

# AIUM Practice Parameter for Ultrasonography in Reproductive Medicine

*Prepared in collaboration with the American  
Institute of Ultrasound in Medicine (AIUM)  
and the Society for Reproductive Endocrinology  
and Infertility (SREI), an affiliate of the American  
Society of Reproductive Medicine (ASRM)*



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The American Institute of Ultrasound in Medicine (AIUM) is a multi-disciplinary association dedicated to advancing the safe and effective use of ultrasound in medicine through professional and public education, research, development of parameters, and accreditation. To promote this mission, the AIUM is pleased to publish, in conjunction with the Society for Reproductive Endocrinology and Infertility (SREI), this *AIUM Practice Parameter for Ultrasonography in Reproductive Medicine*. We are indebted to the many volunteers who contributed their time, knowledge, and energy to bringing this document to completion.

The AIUM represents the entire range of clinical and basic science interests in medical diagnostic ultrasound, and with hundreds of volunteers, the AIUM has promoted the safe and effective use of ultrasound in clinical medicine for more than 50 years. This document and others like it will continue to advance this mission.

Practice parameters of the AIUM are intended to provide the medical ultrasound community with parameters for the performance and recording of high-quality ultrasound examinations. The parameters reflect what the AIUM considers the minimum criteria for a complete examination in each area but are not intended to establish a legal standard of care. AIUM-accredited practices are expected to generally follow the parameters with the recognition that deviations from the parameters will be needed in some cases, depending on patient needs and available equipment. Practices are encouraged to go beyond these parameters to provide additional service and information as needed by their referring physicians and patients.



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# Ultrasound Examination of the Female Pelvis for Infertility and Reproductive Medicine

The following are proposed parameters for ultrasound evaluation of the female pelvis. The document consists of 2 parts:

## Part I: Equipment and Documentation Parameters

### Part II: Parameters for Performance of the Ultrasound Examination of the Female Pelvis for Infertility and Reproductive Medicine

This parameter has been developed to provide assistance to practitioners performing ultrasound studies of the female pelvis. In some cases, additional and/or specialized examinations may be necessary. While it is not possible to detect every abnormality, adherence to the following will maximize the probability of detecting most of the abnormalities that occur.

This parameter includes excerpts from various previously published parameters of the AIUM. The latest versions of all AIUM parameters are available at [www.aium.org](http://www.aium.org).

## Part I: Equipment and Documentation Parameters

### Equipment

The sonographic examination of the female pelvis should be conducted with a real-time scanner, with the availability of multiple types of transducers. The transducer or scanner should be adjusted to operate at the highest clinically appropriate frequency, realizing that there is a trade-off between resolution and beam penetration. With modern equipment, studies performed from the anterior abdominal wall can usually use frequencies of 3.5 MHz or higher, while scans performed from the vagina should use frequencies of 5 MHz or higher.

### Care of the Equipment

All probes should be cleaned after each patient examination. Transvaginal probes should be covered by a protective sheath prior to insertion. Patients should be questioned about latex allergy prior to use of a latex sheath. Following each examination, the sheath should be disposed, and the probe washed, dried, and appropriately disinfected

(see section below: “Parameters for Cleaning and Preparing Endocavitary Ultrasound Transducers Between Patients”). The type of antimicrobial solution and the methodology for disinfection depend on manufacturer and infectious disease recommendations.

### Documentation

Adequate documentation is essential for high-quality patient care. A permanent record of the ultrasound examination and its interpretation should be kept by the facility performing the study. Images of all appropriate areas, both normal and abnormal, should be recorded. Variations from normal size should be accompanied by measurements. Images are to be appropriately labeled with the examination date, facility name, patient identification, and image orientation and/or organ imaged when appropriate. A report of the ultrasound findings should be included in the patient’s medical record. Urgent or clinically important unexpected results should be communicated verbally to any referring and/or treating physician and this communication documented in the report. Retention of the permanent record of the ultrasound examination should be consistent both with clinical needs and with the relevant legal and local health care facility requirements.

