AIUM Practice Parameter for the Performance of Ultrasound Evaluation of the Prostate (and Surrounding Structures), 2025 Revision

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 clinical practice parameters, and accreditation of practices performing ultrasound examinations.

The AIUM Practice Parameter for the Performance of Ultrasound Evaluation of the Prostate (and Surrounding Structures), 2025 Revision was revised by the American Institute of Ultrasound in Medicine (AIUM) in collaboration with other organizations whose members use ultrasound for performing this examination(s) (see "Acknowledgments"). Recommendations for personnel requirements, the request for the examination, documentation, quality assurance, and safety may vary among the organizations and may be addressed by each separately.

This Practice Parameter is intended to provide the medical ultrasound community with recommendations for the performance and recording of high-quality ultrasound examinations. The parameter reflects what the AIUM considers the appropriate criteria for this type of ultrasound examination but is not intended to establish a legal standard of care. Examinations performed in this specialty area are expected to follow the Parameter with the recognition that deviations may occur depending on the clinical situation.

Ultrasound examination of the prostate and surrounding structures is used in the diagnosis of prostate cancer, benign prostatic enlargement, prostatitis, prostatic abscess, congenital anomalies, ejaculatory dysfunction, and male infertility as well as for the treatment of prostatic cancer, abscess, and benign prostatic enlargement.[1] Ultrasound-guided biopsy of the prostate is useful to evaluate patients with abnormal digital rectal examinations or an abnormal serum prostatic-specific antigen (PSA) level, azoospermia, low ejaculatory volume, and in patients requiring tissue diagnosis for further management.

Ultrasound findings may guide systematic biopsy of the prostate or guide a targeted biopsy approach, performed to supplement the standard systematic (nonlesion targeting) biopsy protocol to improve prostate biopsy cancer yield.[2,3] Grayscale, color, spectral, and power Doppler imaging are insufficient to confirm or exclude

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the presence of prostate cancer and should not be used to obviate the need for prostate biopsy.[4–6] Although micro ultrasound elastography and contrast-enhanced ultrasound may provide superior detection of prostate cancer, these techniques are not sufficiently established to be considered routine at this time.

Indications

Indications for prostate ultrasound include, but are not limited to, the following:

1. Guidance for biopsy for elevated PSA,[7] after an abnormal digital rectal examination, following radiotherapy or other treatment to monitor patients with known prostate malignancy,[8,9] or for a suspicious prostate lesion detected on magnetic resonance imaging (MRI). This includes the use of transrectal ultrasound (TRUS) biopsy as part of the TRUS/MRI fusion technique.[6]
2. Assessment of prostate volume before medical, surgical, interventional radiology, or radiation therapy[8,9] and calculations of PSA density.[10]
3. Real-time guidance for the placement of brachytherapy seeds.[11]
4. Real-time guidance for the placement of interstitial catheters for brachytherapy.
5. Real-time guidance for the placement of periprostatic spacer material.
6. Real-time guidance for the placement of fiducials for image-guided radiation therapy.
7. Assessment of lower urinary tract symptoms.[12]
8. Assessment of congenital anomalies.[13]
9. Infertility including azoospermia and a low ejaculatory volume.
10. Hematospermia.
11. Evaluation for suspected recurrence in the prostatectomy bed in patients who have undergone prostatectomy.
12. Ejaculatory dysfunction or painful ejaculation.

Qualifications and Responsibilities of Personnel

Physicians interpreting or performing this type of ultrasound examination should meet the specified AIUM Training Guidelines[14] in accordance with AIUM accreditation policies.[15]

Sonographers performing the ultrasound examination should be appropriately credentialed[16] in the specialty area in accordance with AIUM accreditation policies.[15]

Physicians not personally performing the examination must provide supervision, as defined by the Centers for Medicare and Medicaid Services Code of Federal Regulations 42 CFR §410.32,[17] which is available from the US Government Publishing Office.

Request for the Examination

The written or electronic request for an ultrasound examination must originate from a physician or other appropriately licensed health care provider or under the provider's direction. The clinical information provided should allow for the performance and interpretation of the appropriate ultrasound examination and should be consistent with relevant legal and local health care facility requirements.

Specification of the Examination

Prostate

The transrectal approach to prostate ultrasound is the method of choice because the resulting image quality is superior to transabdominal and transperineal examinations. In patients for whom the transrectal approach is not possible, a transperineal ultrasound examination may be used to direct a biopsy procedure.[18] A transabdominal approach can estimate prostate size in some settings.

