

HOSPITAL PHYSICIAN®

ENDOCRINOLOGY BOARD REVIEW MANUAL

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The *Hospital Physician Endocrinology Board Review Manual* is a study guide for fellows and practicing physicians preparing for board examinations in endocrinology. Each manual reviews a topic essential to the current practice of endocrinology.

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Management of Thyroid Nodules

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Table of Contents

Introduction	2
Differential Diagnosis and Evaluation of Thyroid Nodules	2
Cytologic Diagnosis and Treatment Options	6
Summary Points	8
References	8

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Management of Thyroid Nodules

Jocelyn Hewitt, MD, and Sumathi Srivatsa, MD

INTRODUCTION


Thyroid nodules are a common clinical problem presenting to both endocrinologists and general practitioners. Palpable thyroid nodules are found in 4% to 7% of U.S. residents.^{1,2} A large population-based study in Framingham, Massachusetts, reported palpable nodules in 6.4% of females and 1.5% of males.³ Autopsy studies, however, report much higher rates of thyroid nodules, approaching 50%.⁴ With the introduction and widespread use of more sensitive imaging techniques, nonpalpable thyroid nodules are identified in patients with no prior history of thyroid disease. It is reported that incidental nodules found by ultrasound show a prevalence ranging from 19% up to 67%.⁵ Risk factors for development of thyroid nodules include advanced age, female gender, iodine deficiency, and prior radiation exposure.

The discovery of a thyroid nodule imparts concern for underlying malignancy, although only 5% to 10% of nodules harbor neoplastic cells.^{1,6} According to American Cancer Society estimates, approximately 33,550 new cases of thyroid cancer were diagnosed in 2007, 75% of which involved women.⁷ Cancerous nodules are most likely to occur in patients between the ages of 20 and 55 years.⁷ Differentiated thyroid cancer carries a good prognosis, with a 5-year survival of 97%.⁷ Only malignant or large symptomatic nodules require surgical treatment. However, a systematic approach to the evaluation of thyroid nodules is important to avoid unnecessary surgery. Fine-needle aspiration (FNA) biopsy has resulted in substantial improvements in diagnostic accuracy, cost reductions, and higher malignancy yield at time of surgery.

It is important for endocrinologists to understand the historical and physical examination data that are helpful in evaluating thyroid nodules as well as the appropriate tests to consider in the workup of these lesions. This manual reviews the differential diagnosis and approach to evaluation of clinically or incidentally discovered thyroid nodules. Options for treatment, which are dependent on results of the clinical evaluation, are discussed as well.

DIFFERENTIAL DIAGNOSIS AND EVALUATION OF THYROID NODULES

CASE PRESENTATION

 A 50-year-old woman is referred for evaluation after her primary care physician discovers a palpable mass in the patient's left upper thyroid on routine physical examination.

The patient was previously unaware of the mass and has had no neck pain, dysphagia, hoarseness, or symptoms suggesting thyroid dysfunction or compression. She has no history of head or neck irradiation and takes no medications. Family history is negative for thyroid disease.

Physical examination reveals an enlarged and irregular thyroid gland with a 1-cm nodule in the left upper lobe. The nodule is firm, mobile, and nontender.

- What is the differential diagnosis of a thyroid nodule?

DIFFERENTIAL DIAGNOSIS

A simple way to classify thyroid nodules is to describe them as neoplastic or non-neoplastic (**Figure 1**). Neoplastic nodules can be benign or malignant.

Benign nodules include nonfunctioning and functioning adenomas. Patients with functioning nodules may present with symptoms of hyperthyroidism.

Malignant neoplastic nodules include those of thyroid origin and metastatic disease from other primary tumors. Differentiated thyroid cancers arising from follicular cells include papillary and follicular carcinoma, while anaplastic carcinoma is an undifferentiated form of thyroid cancer. Medullary carcinoma arises from C cells or parafollicular cells of the thyroid and present either in sporadic form or as part of a familial multiple endocrine neoplasia type 2 (MEN2) syndrome. The most common thyroid malignancy is papillary, comprising 75% to 80% of new cases of thyroid cancer, followed by follicular (10%–20%), medullary (3%–5%), and anaplastic (1%–2%) malignancies.^{8,9} Hürthle cell