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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 PRACTICE PARAMETER FOR THE PERFORMANCE OF HYSTEOSALPINGOGRAPHY

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

Hysterosalpingography (HSG) consists of radiographic imaging of the cervical canal, uterine cavity, fallopian tubes, and peritoneal cavity during injection of contrast media with fluoroscopic visualization. It should be done with the minimum radiation exposure necessary to provide sufficient anatomic detail for diagnosis of normal or abnormal findings. Adherence to the following practice parameters will maximize the diagnostic benefit of HSG. An experience-based understanding of the relative merits of other imaging examinations such as sonography, hysterosonography, computed tomography (CT), nuclear medicine, and magnetic resonance imaging (MRI) will result in the selection of the most appropriate test. In each case, the expected gain in information from the diagnostic study should outweigh any potential risk to the patient. Additional diagnostic studies, such as hysteroscopy, may be necessary for complete diagnosis.

II. INDICATIONS, CONTRAINDICATIONS, AND CAUTIONS

A. Indications

Indications for HSG include, but are not limited to, the evaluation of [1-3]:

1. Infertility
2. Follow-up of sterilization procedures
3. Pelvic pain
4. Irregular menstrual cycles
5. Irregular vaginal bleeding
6. Congenital abnormalities and/or anatomic variants
7. Patients prior to or after tubal surgery, selective salpingography, and tubal recanalization or other intervention
8. Postoperative uterine cavity
9. Patients prior to treatment with assisted reproductive technologies
10. Uterine fibroids
11. Thickened or irregular endometrium
12. Sequelae of ectopic pregnancy

B. Contraindications and Cautions

HSG should not be performed on 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 ceased but before the patient has ovulated, usually day 7 to 10 of the menstrual cycle. If necessary, a pregnancy test may be performed prior to the procedure. HSG should not be performed when ongoing pelvic infection or active vaginal bleeding is present. Treatment of known cervical os stenosis should be considered prior to evaluation, as it can make the cannulation of the cervix difficult or impossible. If pelvic infection is of concern, premedication with antibiotics should be considered (see section IV.A). History of allergy or idiosyncratic reaction to iodinated contrast media is a relative contraindication and may require premedication with diphenhydramine, steroids, and/or other medications (see the [ACR Manual on Contrast Media](#) [4]). When hysterosonography is appropriate to answer the clinical question, it is preferred over HSG to eliminate radiation exposure to the patient [5].

III. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

A. Physician

The examination must be performed under the supervision of and interpreted by a licensed physician, with the following qualifications:

1. Certification in Radiology, Diagnostic Radiology or Interventional Radiology/Diagnostic Radiology (IR/DR) 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.

or

Completion of a 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 having spent a minimum of 3 months in documented formal training in the performance, interpretation, and reporting of examinations of the gynecologic system, including HSG. Additionally, the physician should supervise and interpret examinations of the gynecologic system, including HSG, on a regular basis.

and

2. Radiation physics: The supervising physician must have documented training and understanding of the physics of diagnostic radiology and the equipment needed to produce the images. This should include conventional and digital radiography, fluoroscopy, screen-film combinations, and image processing. In addition, the supervising physician must be familiar with the principles of radiation protection, the hazards of radiation, and radiation monitoring requirements as they apply to both patients and personnel.

and

3. Disease processes: The supervising physician must be familiar with the disease processes for which the patient is being evaluated and must understand the many manifestations of these diseases, as well as variants of normal anatomy and congenital anomalies.

and

4. Consultative role: To fulfill a consultative role and be able to interpret the examination, the supervising physician should have training or experience in alternative imaging techniques such as sonography, CT, nuclear medicine, MRI, and vascular imaging.

and

5. Technique: The supervising physician must have an understanding of and experience in proper imaging technique, imaging sequencing, and the volume and concentration of appropriate contrast material. The physician should be familiar with the various contrast agents available and the indications for the use of each. The physician should also be familiar with timing of the examination with reference to the menstrual cycle.

and

6. Adverse reactions: The supervising physician must have training in the recognition and treatment of adverse reactions to contrast material (see the [ACR Manual on Contrast Media](#) [4]).

Maintenance of Competence

All physicians performing HSG procedures who have met the above criteria should perform a sufficient number of these procedures to maintain their skills.

Continuing Medical Education

The physician's continuing medical education should be in accordance with the [ACR Practice Parameter for Continuing Medical Education \(CME\)](#) [6].

B. Qualified Medical Physicist

A Qualified Medical Physicist is an individual who is competent to practice independently one or more subfields in medical physics. The American College of Radiology considers certification and continuing education and experience in the appropriate subfield(s) to demonstrate that an individual is competent to practice in one or more subfields in medical physics, and to be a Qualified Medical Physicist. The ACR strongly recommends that the individual be certified in the appropriate subfield(s) by the American Board of Radiology (ABR), the Canadian College of Physics in Medicine, or by the American Board of Medical Physics (ABMP).

