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The American College of Radiology will periodically define new practice guidelines and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice guidelines and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice guideline and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review, requiring the approval of the Commission on Quality and Safety as well as the ACR Board of Chancellors, the ACR Council Steering Committee, and the ACR Council. The practice guidelines and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice guideline and technical standard by those entities not providing these services is not authorized.

Revised 2010 (Resolution 33)\*

## **ACR–AIUM–SRU PRACTICE GUIDELINE FOR THE PERFORMANCE OF SCROTAL ULTRASOUND EXAMINATIONS**

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### **PREAMBLE**

These guidelines are an educational tool designed to assist practitioners in providing appropriate radiologic care for patients. They are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care. For these reasons and those set forth below, the American College of Radiology cautions against the use of these guidelines in litigation in which the clinical decisions of a practitioner are called into question.

The ultimate judgment regarding the propriety of any specific procedure or course of action must be made by the physician or medical physicist in light of all the circumstances presented. Thus, an approach that differs from the guidelines, standing alone, does not necessarily imply that the approach was below the standard of care. To the contrary, a conscientious practitioner may responsibly adopt a course of action different from that set forth in the guidelines when, in the reasonable judgment of the practitioner, such course of action is indicated by the condition of the patient, limitations of available resources, or advances in knowledge or technology subsequent to publication of the guidelines. However, a practitioner who employs an approach substantially different from these guidelines is advised to document in the patient record information sufficient to explain the approach taken.

The practice of medicine involves not only the science, but also the art of dealing with the prevention, diagnosis, alleviation, and treatment of disease. The variety and complexity of human conditions make it impossible to always reach the most appropriate diagnosis or to predict with certainty a particular response to treatment.

Therefore, it should be recognized that adherence to these guidelines will not assure an accurate diagnosis or a successful outcome. All that should be expected is that the practitioner will follow a reasonable course of action based on current knowledge, available resources, and the needs of the patient to deliver effective and safe medical care. The sole purpose of these guidelines is to assist practitioners in achieving this objective.

### **I. INTRODUCTION**

The clinical aspects contained in specific sections of this guideline (Introduction, Indications, Specifications of the Examination, and Equipment Specifications) were developed collaboratively by the American College of Radiology (ACR), the American Institute of Ultrasound in Medicine (AIUM), 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 guidelines 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 guidelines will maximize the probability of detecting most of the abnormalities that occur in the scrotum.

## **II. QUALIFICATIONS AND RESPONSIBILITIES OF THE PHYSICIAN**

Each organization addresses this requirement individually. ACR language is as follows:

See the [ACR–SPR–SRU Practice Guideline for Performing and Interpreting Diagnostic Ultrasound Examinations](#).

## **III. INDICATIONS**

Indications for scrotal ultrasound include, but are not limited to:

1. Evaluation of scrotal pain, including but not limited to testicular trauma, ischemia/torsion, and infectious or inflammatory scrotal disease.
2. Evaluation of a palpable inguinal, scrotal, or scrotal mass.
3. Evaluation of scrotal asymmetry, swelling, or enlargement.
4. Evaluation of potential scrotal hernia.
5. Detection/evaluation of varicoceles.
6. Evaluation of male infertility.
7. Follow-up of prior indeterminate scrotal ultrasound findings.
8. Localization of undescended testes.
9. Detection of an occult primary tumor in patients with metastatic germ cell tumor.
10. Follow-up of patients with prior primary testicular neoplasms, leukemia, or lymphoma,
11. Evaluation of abnormality 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 intersex conditions.

## **IV. WRITTEN REQUEST FOR THE EXAMINATION**

Each organization addresses this requirement individually. ACR language is as follows:

The written or electronic request for a scrotal ultrasound examination should provide sufficient information to demonstrate the medical necessity of the examination and allow for its proper performance and interpretation.

Documentation that satisfies medical necessity includes 1) signs and symptoms and/or 2) relevant history (including known diagnoses). Additional information regarding the specific reason for the examination or a provisional diagnosis would be helpful and may at times be needed to allow for the proper performance and interpretation of the examination.

The request for the examination must be originated by a physician or other appropriately licensed health care provider. The accompanying clinical information should be provided by a physician or other appropriately licensed health care provider familiar with the patient's clinical problem or question and consistent with the state's scope of practice requirements. (ACR Resolution 35, adopted in 2006)

## **V. SPECIFICATIONS OF THE EXAMINATION**

The testes should be evaluated in at least two 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, as should the epididymis (head, body and tail) when technically feasible. The size and echogenicity of each testis and epididymis should be compared to the contralateral side. Comparison of the testes, including grayscale and color Doppler imaging, is best accomplished with a side-by-side transverse image. Scrotal skin thickness should be evaluated. If a palpable abnormality is the indication for the sonogram, this area should be directly imaged.

Relevant extratesticular structures should be evaluated. Additional techniques such as Valsalva maneuver or upright positioning can be used as needed. Any abnormality should be documented.

Doppler sonography (spectral and color/power Doppler imaging) should be used as necessary in all examinations of the scrotum, particularly in the setting of acute scrotal pain. If used, color and/or power Doppler sonography should include at least one side-by-side image comparing both testes and two images with identical Doppler settings to evaluate symmetry of flow. Low-flow detection settings should be used to document testicular blood flow, and the transducer frequency should be optimized for maximum Doppler sensitivity while maintaining adequate penetration. If flow cannot be demonstrated on color Doppler, power Doppler, if available, should be used to increase flow sensitivity.

## **VI. DOCUMENTATION**

Each organization addresses this requirement individually. ACR language is as follows:

Adequate documentation is essential for high-quality patient care. There should be a permanent record of the ultrasound examination and its interpretation. Comparison with prior relevant imaging studies may prove helpful. Images of all appropriate areas, both normal and abnormal, should be recorded. Variations from normal size should generally be accompanied by measurements. 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.

Reporting should be in accordance with the [ACR Practice Guideline for Communication of Diagnostic Imaging Findings](#).

## VII. EQUIPMENT SPECIFICATIONS

Scrotal studies should be conducted with a real-time scanner, preferably using a 7 to 14 MHz 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 5.0 to 10 MHz range) providing optimal resolution and flow detection should be utilized. The Doppler frequency may differ from imaging frequency. Stand-off pads can be used, if necessary, to improve imaging.

## VIII. QUALITY CONTROL AND IMPROVEMENT, SAFETY, INFECTION CONTROL, AND PATIENT EDUCATION

Each organization addresses this requirement individually. ACR language is as follows:

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented in accordance with the ACR Policy on Quality Control and Improvement, Safety, Infection Control, and Patient Education appearing under the heading *Position Statement on QC & Improvement, Safety, Infection Control, and Patient Education* on the ACR web page (<http://www.acr.org/guidelines>).

Equipment performance monitoring should be in accordance with the [ACR Technical Standard for Diagnostic Medical Physics Performance Monitoring of Real Time Ultrasound Equipment](#).

## ACKNOWLEDGEMENTS

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**Suggested Reading** (Additional articles that are not cited in the document but that the committee recommends for further reading on this topic)

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\*Guidelines and standards are published annually with an effective date of October 1 in the year in which amended, revised or approved by the ACR Council. For guidelines and standards published before 1999, the effective date was January 1 following the year in which the guideline or standard was amended, revised, or approved by the ACR Council.

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