Thyroid Disease

**Purpose**
To identify and promote the most important contributors to improved clinical outcomes for thyroid disease.

**Key Recommendations**
- Consider patients > 50 years old for evaluation for hypothyroidism and hyperthyroidism every 5 years as part of a physical or health maintenance visit.
- Order TSH for patients with signs, symptoms or other indications of hypothyroidism. Order Free T4 for those with pituitary disease, brain injury or in the first trimester of pregnancy.
- Order TSH for suspected hyperthyroidism and confirm elevated FT4 and/or FT3.
- Talk to your patients about how to identify a change in manufacturer of thyroxine and the importance of notifying you if they have a change. Change from one generic to the next, one pharmacy to the next, brand to generic calls for a TSH preferably 6-8 weeks after the change.
- Become familiar with the key points about thyroid nodules.

**High Risk Populations/Disparities**
- Women of Jewish descent are nearly two times more likely than other women to have thyroid disease caused by an overactive immune system.¹
- Among patients with thyroid cancer, blacks have lower survival rates at five years than do whites. A study of a large cancer database found that blacks are 2.3 times more likely to get the most aggressive form of thyroid cancer (anaplastic). Also, thyroid tumors more often are larger and found at a later stage in blacks.¹
- In the National Health and Nutrition Examination Survey (NHANES), among individuals with no thyroid disease, hypothyroidism and hyperthyroidism was significantly higher in females than males.²
- BMI is positively associated with thyroid cancer risk in both men and women.³

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**Thyroid Disease**

**Identification of Thyroid Disease**
Patients ≥ 50 years old should be considered for evaluation for hyperthyroidism and hypothyroidism every 5 years as part of a physical or health maintenance visit.

**Case Finding:**
- Order TSH for patients with signs, symptoms, or other indications of hypo- or hyperthyroidism.
- Other indications, patients:
  - with autoimmune diseases (e.g. Type 1 diabetes mellitus, B12 deficiency, pernicious anemia, Addison’s disease and collagen-vascular diseases)
  - with previous thyroid injury (exposure to radiation, excess iodine)
  - when patient is undergoing treatment with interferon for hepatitis
  - when patient is undergoing treatment with amiodarone or lithium

**Testing:**
- TSH is the best choice except in rare cases
- TSH + FT4 for patients with secondary diagnosis of thyroid disease and other CNS diseases, including brain injury

Refer to endocrinologist if results of tests confusing

**Identification of Thyroid Disease for Pregnant Women and Those Planning Pregnancy:**
- At initial interview, ask questions to identify potential thyroid problems and test as appropriate. Factors to be considered in case finding:
  - Those with autoimmune diseases often associated with thyroid disease, such as type 1 diabetes and pernicious anemia
  - Patients with a prior history of thyroid disease or thyroid surgery, an abnormal thyroid exam, or taking drugs known to affect the thyroid
  - Patients with a family history of thyroid illness or history of miscarriage
- When testing needed, first trimester, perform TSH and FT4
- This is necessary since in the first trimester HCG mimics TSH and leads to suppressed TSH even when patient euthyroid
- Second/third trimester perform TSH except when thyroid disease is secondary diagnosis (cause is hypothyroidic or pituitary)

**Treatment of Pregnant Women with Thyroid Disease**
- Pregnant women who have hypothyroidism and those on thyroid, test on regular basis (see above) during pregnancy, treat appropriately
- Thyroid nodules can and should be evaluated, follow up as necessary with obstetrician/gynecologist, surgeon & endocrinologist working together
- Imaging (ultrasound) may be ordered, as indicated, radioisotope studies should not be done

**Hypothyroidism**
Hypothyroidism is a syndrome that results from inadequate levels of thyroid hormone (T-4 and/or T-3). It is manifested by a set of symptoms, physical findings and laboratory tests.

