



Body System: Endocrine		
Session Topic: Hyperthyroidism and Hypothyroidism		
Educational Format		Faculty Expertise Required
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
Professional Practice Gap	Learning Objective(s) that will close the gap and meet the need	Outcome Being Measured
<ul style="list-style-type: none"> Physicians have gaps in medical knowledge associated with thyroid function testing. Physicians have gaps in medical knowledge gaps with regard to screening and diagnosing hypo/hyper-thyroid disorders. Physicians have knowledge gaps in selecting efficacious treatments based on current evidence-based recommendations. Physicians are frequently unfamiliar with published clinical guidelines for screening/diagnosing/treating hypo/hyper-thyroidism, particularly for at risk populations such as patients with Down syndrome and elderly patients. Recent research suggesting that treatment with levothyroxine provides no symptomatic benefit in older adults with subclinical hypothyroidism 	<ol style="list-style-type: none"> Develop a screening protocol to identify patients with risk factors for developing hypo/hyper-thyroidism, particularly pregnant patients or those planning to become pregnant. Order appropriate laboratory and radiologic tests to diagnose hypo/hyper-thyroidism based on symptomatology. Prescribe appropriate therapy for patients with hypo/hyper-thyroidism symptomatology and monitor patients accordingly. Identify the clinical signs, symptoms and required laboratory tests for diagnosing acute viral thyroiditis. Recognize indications for referral and possible admission and coordinate care and follow-up as necessary. 	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.



ACGME Core Competencies Addressed (select all that apply)		
X	Medical Knowledge	Patient Care
	Interpersonal and Communication Skills	Practice-Based Learning and Improvement
	Professionalism	Systems-Based Practice
Faculty Instructional Goals		
<p>Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.</p> <ul style="list-style-type: none"> • Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations • Facilitate learner engagement during the session • Address related practice barriers to foster optimal patient management • Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the <u>References</u> section below are a good place to start <ul style="list-style-type: none"> ○ Visit http://www.aafp.org/journals for additional resources ○ Visit http://familydoctor.org for patient education and resources • Provide recommendations for developing a screening protocol to identify patients with risk factors for developing hypo/hyper-thyroidism, particularly pregnant patients or those planning to become pregnant. • Provide recommendations for ordering appropriate laboratory and radiologic tests to diagnose hypo/hyper-thyroidism based on symptomatology. • Provide recommendations for prescribing appropriate therapy for patients with hypo/hyper-thyroidism symptomatology and monitor patients accordingly. • Provide recommendations for recognizing the clinical signs, symptoms and required laboratory tests for diagnosing acute viral thyroiditis. • Provide recommendations for recognizing indications for referral and possible admission and coordinate care and follow-up as necessary. 		

Needs Assessment

Hypothyroidism and hyperthyroidism are common clinical disorders encountered by the primary care physician; in fact, thyroid disease is the second most common endocrine disorder affecting women of reproductive age.¹ Approximately 4.6 percent of the U.S. population age 12 and older has hypothyroidism, about and 1 percent of the U.S. population has hyperthyroidism.² There are nearly 13 million Americans with undiagnosed hypothyroidism.³ The prevalence of hyperthyroidism varies by study; however, it is as high as 20 percent in patients on thyroid hormone therapy.⁴ In a study from the Endocrine Society, subclinical hyperthyroidism may be overdiagnosed and overtreated in non-Hispanic blacks (NHB) in otherwise healthy NHB individuals.⁵



Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicate that family physicians have statistically significant and meaningful gaps in the medical skill necessary to provide optimal care and management of hyperthyroidism; and while this same data indicates that family physicians do not have knowledge gaps related to managing hypothyroidism, or thyroid disease in pregnancy, it does suggest that family physicians do have knowledge gaps associated with thyroid function testing.⁶ More specifically, CME outcomes data from 2011-2016 AAFP FMX (formerly Assembly): *Hyperthyroidism and Hypothyroidism* sessions suggest that physicians have knowledge and practice gaps with regard to appropriate laboratory assessment of thyroid function; effective history taking and physical examination; selection of current evidence-based treatments; recognizing at risk patients, and when to screen and diagnose; first-line treatment; monitoring patients on pharmacologic therapy; ordering laboratory/diagnostic tests in accordance with current guidelines; and improved coordination of care and follow-up when referral is indicated.⁷⁻¹¹ Additionally, a review of the literature reveals that physicians are often nonadherent to clinical guidelines for the management of thyroid disorders.¹²⁻¹⁶

