

AIUM Practice Parameter for the Performance of Sonohysterography and Hysterosalpingo-Contrast Sonography

Introduction

The American Institute of Ultrasound in Medicine (AIUM) is a multidisciplinary association dedicated to advancing the safe and effective use of ultrasound in medicine through professional and public education, research, development of clinical practice parameters, and accreditation of practices performing ultrasound examinations.

The *AIUM Practice Parameter for the Performance of Sonohysterography and Hysterosalpingo-Contrast Sonography* was developed (or revised) by the AIUM in collaboration with other organizations whose members use ultrasound for performing this examination(s) (see “Acknowledgments”). Recommendations for personnel requirements, the request for the examination, documentation, quality assurance, and safety may vary among the organizations and each may be addressed separately.

This Practice Parameter is intended to provide the medical ultrasound community with recommendations for the performance and recording of high-quality ultrasound examinations. The parameter reflects what the AIUM considers the appropriate criteria for this type of ultrasound examination but is not intended to establish a legal standard of care. Examinations performed in this specialty area are expected to follow the parameter with recognition that deviations may occur depending on the clinical situation.

This Practice Parameter has been developed to assist qualified physicians performing saline infusion sonohysterography (SIS) and hysterosalpingo-contrast sonography (HyCoSy); each procedure is addressed separately. Properly performed SIS and HyCoSy 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 each procedure.

SIS is the evaluation of the endometrial cavity using the transcervical injection of sterile fluid. Various terms, such as sonohysterography and hysterosonography, have been used to describe this technique. The primary goal of SIS is to visualize the

Received February 9, 2021, Manuscript
accepted for publication February 10, 2021.

doi:10.1002/jum.15670

endometrial cavity in more detail than is possible with standard transvaginal ultrasound.¹ The accuracy of SIS approaches hysteroscopy in detecting endometrial abnormalities.^{2,3}

HyCoSy, also known as sonosalpingography, is the ultrasound evaluation of tubal patency. Tubal patency is demonstrated by instilling contrast into the fallopian tubes via the endometrial cavity, with either direct visualization of fluid flowing through the various tubal segments and out of the tube or the accumulation of fluid in the cul-de-sac. An increase in the amount of free pelvic fluid at the end of the procedure indicates that at least 1 tube is patent. HyCoSy has been demonstrated to have an accuracy essentially equivalent to a hysterosalpingogram and chromoperturbation at laparoscopy.^{2,3}

Indications

Saline Infusion Sonohysterography

Indications^{1,4-13}

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

1. Abnormal uterine bleeding.
2. Uterine cavity evaluation, especially relating to uterine leiomyomas, polyps, synechiae, and cesarean scar niches.¹⁴
3. Abnormalities detected on transvaginal sonography, including focal or diffuse endometrial or intracavitary abnormalities.
4. Congenital or acquired abnormalities of the uterus.
5. Infertility.¹⁵⁻¹⁷
6. Recurrent pregnancy loss.
7. Suboptimal visualization of the endometrium by standard sonography.

Contraindications

Sonohysterography should not be performed in a woman who is pregnant or who could be pregnant. In patients with regular cycles, this is usually avoided by scheduling the examination in the follicular phase of the menstrual cycle, after menstrual flow has completely or almost completely ceased and before the patient has ovulated. In a patient with regular cycles, SIS should ideally be performed before the 10th day of the menstrual cycle. Sonohysterography

should not be performed in patients with a pelvic infection or unexplained pelvic tenderness that could be due to pelvic inflammatory disease. Active vaginal bleeding is not a contraindication to the procedure but may make the interpretation more challenging.¹⁸

Hysterosalpingo-contrast sonography

Indications^{15,16}

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

1. Determination of tubal patency in patients desiring fertility.¹⁹
2. Confirmation of tubal occlusion after sterilization procedures.²⁰

Contraindications

HyCoSy should not be performed in a woman who is pregnant or who could be pregnant. In patients with regular cycles, this is usually avoided by scheduling the examination in the follicular phase of the menstrual cycle, after menstrual flow has completely or almost completely ceased and before the patient has ovulated. HyCoSy should not be performed in patients with a pelvic infection or unexplained pelvic tenderness that could be due to pelvic inflammatory disease. The presence of a hydrosalpinx is not an absolute contraindication to HyCoSy.²¹ HyCoSy should not be performed in the presence of active vaginal bleeding.

Qualifications and Responsibilities of Personnel

Physicians interpreting or performing this type of ultrasound examination should meet the specified AIUM Training Guidelines in accordance with AIUM accreditation policies.