See pages 3-5 for algorithms on diagnosis and treatment of hypothyroidism and hyperthyroidism and thyroid nodule

**Key Points about Hypothyroidism**

**Generic/Brand Medication for Hypothyroidism**
- For safety, use consistent source of thyroxine for a particular patient, either brand name or generic. Treat potential change of thyroxine source (between brand and generic, one generic to another, one pharmacy to another) like a dosage change: check TSH 6-8 weeks following change
- Signs and symptoms of hypothyroidism: decrease in metabolic rate, tiredness, lethargy, sensitivity to cold, menstrual disturbances, goiter, hyperlipidemia
- For most patients, TSH is the test of choice for screening and monitoring of hypothyroidism
- Numerous drugs/diseases can alter T4 & T3 levels
- TSH is not the test of choice for those with pituitary disease, brain injury or in first trimester of pregnancy
- What is normal TSH (within the reference range) depends largely on individual
- Clear evidence that treating asymptomatic patients with TSH greater than 10 reduces morbidity and mortality

**Key Points about Hyperthyroidism**
- TSH the best diagnostic test for hyperthyroidism
- Asymptomatic patients over age 50 with suppressed TSH (less than 0.1) at risk for atrial fibrillation
- Confirmation of elevated FT4 and/or FT3 required after screening with a TSH
- Workup should include iodine uptake and scan to define etiology of hyperthyroidism
- Review treatment options with patient and family

**Key Points about Thyroid Nodule (TN) Evaluation**
- Rule of FIVE: 5% of your overall patient population will have palpable TNs, 5% of all palpable TNs are malignant
- Rule of ACTIVITY: Most nodules are hyperactive are benign (extremely rare exceptions)
- Refer to Endocrinologist
- RISK FACTORS for malignancy:
  - A PALPABLE nodule
  - Age < 20 or > 60
  - M>F
  - History of radiation exposure
  - Familial history of thyroid cancer
  - Progressive growth on oral T-4
- Ultrasound characteristics of TN causing concern:
  - Microcalcifications
  - Hypoechochogenicity
  - Intranodule vascularity
  - Irregular nodule margins
  - Nodule > 10mm

**NOTES About Thyroid Nodules**
- There is no strong evidence that treatment of euthyroid patients with thyroid hormone will shrink benign thyroid nodules.
- Evaluate further if patient has normal or elevated TSH
- Evaluate all palpable nodules
See endocrinologist for any nodule with above risk factors or concerning guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual needs.

Thyroid Disease

Diagnosis and Screening of Those Age 50+ for Primary Hypothyroidism (Thyroid Gland Failure)

**SYMPTOMATIC PATIENT**

- Perform TSH
  - TSH <3
    - No thyroid disease treatment necessary (i)
  - TSH >3 (i)
    - Check FT4 & consider anti-TPO antibodies testing
      - FT4 low or anti-TPO antibodies positive; treat (iv)
      - FT4 normal and anti-TPO antibodies negative, consider treatment or monitor (iii)

**ASYMPTOMATIC PATIENT**

- Perform TSH
  - TSH <5 (i)
    - Normal
    - Check FT4 & anti-TPO antibodies
      - Low FT4
        - Treat
      - Normal FT4, negative antibodies
        - Consider treating (ii)
        - TSH >10
          - Treat
        - TSH 5-10
          - Repeat TSH in 6 mos

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i. Consider FT4 if pituitary disease or other central nervous system disease is possible.
ii. If over 80, may not need treatment.
iii. Check for other causes. See/review annually. More likely to develop hypothyroidism.
iv. If positive antibodies, consider other autoimmune diseases.

Contact an endocrinologist if any questions.

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Diagnosis and Treatment of Hyperthyroidism

**Summary:** Proceed under SYMPTOMATIC even if FT4 & FT3 are in the reference range.

**Patient Symptomatic**
- Check TSH. If TSH <0.3 retest & perform FT4
- Confirm low TSH. If FT4 normal, check FT3
- Radioactive Iodine Uptake & scan
  - Elevated: Consider referring to Endocrinologist given mgmt complexities
  - Normal: Subacute Thyroiditis, Silent Thyroiditis, surreptitious T4 or T3 usage – consider central hypothyroidism
  - Suppressed: Treatment: symptomatic therapy w/ beta blockers

**Patient Asymptomatic**
- High FT4 or FT3
  - If patient >50 yrs old or hx of AF & TSH <0.1, needs further evaluation w/ RAIU & scan, even if FT4 & FT3 are normal.
- Normal FT4 & FT3
  - If patient is asymptomatic, if FT3 & FT4 are normal (except those over 50 & AF)
  - Observe

**Definitions:**
- AFTN - autonomously functioning thyroid nodule
- HCG - human chorionic gonadotropin
- MCG - multinodular goiter
- RAIU - radioactive iodine uptake
- TSH - thyroid stimulating hormone

**References:**

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Thyroid Disease

Thyroid Nodule Evaluation

Thyroid nodule <1cm, repeat in 1 yr. Consider fine needle aspiration (FNA) if nodule demonstrates listed characteristics of concern.