A Qualified Medical Physicist should meet the [ACR Practice Parameter for Continuing Medical Education \(CME\)](#) (ACR Resolution 17, 1996 – revised 2012, Resolution 42). [6]

The appropriate subfield of medical physics for this practice parameter is Diagnostic Medical Physics. (Previous medical physics certification categories including Radiological Physics, Diagnostic Radiological Physics, and Diagnostic Imaging Physics are also acceptable.)

C. Registered Radiologist Assistant

A registered radiologist assistant is an advanced level radiographer who is certified and registered as a radiologist assistant by the American Registry of Radiologic Technologists (ARRT) after having successfully completed an advanced academic program encompassing an ACR/ASRT (American Society of Radiologic Technologists) radiologist assistant curriculum and a radiologist-directed clinical preceptorship. Under radiologist supervision, the radiologist assistant may perform patient assessment, patient management, and selected examinations as delineated in the Joint Policy Statement of the ACR and the ASRT titled “Radiologist Assistant: Roles and Responsibilities” and as allowed by state law. The radiologist assistant transmits to the supervising radiologists those observations that have a bearing on diagnosis. Performance of diagnostic interpretations remains outside the scope of practice of the radiologist assistant. (ACR Resolution 34, adopted in 2006) [7]

D. Radiologic Technologist

Certification by the ARRT or unrestricted state licensure is required.

Qualifications and performance of technologists should comply with procedure manuals at the imaging facility. Continuing medical education (CME) programs and on-the-job training under the supervision of a qualified physician should be available.

IV. SPECIFICATIONS OF THE EXAMINATION

The written or electronic request for HSG 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)

A. Patient Preparation

The referring or imaging physician may elect to prescribe prophylactic antibiotics. If dilated and/or obstructed fallopian tubes are diagnosed and the patient is not taking prophylactic antibiotics, consideration should be given to administering antibiotics at the time of the examination.

B. Procedure

All air should be removed from the cannula by priming it in the vertical position. The cervical canal or endometrial cavity should be accessed using aseptic technique and an appropriate volume (typically in the range of 10 to 30 ml) of contrast agent administered under intermittent fluoroscopic observation to demonstrate the

anatomic structures to be studied. If hydrosalpinx is demonstrated, overdistention of the fallopian tube(s) should be avoided, and a 10 minute delayed image after ambulation could be obtained.

The contrast should be injected slowly to prevent spasm and discomfort. Additional comfort considerations such as use of warmed or plastic speculum, catheter with stiff introduction sheath rather than a tenaculum, and appropriate lithotomy positioning could be taken. The patient should require no sedation or analgesia. If needed, topical anesthetic such as local application of lidocaine cream or lidocaine injection applied before the procedure may be effective for pain relief during HSG [8,9].

C. Contrast Agent

Oil-based and various water-soluble contrast agents can be used for HSG, and the relative advantages and disadvantages of the contrast agent used should be understood. Particularly if an oil-based contrast agent is used, injection should be halted immediately if myometrial or venous intravasation is observed [10,11].

D. Images

Appropriate images should be produced to demonstrate normal and abnormal findings. Supine frontal views are routinely obtained, and oblique and prone views may be obtained as indicated. The endometrial cavity and fallopian tubes are opacified as fully as necessary for diagnostic evaluation. Selective cannulation of the fallopian tubes may be performed to distinguish between lack of filling due to spasm versus tubal obstruction [12,13].

Care should be taken to ensure that accurate orientation of the anatomy is annotated by electronic or physical side markers on the images.

Post-drainage images may be obtained if endometrial pathology is suspected. If a balloon catheter 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 and cervical canal [14-16].

E. Post Procedure Care

The imaging or referring physician should discuss the HSG findings with the patient. The patient should be instructed to contact the imaging physician or referring physician if she develops fever, persistent pain, or unusual bleeding following the procedure. The patient can be told to expect a sensation of menstrual cramping.

V. DOCUMENTATION

Reporting should be in accordance with the [ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#) [17].

VI. EQUIPMENT SPECIFICATIONS

Examinations must be performed with fluoroscopic and radiographic equipment meeting all applicable federal, state and local radiation standards. The equipment should provide diagnostic fluoroscopic image quality and recording capability (radiographs, video or digital). The equipment should be capable of producing kilovoltage greater than 100 kVp. Fluoroscopy equipment with “last image hold” feature is desirable.

Appropriate emergency equipment and medications must be immediately available to treat adverse reactions associated with administered medications. The equipment and medications should be monitored for inventory and drug expiration dates on a regular basis. The equipment, medications, and other emergency support must also be appropriate for the range of ages and sizes in the patient population.