Sonographers performing the ultrasound examination should be appropriately credentialed in the specialty area in accordance with AIUM accreditation policies.

Physicians not personally performing the examination must provide supervision as defined by the Centers for Medicare and Medicaid Services Code of Federal Regulations 42 CFR §410.32.

It is strongly recommended that the physician performing the study has documented formal training

in the performance, interpretation, and reporting of ultrasound examinations of the female pelvis. In addition, the physician should supervise and interpret ultrasound examinations of the female pelvis on a regular basis and be familiar with techniques of cervical cannulation.

Request for the Examination

A written or electronic request for an ultrasound examination must originate from a physician or other appropriately licensed health care provider or under the provider's direction. The clinical information provided should allow for the performance and interpretation of the appropriate ultrasound examination and should be consistent with relevant legal and local health care facility requirements.

Specifications of the Examination

Patient Preparation

Pelvic organ tenderness should be assessed during the preliminary transvaginal ultrasound examination. If the patient's history or physical examination is concerning for active pelvic inflammatory disease, SIS/HyCoSy should be deferred until an appropriate course of treatment has been completed. A pregnancy test is advised when clinically indicated. Patients should be questioned about a latex allergy or a reaction to povidone-iodine or another topical antiseptic (2–4% chlorhexidine gluconate is a safe alternative^{22,23}) before use of these products. In patients with regular cycles, a SIS or HyCoSy should be performed in the early follicular phase, as close to the end of menstrual bleeding as possible.

Procedure

Saline Infusion Sonohysterography

A transvaginal ultrasound examination should be performed before performing SIS. The presence of unusual pain, lesions, or purulent vaginal or cervical discharge may require rescheduling the procedure pending further evaluation or treatment. The pre-SIS ultrasound allows identification of pertinent pelvic anatomy, may visualize other adnexal or ovarian abnormalities, and allows the unenhanced (with no

fluid) assessment of the myometrium and endometrium. This study allows visualization of the orientation and flexion of the uterus, which may assist in placement of the catheters. Before 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 normal saline or another contrast fluid was instilled slowly by means of manual injection under real-time ultrasound imaging. Imaging should include real-time scanning of the endometrium and cervical canal.^{24,25}

Hysterosalpingo-contrast Sonography

A transvaginal ultrasound examination should be performed before performing HyCoSy. The presence of unusual pain or purulent vaginal or cervical discharge may require rescheduling the procedure pending further evaluation or treatment. The preliminary ultrasound allows identification of pertinent pelvic anatomy and may visualize other adnexal or ovarian abnormalities. The preliminary study visualizes the orientation and flexion of the uterus, which may assist in placement of the catheters. SIS can be performed, as described above, immediately before HyCoSy. If performing SIS, the catheter should be flushed with sterile fluid before insertion. After cleansing the external os, the cervical canal or uterine cavity should be catheterized using an aseptic technique, typically using a balloon catheter to avoid backflow of fluid during HyCoSy. Appropriate sterile fluid, with air, contrast, or foam, is instilled slowly by means of manual injection under real-time ultrasound imaging.^{19, 24–28} Commercial devices that mix air and saline together to form the air-infused saline for HyCoSy are available. One can produce similar results by filling a 30-mL syringe with 15 mL of saline and 15 mL of air. Pushing the plunger while rocking the syringe up and down effectively infuses air with saline, which is easily seen on ultrasound.

Contrast Agent

Saline Infusion Sonohysterography

Sterile normal saline should be used for SIS.

Hysterosalpingo-contrast Sonography

Appropriate sterile fluid, such as normal saline infused with air or an appropriate contrast medium, should be used for HyCoSy.

Analgesics

Saline Infusion Sonohysterography

Nonsteroidal anti-inflammatory drugs may benefit some patients during SIS.

Hysterosalpingo-contrast Sonography

Some authors advocate the use of nonsteroidal anti-inflammatories to reduce pain and potentially reduce tubal spasms, similar to a hysterosalpingogram.^{29–31}

Images²⁹

Saline Infusion Sonohysterography

Precatheterization images should be obtained and recorded in accordance with the *AIUM Practice Parameter for the Performance of Ultrasound of the Female Pelvis*. There is a recommendation to instill fluid into the endometrial cavity with real-time ultrasound, ensuring adequate visualization. A complete survey of the uterine cavity should be performed, with images obtained to document normal and abnormal findings. Images should include sagittal and transverse images of the endometrium, with measurement of each layer of the endometrium in the sagittal plane. One should also evaluate the endometrium for any asymmetry, irregularity, or presence of focal lesions. Three-dimensional imaging may be helpful in the evaluation. If an intrauterine balloon is used for the examination, additional 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, including a cesarean scar niche, if present. The location of any focal lesions should be demonstrated in sagittal and transverse planes or with 3-dimensional imaging. The size, sonographic characteristics, and depth of penetration into the myometrium, in the case of submucous myomas, should be documented. The use of color Doppler or power Doppler imaging may be helpful in evaluating the vascularity of an intrauterine abnormality.

