

AIUM Practice Parameter for the Performance of Scrotal Ultrasound Examinations

Introduction

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 Scrotal Ultrasound Examinations* was developed (or revised) by the 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 recognition that deviations may occur depending on the clinical situation.

Indications

Indications for scrotal ultrasound include but are not limited to^{1,2} the following:

1. Evaluation of scrotal pain, including but not limited to testicular trauma, ischemia/torsion, postsurgical pain, and infectious or inflammatory scrotal disease.^{3–10}
2. Evaluation of a palpable inguinal, intrascrotal, or testicular mass.^{1,2,11–13}
3. Evaluation of scrotal asymmetry, swelling, or enlargement.^{1,2,14–16}
4. Evaluation of potential intrascrotal hernia.¹⁷
5. Detection/evaluation of varicoceles.¹⁸

Received February 9, 2021. Manuscript accepted for publication February 10, 2021.

doi:10.1002/jum.15667

6. Evaluation of male infertility.¹
7. Follow up of prior indeterminate scrotal ultrasound findings.¹⁹
8. Localization of nonpalpable testes.^{20,21}
9. Evaluation of inguinal testes.²²
10. Detection of an occult primary tumor in patients with a metastatic germ cell tumor²³ or unexplained retroperitoneal adenopathy.
11. Follow up of patients with prior primary testicular neoplasms, leukemia, or lymphoma.²⁴
12. Evaluation of an abnormality noted on other imaging studies (including but not limited to computed tomography, magnetic resonance imaging, and positron emission tomography).
13. Evaluation of a disorder of sexual development.²⁵

Qualifications and Responsibilities of Personnel

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

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

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.

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.

Specifications of the Examination

The presence of 2 testes should be documented either on a single transverse, coronal, or coronal oblique image. In addition, a cine loop survey scan, taken in both longitudinal and transverse projections, can be obtained and stored with the rest of the study. The testes should be evaluated in at least 2 planes: longitudinal and transverse. Transverse images should be obtained in the superior, mid, and inferior portions of the testes. Longitudinal views should be obtained centrally, as well as medially and laterally. In cases of acute swelling or pain, some authors suggest that the asymptomatic side should be evaluated first and the symptomatic side afterward with the same/similar grayscale and Doppler settings.⁸ Each testis should be evaluated in its entirety. The size, echogenicity, and blood flow of each testis and the epididymis should be compared with the contralateral side. Comparison of the testes is best accomplished with a side-by-side transverse image. If a palpable abnormality is the indication for the sonogram, this area should be directly imaged.^{1,2} In the event that a testis is not identified within the scrotum, the ipsilateral inguinal canal and inguinal rings should be scanned.

Relevant extratesticular structures should be evaluated. The head, body, and tail of the epididymis should be evaluated when technically feasible. The spermatic cord and the supratesticular area should be evaluated if there is suspicion of testicular torsion.^{9,10,26} The scrotal wall, including the overlying skin, should be evaluated. Additional techniques, such as the Valsalva maneuver and upright positioning, can be used as needed. Any abnormality should be documented. Testicular volumes could be provided by using the Lambert formula (length × width × height × 0.71) or ellipsoid formula (length × width × height × 0.52).²⁷

Doppler sonography (spectral and color/power Doppler imaging) should be used as necessary in examinations of the scrotum and is required in the setting of acute scrotal pain and evaluation of varicocele. If used, color and/or power Doppler sonography should include at least 1 side-by-side image comparing both testes. Identical Doppler settings should be used to evaluate symmetry of flow between the testes. Low-flow detection settings should be used, if necessary, to document testicular blood flow.

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*.

Equipment Specifications

Scrotal studies should be conducted with a real-time scanner, preferably using a 7–12-MHz or higher linear array transducer. A curvilinear or vector transducer or linear transducer with lower frequencies may be needed if the scrotum is enlarged, recognizing that there is a tradeoff between spatial resolution and beam penetration. The highest possible Doppler frequencies (typically in the 5.0–10-MHz range) providing optimal resolution and flow detection should be used. The Doppler frequency may differ from the imaging frequency. Standoff pads can be used, if necessary, to improve imaging.

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*.

As Low as Reasonably Achievable (ALARA) Principle

The potential benefits and risks of each examination should be considered. The ALARA principle should be observed for factors that affect the acoustic output and by considering the transducer dwell time and total scanning time. Further details on ALARA may be found in the current AIUM publication *Medical Ultrasound Safety*.

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 and Equipment Between Patients, Safe Handling, and Use of Ultrasound Coupling Gel*.

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 Practices*.

Acknowledgments

This parameter was revised by the AIUM in collaboration with the American College of Radiology (ACR), the Society of Radiologists in Ultrasound (SRU), and the Society for Pediatric Radiology (SPR). We are indebted to the many volunteers who contributed their time, knowledge, and energy to developing this document.

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