## Part II: Parameters for Performance of the Ultrasound Examination of the Female Pelvis for Infertility and Reproductive Medicine

The following parameters describe the examination to be performed for each organ and anatomic region in the female pelvis. Whenever possible, all relevant structures should be identified by the vaginal approach. When a transvaginal scan fails to image all areas needed for diagnosis, a transabdominal scan should be performed. In some cases, both a transabdominal and a transvaginal scan may be needed.

## General Pelvic Preparation

For a pelvic sonogram performed transabdominally, the patient's urinary bladder should, in general, be distended adequately to displace the small bowel and its contained gas from the field of view. Occasionally, overdistension of the bladder may compromise evaluation. When this occurs, imaging may be repeated after the patient partially empties her bladder.

For a transvaginal sonogram, the urinary bladder is preferably empty. The patient, the sonographer, or the physician may introduce the transvaginal transducer, preferably under real-time monitoring. Transvaginal sonography is a specialized form of a pelvic examination. Therefore, policies applied locally regarding chaperone or patient privacy issues during a pelvic examination should also be applied during a transvaginal ultrasound examination.

## Uterus

The vagina and the uterus provide anatomic landmarks that can be used as reference points when evaluating the pelvic structures. In evaluating the uterus, the following should be documented: (1) uterine size, shape, and orientation; (2) the endometrium; (3) the myometrium; and (4) the cervix. The vagina may be imaged as a landmark for the cervix and lower uterine segment. Uterine length is evaluated on a long axis view as the distance from the fundus to the cervix. The anteroposterior (AP) diameter of the uterus is measured in the same long axis view from its anterior to posterior walls, perpendicular to its long axis. The transverse diameter is measured from the transaxial or coronal view, perpendicular to the long axis of the uterus. If volume measurements of the uterine corpus are performed, the cervical component should be excluded from the uterine measurement.

Abnormalities of the uterus should be documented. The endometrium should be analyzed for thickness, focal abnormalities, and the presence of fluid or masses in the endometrial cavity. Assessment of the endometrium should allow for variations expected with phases of the menstrual cycle and with hormonal supplementation. The endometrial thickness measurement should include both layers, measured anterior to posterior, in the sagittal plane. Any fluid within the endometrial cavity should be excluded from this measurement. If the endometrial echo is difficult to image or ill-defined, a comment should be added to the report.

The myometrium and cervix should be evaluated for contour changes, echogenicity, and masses. Masses, if identified, should be measured in at least 2 dimensions and their locations recorded.

## Adnexa (Ovaries and Fallopian Tubes)

When evaluating the adnexa, an attempt should be made to identify the ovaries first since they can serve as a major point of reference for assessing the presence of adnexal pathology. Although their location is variable, the ovaries are most often situated anterior to the internal iliac (hypogastric) vessels, lateral to the uterus, and superficial to the obturator internus muscle. The ovaries should be measured, and ovarian abnormalities should be documented. Ovarian size can be determined by measuring the ovary in 3 dimensions on views obtained in 2 orthogonal planes. It is recognized that the ovaries may not be identifiable in some women. This occurs most frequently after menopause or in patients with a large leiomyomatous uterus.

The normal fallopian tubes are not commonly identified. This region should be surveyed for abnormalities, particularly dilated tubular structures.

If an adnexal mass is noted, its relationship to the uterus and the ovaries, if separately visualized, should be documented. Its size, echogenicity, and internal characteristics (cystic, solid, or complex) should be determined. Doppler ultrasound may be useful in select cases to identify the vascular nature of pelvic structures.

## Cul-de-sac

The cul-de-sac and bowel posterior to the uterus may not be clearly defined. This area should be evaluated for the presence of free fluid or masses. When free fluid is detected, its echogenicity should be assessed. If a mass is detected, its size, position, shape, echogenicity, internal characteristics (cystic, solid, or complex), and relationship to the ovaries and uterus should be documented. Identification of peristalsis can be helpful in distinguishing a loop of bowel from a pelvic mass. In the absence of peristalsis, differentiation of normal loops of bowel from a mass may be difficult. A transvaginal examination may be helpful to distinguish a suspected mass from fluid and feces within the normal rectosigmoid. An ultrasound water enema study or a repeat examination after a cleansing enema may also help to distinguish a suspected mass from bowel.

