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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.

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ACR–ACOG–AIUM–SRU PRACTICE PARAMETER FOR THE PERFORMANCE OF SONOHYSTEROGRAPHY

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 and Contraindications, 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), the American College of Obstetricians and Gynecologists (ACOG), and the Society of Radiologists in Ultrasound (SRU). Recommendations for physician qualifications, written request for the examination, procedure documentation, and quality control may vary among the four organizations and are addressed by each separately.

This practice parameter has been developed to assist qualified physicians performing sonohysterography. Properly performed sonohysterography can provide information about the uterus, endometrium, and fallopian tubes. Additional studies may be necessary for complete diagnosis. Adherence to the following practice parameter will maximize the diagnostic benefit of sonohysterography.

Sonohysterography is the evaluation of the endometrial cavity using the transcervical injection of sterile fluid. Various terms such as saline infusion sonohysterography or hysterosonography have been used to describe this technique. The primary goal of sonohysterography is to visualize the endometrial cavity in more detail than is possible with routine endovaginal ultrasound [1]. Sonohysterography may also be used to assess tubal patency [2]. An increase in the amount of free pelvic fluid at the end of the procedure indicates that at least one tube is patent.

II. INDICATIONS AND CONTRAINDICATIONS

A. Indications [1-11]

Indications include but are not limited to evaluation of the following:

1. Abnormal uterine bleeding
2. Uterine cavity, especially with regard to uterine myomas, polyps, and synechiae
3. Abnormalities detected on endovaginal sonography, including focal or diffuse endometrial or intracavitary abnormalities
4. Congenital or acquired abnormalities of the uterus
5. Infertility
6. Recurrent pregnancy loss
7. Suboptimal visualization of the endometrium on endovaginal ultrasound

B. Contraindications

Sonohysterography should not be performed in a woman who is pregnant or who could be pregnant. This is usually avoided by scheduling the examination in the follicular phase of the menstrual cycle, after menstrual flow has essentially ceased but before the patient has ovulated. In a patient with regular cycles, sonohysterography should not in most cases be performed later than the 10th day of the menstrual cycle. Sonohysterography should not be performed in patients with a pelvic infection or unexplained pelvic tenderness, which could be due to pelvic inflammatory disease. Active vaginal bleeding is not a contraindication to the procedure but may make the interpretation more challenging [12].

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](#) [13].

In addition, the physician must have spent a minimum of 3 months in documented formal training in the performance, interpretation, and reporting of examinations of the female reproductive system. Additionally, the

physician should supervise and interpret examinations of the female reproductive system on a regular basis and be familiar with techniques of cervical cannulation.

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 sonohysterography 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 FOR INDIVIDUAL EXAMINATIONS

A. Patient Preparation

Pelvic organ tenderness should be assessed during the preliminary endovaginal sonogram. If the patient's history or physical exam is concerning for active pelvic inflammatory disease, the examination should be deferred until an appropriate course of treatment has been completed. In the presence of nontender hydrosalpinges, consideration may be given to administering antibiotics at the time of the examination; in this case it is prudent to discuss the antibiotic regimen with the referring physician. A pregnancy test is advised when clinically indicated. Patients should be questioned about a latex allergy or a reaction to betadine or other topical antiseptic prior to use of these products. A sonohysterogram should be performed in the early follicular phase, as close to the end of the menstrual period as possible.

B. Procedure

A previous endovaginal sonogram is useful for measurement of the endometrium and evaluation of the uterus, ovaries, and pelvic free fluid. A speculum is used to allow visualization of the cervix. The presence of unusual pain, lesions, or purulent vaginal or cervical discharge may require rescheduling the procedure pending further evaluation. Prior to insertion, the catheter should be flushed with sterile fluid to avoid introducing air during the study. After cleansing the external os, the cervical canal and/or uterine cavity should be catheterized using an aseptic technique, and appropriate sterile fluid should be instilled slowly by means of manual injection under real-time sonographic imaging. Imaging should include real-time scanning of the endometrial and cervical canal [14,15]. Imaging may include evaluation of fallopian tube patency if indicated.

C. Contrast Agent

Appropriate sterile fluid such as normal saline should be used for sonohysterography. If the requesting physician is interested in tubal patency, then a sonosalpingogram can be offered using agitated saline [16,17].

D. Images

Precatheterization images should be obtained and recorded, in at least two planes, to demonstrate normal and abnormal findings. These images should include the thickest bilayer endometrial measurement, which includes the anterior and posterior endometrial thicknesses, obtained in a sagittal view.

Once the uterine cavity is filled with fluid, a complete survey of the uterine cavity should be performed and representative images obtained to document normal and abnormal findings. If a balloon catheter filled with saline is used for the examination, images should be obtained at the end of the procedure with the balloon deflated to fully evaluate the endometrial cavity, particularly the cervical canal and lower portion of the endometrial cavity.

Color Doppler sonography may be helpful in evaluating the vascularity of an intrauterine abnormality and tubal patency.

3-D imaging, in particular reconstructed coronal plane imaging, is useful in the assessment of Müllerian duct anomalies and for pre-operative mapping of myomas [18,19].

E. Postprocedure Care

The imaging or referring physician should discuss the sonohysterogram findings with the patient. The patient should be instructed to contact her physician if she develops fever, persistent pain, or unusual bleeding following the procedure. The patient should be told to expect leaking of fluid after the procedure that may be blood-tinged or may have a similar color as the cleaning solution.

VI. DOCUMENTATION

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

Adequate documentation is essential for high quality in 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 the 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](#) [20].

