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The American College of Radiology will periodically define new practice parameters 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 parameters and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice parameter 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 and approval. The practice parameters 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 parameter and technical standard by those entities not providing these services is not authorized.

Revised 2015 (Resolution 34) *

ACR–AIUM–SRU PRACTICE PARAMETER FOR THE PERFORMANCE OF ULTRASOUND EVALUATION OF THE PROSTATE (AND SURROUNDING STRUCTURES)

PREAMBLE

This document is an educational tool designed to assist practitioners in providing appropriate radiologic care for patients. Practice Parameters and Technical Standards are not inflexible rules or requirements of practice and are not intended, nor should they be used, to establish a legal standard of care¹. For these reasons and those set forth below, the American College of Radiology and our collaborating medical specialty societies caution against the use of these documents 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 practitioner in light of all the circumstances presented. Thus, an approach that differs from the guidance in this document, 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 this document 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 this document. However, a practitioner who employs an approach substantially different from the guidance in this document 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 the guidance in this document 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 this document is to assist practitioners in achieving this objective.

¹ *Iowa Medical Society and Iowa Society of Anesthesiologists v. Iowa Board of Nursing*, ___ N.W.2d ___ (Iowa 2013) Iowa Supreme Court refuses to find that the *ACR Technical Standard for Management of the Use of Radiation in Fluoroscopic Procedures* (Revised 2008) sets a national standard for who may perform fluoroscopic procedures in light of the standard's stated purpose that ACR standards are educational tools and not intended to establish a legal standard of care. See also, *Stanley v. McCarver*, 63 P.3d 1076 (Ariz. App. 2003) where in a concurring opinion the Court stated that "published standards or guidelines of specialty medical organizations are useful in determining the duty owed or the standard of care applicable in a given situation" even though ACR standards themselves do not establish the standard of care.

I. INTRODUCTION

The clinical aspects contained in specific sections of this practice parameter (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 qualifications, written request for the examination, procedure documentation, and quality control vary among the three organizations and are addressed by each separately.

Ultrasound examination of the prostate and surrounding structures is used in the diagnosis of prostate cancer, benign prostatic enlargement, prostatitis, prostatic abscess, congenital anomalies, and male infertility, and for the treatment of prostatic cancer, abscess, and benign prostatic enlargement [1]. Ultrasound-guided biopsy of the prostate is reserved for evaluating those patients who have abnormal digital rectal examinations or an abnormal serum PSA level and those in whom tissue diagnosis is needed for further management.

Ultrasound findings may be used to guide targeted or systematic biopsy of the prostate, which is performed to supplement the standard systematic biopsy protocol in order to improve the positive cancer yield of prostate biopsy [2,3]. However, current ultrasound techniques using grayscale Doppler, color Doppler, and power Doppler imaging, elastography, and contrast-enhanced ultrasound are not sufficient to confirm or exclude the presence of prostate cancer, and they should not be used to preclude the performance of prostate biopsy [4,5].

These practice parameters are intended to assist practitioners performing an ultrasound examination of the prostate. Ultrasound of the prostate and surrounding structures should be performed only when there is a valid medical reason, and the lowest possible ultrasonic exposure should be used to gain the necessary diagnostic information. In some cases, an additional and/or specialized examination may be necessary. Although it is not possible to detect every abnormality, following this practice parameter will maximize the detection of abnormalities of the prostate.

II. INDICATIONS

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

1. Guidance for biopsy in the presence of an abnormal digital rectal examination or elevated prostatic specific antigen (PSA) [6] or a suspicious prostatic lesion detected on MR. This includes use of TRUS biopsy as part of the TRUS/MRI fusion technique [7].
2. Assessment of prostate volume prior to medical, surgical, radiation therapy [8,9] and to calculate PSA density [10]
3. Real-time guidance for the placement of brachytherapy seeds [11]
4. Assessment of lower urinary tract symptoms [12]
5. Assessment of congenital anomalies [13]
6. Infertility
7. Hematospermia
8. Evaluation for suspected recurrence in the prostatectomy bed in patients who have undergone prostatectomy

III. QUALIFICATIONS AND RESPONSIBILITIES OF THE PHYSICIAN

Each organization will address this section in its document. ACR language is as follows:

See the [ACR–SPR–SRU Practice Parameter for Performing and Interpreting Diagnostic Ultrasound Examinations](#) [14].

IV. WRITTEN REQUEST FOR THE EXAMINATION

Each organization will address this section in its document. ACR language is as follows:

The written or electronic request for an ultrasound evaluation of the prostate 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 following practice parameters describe the examination of the prostate and surrounding structures.

