulate a plan of treatment for anaplastic thyroid cancer • Independently incorporates knowledge of somatic mutations and the role of targeted therapy in consideration of neoadjuvant treatment for metastatic, locally advanced, and recurrent thyroid cancer	• Anticipates and prevents the need for emergency advanced airway procedures during thyroidectomy or parathyroidectomy • Independently refines the operative plan for thyroidectomy or parathyroidectomy based on cancer-related findings (eg, extrathyroidal extension, nodal metastases, or unresectable disease) • Independently uses ioPTH test results to guide the extent of parathyroidectomy in a complex case • Demonstrates consistent careful tissue handling, minimizing bleeding and tissue trauma; adapts technique to tissue quality • Identifies correct planes and advances the dissection during a complex case (eg, large goiter, thyroiditis, extrathyroidal cancer invasion, reoperative situations) • Identifies and preserves the RLN in a complex situation, including	• Anticipates and provides early intervention for postop complications (eg, hematoma, hypocalcemia, voice changes, chyle leak) • Independently integrates pathology findings, somatic mutation analysis, and patient-specific factors after surgery for thyroid cancer to develop a comprehensive treatment and surveillance plan • Independently develops a postop surveillance plan for a patient after parathyroidectomy to confirm biochemical cure; independently formulates a plan in a situation of persistence or recurrence or when there are indications for testing for familial endocrine syndromes • Communicates clearly, concisely, promptly, and in organized written form, including anticipatory guidance so the postop plan of care is clear to other members of the health care team

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routinely needed for common presentations, though input may be needed for more complex or unusual presentations.	• Independently develops a comprehensive plan and workup for a patient with a proven or suspected endocrinopathy syndrome (tumor/hormonal markers, imaging, genetic testing, and counseling) • Communicates diagnostic and therapeutic reasoning clearly, concisely, promptly, and in an organized written form, including anticipatory guidance; written or verbal communication (patient notes, email) serves as an example for others to follow	reoperations, multiple branches, and nonrecurrent anatomy • Independently identifies anatomic variations during parathyroid exploration (ectopic, intrathyroidal, supernumerary) and alters surgical management accordingly • Creates an operative note with a complete description of the procedure, a rationale for modifications of the operative plan, and documentation of anatomic or disease variants	