

The American College of Radiology, with more than 30,000 members, is the principal organization of radiologists, radiation oncologists, and clinical medical physicists in the United States. The College is a nonprofit professional society whose primary purposes are to advance the science of radiology, improve radiologic services to the patient, study the socioeconomic aspects of the practice of radiology, and encourage continuing education for radiologists, radiation oncologists, medical physicists, and persons practicing in allied professional fields.

The American College of Radiology will periodically define new practice parameters and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients throughout the United States. Existing practice parameters and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

Each practice parameter and technical standard, representing a policy statement by the College, has undergone a thorough consensus process in which it has been subjected to extensive review and approval. The practice parameters and technical standards recognize that the safe and effective use of diagnostic and therapeutic radiology requires specific training, skills, and techniques, as described in each document. Reproduction or modification of the published practice parameter and technical standard by those entities not providing these services is not authorized.

Revised 2019 (Resolution 27)*

ACR–ACOG–AIUM–SPR–SRU PRACTICE PARAMETER FOR THE PERFORMANCE OF ULTRASOUND OF THE FEMALE PELVIS

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, 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), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU). Recommendations for Qualifications and Responsibilities of Personnel, Written Requests for the Examination, Documentation, and Quality Control and Improvement, Safety, Infection Control, and Patient Education vary among the four organizations and are addressed by each separately.

This practice parameter has been developed to assist physicians and other health care providers performing sonographic studies of the female pelvis. Ultrasound of the female pelvis 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. In some cases, additional or specialized examinations may be necessary. Although it is not possible to detect every abnormality, adherence to the following practice parameter will maximize the probability of detecting most abnormalities. For ultrasound of the urinary bladder, see [ACR–AIUM–SPR–SRU Practice Parameter for the Performance of an Ultrasound Examination of the Abdomen and/or Retroperitoneum](#) [1].

II. INDICATIONS

Indications for pelvic sonography include, but are not limited to, the following:

1. Evaluation of pelvic pain
2. Evaluation of pelvic masses
3. Evaluation of endocrine abnormalities, including polycystic ovaries
4. Evaluation of dysmenorrhea (painful menses)
5. Evaluation of amenorrhea
6. Evaluation of abnormal uterine bleeding (AUB)
7. Evaluation of postmenopausal bleeding (PMB)
8. Evaluation of delayed menses
9. Follow-up of a previously detected abnormality
10. Evaluation, monitoring, and/or treatment of infertility patients
11. Evaluation when there is limited clinical examination of the pelvis
12. Evaluation for signs or symptoms of pelvic infection
13. Further characterization of a pelvic abnormality noted on another imaging study
14. Evaluation of congenital uterine, gonadal, and lower genital tract anomalies
15. Evaluation of excessive bleeding, pain, or signs of infection after pelvic surgery, delivery, or abortion
16. Localization of an intrauterine device (IUD)
17. Screening for malignancy in high-risk patients
18. Evaluation of incontinence or pelvic organ prolapse
19. Guidance for interventional or surgical procedures
20. Preoperative and postoperative evaluation of pelvic structures

III. QUALIFICATIONS OF PERSONNEL

See the [ACR–SPR–SRU Practice Parameter for Performing and Interpreting Diagnostic Ultrasound Examinations](#) [2].

IV. WRITTEN REQUEST FOR THE EXAMINATION

The written or electronic request for a pelvic ultrasound examination 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). The provision of 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 scope of practice requirements. (ACR Resolution 35, adopted in 2006 – revised in 2016, Resolution 12-b)

V. SPECIFICATIONS OF THE EXAMINATION

The following section details the examination to be performed for each organ and anatomic region in the female pelvis. All relevant structures should be identified by the transabdominal and/or transvaginal approach. A transrectal or transperineal approach may be useful in patients who are not candidates for introduction of a vaginal transducer and in assessing the patient with pelvic organ prolapse. More than one approach may be necessary [3,4].