## Limited Examination

In some circumstances, a limited pelvic ultrasound examination is appropriate, especially when monitoring ovarian stimulation (eg, an ovarian folliculogram study or determining endometrial qualities prior to cryopreserved embryo transfer). A comprehensive exam should have previously been performed in the preceding 4 to 6 months to rule out other gynecologic pathology. The limited exam can be restricted to the organ or measurements of interest. In the case of an ovarian folliculogram, the following should be documented: ovarian follicle number in each ovary, endometrial thickness, and endometrial morphologic appearance. In addition, follicular diameters in 2 dimensions for each follicle above 10 mm should be recorded. A single recorded value representing the mean of 2 diameter measurements performed at right angles is also acceptable. Given that these patients will have had a full pelvic exam at the appropriate interval prior to initiating therapy, for infertility patients undergoing limited folliculogram studies, permanent recorded images should be obtained as indicated. Pertinent clinical information should be recorded in the patient record.

## Ultrasound-Guided Procedures

- A. Follicle Puncture:** Ultrasound-assisted (transvaginal or transabdominal) follicle puncture for retrieving eggs for in vitro fertilization (IVF) is appropriate in the following circumstances:
1. The patient has undergone comprehensive sonographic evaluation of the pelvis within 4 to 6 months prior to the start of hormonal stimulation of the ovaries.
  2. Real-time continuous guidance is available, and the image demonstrates a safe approach for the needle path.
  3. The ovaries can be brought in close proximity to the ultrasound transducer, thus avoiding the puncture of vital structures (eg, bowel and blood vessels).
- B. Cyst Aspiration:** Ultrasound-assisted (transvaginal or transabdominal) ovarian cyst puncture and aspiration is appropriate in patients who have been diagnosed with a persistent ovarian cyst and who meet the following criteria:
1. Failed resolution of the cyst following observation and/or hormonal manipulation.

2. The cyst is unilocular and thin-walled without internal excrescences or septations.
3. Real-time continuous guidance is available, and the image demonstrates a safe approach for the needle path.
4. The cyst can be brought in close proximity to the ultrasound transducer, thus avoiding the puncture of vital structures (eg, bowel and blood vessels).

- C. Embryo Transfer:** Ultrasound-assisted embryo transfer is appropriate in patients undergoing a “fresh” IVF cycle or following embryo cryopreservation or embryo/egg donation. If an abdominal ultrasound examination is performed, the bladder should be full to facilitate visualization of the endometrium and the transfer catheter.

## Qualifications and Responsibilities of the Physician

Physicians who perform or supervise ultrasound-guided follicular aspiration or embryo transfer should be skilled in pelvic ultrasonography and appropriate placement of catheters and ultrasound-guided needle placement. They should understand the indications, limitations, and possible complications of the procedure. Physicians should have training, experience, and demonstrated competence in gynecologic ultrasonography and treatment procedures. Physicians are responsible for the documentation of the examination, quality control, and patient safety. Urgent or clinically important unexpected results should be communicated verbally to any referring and/or treating physician and this communication documented in the report.

# Ultrasound Examination of the Female Pelvis in the First 10 Weeks (Embryonic Period) of Pregnancy

## Introduction

This portion of the parameter has been developed for use by practitioners performing sonographic studies only during the first 10 menstrual weeks of pregnancy. Such sonography should be performed only when there is a valid medical reason, and the lowest possible ultrasonic exposure settings should be used to gain the necessary diagnostic information. A limited examination may be performed in clinical emergencies or in specific clinical scenarios, such as evaluation of fetal or embryonic cardiac activity. A limited follow-up examination may be appropriate if a complete prior examination is on record. While this parameter describes the key elements of standard sonographic examinations in the first 10 weeks of pregnancy, in some cases, other specialized examinations may be necessary as well.