A. Prostate

The transrectal approach to ultrasound of the prostate is the method of choice, as image quality is superior to transabdominal or transperineal examinations. In patients for whom the transrectal approach is not possible, a transperineal ultrasound examination may be used to direct a biopsy procedure [15]. A transabdominal approach can be useful to obtain an estimate of 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 x height x width x 0.52) [16,17]. The volume of the prostate may be correlated with the PSA level. Alternatively, prostate volume can be calculated using prostate planimetry, which allows greater accuracy by accommodating individual variations in prostate shape [18].

The gland should be evaluated for focal mass, echogenicity, symmetry, and continuity of margins. Color and power Doppler sonography may be helpful in detecting areas of increased vascularity that can be used to select potential sites for biopsy [19]. The periprostatic fat and neurovascular bundle should be evaluated for symmetry and echogenicity. The course of the prostatic urethra should be documented, when possible, and asymmetry between left and right periurethral tissues as well as any effect on the base of the bladder should be noted.

B. 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 normal 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. Inclusion of the anterior perirectal space, in particular the region that abuts the prostate and perirectal tissues, is important.

VI. DOCUMENTATION

Each organization will address this section in its document. 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. 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.

Reporting should be in accordance with the [ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#) [20].

VII. EQUIPMENT SPECIFICATIONS

A. 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 may be necessary for transabdominal and transperineal examinations, which may be performed with curvilinear or sector transducers.

Ultrasound-guided prostate biopsy can be performed with either side-fire or end-fire probe configuration, acknowledging that transducer selection may vary with specific anatomic considerations [21].

B. Care of the Equipment

Transrectal probe, after ultrasound gel application, must be covered by a disposable sheath prior to its insertion. Following the examination and disposal of the sheath, the probe must be disinfected. The method of disinfection may vary with manufacturer recommendations and institutional practices. Disposable accessory items used during the study must be discarded after each examination.

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

Each organization will address this section in its document. 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 website (<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](#) [22].

ACKNOWLEDGEMENTS

This practice parameter was revised according to the process described under the heading *The Process for Developing ACR Practice Parameters and Technical Standards* on the ACR website (<http://www.acr.org/guidelines>) by the Committee on Practice Parameters – Ultrasound of the ACR Commission on Ultrasound, in collaboration with the AIUM and the SRU.

Collaborative Committee

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

ACR

Vikram Dogra, MD, Chair
Sheila Sheth, MD, FACR
Maryellen R.M. Sun, MD

AIUM

Ethan Halpern, MD
Ants Toi, MD

SRU

Carol B. Benson, MD, FACR
Ulrike M. Hamper, MD, MBA, FACR

Committee on Practice Parameters – Ultrasound

(ACR Committee responsible for sponsoring the draft through the process)

Beverly E. Hashimoto, MD, FACR, Chair
Sandra O. DeJesus Allison, MD
Teresita L. Angtuaco, MD, FACR
Marcela Bohm-Velez, MD, FACR
Maria A. Calvo-Garcia, MD
Nirvikar Dahiya, MD, MBBS
Helena Gabriel, MD
Gail N. Morgan, MD
Harriet J. Paltiel, MD
Maitray D. Patel, MD
Henrietta Kotlus Rosenberg, MD, FACR
Sheila Sheth, MD, FACR
Maryellen R.M. Sun, MD
Sharlene A. Teefey, MD, FACR
Jason M. Wagner, MD

Beverly G. Coleman, MD, FACR, Chair, Commission on Ultrasound
Debra L. Monticciolo, MD, FACR, Chair, Commission on Quality and Safety
Jacqueline Anne Bello, MD, FACR, Vice-Chair, Commission on Quality and Safety
Julie K. Timins, MD, FACR, Chair, Committee on Practice Parameters and Technical Standards
Matthew S. Pollack, MD, FACR, Vice-Chair, Committee on Practice Parameters and Technical Standards

Comments Reconciliation Committee

Kristen K. DeStigter, MD, FACR, Chair
Vanessa Van Duyn Wear, MD, Co-Chair
Kimberly Applegate, MD, MS, FACR
Robert L. Bard, MD
Carol B. Benson, MD, FACR
Beverly Coleman, MD, FACR
Vikram Dogra, MD
Ethan Halpern, MD
Ulrike M. Hamper, MD, MBA, FACR
Beverly E. Hashimoto, MD, FACR
William T. Herrington, MD, FACR
Debra L. Monticciolo, MD, FACR
Sheila Sheth, MD, FACR
Maryellen R.M. Sun, MD
Julie K. Timins, MD, FACR
Ants Toi, MD

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*Practice parameters and technical 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 practice parameters and technical standards published before 1999, the effective date was January 1 following the year in which the practice parameter or technical standard was amended, revised, or approved by the ACR Council.

Development Chronology for this Practice Parameter

1992 (Resolution 10)

Revised 1996 (Resolution 21)

Revised 2000 (Resolution 39)

Revised 2005 (Resolution 31)

Amended 2006 (Resolution 35)

Revised 2010 (Resolution 32)

Amended 2014 (Resolution 39)

Revised 2015 (Resolution 34)