A. General Pelvic Preparation

For a transabdominal pelvic sonogram, the patient's bladder can be distended if necessary to displace bowel from the field of view and to provide an optimal acoustic window to better visualize the pelvic structures, particularly if a transvaginal examination cannot be performed. Occasionally, overdistention of the bladder may compromise the evaluation. When this occurs, imaging may be repeated after partial bladder emptying. If an abnormality of the urinary bladder is detected, it should be documented and reported.

For a transvaginal sonogram, the urinary bladder is preferably empty. The patient, the sonographer, or the physician may introduce the vaginal transducer, preferably under real-time monitoring. Consideration of having a chaperone present should be in accordance with local policy [5,6].

B. Uterus

The vagina and uterus provide anatomic landmarks that can be used as reference points for the other pelvic structures, whether normal or abnormal. In examining the uterus, the following should be evaluated: (a) the uterine size, shape, and orientation; (b) the endometrium; (c) the myometrium; and (d) the cervix. The vagina may be imaged while introducing the transducer and can be a landmark for the cervix [7,8]. If evaluation of the vaginal mucosa and rectovaginal septum are desired, instillation of 20 mL of sterile gel into the vagina with distension of the vaginal fornices may be helpful [9].

Overall uterine length is evaluated in sagittal view from the fundus to the cervix (to the external os, if it can be identified). The length can be measured as a straight line from the fundus to the external os using outer-to-outer technique or by measuring from the fundal region along the endometrial lining and endocervical canal using outer-to-outer technique [10]. The depth of the uterus (anteroposterior dimension) is measured in the same sagittal view from its anterior to posterior walls, perpendicular to the length. The maximum width is measured in the transverse or coronal view. If volume measurements of the uterine corpus are performed, the cervical component should be excluded from the uterine length measurement.

Abnormalities of the uterus should be documented [11-13]. The myometrium and cervix should be evaluated for contour changes, echogenicity, masses, and cysts as well as symmetry between anterior and posterior myometrium. Fixed retroflexion of the uterus, particularly in the presence of posterior adenomyosis, should be recognized as a possible indicator of deeply infiltrating endometriosis (DIE) in the posterior cul-de-sac [14]. Size and location of clinically relevant lesions should be documented. Masses that may require follow-up or intervention should be measured in at least two dimensions, acknowledging that it is not usually necessary to measure all uterine fibroids.

The endometrium should be analyzed for thickness, focal abnormality, echogenicity, and the presence and characteristics of fluid or masses in the cavity. The thickest part of the endometrium should be measured

perpendicular to its longitudinal plane in the anteroposterior diameter from echogenic to echogenic border, using outer-to-outer technique [10] (see Figure 1). The adjacent hypoechoic myometrium and fluid in the cavity should be excluded (see Figure 2). In reproductive-aged postmenarchal patients, assessment of the endometrium should allow for variations expected with phases of the menstrual cycle and with hormonal supplementation [13,15,16]. It should be reported if the endometrium is not adequately seen in its entirety or is ill-defined; in this circumstance, measurement should not be included in the report. Sonohysterography may be a useful adjunct to evaluate the patient with AUB or to further clarify an abnormally thickened endometrium and to further evaluate an incompletely visualized endometrium. (See the [ACR-ACOG-AIUM-SRU Practice Parameter for the Performance of Sonohysterography](#) [17]). If the patient has an IUD, its location should be documented.



Figure 1. Measurement of endometrial thickness.

The endometrial thickness measured in its thickest portion from echogenic to echogenic border (calipers) perpendicular to the midline longitudinal plane of the uterus.



Figure 2. Measurement of endometrium with fluid in cavity.

In the presence of endometrial fluid, the measurement of the two separate layers of the endometrium (calipers), excluding the fluid, are added to determine the endometrial thickness.

The addition of 3-D to 2-D ultrasound (transabdominal, transvaginal, transperineal, and/or transrectal) can be helpful in many circumstances, including, but not limited to, evaluating the relationship of masses to the endometrial cavity, identifying uterine congenital anomalies and thickened and/or heterogenous endometrium, and evaluating the location and orientation of an IUD and the integrity of the pelvic floor [14,18-25].

