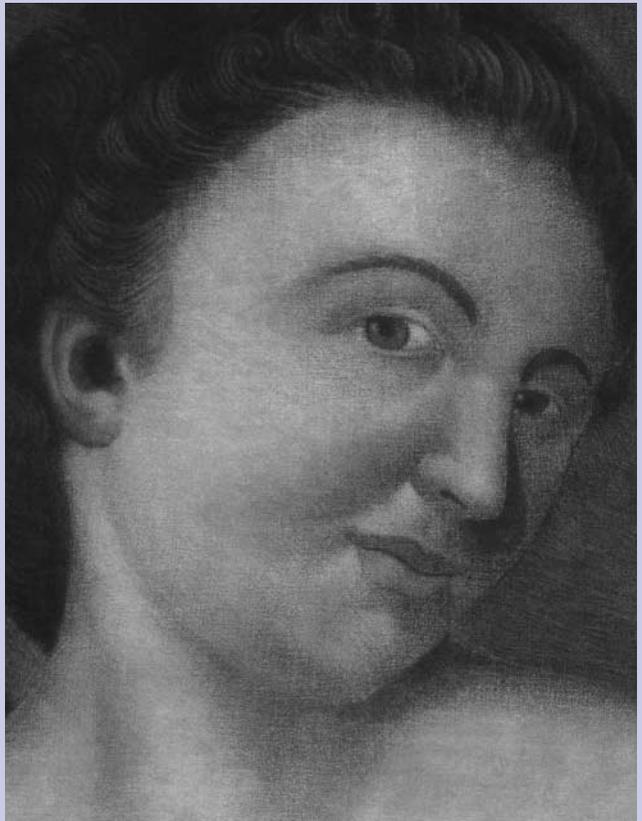


# ***AIUM Standard for the Performance of Breast Ultrasound Examination***



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The 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 Standard for the Performance of Breast 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.

Clinical Standards 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 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 with the recognition that deviations from the standards will be needed in some cases, depending on patient needs and available equipment. Practices are encouraged to go beyond the standards 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 standard (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).

This standard has been developed to provide assistance to practitioners performing ultrasound examination of the breast. When ultrasound is used as guidance for interventional procedures or biopsy, standards that address those specific situations should be consulted.

## II. Indications

Appropriate indications for breast sonography include:

1. Identification and characterization of palpable and nonpalpable abnormalities and further evaluation of clinical and mammographic findings.
2. Guidance of interventional procedures.
3. Evaluation of problems associated with breast implants.
4. Treatment planning for radiation therapy.

Breast sonography is the initial imaging technique to evaluate palpable masses in women under 30 and in lactating and pregnant women.

Although the efficacy of ultrasound as a screening study for occult masses is an area for research at the current time, ultrasound is not indicated as a screening study for microcalcifications.

## 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. Specifications of the Examination

### A. Lesion Characterization and Technical Factors

1. The breast sonogram should be correlated with mammographic and other appropriate breast imaging studies as well as with physical examination directed to the area in question. If sonography has been performed previously, the current examination should be compared with prior sonograms, as appropriate. A lesion or any area of the breast being studied should be viewed in 2 perpendicular projections; 1 view is insufficient.
2. At least 1 set of images of a lesion should be obtained without calipers. The maximal dimensions of a mass should be recorded in at least 2 dimensions.
3. The images should be labeled as to right or left breast, the lesion's location, and the orientation of the transducer with respect to the breast (e.g., transverse or longitudinal, radial or anti-radial). The location of the lesion should be recorded; the quadrant should be specified or the location can be indicated by using clock notation and distance from the nipple, or shown on a diagram of the breast.

Several sonographic features may be helpful in characterizing breast masses. These features should be noted: size, shape, echogenicity, margin features, orientation, and attenuation (e.g., shadowing or enhancement).

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4. Mass characterization with ultrasonography is highly dependent on technical factors.

Breast ultrasound should be performed with a high-resolution scanner (Section VI). Proper gain settings and focal zone selections should be optimized to obtain high-quality images. The patient should be positioned to minimize the thickness of the portion of the breast being evaluated. For evaluation of superficial lesions, a stand-off device may be helpful.

#### B. Guidance of Interventional Procedures

1. The interventional procedures that can be performed with ultrasonographic guidance include, but are not limited to, cyst aspiration, presurgical needle hookwire localization, and fine-needle or core biopsy.
2. A full ultrasonographic examination should first be completed of the mass or area of the breast in which the procedure is planned.
3. There is no single correct method for accomplishing interventional procedures with ultrasound-imaging guidance. Both freehand technique with direct ultrasound visualization and use of a probe with a needle guide are suitable for breast interventions. The type of equipment on hand and the experience of the physician performing the procedure will determine selection of a technique.
4. High-frequency transducers of 7.0 MHz and higher used for imaging breast tissues are suitable for guiding interventional procedures.

With these transducers, continuous visualization of the needle path is possible. Depending on the probe configuration, the geometry of the acoustic beam, and the route of needle entry, either a small portion of the needle may be visible as an echogenic dot or, if the needle entry is aligned with the acoustic beam and nearly perpendicular to it, the entire shaft, including the needle tip, may be visible.

5. Local anesthetic injection is useful to decrease pain during biopsies. It should be injected along the course that will be traversed by the biopsy needle, taking care not to inject small air bubbles that may obscure the region of interest. Ultrasonic guidance can be used to aid in infiltration of anesthetic around the mass.
6. A small incision is often required before introduction of a 14-gauge or larger biopsy needle. A coaxial needle system may also be used and will not generally require the skin incision.

When ultrasound guidance is used to assist in needle placement for interventional procedures, care should be taken to ensure that scanning geometry and transducer placement permit adequate visualization of the needle and the needle tip.

## V. Documentation

Images of all important findings, including, in the case of interventional procedures, the relationship of the needle to the lesion, should be recorded on a retrievable and reviewable image storage format.

- A. Image labeling should include a permanent identification label that contains:
  1. The facility name and location.
  2. Examination date.



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3. Patient's first and last name.
  4. Identification number and/or date of birth.
  5. Anatomic location using quadrant, clock notation, or labeled diagram of the breast. Indication of the distance of the abnormality from the nipple also may be helpful.
  6. Sonographer's or sonologist's identification number, initials, or other symbol.
- B. The physician's report of the ultrasonographic findings should be placed in the patient's medical record.
- C. Retention of the breast ultrasonographic images should be consistent with the policies for retention of mammograms, in compliance with federal and state regulations, local health care facility procedures, and clinical need.
- D. Reporting should be in accordance with the *AIUM Standard for Documentation of an Ultrasound Examination*.

## VI. Equipment Specifications

Breast ultrasound should be performed with a high-resolution and real-time linear array scanner operating at a center frequency of at least 7 MHz. Equipment permitting electronic adjustment of focal zone(s) is recommended. In general, the highest frequency capable of adequate penetration to the depth of interest should be used. For evaluation of superficial lesions, a stand-off device may be helpful.

## 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 standard 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 Book of Standards.

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