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## **ACR PRACTICE GUIDELINE FOR THE PERFORMANCE OF A THYROID AND PARATHYROID ULTRASOUND EXAMINATION**

### **PREAMBLE**

These guidelines are an educational tool designed to assist practitioners in providing appropriate radiologic care for patients. They are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care. For these reasons and those set forth below, the American College of Radiology cautions against the use of these guidelines in litigation in which the clinical decisions of a practitioner are called into question.

The ultimate judgment regarding the propriety of any specific procedure or course of action must be made by the physician or medical physicist in light of all the circumstances presented. Thus, an approach that differs from the guidelines, standing alone, does not necessarily imply that the approach was below the standard of care. To the contrary, a conscientious practitioner may responsibly adopt a course of action different from that set forth in the guidelines when, in the reasonable judgment of the practitioner, such course of action is indicated by the condition of the patient, limitations on available resources or advances in knowledge or technology subsequent to publication of the guidelines. However, a practitioner who employs an approach substantially different from these guidelines is advised to document in the patient record information sufficient to explain the approach taken.

The practice of medicine involves not only the science, but also the art of dealing with the prevention, diagnosis,

alleviation and treatment of disease. The variety and complexity of human conditions make it impossible to always reach the most appropriate diagnosis or to predict with certainty a particular response to treatment. It should be recognized; therefore, that adherence to these guidelines will not assure an accurate diagnosis or a successful outcome. All that should be expected is that the practitioner will follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The sole purpose of these guidelines is to assist practitioners in achieving this objective.

### **I. INTRODUCTION**

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

This guideline has been developed to assist 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 a 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, e.g., 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 PERSONNEL

See the [ACR Practice Guideline for Performing and Interpreting Diagnostic Ultrasound Examinations](#).

## 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 two 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 two dimensions (transverse and longitudinal) and preferably in three dimensions (AP, 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 two and preferably in three 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 [ACR Practice Guideline for Communication: Diagnostic Radiology](#).

## 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 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 ACR Policy on Quality Control Improvement, Safety, Infection Control, and Patient Education Concerns appearing elsewhere in the ACR Practice Guidelines and Technical Standards book.

Equipment performance monitoring should be in accordance with the [ACR Technical Standard for Diagnostic Medical Physics Performance Monitoring of Real Time Ultrasound Equipment](#).

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