C. Adnexa Including Ovaries and Fallopian Tubes

When evaluating the adnexa, an attempt should be made to identify the ovaries first because they can serve as a major point of reference for assessing the presence of adnexal pathology. Ovarian size may be determined by measuring the ovary in three dimensions (longitudinal, transverse, and anteroposterior diameters) on views obtained in two orthogonal planes [26,27] with calculation of ovarian volume as necessary. Any ovarian abnormalities should be documented [28-33].

The ovaries may not be identifiable in some females. This occurs most frequently prior to puberty and after menopause when the ovaries are smaller and/or follicles are not consistently present to serve as a landmark [34]. The adnexal region should be surveyed for abnormalities, particularly masses and dilated tubular structures.

If an adnexal abnormality is noted, its relationship to the ovaries and uterus should be assessed. The size and sonographic characteristics of adnexal masses should be documented. The addition of 3-D to 2-D ultrasound can be helpful to differentiate ovarian multiseptated cysts from hydrosalpinges. Additionally, the use of the "slide-by" technique can demonstrate the presence or absence of mobility of the adnexal structures [35]. Abnormal ovarian location, such as in the posterior cul-de-sac with adhesion, particularly to the uterus, pelvic side wall, or contralateral ovary, should be documented as this may indicate endometriosis, or other sources of adhesions, or displacement of the ovary in the setting of ovarian torsion. Documentation should include whether the mass is cystic or solid, and, if cystic, simple or complex. A detailed description of complex cysts should be provided, including presence or absence of septations (thick or thin), solid components, mural nodules, excrescences or papillations, and vascular

characteristics if appropriate. If sonographic characteristics are suggestive of a specific diagnosis, such as hemorrhagic cyst, endometrioma, mature teratoma, hydrosalpinx, or pedunculated fibroid, this information should also be provided.

Spectral, color, and/or power Doppler ultrasound may be useful to evaluate the vascular characteristics of pelvic lesions [36-39].

D. Cul-de-Sac

The cul-de-sac and bowel posterior to the uterus may be evaluated for the presence of free fluid, loculated fluid, or mass. If a mass is detected, its size, position, shape, sonographic characteristics, and relationship to the ovaries and uterus should be documented. Differentiation of normal loops of bowel from a mass may be difficult if only a transabdominal examination is performed. The rectosigmoid colon wall may be imaged from the posterior vaginal fornix [40]. Special attention to the posterior cul-de-sac should be made in women with pelvic pain, fixed retroflexion of the uterus, sonographic evidence of posterior adenomyosis and in those with known or clinically suspected endometriosis [14,40]. Hypoechoic masses with tapering ends in the rectosigmoid wall may be seen in DIE [40,41]. The presence of adhesions in the cul-de-sac may be inferred in the absence of a normal uterine sliding sign [40,42] during dynamic imaging.

VI. DOCUMENTATION

Adequate documentation is essential for high-quality patient care. There should be a permanent record of the ultrasound examination and its interpretation. Cine clips may be useful. 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. Images should be labeled with the patient identification, facility identification, examination date, anatomic landmark, 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 consistent both with clinical need and with relevant legal and local health care facility requirements.

Reporting should be in accordance with the [ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#) [43].

VII. EQUIPMENT SPECIFICATIONS

The sonographic examination of the female pelvis should be conducted with a real-time scanner, preferably using sector, curved linear, and/or endocavitary transducers. The transducer should be adjusted to operate at the highest frequency appropriate for the clinical circumstance, realizing that there is a trade-off between resolution and beam penetration.

VIII. QUALITY CONTROL AND IMPROVEMENT, SAFETY, INFECTION CONTROL, AND PATIENT EDUCATION

All transducers should be cleaned after use. Any transducer in contact with mucosa should be covered by a protective sheath prior to use. Following the examination, the sheath should be disposed of and the transducer cleaned with high-level disinfectant. The method of high-level disinfection may depend on manufacturer's specifications and infectious disease 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 (<https://www.acr.org/Advocacy-and-Economics/ACR-Position-Statements/Quality-Control-and-Improvement>).