Physicians may improve their care of patients with hypo/hyper-thyroidism by engaging in continuing medical education that provides practical integration of current evidence-based guidelines and recommendations into their standards of care, including, but not limited to the following:^{4,17-21}

- Physicians should not routinely screen for subclinical thyroid disease.
- To reduce the risk of atrial fibrillation, heart failure, and mortality, physicians should treat adults with subclinical hyperthyroidism who are 65 years or older and have TSH levels less than 0.1 mIU per L.
- To decrease the risk of further bone loss, physicians should treat postmenopausal women with TSH levels less than 0.1 mIU per L and osteoporosis.
- The choice of treatment modality for hyperthyroidism caused by overproduction of thyroid hormones depends on the patient's age, symptoms, comorbidities, and preference.
- The diagnostic workup for hyperthyroidism includes measuring thyroid-stimulating hormone, free thyroxine (T4), and total triiodothyronine (T3) levels to determine the presence and severity of the condition, as well as radioactive iodine uptake and scan of the thyroid gland to determine the cause. Thyrotropin receptor antibodies are almost always positive in Graves Disease (hyperthyroidism).
- The presence of TSIs is particularly useful in reaching the diagnosis in pregnant women, in whom the use of radioisotopes is contraindicated.
- Other markers of thyroid autoimmunity, such as antithyroglobulin antibodies or antithyroidal peroxidase antibodies, are usually present.
- Other autoantibodies that may be present include thyrotropin receptor–blocking antibodies and anti–sodium-iodide symporter antibody.
- The presence of these antibodies supports the diagnosis of an autoimmune thyroid disease.
- Methimazole (Tapazole) is the preferred antithyroid medication except in the first trimester of pregnancy and in patients with an adverse reaction to the medication.
- The choice of radioactive iodine, antithyroid medication, or surgery for hyperthyroidism should be based on the cause and severity of the disease as well as on the patient's age, goiter size, comorbid conditions, and treatment desires.



- Total thyroidectomy is recommended only for patients with severe disease or large goiters in whom recurrences would be more problematic. Patients complaining of dysphagia or shortness of breath may also be appropriate surgical candidates.
- Nonselective beta blockers such as propranolol (Inderal) should be prescribed for symptom control because they have a more direct effect on hypermetabolism.
- Thyroid-stimulating hormone testing should be used to diagnose primary hypothyroidism.
- Older patients and patients with known or suspected ischemic heart disease should be started on 25 to 50 mcg of levothyroxine daily, rather than the full replacement dosage, because of the potential risk of tachyarrhythmia or acute coronary syndrome.
- Graves disease may worsen diabetes control as reflected in a rise in A1C
- Patients with hypothyroidism who become pregnant should have their levothyroxine dosage immediately increased to nine doses weekly.
- When compared with generic levothyroxine, branded drugs is associated with improved TSH outcomes. Therefore, the use of branded levothyroxine should be encouraged for all patients with thyroid disorders including those who are pregnant.
- Patients, who remain symptomatic on appropriate doses of levothyroxine, as determined by a thyroid - stimulating hormone level of less than 2.5 mIU per L, are highly unlikely to benefit from combination triiodothyronine/thyroxine therapy.
- The timing of levothyroxine dosing is critical to attaining targeted TSH levels. Many drugs and supplements can interfere with the absorption of levothyroxine. Drugs such as calcium, iron, seizure medications and antacids should be given at least 2 hours apart from the dosing of levothyroxine.
- Patients with elevated thyroid peroxidase antibody levels and subclinical hypothyroidism should be monitored annually for the development of overt hypothyroidism.
- Women with postpartum thyroiditis and subclinical hypothyroidism should be treated with levothyroxine to achieve a thyroid-stimulating hormone level of less than 2.5 mIU per L if they are pregnant or desire fertility.
- The optimal method to assess serum FT4 during pregnancy uses direct measurement techniques. Serum TSH is a more accurate indicator of maternal thyroid status than alternative FT4 assay methods.
- Targeted screening for thyroid disease should be performed in pregnant women at high risk, including those with a history of thyroid disease, type 1 diabetes mellitus, or other autoimmune disease; current or past use of thyroid therapy; or a family history of autoimmune thyroid disease.
- Hypothyroidism during pregnancy should be treated with levothyroxine, with a serum TSH goal of less than 2.5 mIU per L.
- Serum TSH should be measured in pregnant women who are being treated for hypothyroidism at four to six weeks' gestation, then every four to six weeks until 20 weeks' gestation and on a stable medication dosage, then again at 24 to 28 weeks' and 32 to 34 weeks' gestation.
- Propylthiouracil is the preferred agent for the treatment of hyperthyroidism during the first trimester of pregnancy and in women with methimazole (Tapazole) allergy and hyperthyroidism. Consideration should be given to switching to methimazole after the