## Specifications of the Examination

### 1. Indications

A sonographic examination can be of benefit in many circumstances in the embryonic period of pregnancy, including but not limited to the following indications:

- a. To confirm the presence of an intrauterine pregnancy.
- b. To evaluate a suspected ectopic pregnancy.
- c. To define the cause of vaginal bleeding.
- d. To evaluate pelvic pain.
- e. To date the pregnancy.
- f. To diagnose or evaluate multiple gestations.
- g. To confirm cardiac activity.
- h. To evaluate maternal pelvic masses and/or uterine abnormalities.
- i. To evaluate a suspected hydatidiform mole.

#### Comment

A limited examination may be performed to assess the presence of cardiac activity.

### 2. Imaging Parameters

#### Overall Comment

Scanning in the first 10 weeks of pregnancy may be performed either transabdominally or transvaginally, although transvaginal scanning is preferred. Patients should be questioned about latex allergy prior to use of a latex sheath.

- a. The uterus, including the cervix, and adnexa should be evaluated for the presence of a gestational sac. If a gestational sac is seen, its location should be documented. The gestational sac should be evaluated for the presence or absence of a yolk sac or embryo, and the embryonic size should be measured and recorded, when possible.

#### Comment

Embryonic size is a more accurate indicator of gestational (menstrual) age than is mean gestational sac diameter. However, the mean gestational sac diameter may be measured and recorded when an embryo is not identified. Caution should be used in making the presumptive diagnosis of a gestational sac in the absence of a definite embryo or yolk sac. Without these findings, an intrauterine fluid collection could represent a pseudo-gestational sac associated with an ectopic pregnancy.

- b. Presence or absence of cardiac activity should be reported.

#### Comment

With transvaginal scans, cardiac motion is usually observed when the embryo is 5 mm or greater in length. If an embryo less than 5 mm in length is seen without cardiac activity, a subsequent scan at a later time may be needed to document cardiac activity. If possible, the M-mode function of the scanner should be used to document cardiac activity.

c. Embryonic number should be reported.

#### Comment

Amnionicity and chorionicity should be documented for all multiple pregnancies when possible.

d. Evaluation of the uterus, adnexal structures, and cul-de-sac should be performed.

#### Comment

The presence, location, and size of adnexal masses should be recorded. The presence of leiomyomata should be recorded, and measurements of the largest or any potentially clinically significant leiomyomata should be recorded. The cul-de-sac should be scanned for the presence or absence of fluid.

### 3. Equipment Specifications

These studies should be conducted with real-time scanners, using a transabdominal and/or a transvaginal approach. A transducer of appropriate frequency should be used.

#### Comment

Real-time sonography is necessary to confirm the presence of cardiac activity. A transvaginal scanning approach is preferred for this indication.

### 4. Fetal Safety

Diagnostic ultrasound studies of the fetus are generally considered to be safe during pregnancy. This diagnostic procedure should be performed only when there is a valid medical indication, and the lowest possible ultrasonic exposure setting should be used to gain the necessary diagnostic information under the as low as reasonably achievable (ALARA) principle.

The promotion, selling, or leasing of ultrasound equipment for making “keepsake fetal videos” is considered by the US Food and Drug Administration (FDA) to be an unapproved use of a medical device. Use of a diagnostic ultrasound system for these purposes, without a physician’s order, may be in violation of state laws or regulations.

# Sonohysterography in Reproductive Medicine and Infertility

## Introduction

This portion of the parameter has been developed to provide assistance to qualified physicians performing sonohysterography. Properly performed sonohysterography can provide information about the uterus and the endometrium. Additional studies may be necessary for complete diagnosis. However, adherence to the following standard will maximize the diagnostic benefit of sonohysterography.

## Definition

Sonohysterography consists of sonographic imaging of the uterus and uterocervical cavity, using real-time sonography during injection of sterile fluid (saline or water) into the uterine cavity.

