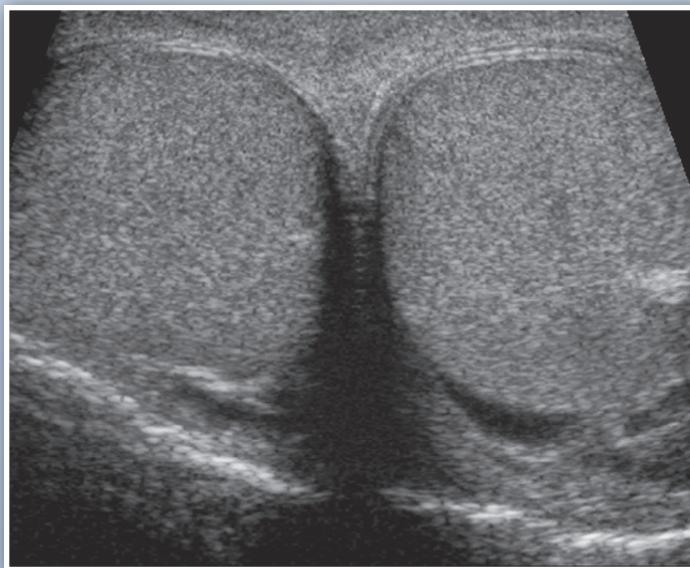


AIUM Practice Parameter for the Performance of

Scrotal Ultrasound Examinations

*Parameter developed in collaboration with the American College of Radiology,
the Society for Pediatric Radiology, and the Society of Radiologists in Ultrasound.*



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 parameters, and accreditation. To promote this mission, the AIUM is pleased to publish in conjunction with the American College of Radiology (ACR), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU) this *AIUM Practice Parameter for the Performance of Scrotal Ultrasound Examinations*.

The AIUM represents the entire range of clinical and basic science interests in medical diagnostic ultrasound, and, with hundreds of volunteers, this multi-disciplinary organization 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 parameters of the AIUM are intended to provide the medical ultrasound community with parameters for the performance and recording of high-quality ultrasound examinations. The parameters 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 parameters with recognition that deviations from these parameters will be needed in some cases, depending on patient needs and available equipment. Practices are encouraged to go beyond the parameters to provide additional service and information as needed.



I. Introduction

The clinical aspects contained in specific sections of this parameter (Introduction, Indications, Specifications of the Examination, and Equipment Specifications) were developed collaboratively by the American Institute of Ultrasound in Medicine (AIUM), the American College of Radiology (ACR), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU). Recommendations for physician requirements, written request for the examination, procedure documentation, and quality control vary among the three organizations and are addressed by each separately.

These parameters are intended to assist practitioners performing ultrasound studies of the scrotum. In some cases, additional and/or specialized examinations may be necessary. While it is not possible to detect every abnormality, adherence to the following parameters will maximize the probability of detecting most of the abnormalities that occur in the scrotum.

II. Qualifications and Responsibilities of the Physician

See www.aium.org for AIUM Official Statements including *Standards and Guidelines for the Accreditation of Ultrasound Practices* and relevant Physician Training Guidelines.

III. Indications

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

1. Evaluation of scrotal pain, including but not limited to testicular trauma, ischemia/torsion, and infectious or inflammatory scrotal disease.^{3–7}
2. Evaluation of palpable inguinal, intrascrotal, or testicular masses.^{1,2,8,9}
3. Evaluation of scrotal asymmetry, swelling, or enlargement.^{1,2,10–12}
4. Evaluation of potential intrascrotal hernias.¹³
5. Detection/evaluation of varicoceles.¹⁴
6. Evaluation of male infertility.¹
7. Follow-up of prior indeterminate scrotal ultrasound findings.
8. Localization of nonpalpable testes.^{15,16}
9. Detection of occult primary tumors in patients with metastatic germ cell tumors¹⁷ or unexplained retroperitoneal adenopathy.
10. Follow-up of patients with prior primary testicular neoplasms, leukemia, or lymphoma.¹⁸
11. Evaluation of abnormalities noted on other imaging studies (including but not limited to computed tomography [CT], magnetic resonance imaging [MRI], and positron emission tomography [PET]).
12. Evaluation of a disorder of sexual development.¹⁹

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 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

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. Each testis should be evaluated in its entirety. The size, echogenicity, and blood flow of each testis and epididymis should be compared to 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. The pelvis and the retroperitoneum may also be scanned to look for testicular ectopia.¹⁶

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Relevant extratesticular structures should be evaluated. The head, body, and tail of the epididymis should be evaluated when technically feasible. The spermatic cord should be evaluated if there is suspicion for testicular torsion.²⁰ The scrotal wall, including the overlying skin, should be evaluated. Additional techniques such as the Valsalva maneuver or upright positioning can be used as needed. Any abnormality should be documented. In pediatric patients, testicular volumes could be provided using the Lambert formula ($\text{length (L)} \times \text{width (W)} \times \text{height (H)} \times 0.71$) or ellipsoid formula ($\text{L} \times \text{W} \times \text{H} \times 0.52$).²¹

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. 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 to document testicular blood flow.

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 side (right or left) of the anatomic site imaged. An offi-

cial 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 Parameter for Documentation of an Ultrasound Examination*.

VII. Equipment Specifications

Scrotal studies should be conducted with a real-time scanner, preferably using a 7-MHz or higher linear array transducer. A curvilinear or vector transducer with lower frequencies may be needed if the scrotum is enlarged, recognizing that there is a trade-off between resolution and beam penetration. The highest possible Doppler frequencies (typically in the 5- to 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.

VIII. Quality Control and Improvement, Safety, Infection Control, and Patient Education

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*. 3

Equipment performance monitoring should be in accordance with the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

IX. ALARA Principle

The potential benefits and risks of each examination should be considered. The ALARA (as low as reasonably achievable) principle should be observed when adjusting controls that affect the acoustic output and by considering transducer dwell times. Further details on ALARA may be found in the AIUM publication *Medical Ultrasound Safety, Third Edition*.

Acknowledgments

This parameter was revised by the American Institute of Ultrasound in Medicine (AIUM) in collaboration with the American College of Radiology (ACR), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU) according to the process described in the *AIUM Clinical Standards Committee Manual*.

Collaborative Committee

Members represent their societies in the initial and final revision of this practice parameter.

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