Thyroid nodule ≥1cm

Perform TSH

TSH low

TSH high or normal

Proceed with follow up for hyperthyroidism. If cold nodule is identified on scan, proceed to ultrasound and consider fine needle aspiration (FNA).

Refer to Endocrinologist or Interventional Radiologist/Surgeon with expertise in thyroid nodule biopsy.

**Thyroid Nodule (TN) Evaluation**

1. **Rule of FIVE:** 5% of your overall patient population will have palpable TNS. 5% of all palpable TNS are malignant.
2. **Rule of ACTIVITY:** All nodules (extremely rare exceptions) that are hyperactive are benign.
3. **RISK FACTORS for malignancy:**
   - A palpable nodule
   - Age <20 or >60
   - M > F
   - History of radiation exposure
   - Familial history of thyroid cancer
   - Progressive growth on oral T-4

Ultrasound characteristics that cause concern with thyroid nodules:
1. Microcalcifications
2. Hypoechoegenicity
3. Intranodule vascularity
4. Irregular nodule margins
5. Nodule >10mm

**NOTES:**
- Evaluate further if patient has normal or elevated TSH.
- All palpable nodules should be evaluated.
- Nodule <1cm with abnormal ultrasound features and multinodular goiters, consider endocrine evaluation.

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## Thyroid Disease

### Summary of Recommendations for Thyroid Testing from National Organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Core Recommendation</th>
<th>Recommendation – Pregnant Women</th>
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<tbody>
<tr>
<td><strong>American Academy of Family Physicians</strong></td>
<td>Evidence is insufficient to recommend for or against routine screening for thyroid disease in adults. (Clinical Considerations: <a href="http://www.aafp.org/patient-care/clinical-recommendations/all/thyroid.html">http://www.aafp.org/patient-care/clinical-recommendations/all/thyroid.html</a>)</td>
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<tr>
<td><strong>American College of Obstetrics and Gynecologists</strong></td>
<td></td>
<td>Thyroid testing is not a routine part of prenatal care and should be limited to women with symptoms of thyroid disease and those with a history of thyroid disease or other medical conditions associated with it, such as diabetes. (Committee Opinion #381, Subclinical Hypothyroidism in Pregnancy, Obstetrics &amp; Gynecology. October 2007. Practice Bulletin Number 148: Thyroid disease in pregnancy, April 2015. Obstet Gynecol. 2015;125: 996–1005 - recommendation to not perform routine screening for thyroid disease in pregnancy has not changed.)</td>
</tr>
<tr>
<td><strong>The Endocrine Society</strong></td>
<td></td>
<td>The committee could not reach agreement regarding screening recommendations for all newly pregnant women. 1) Some members recommended screening of all pregnant women for serum TSH abnormalities by the ninth week or at the time of their first visit. 2) Some members recommended neither for nor against universal screening of all pregnant women for TSH abnormalities at the time of their first visit. These members strongly support aggressive case finding to identify and test high-risk women (Table 1) for elevated TSH concentrations by the ninth week or at the time of their first visit before and during pregnancy. (Abalovich M, Alexander EK, Amino N, Barbour L, Cobin RH, De Groot L, et.al. Management of Thyroid Dysfunction during Pregnancy and Postpartum: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab, August 2012, 97(8):2543–2565.)</td>
</tr>
<tr>
<td><strong>United States Preventive Services Task Force</strong></td>
<td>Current evidence is insufficient to assess the balance of benefits and harms of screening for thyroid dysfunction in nonpregnant, asymptomatic adults. (Released March 2015.)</td>
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Resources for Patients

American Thyroid Association
- **Patients and Public – Thyroid Information** - Provides up-to-date online information for thyroid patients and their families and free patient brochures about thyroid disease.
- **Complementary and Alternative Medicine (CAM)** - Provides information about thyroid disease and CAM, reviews types of CAM and stresses importance of patient’s talking to their physician before taking CAM.

Hormone Health Network
Provides online information about hypothyroidism, hyperthyroidism, thyroid nodules and thyroid disorder symptoms.

**National Institute of Diabetes, Digestive and Kidney Diseases**
Provides online information about thyroid and testing physicians may order.
Thyroid Disease

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