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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 2006 (Res. 42, 35)\*

## **ACR 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) and the American Institute of Ultrasound in Medicine (AIUM). Recommendations for physician requirements, written request for the examination, procedure documentation, and quality control vary between the two organizations and are addressed by each separately.

These guidelines have been developed 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**

See the [ACR 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.
2. Evaluation of testicular ischemia/torsion.
3. Evaluation of scrotal swelling/enlargement.
4. Evaluation of infectious or inflammatory disease such as epididymitis, orchitis, or scrotal/testicular abscess.
5. Evaluation of scrotal asymmetry and the location (intratesticular or extratesticular) and characterization of scrotal masses.
6. Search for an occult primary tumor in patients with known metastatic germ cell tumor.
7. Follow-up of patients with prior primary testicular neoplasms, leukemia, or lymphoma.
8. Evaluation of extratesticular scrotal contents.
9. Evaluation of scrotal trauma.
10. Localization of undescended testes.
11. Detection of varicoceles in infertile men.
12. Follow-up of patients with indeterminate scrotal abnormalities.

### IV. WRITTEN REQUEST FOR THE EXAMINATION

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 studied in at least two projections, long axis and transverse. Views of each testis should include the superior, mid, and inferior portions, as well as its medial and lateral portions. Each testis and epididymis should be evaluated in its entirety. The size and

echogenicity of each testis and epididymis should be compared with its opposite side, when possible. Scrotal skin thickness should be evaluated. Doppler sonography should be considered in all examinations of the adult scrotum. If a palpable abnormality is reported by the patient this area should be directly imaged.

Blood flow in the testes and surrounding scrotal contents should be evaluated with color or power Doppler when there is a question of torsion versus epididymitis in the clinical setting of the acute scrotum. Spectral Doppler is an additional option that may add ancillary information in this clinical setting. The flow in the symptomatic testis should be compared with that of the asymptomatic side, and any asymmetry should be noted. Low-flow detection settings should be utilized when needed to document testicular blood flow, and the transducer frequency should be optimized for maximum Doppler sensitivity while maintaining adequate penetration.

Flow in intratesticular arteries cannot always be established with certainty by Doppler sonography. If flow cannot be demonstrated in the asymptomatic testis, testicular scintigraphy should be considered to corroborate the presence or absence of testicular perfusion. Doppler evaluation may be helpful in differentiating neoplastic from certain non-neoplastic focal abnormalities in the testes (such as hematoma, infarct, etc).

Any abnormality should be documented, and all extratesticular structures evaluated. Additional techniques, such as Valsalva maneuver or upright positioning, can be utilized as needed.

### VI. DOCUMENTATION

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 healthcare facility requirements.

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

## VII. EQUIPMENT

Scrotal studies should be conducted with a real-time scanner, preferably using a linear or a curved linear transducer. The equipment should be adjusted to operate at the highest clinically appropriate frequency, recognizing that there is a trade-off between resolution and beam penetration. These frequencies are usually 5.0 MHz or greater. For pediatric applications, 7 to 10 MHz is preferable. Resolution should be of sufficient quality to routinely differentiate small cystic lesions from solid lesions. Doppler frequencies used should be the highest to optimize resolution and flow detection. Doppler frequencies range from 3.5 to 10 MHz. Stand-off pads can be used, if necessary, to improve imaging.

When Doppler studies are performed, the Doppler frequency may differ from imaging frequency. Diagnostic information should be optimized, while keeping total ultrasound exposure as low as reasonably achievable.

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

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 Concerns appearing elsewhere in the ACR Practice Guidelines and Technical Standards book.

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

### ACKNOWLEDGEMENTS

This guideline was revised according to the process described in the ACR Practice Guidelines and Technical Standards book by the Guidelines and Standards Committee of the ACR Commission on Ultrasound in collaboration with the American Institute of Ultrasound in Medicine (AIUM).

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##### Suggested Reading

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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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