## Goal

The goal of sonohysterography is to visualize the endometrial cavity in more detail than is possible with routine transvaginal sonography.

## Indications and Contraindications

The most common indication for sonohysterography is abnormal uterine bleeding in both premenopausal and postmenopausal women. Other indications include but are not limited to:

### A. Indications

1. Infertility and habitual abortion.
2. Congenital abnormalities and/or anatomic variants of the uterine cavity.
3. Preoperative and postoperative evaluation of the uterine cavity, especially with regard to uterine myomas, polyps, and cysts.
4. Suspected uterine cavity synechiae.
5. Further evaluation of suspected abnormalities seen on transvaginal sonography, including focal or diffuse endometrial thickening or debris.

6. Inadequate imaging of the endometrium by transvaginal sonography.
7. Screening evaluation of the uterine cavity prior to fertility treatment(s) using assisted reproductive technologies.

### 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 may be due to chronic pelvic inflammatory disease. Pelvic organ tenderness should be assessed during the preliminary transvaginal sonogram. Active vaginal bleeding is not a contraindication to the procedure but may make the interpretation more challenging.

## Qualifications and Responsibilities of the Physician

Physicians who perform or supervise diagnostic sonohysterography should be skilled in pelvic ultrasonography and appropriate placement of catheters. They should understand the indications, limitations, and possible complications of the procedure. Physicians should have training, experience, and demonstrated competence in gynecologic ultrasonography and sonohysterography. Physicians are responsible for the documentation of the examination, quality control, and patient safety. Urgent or clinically important unexpected results should be communicated verbally to any referring and/or treating physician and this communication documented in the report.



## Specifications of the Examination

### A. Patient Preparation

The referring physician may elect to prescribe prophylactic antibiotics if patients routinely take these for other invasive procedures. If painful, dilated, and/or obstructed fallopian tubes are found prior to fluid infusion, and the patient is not taking prophylactic antibiotics, the examination should be delayed until treatment can be administered. In the presence of nontender hydrosalpinges, consideration may be given to administering antibiotics at the time of the examination. A pregnancy test is advised when clinically indicated. Patients should be questioned about latex allergy prior to use of a latex sheath.

### B. Procedure

Preliminary routine transvaginal sonography with measurements of the endometrium and evaluation of the uterus and the ovaries should be performed prior to sonohysterography. 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. After cleansing the external os, the cervical canal and/or uterine cavity should be catheterized using 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 canals.

For infertility patients, tubal patency may be determined during sonohysterography by using the following methods: During the preliminary sonogram, the posterior cul-de-sac and pelvis should be evaluated for the presence of free fluid. If none is present before injection of fluid and it is present after fluid injection, then one can state that at least 1 tube is patent. Additionally, contrast material or a small amount of air injected with the fluid may be used with concurrent real-time sonographic imaging of the cornua, adnexae, and cul-de-sac to assess tubal patency. This can facilitate assessing patency of each fallopian tube.

### C. Distension Media

Appropriate sterile fluid such as normal saline or water should be used for sonohysterography.

### D. Images

Appropriate images, in at least 2 planes, using a high-frequency transvaginal ultrasound probe should be produced and recorded to demonstrate normal and abnormal findings. Precatheterization images should be obtained, including the thickest bilayer endometrial measurement on a sagittal image.

Once the uterine cavity is filled with fluid, representative images with a complete survey of the uterine cavity are obtained as necessary for diagnostic evaluation. 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 particularly the cervical canal and the lower uterine segment.

### E. Equipment Specifications

Sonohysterography is usually conducted with a transvaginal 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 principle.

# Training Guidelines for Physicians Who Evaluate and Interpret Diagnostic Ultrasound Examinations

Adapted from the AIUM Official Statement *Training Guidelines for Physicians Who Evaluate and Interpret Diagnostic Ultrasound Examinations*, ©2008 by the American Institute of Ultrasound in Medicine.

