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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 2017 (Resolution 32)*

ACR–SPR–SRU PRACTICE PARAMETER FOR PERFORMING AND INTERPRETING DIAGNOSTIC ULTRASOUND EXAMINATIONS

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 physician or medical physicist in light of all the circumstances presented. Thus, an approach that differs from the practice parameters, 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 practice parameters 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 practice parameters. However, a practitioner who employs an approach substantially different from these practice parameters 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 practice parameters 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 practice parameters 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

This practice parameter was revised collaboratively by the American College of Radiology (ACR), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU).

Diagnostic ultrasound is an established, effective diagnostic imaging technique that uses high-frequency sound waves for both anatomic (grayscale) and color/power/spectral Doppler (anatomic and hemodynamic) evaluation. Body parts examined and indications for performing an ultrasound include, but are not limited to, the following areas (for Breast Ultrasound indications, qualifications and responsibilities of personnel, refer to the [ACR Practice Parameter for the Performance of a Breast Ultrasound Examination](#) [1]):

1. Obstetrics and gynecology ultrasound
2. Thorax, abdomen, and pelvis ultrasound
3. Renal and retroperitoneal ultrasound
4. Vascular ultrasound (carotid, aortic, abdominal, intracranial, peripheral arterial, and peripheral venous studies, including spectral, power, and color Doppler)
5. Neurosonography
6. Guidance for interventional and therapeutic procedures, including fine needle aspiration, biopsy, and line placement
7. Intraoperative guidance
8. Evaluation of Superficial structures such as neck, scrotum, breast, thyroid, testicle, and skin
9. Endoluminal evaluation (ie, depth of tumor invasion, sphincter integrity)
10. Ophthalmologic ultrasound
11. Echocardiography
12. Musculoskeletal system ultrasound
13. Tissue elastography

Extensive experience has shown that ultrasound is a safe and accurate diagnostic procedure. Although no harmful effects of ultrasound have been demonstrated at the power levels used for diagnostic studies, quality assurance studies and best practice models dictate that all clinical studies be performed using appropriate equipment and techniques according to the ALARA principle, that is, utilizing the lowest possible ultrasound power settings to acquire the necessary diagnostic information. Diagnostic ultrasound examinations should be performed only when there is an appropriate clinical indication. All diagnostic ultrasound examinations should be supervised and interpreted by trained and qualified physicians.

II. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

A. Physician

Physicians who supervise, perform, and/or interpret diagnostic ultrasound examinations should be licensed medical practitioners who have a thorough understanding of the indications for ultrasound examinations as well as a familiarity with the physical principles and limitations of ultrasound technology. This should include an understanding of ultrasound instrumentation, power output, equipment calibration, and safety. They should be familiar with alternative and complementary imaging and diagnostic procedures (including laboratory tests) and should be capable of correlating this additional medical information with the sonographic findings. Physicians interpreting diagnostic ultrasound examinations should be able to demonstrate familiarity with anatomy, physiology, and pathophysiology of those organs or areas that are being examined. These physicians should be able to provide evidence of the training and competence needed to perform diagnostic ultrasound examinations successfully.

Physicians performing and/or interpreting diagnostic ultrasound examinations should meet at least one of the following criteria:

Certification in Radiology, Diagnostic Radiology, or Interventional Radiology by the American Board of Radiology, the American Osteopathic Board of Radiology, the Royal College of Physicians and Surgeons of Canada, or the Collège des Médecins du Québec, and involvement with the supervision and/or performance, interpretation, and reporting of 300 ultrasound examinations within the last 36 months².

or

Completion of a diagnostic radiology or interventional radiology residency program approved by the Accreditation Council for Graduate Medical Education (ACGME), the Royal College of Physicians and Surgeons of Canada (RCPSC), the Collège des Médecins du Québec, or the American Osteopathic Association (AOA) to include involvement with the supervision and/or performance, interpretation, and reporting of 500 ultrasound examinations in the past 36 months².

or

Physicians performing, interpreting and reporting ultrasounds of a specific anatomic area who have not completed a diagnostic or interventional radiology residency program should meet the following criteria: Completion of an ACGME approved residency program in specialty practice plus 200 hours of Category I CME in the subspecialty where ultrasound reading occurs; and supervision and/or performance, interpretation, and reporting of 500 cases relative to each subspecialty area interpreted (eg, pelvic, obstetrical, thyroid, vascular) during the past 36 months in a supervised situation.

The physicians should be familiar with interpretation and documentation in accordance with the [ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#) [2].

Maintenance of Competence

All physicians performing ultrasound examinations should demonstrate evidence of continuing competence in the interpretation and reporting of those examinations. If competence is assured primarily based on continuing experience, a minimum of 100 examinations per year or 50 per anatomic location is recommended in order to maintain the physician's skills. Continued competency should be monitored for technical success, accuracy of interpretation, and appropriateness of evaluation.

Continuing Medical Education

The physician's continuing education should be in accordance with the [ACR Practice Parameter for Continuing Medical Education \(CME\)](#) [3] and should include CME in ultrasonography as is appropriate to his/her practice.

B. Diagnostic Medical Sonographer

Sonographers performing ultrasound examinations should be qualified with appropriate training. This qualification can be demonstrated by certification or eligibility for certification by a nationally recognized certifying body (eg, ARDMS or ARRT). The sonographer should have ongoing continuing education in ultrasound.

III. SPECIFICATIONS OF THE EXAMINATION

The written or electronic request for ultrasound examinations 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

²Completion of an accredited radiology residency in the past 24 months will be presumed to be satisfactory experience for the performance, reporting, and interpreting requirement.

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)

Quality may be enhanced by having the ultrasound practice undergo an accreditation process.

IV. 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. The initials of the operator should be accessible on the images or electronically on PACS. 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 based on clinical need and relevant legal and local health care facility requirements.

Reporting should be in accordance with the [ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#) [2].

V. 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 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–AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Real Time Ultrasound Equipment](#) [4].

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