Three-dimensional imaging, specifically reconstructed coronal plane imaging, is also useful in the assessment of Müllerian duct anomalies and for preoperative mapping of myomas.^{32,33}

Hysterosalpingo-contrast Sonography

Precatheterization images of the pelvis should be obtained and recorded in accordance with the *AIUM Practice Parameter for the Performance of Ultrasound of the Female Pelvis*. There is a recommendation to instill fluid into the endometrial cavity with real-time ultrasound, ensuring adequate visualization. If SIS is performed before HyCoSy, images are obtained as described above. Before instilling contrast for HyCoSy, the uterus is imaged in a transverse plane, visualizing both cornua simultaneously. Contrast is then instilled under direct ultrasound visualization, assessing the passage of contrast through the courses of the fallopian tubes, including the interstitial and isthmic portions, the ampulla, and passage of contrast from the fimbria. Accumulation of contrast in the pelvis is consistent with at least 1 patent tube. Rotating the patient on each hip may assist in demonstrating tubal patency. Various authors have found power Doppler and 3-dimensional imaging helpful in evaluating tubal patency.^{34,35} The lack of tubal patency should be considered with swirling of contrast in the cornual regions of the endometrium. A tubal spasm may result in a similar appearance.^{3,36}

Postprocedure Care

The imaging or referring physician should discuss the SIS and/or HyCoSy findings with the patient. The patient may have leaking of fluid after the procedure that could be blood tinged or have a similar color as the cleaning solution. The patient should contact her physician if symptoms such as fever, persistent pain, or unusual bleeding develop after the procedure.

Documentation

Accurate and complete documentation is essential for high-quality patient care. Written reports and ultrasound images/video clips that contain diagnostic information should be obtained and archived, with recommendations for follow-up studies if clinically applicable, in accordance with the *AIUM Practice Parameter for Documentation of an Ultrasound Examination*.

Saline Infusion Sonohysterography

Measurement of the endometrium should be done in the sagittal plane by measuring each layer of the endometrium separately and then adding the results together to obtain the endometrium thickness. One should document whether the layers are uniform and symmetric or if there is asymmetry or irregularities present. Measurement of endometrial polyps and fibroids should be made in 3 orthogonal planes. When addressing fibroids, a comment about the subjective depth of projection into the endometrial cavity, as a percentage of the overall size of the fibroid, is helpful in determining treatment options.

HyCoSy

Images should be obtained in the transverse plane, ideally visualizing both uterine cornua simultaneously. Documentation should include flow of contrast through the interstitial portion of the tube, the ampullary portion of the tube, and out the fimbriated end of the tube. Documentation should include any change in the amount of cul-de-sac fluid during the HyCoSy. Flow of contrast may not be seen in all tubal segments because of overlying bowel loops or acoustic shadows from bowel contents. If brisk flow is seen through at least 1 tubal segment, without associated tubal dilatation, the tube is considered patent. The lack of flow into and through the tube should be documented.

Equipment Specifications

HyCoSy is usually conducted with a high-frequency transvaginal transducer. The transducer should be adjusted to operate at the highest clinically appropriate frequency under the as low as reasonably achievable principle.

Quality and Safety

Policies and procedures related to quality assurance and improvement, safety, infection control, and equipment performance monitoring should be developed and implemented in accordance with the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

ALARA Principle

The potential benefits and risks of each examination should be considered. The ALARA principle should be observed for factors that affect the acoustical output and by considering transducer dwell time and total scanning time. Further details on ALARA may be found in the current AIUM publication *Medical Ultrasound Safety*.

Infection Control

Transducer preparation, cleaning, and disinfection should follow manufacturer recommendations and be consistent with the AIUM's *Guidelines for Cleaning and Preparing External- and Internal-Use Ultrasound Transducers and Equipment Between Patients, Safe Handling, and Use of Ultrasound Coupling Gel*.

Equipment Performance Monitoring

Monitoring protocols for equipment performance should be developed and implemented in accordance with the *AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices*.

Acknowledgments

This parameter was revised by the AIUM in collaboration with the American College of Obstetricians and Gynecologists, the American College of Radiology, and the Society of Radiologists in Ultrasound. We are indebted to the many volunteers who contributed their time, knowledge, and energy to developing this document.

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