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The American College of Radiology will periodically define new practice guidelines and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice guidelines and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice guideline and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review, requiring the approval of the Commission on Quality and Safety as well as the ACR Board of Chancellors, the ACR Council Steering Committee, and the ACR Council. The practice guidelines and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice guideline and technical standard by those entities not providing these services is not authorized.

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ACR–AIUM PRACTICE GUIDELINE FOR THE PERFORMANCE OF A THYROID AND PARATHYROID ULTRASOUND EXAMINATIONS

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 of 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.

Therefore, it should be recognized 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 contained in specific sections of this guideline (Introduction, Indications, Specifications of the Examination, and Equipment Specifications) were revised collaboratively by the American College of Radiology (ACR) and the American Institute of Ultrasound in Medicine (AIUM). Recommendations for physician requirements, written request for the examination, 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 sonographic evaluations 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 and 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 high-risk patients for occult thyroid malignancy.
5. Follow-up of thyroid nodules, when indicated.
6. Evaluation for recurrent disease or regional nodal metastases in patients with proven or suspected thyroid carcinoma.
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 adjacent cervical lymph nodes for biopsy, ablation, or other interventional procedures.
10. Localization of autologous parathyroid gland implants.

III. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

Each organization addresses this requirement individually. ACR language is as follows:

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

IV. WRITTEN REQUEST FOR THE EXAMINATION

Each organization addresses this requirement individually. ACR language is as follows:

The written or electronic request for a thyroid and parathyroid ultrasound examination should provide sufficient information to demonstrate the medical necessity of the examination and allow for its proper performance and interpretation.

Documentation that satisfies medical necessity includes 1) signs and symptoms and/or 2) relevant history (including known diagnoses). Additional information regarding the specific reason for the examination or a provisional diagnosis would be helpful and may at times be needed to allow for the proper performance and interpretation of the examination.

The request for the examination must be originated by a physician or other appropriately licensed health care provider. The accompanying clinical information should be provided by a physician or other appropriately licensed health care provider familiar with the patient’s clinical problem or question and consistent with the state’s scope of practice requirements. (ACR Resolution 35, adopted in 2006)

V. SPECIFICATIONS OF THE EXAMINATIONS

A. The Thyroid Examination

The examination should be performed with the neck in hyperextension. The right and left lobes of the thyroid gland should be imaged in at least two projections, in longitudinal and transverse planes. 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 three dimensions (AP, transverse, and longitudinal). The thickness (AP measurement) of the isthmus on the transverse view should be recorded. Visualized thyroid abnormalities should be documented. The location, size, number, and character of significant abnormalities should be documented and measurements should be made in at least two and preferably in three dimensions. Abnormalities of the adjacent soft tissues, when encountered, such as abnormal 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 for aspiration or biopsy of thyroid abnormalities or other masses of the neck, or for 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 carotid artery bifurcation superiorly to the thoracic inlet inferiorly. As parathyroid glands may be hidden below the clavicles in the lower neck and upper mediastinum, it may also be helpful to have the patient swallow during the examination with constant real-time observation. The upper mediastinum may be imaged with an appropriate probe by angling under the sternum from the sternal notch. Although the normal parathyroid glands are usually not visualized using available sonographic technology, enlarged parathyroid glands may be visualized. When visualized, the location, size, and number should be documented and measurements should be made in three dimensions. The relationship of any visualized parathyroid gland(s) 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 for aspiration or biopsy of parathyroid abnormalities or other masses of the neck, or for interventional procedures.

VI. DOCUMENTATION

Each organization addresses this requirement individually. ACR language is as follows:

Adequate documentation is essential for high-quality patient care. There should be a permanent record of the ultrasound examination and its interpretation. Comparison with prior relevant imaging studies may prove helpful. Images of all appropriate areas, both normal and abnormal, should be recorded. Variations from normal size should generally be accompanied by measurements. Images should be labeled with the patient identification, facility identification, examination date, and image orientation. An official interpretation (final report) of the ultrasound examination should be included in the patient's medical record. Retention of the ultrasound examination images should be consistent both with clinical need and with relevant legal and local healthcare facility requirements.

Reporting should be in accordance with the [ACR Practice Guideline for Communication of Diagnostic Imaging Findings](#).

VII. EQUIPMENT SPECIFICATIONS

Thyroid and 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 10-14 MHz or greater are preferred, though some patients may require a lower frequency transducer for depth penetration. Resolution should be of sufficient quality to evaluate the internal morphology of visible lesions. Doppler frequencies should be set to optimize flow detection. Diagnostic information should be optimized, while keeping total sonographic exposure as low as reasonably achievable.

VIII. QUALITY CONTROL IMPROVEMENT, SAFETY, INFECTION CONTROL, AND PATIENT EDUCATION

Each organization addresses this requirement individually. ACR language is as follows:

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 and Improvement, Safety, Infection Control, and Patient Education appearing under the heading *Position Statement on QC & Improvement, Safety, Infection Control, and Patient Education* on the ACR web page (<http://www.acr.org/guidelines>).

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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Suggested Reading (Additional articles that are not cited in the document but that the committee recommends for further reading on this topic)

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*Guidelines and standards are published annually with an effective date of October 1 in the year in which amended, revised or approved by the ACR Council. For guidelines and standards published before 1999, the effective date was January 1 following the year in which the guideline or standard was amended, revised, or approved by the ACR Council.

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- Revised 2003 (Resolution 18)
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- Revised 2007 (Resolution 31)