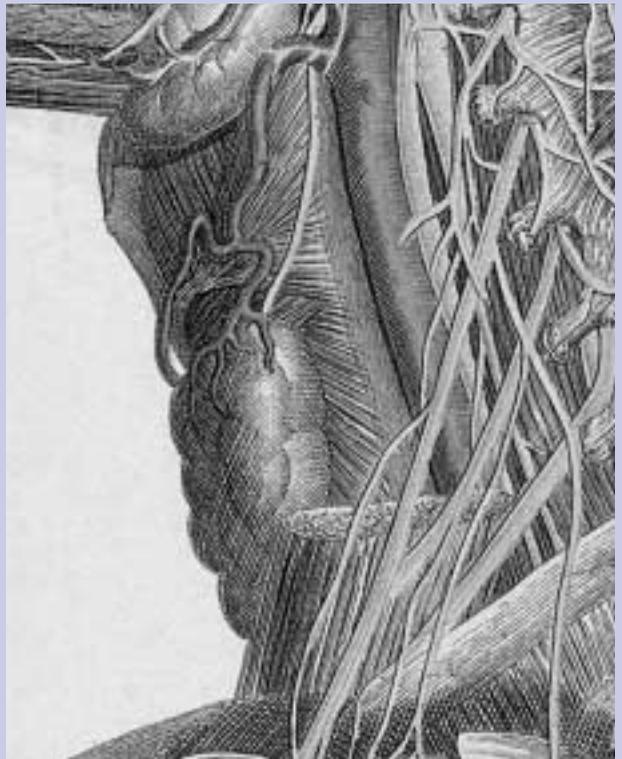


# *AIUM Practice Guideline for the Performance of a Thyroid and Parathyroid Ultrasound Examination*



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**T**he American Institute of Ultrasound in Medicine (AIUM) is an educational, scientific, and professional society concerned with the advancement of the art and science of ultrasound in medicine and research. To promote this mission, the AIUM is pleased to publish, in conjunction with the American College of Radiology (ACR), this new Guideline for the Performance of a Thyroid and Parathyroid Ultrasound Examination. We are indebted to the many volunteers who contributed their time, knowledge, and energy to bringing this document to completion.

The AIUM represents the entire range of clinical and basic science interests in medical diagnostic ultrasound, and, with hundreds of volunteers, the AIUM has promoted the safe and effective use of ultrasound in clinical medicine for 50 years. This document, and others like it, will continue to advance this mission.

Clinical standards and practice guidelines of the AIUM are intended to provide the medical ultrasound community with guidelines for the performance and recording of high-quality ultrasound examinations. The standards and guidelines reflect what the AIUM considers the minimum criteria for a complete examination in each area but are not intended to establish a legal standard of care. AIUM-accredited practices are expected to generally follow the standards and guidelines with the recognition that deviations from the standards and guidelines will be needed in some cases, depending on patient needs and available equipment. Practices are encouraged to go beyond the standards and guidelines to provide additional service and information as needed by their referring physicians and patients.



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## I. Introduction

The clinical aspects of this guideline (Indications, Specifications of the Examination, and Equipment Specifications) were developed collaboratively by the American Institute of Ultrasound in Medicine (AIUM) and the American College of Radiology (ACR). Recommendations for physician requirements, procedure documentation, and quality control vary between the 2 organizations and are addressed by each separately.

This guideline has been developed to provide assistance to practitioners performing a sonographic evaluation of the thyroid and parathyroid glands. Occasionally, an additional and/or specialized examination with another modality may be necessary. While it is not possible to detect every abnormality, adherence to the following guidelines will maximize the probability of detecting most abnormalities that occur in the thyroid and parathyroid glands.

## II. Indications

Indications for thyroid/parathyroid ultrasound include, but are not limited to

1. Evaluation of the location and characteristics of palpable neck masses.
2. Evaluation of abnormalities detected by other imaging examinations or laboratory studies, eg, areas of abnormal uptake seen on radioisotope thyroid examinations.
3. Evaluation of the presence, size, and location of the thyroid gland.
4. Evaluation of suspected regional nodal metastases in patients with a proven thyroid carcinoma.
5. Evaluation of high-risk patients for occult thyroid malignancy.
6. Follow-up of thyroid nodules.
7. Localization of parathyroid abnormalities in patients with suspected primary or secondary hyperparathyroidism.