Physicians who evaluate and interpret diagnostic ultrasound examinations should be licensed medical practitioners who have a thorough understanding of the indication and guidelines for ultrasound examinations as well as familiarity with the basic physical principles and limitations of the technology of ultrasound imaging. They should be familiar with alternative and complementary imaging and diagnostic procedures and should be capable of correlating the results of these other procedures with the ultrasound examination findings. They should have an understanding of ultrasound technology and instrumentation, ultrasound power output, equipment calibration, and safety. Physicians responsible for ultrasound examinations should be able to demonstrate familiarity with the anatomy, physiology, and pathophysiology of those organs or anatomic areas that are being examined. These physicians should provide evidence of training and requisite competence needed to successfully perform and interpret diagnostic ultrasound examinations in the area(s) they practice. The training should include methods of documentation and reporting of ultrasound studies. Physicians performing diagnostic ultrasound examinations should meet at least one of the following:

1. Completion of an approved residency program, fellowship, or postgraduate training that includes the equivalent of at least 3 months of diagnostic ultrasound training in the area(s) they practice under the supervision of a qualified physician(s),\* during which the trainees will have evidence of being involved with the performance, evaluation, and interpretation of at least 300\*\* sonograms.
2. In the absence of formal fellowship or postgraduate training or residency training, documentation of clinical experience could be acceptable providing the following could be demonstrated:
  - a. Evidence of 100 *AMA PRA Category 1 Credits*<sup>TM</sup> dedicated to diagnostic ultrasound in the area(s) they practice, and

- b. Evidence of being involved with the performance, evaluation, and interpretation of the images of at least 300\*\* sonograms within a 3-year period. It is expected that in most circumstances, examinations will be under the supervision of a qualified physician(s)\*. These sonograms should be in the area(s) they are practicing.

\* A qualified physician is one who, at minimum, meets the criteria defined above in this document.

\*\* Three hundred cases were selected as a minimum number needed to gain experience and proficiency with ultrasonography as a diagnostic modality. This is necessary to develop technical skills, to appreciate the practical applications of basic physics as it affects image quality and artifact formation, and to acquire an experience base for understanding the range of normal and recognizing deviations from normal.

Cases presented as preselected, limited image sets, such as in lectures, case conferences, and teaching files, are excluded. The ability to analyze a full image set, determining its completeness and the adequacy of image quality, and performing the diagnostic process, distinguishing normal from abnormal, is considered a primary goal of the training experience.

# Guidelines for Cleaning and Preparing Endocavitary Ultrasound Transducers Between Patients

Adapted from the AIUM Official Statement *Guidelines for Cleaning and Preparing Endocavitary Ultrasound Transducers Between Patients*, ©2003 by the American Institute of Ultrasound in Medicine.

The purpose of this document is to provide guidance regarding the cleaning and disinfection of transvaginal ultrasound probes.

All sterilization/disinfection represents a statistical reduction in the number of microbes present on a surface. Meticulous cleaning of the instrument is the essential key to an initial reduction of the microbial/organic load by at least 99%. This cleaning is followed by a disinfecting procedure to ensure a high degree of protection from infectious disease transmission, even if a disposable barrier covers the instrument during use.

Medical instruments fall into different categories with respect to potential for infection transmission. The most critical level of instruments is that which is intended to penetrate skin or mucous membranes. These require sterilization. Less critical instruments (often called “semi-critical” instruments) that simply come into contact with mucous membranes such as fiber-optic endoscopes require high-level disinfection rather than sterilization.

Although endocavitary ultrasound probes might be considered even less critical instruments because they are routinely protected by single-use disposable probe covers, leakage rates of 0.9% to 2% for condoms and 8% to 81% for commercial probe covers have been observed in recent studies. For maximum safety, one should therefore perform high-level disinfection of the probe between each use and use a probe cover or condom as an aid to keeping the probe clean.

There are 4 generally recognized categories of disinfection and sterilization. Sterilization is the complete elimination of all forms of microbial life, including spores and viruses. Disinfection, the selective removal of microbial life, is divided into 3 classes:

**High-Level Disinfection:** Destruction/removal of all microorganisms except bacterial spores.

**Mid-Level Disinfection:** Inactivation of *Mycobacterium tuberculosis*, bacteria, most viruses, and most fungi and some bacterial spores.

