American Thyroid Association Guidelines for Detection of Thyroid Dysfunction

Paul W. Ladenson, MD; Peter A. Singer, MD; Kenneth B. Ain, MD; Nandalal Bagchi, MD, PhD; S. Thomas Bigos, MD; Elliot G. Levy, MD; Steven A. Smith, MD; Gilbert H. Daniels, MD

Objective: To define the optimal approach to identify patients with thyroid dysfunction.

Participants: The 8-member Standards of Care Committee of the American Thyroid Association prepared a draft, which was reviewed by the association’s 780 members, 50 of whom responded with suggested revisions.

Evidence: Relevant published studies were identified through MEDLINE and the association membership’s personal resources.

Consensus Process: Consensus was reached at group meetings. The first draft was prepared by a single author (P.W.L.) after group discussion. Suggested revisions were incorporated after consideration by the committee.

Conclusions: The American Thyroid Association recommends that adults be screened for thyroid dysfunction by measurement of the serum thyrotropin concentration, beginning at age 35 years and every 5 years thereafter. The indication for screening is particularly compelling in women, but it can also be justified in men as a relatively cost-effective measure in the context of the periodic health examination. Individuals with symptoms and signs potentially attributable to thyroid dysfunction and those with risk factors for its development may require more frequent serum thyrotropin testing.

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THYROID dysfunction is common in adults1-3 (Table 1) and frequently has significant clinical consequences. Hyperthyroidism and hypothyroidism can be accurately diagnosed with laboratory tests5,7 and are readily treatable. (Although hyperthyroidism can be narrowly construed as those causes of thyrotoxicosis that result from glandular hyperactivity, the term here refers to all conditions causing thyroid hormone excess, including certain forms of thyroiditis and exogenous thyroid hormone administration.)

Clinical manifestations of thyroid dysfunction vary considerably among patients in their character and severity. Associated symptoms and signs are often nonspecific and progress slowly. Consequently, the accuracy of clinical diagnosis is limited. Physicians must consider and exclude thyroid dysfunction much more often than they will establish a diagnosis. If only patients presenting with clearly suggestive symptoms and signs are evaluated, many affected individuals will remain undiagnosed. For these persons, appropriate treatment for thyroid dysfunction or conservative monitoring to anticipate its potential future consequences can only be implemented when routine laboratory screening identifies them (see the “Screening for Thyroid Dysfunction” section below).

CASE FINDING FOR THYROID DYSFUNCTION

A number of symptoms and signs are well-established manifestations of thyroid dysfunction (Table 2). Additional findings in patients’ personal and family histories indicate increased risk of developing thyroid dysfunction. Risk factors identifiable in personal history include (1) previous thyroid dysfunction; (2) goiter; (3) surgery or radiotherapy affecting the thyroid gland; (4) diabetes mellitus; (5) vitiligo; (6) pernicious anemia; (7) leukotrichia (prematurely gray hair); and (8) medications and other compounds, such as lithium carbonate and iodine-containing compounds (eg, amiodarone hydrochloride, radiocontrast agents, expectorants containing potassium iodide, and

From The John Hopkins University School of Medicine, Baltimore, Md (Dr Ladenson); University of Southern California, Los Angeles (Dr Singer); University of Kentucky, Lexington (Dr Ain); Maine Medical Center, Bangor (Dr Bigos); University of Miami, Miami, Fla (Dr Levy); Mayo Clinic, Rochester, Minn (Dr Smith); and Massachusetts General Hospital and Harvard Medical School, Boston, Mass (Dr Daniels). The American Thyroid Association is located in Nanuet, NY (Web address: http://www.thyroid.org).
Table 1. Prevalence of Thyroid Dysfunction*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Reported Prevalences in Adult Populations, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothyroidism</td>
<td>2</td>
</tr>
<tr>
<td>Mild (subclinical) hypothyroidism†</td>
<td>5-17</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
<td>0.2</td>
</tr>
<tr>
<td>Mild (subclinical) hypothyroidism‡</td>
<td>0.1-6.0</td>
</tr>
</tbody>
</table>

*Vanderpump and Tunbridge.† Elevated serum thyrotropin concentration with a normal serum free thyroxine concentration.‡ Serum thyrotropin concentration less than 0.1 mIU/L with normal serum free thyroxine and triiodothyronine concentrations.