The prostate should be imaged in its entirety in at least two orthogonal planes, sagittal and axial or longitudinal and coronal, from the apex to the base of the gland. An estimated volume is determined from measurements in three orthogonal planes (volume = length × height × width × 0.52).[19,20] The volume of the prostate may be correlated with the PSA level. Alternatively, prostate planimetry, allows greater accuracy of prostate volume by accommodating individual variations in prostate shape.[21]

The prostate gland should be evaluated for focal mass, echogenicity, symmetry, and continuity of

margins. Color and power Doppler sonography may help detect areas of increased vascularity that can be used to select potential sites for biopsy.[22] Optionally, a cine loop survey scan obtained in longitudinal and transverse projections can be obtained and stored with the study. The periprostatic fat and neurovascular bundle can be evaluated for symmetry and echogenicity. Demonstration of any interruption in the normal fat plane along the anterior perirectal space may be particularly important to aid characterization of malignant lesions in the prostate and to evaluate periprostatic spread of cancer. The course of the prostatic urethra should be documented when possible, and asymmetry between left and right periurethral tissues and any effect on the base of the bladder should be noted.

Seminal Vesicles, Vasa Deferentia, and Perirectal Space

The seminal vesicles should be evaluated for size, shape, position, symmetry, and echogenicity from their insertion into the prostate via the ejaculatory ducts to their cranial and lateral extents. Particular attention should be given to the expected tapering of the seminal vesicle as it joins the prostate. In patients being evaluated for infertility, the vasa deferentia must be evaluated. The presence and size of seminal vesicle, ejaculatory, Müllerian, or utricle cysts or evidence of seminal vesicle or ejaculatory duct obstruction should be noted.

Documentation

Accurate and complete documentation is essential for high-quality patient care. Written reports and ultrasound images/video clips that contain diagnostic information should be obtained and archived, with recommendations for follow-up studies if clinically applicable, in accordance with the AIUM Practice Parameter for Documentation of an Ultrasound Examination.[23]

Comparison with previous relevant imaging studies may prove helpful. Images of all appropriate normal and abnormal areas should be recorded. The prostate should be measured in three planes. Any focal abnormality should also be measured. 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 health care facility requirements.

Equipment Specification

Equipment performance monitoring should be in accordance with the *AIUM Routine Quality Assurance of Clinical Ultrasound Equipment*.[24]

Equipment

Endorectal ultrasound of the prostate should be conducted with a transrectal (also termed endorectal) transducer using the highest clinically appropriate frequency (usually 6 MHz or higher), realizing that there is a trade-off between resolution and beam penetration. Both side-fire and end-fire transducers may be used. A lower-frequency transducer may be necessary for transabdominal and transperineal examinations, which may be performed with curvilinear or sector transducers.

An ultrasound-guided prostate biopsy can be performed with side-fire probe, end-fire probe, or biplanar or triplanar transducer configuration, acknowledging that transducer selection may vary with specific anatomic considerations.[25]

Care of the Equipment

After ultrasound gel application, the transrectal probe must be covered by a disposable sheath before insertion. Additional gel should be applied after covering the probe with a disposable sheath to aid in comfort with probe insertion and optimizing the transducer to the target interface. The probe must be disinfected after examining and disposing of the sheath. The method of disinfection may vary by manufacturer recommendations and institutional practices. It is optimal to use a high-level disinfection protocol. Disposable accessory items used during the study must be discarded after each examination. Reusable accessory items should be processed or sterilized according to appropriate guidelines and procedures.[26]

Quality and Safety

Policies and procedures related to quality assurance and improvement, safety, infection control, and equipment-performance monitoring should be developed and implemented in accordance with the AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices.[15]

ALARA Principle

The potential benefits and risks of each examination should be considered. The ALARA (as low as reasonably achievable) principle[27] should be observed for factors that affect the acoustical output and by considering transducer dwell time and total scanning time. Further details on ALARA may be found in the current version of the AIUM's publication *Medical Ultrasound Safety*.[28]

Infection Control

Transducer preparation, cleaning, and disinfection should follow manufacturer recommendations and be consistent with the AIUM's Guidelines for Cleaning and Preparing External- and Internal-Use Ultrasound Transducers Between Patients, Safe Handling, and Use of Ultrasound Coupling Gel.[26]

Equipment Performance Monitoring

Monitoring protocols for equipment performance should be developed and implemented in accordance with the AIUM Standards and Guidelines for the Accreditation of Ultrasound Practice.[15]

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Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

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