**Low-Level Disinfection:** Destruction of most bacteria, some viruses, and some fungi. Low-level disinfection will not necessarily inactivate *M tuberculosis* or bacterial spores.

The following specific recommendations are made for the use of endocavitary ultrasound transducers. Users should also review the Centers for Disease Control and Prevention (CDC) document on sterilization and disinfection of medical devices to be certain that their procedures conform to the CDC principles for disinfection of patient care equipment.

- 1. Cleaning:** After removal of the probe cover, use running water to remove any residual gel or debris from the probe. Use a damp gauze pad or other soft cloth and a small amount of mild nonabrasive liquid soap (household dishwashing liquid is ideal) to thoroughly cleanse the transducer. Consider the use of a small brush especially for crevices and areas of angulation depending on the design of your particular transducer. Rinse the transducer thoroughly with running water, and then dry the transducer with a soft cloth or paper towel.
- 2. Disinfection:** Cleaning with a detergent/water solution as described above is important as the first step in proper disinfection since chemical disinfectants act more rapidly on clean surfaces. However, the additional use of a high-level liquid disinfectant will ensure further statistical reduction in the microbial load. Because of the potential disruption of the barrier sheath, additional high-level disinfection with chemical agents is necessary. Examples of such high-level disinfectants include but are not limited to
  - a. 2.4% to 3.2% glutaraldehyde products (a variety of available proprietary products, including Cidex, Metricide, and Procide).
  - b. Non-glutaraldehyde agents, including Cidex OPA (*o*-phthalaldehyde) and Cidex PA (hydrogen peroxide and peroxyacetic acid).
  - c. 7.5% hydrogen peroxide solution.

d. Common household bleach (5.25% sodium hypochlorite) diluted to yield 500 parts per million chlorine (10 cc in 1 L of tap water). This agent is effective but generally not recommended by probe manufacturers because it can damage metal and plastic parts.

Other agents such as quaternary ammonium compounds are not considered high-level disinfectants and should not be used. Isopropanol is not a high-level disinfectant when used as a wipe, and probe manufacturers generally do not recommend soaking probes in the liquid.

The FDA has published a list of approved sterilants and high-level disinfectants for reprocessing reusable medical and dental devices. That list can be consulted to identify agents that may be useful for probe disinfection.

Practitioners should consult the labels of proprietary products for specific instructions. They should also consult instrument manufacturers regarding compatibility of these agents with probes. Many of the chemical disinfectants are potentially toxic, and many require adequate precautions such as proper ventilation, personal protective devices (gloves, face/eye protection, etc) and thorough rinsing before reuse of the probe.

**3. Probe Covers:** The transducer should be covered with a barrier. If the barriers used are condoms, these should be nonlubricated and nonmedicated. Practitioners should be aware that condoms have been shown to be less prone to leakage than commercial probe covers and have a 6-fold enhanced acceptable quality level (AQL) when compared to standard examination gloves. They have an AQL equal to that of surgical gloves. Users should be aware of latex sensitivity issues and have available non-latex-containing barriers.

**4. Aseptic Technique:** For the protection of the patient and the health care worker, all endocavitary examinations should be performed with the operator properly gloved throughout the procedure. Gloves should be used to remove the condom or other barrier from the transducer and to wash the transducer as outlined above. As the barrier (condom) is removed, care should be taken not to contaminate the probe with secretions from the patient. At the completion of the procedure, hands should be thoroughly washed with soap and water.

**Note:** An obvious disruption in condom integrity does not require modification of this protocol. These guidelines take into account possible probe contamination due to a disruption in the barrier sheath.

In summary, routine high-level disinfection of the endocavitary probe between patients plus the use of a probe cover or condom during each examination is required to properly protect patients from infection during endocavitary examinations. For all chemical disinfectants, precautions must be taken to protect workers and patients from the toxicity of the disinfectant.

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