VII. EQUIPMENT SPECIFICATIONS

Sonohysterography is usually conducted with a high-frequency endovaginal transducer. In cases of an enlarged uterus, additional transabdominal images during infusion may be required to fully evaluate the endometrium. The transducer should be adjusted to operate at the highest clinically appropriate frequency under the ALARA (as low as reasonably achievable) principle.

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:

Vaginal transducers should be covered by a protective sheath prior to insertion. Coupling gel should be used. Following the examination, the sheath should be disposed of and the transducer cleaned in an antimicrobial

solution. The type of solution and amount of time for cleaning should follow manufacturer and infectious disease control recommendations.

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](#) [21].

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REFERENCES

1. Bree RL, Bowerman RA, Bohm-Velez M, et al. US evaluation of the uterus in patients with postmenopausal bleeding: A positive effect on diagnostic decision making. *Radiology*. 2000;216(1):260-264.
2. Hajishafiha M, Zobairi T, Zanjani VR, Ghasemi-Rad M, Yekta Z, Mladkova N. Diagnostic value of sonohysterography in the determination of fallopian tube patency as an initial step of routine infertility assessment. *J Ultrasound Med*. 2009;28(12):1671-1677.
3. Becker E, Jr., Lev-Toaff AS, Kaufman EP, Halpern EJ, Edelweiss MI, Kurtz AB. The added value of transvaginal sonohysterography over transvaginal sonography alone in women with known or suspected leiomyoma. *J Ultrasound Med*. 2002;21(3):237-247.
4. Breitkopf DM, Frederickson RA, Snyder RR. Detection of benign endometrial masses by endometrial stripe measurement in premenopausal women. *Obstet Gynecol*. 2004;104(1):120-125.
5. Doubilet PM. Society of Radiologists in Ultrasound Consensus Conference statement on postmenopausal bleeding. *J Ultrasound Med*. 2001;20(10):1037-1042.
6. Dubinsky TJ, Stroehlein K, Abu-Ghazze Y, Parvey HR, Maklad N. Prediction of benign and malignant endometrial disease: hysterosonographic-pathologic correlation. *Radiology*. 1999;210(2):393-397.
7. Goldstein RB, Bree RL, Benson CB, et al. Evaluation of the woman with postmenopausal bleeding: Society of Radiologists in Ultrasound-Sponsored Consensus Conference statement. *J Ultrasound Med*. 2001;20(10):1025-1036.
8. Goldstein SR. Use of ultrasonohysterography for triage of perimenopausal patients with unexplained uterine bleeding. *Am J Obstet Gynecol*. 1994;170(2):565-570.
9. Laifer-Narin S, Ragavendra N, Parmenter EK, Grant EG. False-normal appearance of the endometrium on conventional transvaginal sonography: comparison with saline hysterosonography. *AJR Am J Roentgenol*. 2002;178(1):129-133.

10. Laifer-Narin SL, Ragavendra N, Lu DS, Sayre J, Perrella RR, Grant EG. Transvaginal saline hysterosonography: characteristics distinguishing malignant and various benign conditions. *AJR Am J Roentgenol.* 1999;172(6):1513-1520.
11. Mihm LM, Quick VA, Brumfield JA, Connors AF, Jr., Finnerty JJ. The accuracy of endometrial biopsy and saline sonohysterography in the determination of the cause of abnormal uterine bleeding. *Am J Obstet Gynecol.* 2002;186(5):858-860.
12. Berry E, Lindheim SR, Connor JP, et al. Sonohysterography and endometrial cancer: incidence and functional viability of disseminated malignant cells. *Am J Obstet Gynecol.* 2008;199(3):240 e241-248.
13. American College of Radiology. ACR-SPR-SRU Practice Parameter for Performing and Interpreting Diagnostic Ultrasound Evaluations. 2014; <http://www.acr.org/~media/13B896B9F4844E3082E7D7ED66AFC148.pdf>. Accessed September 26, 2014.
14. Lindheim SR, Sprague C, Winter TC, 3rd. Hysterosalpingography and sonohysterography: lessons in technique. *AJR Am J Roentgenol.* 2006;186(1):24-29.
15. Spieldoch RL, Winter TC, Schouweiler C, Ansary S, Evans MD, Lindheim SR. Optimal catheter placement during sonohysterography: a randomized controlled trial comparing cervical to uterine placement. *Obstet Gynecol.* 2008;111(1):15-21.
16. Allison SJ, Horrow MM, Kim HY, Lev-Toaff AS. saline-infused sonohysterography: tips for achieving greater success. *Radiographics.* 2011;31(7):1991-2004.
17. Jeanty P, Besnard S, Arnold A, Turner C, Crum P. Air-contrast sonohysterography as a first step assessment of tubal patency. *J Ultrasound Med.* 2000;19(8):519-527.
18. Benacerraf BR, Shipp TD, Bromley B. Improving the efficiency of gynecologic sonography with 3-dimensional volumes: a pilot study. *J Ultrasound Med.* 2006;25(2):165-171.
19. Ghate SV, Crockett MM, Boyd BK, Paulson EK. Sonohysterography: do 3D reconstructed images provide additional value? *AJR Am J Roentgenol.* 2008;190(4):W227-233.
20. American College of Radiology. ACR Practice Parameter for Communication of Diagnostic Imaging Findings. 2014; <http://www.acr.org/~media/13B896B9F4844E3082E7D7ED66AFC148.pdf>. Accessed September 26, 2014.
21. American College of Radiology. ACR Technical Standard for Diagnostic Medical Physics Performance Monitoring of Real Time Ultrasound Equipment. 2011; <http://www.acr.org/~media/152588501B3648BA803B38C8172936F9.pdf>. Accessed September 26, 2014.

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