The American Institute of Ultrasound in Medicine (AIUM) is a multidisciplinary association dedicated to advancing the safe and effective use of ultrasound in medicine through professional and public education, research, development of guidelines, and accreditation. To promote this mission, the AIUM is pleased to publish, in conjunction with the American College of Radiology (ACR), this revised AIUM Practice 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 more than 50 years. This document and others like it will continue to advance this mission.

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 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 guidelines with recognition that deviations from these guidelines will be needed in some cases, depending on patient needs and available equipment. Practices are encouraged to go beyond the guidelines to provide additional service and information as needed.
I. Introduction
The clinical aspects of this guideline (Indications, Specifications of the Examination, and Equipment Specifications) were revised collaboratively by the American Institute of Ultrasound in Medicine (AIUM) and the American College of Radiology (ACR). Recommendations for personnel 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/parathyroid ultrasound examination 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 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
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. Written Request for the Examination
The written or electronic request for an ultrasound examination should provide sufficient information to allow for the appropriate performance and interpretation of the examination.

The request for the examination must be originated by a physician or other appropriately licensed health care provider or under their direction. The accompanying clinical information should be provided by a physician or other appropriate health care provider familiar with the patient's clinical situation and should be consistent with relevant legal and local health care facility requirements.
V. Specifications of the Examination

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 2 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 3 dimensions (anteroposterior, transverse, and longitudinal). The thickness (anteroposterior 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 2 and preferably in 3 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 with 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 3 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

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. Variations from normal size should be accompanied by measurements. Images should be labeled with the patient identification, facility identification, examination date, and the side (right or left) of the anatomic site imaged. An official interpretation (final report) of the ultrasound findings should be included in the patient's medical record. Retention of the ultrasound examination should be consistent both with clinical needs and with relevant legal and local health care facility requirements.

Reporting should be in accordance with the AIUM Practice Guideline for Documentation of an Ultrasound Examination.
VII. 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 10 to 14 MHz or greater are preferred, although 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 ultrasound exposure as low as reasonably achievable.

VIII. Quality Control and Improvement, Safety, Infection Control, and Patient Education Concerns
Policies and procedures related to quality control, 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.

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This guideline was revised 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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