first trimester, and the dosage should be adjusted to maintain a serum FT4 level in the upper one-third of the normal range.

- In pregnant women who are being treated for hyperthyroidism, serum TSH and FT4 should be measured every two weeks until the patient is on a stable medication dosage.
- There is conflicting evidence about the benefit of treating subclinical hyperthyroidism in adults older than 60 to 65 years who have cardiovascular risk factors.
- There is limited-quality evidence about the benefit of treating subclinical hyperthyroidism in postmenopausal women who have decreased bone mineral density.
- The AAFP and the U.S. Preventive Services Task Force concludes that the evidence is insufficient to recommend for or against routine screening for thyroid disease in adults.
- The American Thyroid Association, the American Association of Clinical Endocrinologists, and The Endocrine Society recommend against routine screening for subclinical thyroid disease.
- Do not routinely order a thyroid ultrasound in patients with abnormal thyroid function tests if there is no palpable abnormality of the thyroid gland.
- Do not order a total or free triiodothyronine level when assessing levothyroxine dose in hypothyroid patients.
- The AAFP *recommends* screening for congenital hypothyroidism (CH) in newborns.

Faculty should be prepared to discuss recent research suggesting that treatment with levothyroxine provides no symptomatic benefit in older adults with subclinical hypothyroidism.²²

Choosing Wisely® Recommendations:²¹

- Do not order multiple tests in the initial evaluation of a patient with suspected thyroid disease. Check thyroid-stimulating hormone level, and if abnormal, follow up with additional evaluation and treatment depending on the findings. (American Society for Clinical Pathology)
- Do not routinely order thyroid ultrasonography in patients with abnormal thyroid function tests if there is no palpable abnormality of the thyroid gland. (The Endocrine Society/American Association of Clinical Endocrinologists)

Physicians can improve patient satisfaction with the referral process by using readily available strategies and tools such as, improving internal office communication, engaging patients in scheduling, facilitating the appointment, tracking referral results, analyzing data for improvement opportunities, and gathering patient feedback.^{23,24}

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.



Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Hyperthyroidism: Diagnosis and Treatment²⁰
- Subclinical Hyperthyroidism: When to Consider Treatment²¹
- Update on subclinical hyperthyroidism⁴
- Hypothyroidism: an update¹⁷
- Hyperthyroidism: diagnosis and treatment¹⁸
- Thyroid disease in pregnancy¹
- Thyroiditis: An Integrated Approach¹⁹
- AACE/ATA Clinical practice guidelines for hypothyroidism in adults^{25,26}
- AACE/ATA Hyperthyroidism and other causes of thyrotoxicosis: management guidelines²⁷
- ACR Appropriateness Criteria: neuroendocrine imaging²⁸
- Engaging Patients in Collaborative Care Plans²⁹
- The Use of Symptom Diaries in Outpatient Care³⁰
- Health Coaching: Teaching Patients to Fish³¹
- Medication adherence: we didn't ask and they didn't tell³²
- Encouraging patients to change unhealthy behaviors with motivational interviewing³³
- Integrating a behavioral health specialist into your practice³⁴
- Simple tools to increase patient satisfaction with the referral process²³
- FamilyDoctor.org. Hypothyroidism Overview (patient education)³⁵
- FamilyDoctor.org. Hyperthyroidism Overview (patient education)³⁶

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