8. Assessment of the number and size of enlarged parathyroid glands in patients who have undergone previous parathyroid surgery or ablative therapy with recurrent symptoms of hyperparathyroidism.
9. Localization of thyroid/parathyroid abnormalities or cervical lymph nodes for biopsy, ablation, or other interventional procedures.
10. Localization of autologous parathyroid gland implants.

## III. Qualifications and Responsibilities of the Personnel

See the AIUM Official Statement: *Training Guidelines for Physicians Who Evaluate and Interpret Diagnostic Ultrasound Examinations* and the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

## IV. Specifications of the Examinations

### A. The Thyroid Examination

The examination should be performed with the neck in hyperextension. The right lobe and left lobe of the thyroid gland should be imaged in at least 2 projections: long axis and transverse. Recorded views of the thyroid should include transverse images of the superior, mid, and inferior portions of the right and left thyroid lobes; longitudinal images of the medial, mid, and lateral portions of both lobes; and at least a transverse image of the isthmus. The size of each thyroid lobe should be recorded in at least 2 dimensions (transverse and longitudinal) and preferably in 3 dimensions (anterior/posterior, transverse, and longitudinal). Visualized thyroid abnormalities should be documented. The location, size, number, and character of abnormalities should be recorded. Abnormalities of the adjacent soft tissues, when encountered, such as enlarged lymph nodes or thrombosed veins, should be documented.

Whenever possible, comparison should be made with other appropriate imaging studies. Spectral, color, and/or power Doppler ultrasound may be useful to evaluate the vascularity of the thyroid gland and of localized masses.

Sonographic guidance may be used to biopsy thyroid abnormalities or other masses of the neck or to guide interventional procedures.

## **B. The Parathyroid Examination**

Examination for suspected parathyroid enlargement should include images in the region of the anticipated parathyroid gland location. The examination should be performed with the neck hyperextended and should include longitudinal and transverse images from the carotid arteries to the midline bilaterally and extending from the hyoid bone superiorly to the thoracic inlet inferiorly. Parathyroid glands may be hidden below the clavicles in the lower neck and upper mediastinum, so it is also advantageous to have the patient swallow during the examination with constant real-time observation. The upper mediastinum may be imaged with curved or sector probes. Although the normal parathyroid glands are usually not visualized using available sonographic technology, enlarged parathyroid glands in the neck may be visualized. When visualized, the size and number of the parathyroid glands should be documented, and measurements should be made in at least 2 and preferably in 3 dimensions. The relationship to the thyroid gland should be documented, if applicable.

Whenever possible, comparison should be made with other appropriate imaging studies. Spectral, color, and/or power Doppler ultrasound may be helpful.

Sonographic guidance may be used to biopsy parathyroid abnormalities or other masses of the neck or to guide interventional procedures.

## **V. Documentation**

Adequate documentation is essential for high-quality patient care. There should be

a permanent record of the ultrasound examination and its interpretation. Images of all appropriate areas, both normal and abnormal, should be recorded in a suitable archival format. Variations from normal size should be accompanied by measurements. Images are to be labeled with the examination date, patient identification, image orientation, and institution where the examination was performed. A report of the sonographic findings should be included in the patient's medical record, regardless of where the study is performed. Retention of the sonographic examination should be consistent both with clinical need and with relevant legal and local health care facility requirements.

Reporting should be in accordance with the *AIUM Standard for Documentation of an Ultrasound Examination*.

## **VI. Equipment Specifications**

Thyroid/parathyroid studies should be conducted with a linear or curved linear transducer. The equipment should be adjusted to operate at the highest clinically appropriate frequency, realizing that there is a trade-off between resolution and beam penetration. For most patients, mean frequencies of 7 MHz or greater are preferred; occasionally some patients may require a lower-frequency transducer for depth penetration. Doppler frequencies used should be the highest to optimize resolution and flow detection. Resolution should be of sufficient quality to evaluate the internal morphology of the lesions. Diagnostic information should be optimized while keeping total sonographic exposure as low as reasonably achievable.

## **VII. Quality Control and Improvement, Safety, Infection Control, and Patient Education Concerns**

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented in accordance with the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

Equipment performance monitoring should be in accordance with the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

## Acknowledgments

This guideline was developed by the American Institute of Ultrasound in Medicine (AIUM), in collaboration with the American College of Radiology (ACR), according to the process described in the *ACR Practice Guidelines and Technical Standards Book*.

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