

Initial Evaluation and Workup of Thyroid Nodules in Adults



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KEYWORDS

- Thyroid nodule • Thyroid cancer • Thyroid ultrasound • Hypoechoic
- Microcalcifications

KEY POINTS

- Most thyroid nodules encountered in clinical practice are benign; however, evaluation is needed to rule out thyroid cancer.
- Screening for risk factors—family history, childhood radiation exposure, or recent onset of voice hoarseness—can help identify individuals at higher risk for thyroid cancer.
- Physical examination findings that increase suspicion of malignancy include cervical lymphadenopathy, vocal cord paralysis, and a fixed, firm palpable nodule.
- Thyroid-stimulating hormone (TSH) testing is recommended for initial evaluation of thyroid nodules; suppressed TSH level can identify patients who need a radionuclide thyroid scan.
- High-risk ultrasound characteristics, such as nodules greater than 1 cm, solid consistency, hypoechoic echotexture, microcalcifications, or irregular borders, can help to identify potentially malignant nodules.

INTRODUCTION

Palpable thyroid nodules are discovered during routine examinations in approximately 5% of women and 1% of men in iodine-replete parts of the world.^{1,2} Studies using high-resolution ultrasound (US) imaging have detected a prevalence of thyroid nodules in 19% to 68% of randomly selected individuals, with increased incidence in women and in the elderly.^{3,4} The vast majority of thyroid nodules are benign; however, the clinical importance of thyroid nodules rests on excluding malignancy, which occurs in 7% to 15% of nodules depending on age, sex, and other risk factors for thyroid cancer.^{5,6}

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Papillary and follicular cancers (differentiated thyroid cancers) comprise the majority (>90%) of all thyroid cancers. In 2014, it was estimated that there were 63,000 cases of newly diagnosed thyroid cancers,⁷ compared with 37,200 cases diagnosed in 2009. The annual incidence of thyroid cancer has almost tripled from 1975 to 2009.⁸ The majority of this is attributable to increased prevalence of papillary cancers. One study predicts that by 2019, papillary thyroid cancer will become the third most common cancer in women.⁹

In 2015, the American Thyroid Association (ATA) updated its guidelines for the management of adult patients with thyroid nodules and differentiated thyroid cancer.¹⁰ This article references many of the recommendations from the guidelines with a primary focus on the initial workup and evaluation of thyroid nodules in adults. Primary care clinicians should be familiar with the evaluation of thyroid nodules and US characteristics that identify nodules at greater risk for malignancy so that appropriate referrals for diagnostic tests and specialists can be made in a timely manner.

THYROID NODULE DEFINITION AND GUIDING CLINICAL CONTEXT

Thyroid nodules are discrete lesions within the thyroid gland that are radiologically distinct from the surrounding thyroid parenchyma. A palpable abnormality on physical examination that does not have a corresponding radiographic abnormality does not meet the strict definition of a thyroid nodule.¹¹ Nodules that are nonpalpable and detected by thyroid US examination or other imaging studies are termed incidentally discovered nodules or “incidentalomas.”¹⁰ These nonpalpable incidentalomas have the same risk of cancer as palpable nodules of the same size.¹² Individuals with 1 palpable nodule found during a physical examination will have additional nodules found during a US examination 50% of the time.¹³ In general, only nodules greater than 1 cm should be evaluated because they have a greater potential to be clinically significant cancers.¹⁰ However, nodules that are less than 1 cm and have other suspicious features, such as surrounding lymphadenopathy and/or risk factors such as exposure to radiation or a family history of thyroid cancer, warrant further evaluation. There are very rare thyroid cancers that present as nodules less than 1 cm and do not exhibit the typical high-risk US or clinical features but still may cause significant morbidity and mortality. It is deemed that the cost–benefit ratio is unfavorable, and attempts to diagnose and treat all such small cancers will cause more harm than good.¹⁰ This statement from the 2015 ATA thyroid nodule guidelines provides a good summary of the overarching clinical context: “In general, the guiding clinical strategy acknowledges that most thyroid nodules are low risk, and many thyroid cancers pose minimal risk to human health and can be effectively treated.”¹⁰

INITIAL EVALUATION OF THYROID NODULES

A normal radionuclide examination will show even distribution of tracer throughout the thyroid gland (**Fig. 1A**). A low thyroid-stimulating hormone (TSH) level may be indicative of a hyperfunctioning nodule (“hot nodule”), which will reveal increased tracer uptake compared with surrounding thyroid tissue on a radionuclide scan (**Fig. 1B**) or a toxic multinodular goiter, which reveals patchy increased tracer uptake throughout the thyroid gland (**Fig. 1C**). Given that hyperfunctioning nodules have a very low risk for malignancy, no further workup for thyroid cancer is typically recommended. Hypofunctioning nodules show decreased tracer uptake compared with the surrounding thyroid tissue on a scan also referred to as a “cold nodule” (**Fig. 1D**). These cannot exclude thyroid cancers; however, the majority of nodules are hypofunctioning or “cold” on radionuclide scans and are not thyroid cancers.

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