VII. RADIATION SAFETY IN IMAGING

Radiologists, medical physicists, registered radiologist assistants, radiologic technologists, and all supervising physicians have a responsibility for safety in the workplace by keeping radiation exposure to staff, and to society as a whole, “as low as reasonably achievable” (ALARA) and to assure that radiation doses to individual patients are appropriate, taking into account the possible risk from radiation exposure and the diagnostic image quality necessary to achieve the clinical objective. All personnel that work with ionizing radiation must understand the key principles of occupational and public radiation protection (justification, optimization of protection and application of dose limits) and the principles of proper management of radiation dose to patients (justification, optimization and the use of dose reference levels) http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1578_web-57265295.pdf.

Nationally developed guidelines, such as the ACR’s [Appropriateness Criteria®](#), should be used to help choose the most appropriate imaging procedures to prevent unwarranted radiation exposure.

Facilities should have and adhere to policies and procedures that require varying ionizing radiation examination protocols (plain radiography, fluoroscopy, interventional radiology, CT) to take into account patient body habitus (such as patient dimensions, weight, or body mass index) to optimize the relationship between minimal radiation dose and adequate image quality. Automated dose reduction technologies available on imaging equipment should be used whenever appropriate. If such technology is not available, appropriate manual techniques should be used.

Additional information regarding patient radiation safety in imaging is available at the Image Gently® for children (www.imagegently.org) and Image Wisely® for adults (www.imagewisely.org) websites. These advocacy and awareness campaigns provide free educational materials for all stakeholders involved in imaging (patients, technologists, referring providers, medical physicists, and radiologists).

Radiation exposures or other dose indices should be measured and patient radiation dose estimated for representative examinations and types of patients by a Qualified Medical Physicist in accordance with the applicable ACR technical standards. Regular auditing of patient dose indices should be performed by comparing the facility’s dose information with national benchmarks, such as the ACR Dose Index Registry, the NCRP Report No. 172, Reference Levels and Achievable Doses in Medical and Dental Imaging: Recommendations for the United States or the Conference of Radiation Control Program Director’s National Evaluation of X-ray Trends. (ACR Resolution 17 adopted in 2006 – revised in 2009, 2013, Resolution 52).

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 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 Radiographic Equipment](#) [18] and the [ACR–AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Fluoroscopic Equipment](#) [19].

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Principal Reviewers: Lonnie J. Bargo, MD
Lawrence R. Bigongiari, MD, FACR

Committee on Body Imaging (Abdominal)

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

Ruedi F. Thoeni, MD, Chair	Dean D. Maglinte, MD, FACR
Mahmoud M. Al-Hawary, MD	Frank H. Miller, MD, FACR
Mark E. Baker, MD, FACR	Donald G. Mitchell, MD, FACR
Barry D. Daly, MD, MB, BCH	Eric M. Rubin, MD
Isaac R. Francis, MD, FACR	Scott D. Stevens, MD, FACR
Patrick Gonzales, MD	William E. Torres, MD, FACR
Richard M. Gore, MD, FACR	

Committee on Practice Parameters – General, Small, Emergency and/or Rural Practice

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

Sayed Ali, MD, Chair	Padmaja A. Jonnalagadda, MD
Marco A. Amendola, MD, FACR	Pil S. Kang, MD
Gory Ballester, MD	Jason B. Katzen, MD
Lonnie J. Bargo, MD	Serena McClam Liebengood, MD
Christopher M. Brennan, MD, PhD	Steven E. Liston, MD, MBA, FACR
Resmi A. Charalel, MD	Gagandeep S. Mangat, MD
Charles E. Johnson, MD	Tammam N. Nehme, MD
Candice A. Johnstone, MD	Jennifer L. Tomich, MD

Lincoln L. Berland, MD, FACR, Chair, Commission on Body Imaging
Robert S. Pyatt, Jr., MD, FACR, Chair, Commission on General, Small Emergency and/or Rural Practice
Jacqueline A. Bello, MD, FACR, Chair, Commission on Quality and Safety
Matthew S. Pollack, MD, FACR, Chair, Committee on Practice Parameters and Technical Standards

Comments Reconciliation Committee

Joseph G. Cernigliaro, MD, FACR, Chair	William T. Herrington, MD, FACR
Joshua M. McDonald, MD, Co-Chair	Cathrine E. Keller, MD
Sayed Ali, MD	Paul A. Larson, MD, FACR
Lonnie J. Bargo, MD	Matthew S. Pollack, MD, FACR
Jacqueline A. Bello, MD, FACR	Robert S. Pyatt Jr., MD, FACR
Lincoln L. Berland, MD, FACR	Timothy L. Swan, MD, FACR, FSIR
Lawrence R. Bigongiari, MD, FACR	Ruedi F. Thoeni, MD

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