Table 2. Common Symptoms and Signs of Thyroid Dysfunction

<table>
<thead>
<tr>
<th>Hypothyroidism</th>
<th>Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Weight gain</td>
<td>Weight loss</td>
</tr>
<tr>
<td>Cold intolerance</td>
<td>Heat intolerance</td>
</tr>
<tr>
<td>Skin dryness</td>
<td>Hyperthyroidism</td>
</tr>
<tr>
<td>Hair dryness or loss</td>
<td>Nervousness</td>
</tr>
<tr>
<td>Depression</td>
<td>Insomnia</td>
</tr>
<tr>
<td>Dementia</td>
<td>Tremor</td>
</tr>
<tr>
<td>Muscle cramps and myalgias</td>
<td>Muscle weakness</td>
</tr>
<tr>
<td>Edema</td>
<td>Dyspnea</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Palpitations</td>
</tr>
<tr>
<td>Constipation</td>
<td>Tachycardia and atrial tachyarrhythmias</td>
</tr>
<tr>
<td>Menstrual irregularity</td>
<td>Hyperdefecation</td>
</tr>
<tr>
<td>(especially menorrhagia)</td>
<td>Menstrual irregularity (especially hypomenorrhagia)</td>
</tr>
</tbody>
</table>

SCREENING FOR THYROID DYSFUNCTION

Thyroid dysfunction meets many criteria for a condition justifying population screening:

1. The prevalences of various forms of thyroid dysfunction are substantial.

2. Overt hypothyroidism and hyperthyroidism have well-established clinical consequences. Even mild hypothyroidism can progress to overt hypothyroidism, particularly in patients with antithyroid antibodies or previous thyroid irradiation. Mild hypothyroidism refers to patients in whom there is elevation of the serum thyrotropin [thyroid-stimulating hormone (TSH)] concentration in association with a normal serum free thyroxine ([FT4]) concentration. This state is also termed subclinical hypothyroidism, compensated hypothyroidism, decreased thyroid reserve, and prehypothyroidism. Mild hypothyroidism can also be associated with reversible hypercholesterolemia, particularly when the serum TSH concentration is greater than 10 mIU/L, and, in some patients, with reversible symptoms and cognitive dysfunction. Mild (subclinical) hyperthyroidism has been associated with a higher incidence of atrial fibrillation in older persons; reduced bone mineral density, particularly in postmenopausal women; and symptoms (eg, palpitations) in some patients.

3. The serum TSH assay is an accurate, widely available, safe, and relatively inexpensive diagnostic test for all common forms of hypothyroidism and hyperthyroidism.

4. There are effective therapies for both hypothyroidism and hyperthyroidism for patients in whom treatment is indicated.

Screening of all newborn children for hypothyroidism is already a widely accepted and legislatively mandated practice. In addition, serum TSH measurement in adults every 5 years has been shown by decision analysis to have equivalent or more favorable cost-effectiveness in comparison with other widely accepted disease detection strategies, for example, for hypertension, breast cancer, and hypercholesterolemia. The cost-effectiveness of screening is more favorable in women and older persons and is strongly influenced by the cost of TSH measurement. Consequently, it is recommended that all adults have their serum TSH concentration measured beginning at age 35 years and every 5 years thereafter, the interval at which a periodic health examination has been advocated by the US Preventive Services Task Force.

More frequent screening may be appropriate in individuals at higher risk of developing thyroid dysfunction.

LABORATORY TESTING STRATEGIES

Serum TSH measurement is the single most reliable test to diagnose all common forms of hypothyroidism and hyperthyroidism, particularly in the ambulatory setting. An elevated serum TSH concentration is present in both overt and mild hypothyroidism. In the latter, the se-
The causes of isolated TSH elevation include (1) mild (subclinical) hyperthyroidism, (2) recovery from hypothyroxinemia of nonthyroid illnesses, and (3) medications such as lithium carbonate and amiodarone. (Inhibition of thyroid hormone production by these drugs may cause both transient reversible elevation of the serum TSH level and true hyperthyroidism.) The causes of isolated TSH suppression include (1) mild (subclinical) hyperthyroidism, (2) recovery from overt hyperthyroidism, (3) nonthyroidal illnesses (which can cause a low serum FT$_3$ concentration), (4) pregnancy during the first trimester, and (5) medications, such as dopamine and glucocorticoids.

CONCLUDING RECOMMENDATIONS

The American Thyroid Association recommends that adults be screened for thyroid dysfunction by measurement of the serum TSH concentration, beginning at age 35 years and every 5 years thereafter. The indication for screening is particularly compelling in women, but it may also be justified in men as a relatively cost-effective measure in the context of the periodic health examination. Individuals with clinical manifestations potentially attributable to thyroid dysfunction and those with risk factors for its development may require more frequent serum TSH testing.

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Corresponding author: Paul W. Ladenson, Division of Endocrinology and Metabolism, The Johns Hopkins University School of Medicine, 1830 E Monument St, Suite 333, Baltimore, MD 21287-0003 (e-mail: ladenson@jhud.edu).

REFERENCES

REFERENCES


Correction

Error in Byline and Affiliation Footnote. In the Special Article by Ladenson et al titled “American Thyroid Association Guidelines for Detection of Thyroid Dysfunction” published in the June 12 issue of the ARCHIVES (2000;160:1573-1575), an error occurred in the byline and in the affiliation footnote on page 1573. Harvey D. Cohen, MD, should have been added to the author byline, and Harvey D. Cohen, MD, Rancho Cucamonga, Calif, should have been added to the affiliation footnote.

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