Equipment performance monitoring should be in accordance with the [ACR–AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Real Time Ultrasound Equipment](#) [44].

ACKNOWLEDGEMENTS

This practice parameter was revised according to the process described under the heading *The Process for Developing ACR Practice Guidelines and Technical Standards* on the ACR website (<https://www.acr.org/Clinical-Resources/Practice-Parameters-and-Technical-Standards>) by the Committee on Practice Parameters – Ultrasound of the ACR Commission on Ultrasound and the Committee on Practice Parameters – Pediatric Radiology of the ACR Commission on Pediatric Radiology, in collaboration with the ACOG, the AIUM, the SPR, and the SRU.

Collaborative Committee

Members represent their societies in the initial and final revision of this practice parameter.

ACR

Marcela Bohm-Velez, MD, FACR,
Chair
Safwan Safar Halabi, MD
Jamie Hui MD
Pallavi Sagar, MD
Scott Young, MD

ACOG

Wendy R. Brewster, MD, PhD

Bethany Skinner, MD

AIUM

Reem Abu-Rustum, MD

Beryl Benacerraf, MD
Bryann Bromley, MD
Steven Goldstein, MD

SPR

Harris L Cohen, MD
Cicero T Silva, MD

SRU

Kirsteen Burton, MD, PhD
Lori Mankowski Gettle, MD, MBA

Committee on Practice Parameters – Ultrasound

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

Sheila Sheth, MD, FACR, Chair
Marcela Böhm-Velez, MD, FACR
Kaleigh Burke, MD
Nirvikar Dahiya, MD, MBBS, FAIUM
Christopher Fung, MD
Helena Gabriel, MD

Jamie Hui, MD
Stephen I. Johnson, MD
David U. Kim, MD
Harriet J. Paltiel, MD
Henrietta K. Rosenberg, MD, FACR
Jason M. Wagner, MD

Committee on Practice Parameters – Pediatric Radiology

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

Beverly Newman, MB, BCh, BSc, FACR, Chair
Timothy J. Carmody, MD, FACR
Tara M. Catanzano, MB, BCh
Lee K. Collins, MD
Kassa Darge, MD, PhD
Monica S. Epelman, MD
Dorothy L. Gilbertson-Dahdal, MD
Safwan S. Halabi, MD

Kerri A. Highmore, MD
Sue C. Kaste, DO
Terry L. Levin, MD, FACR
Matthew P. Lungren, MD, MPH
Helen R. Nadel, MD
Sumit Pruthi, MBBS
Pallavi Sagar, MD
Richard B. Towbin, MD, FACR

Beverly G. Coleman, MD, FACR, Chair, Commission on Ultrasound
Richard A. Barth, MD, FACR, Chair, Commission on Pediatric Radiology
Jacqueline Anne Bello, MD, FACR, Chair, Commission on Quality and Safety
Matthew S. Pollack, MD, FACR, Chair, Committee on Practice Parameters and Technical Standards
Mary S. Newell, MD, FACR, Vice Chair, Committee on Practice Parameters and Technical Standards

Comments Reconciliation Committee

Amy Kotsenas, MD, FACR, Chair
Aradhana Venkatesan, MD, Co-Chair
Richard A. Barth, MD, FACR
Jacqueline A. Bello, MD, FACR
Beryl Benacerraf, MD
Genevieve Bennett, MD
Marcela Bohm-Velez, MD, FACR
Wendy Brewster, MD
Bryann Bromley, MD
Kirsteen Burton, MD, PhD
Lauren Castleberry, MD
Harris L Cohen, MD
Beverly G. Coleman, MD, FACR
Gena Dunivan, MD
Richard Duszak, Jr., MD, FACR
Alison Edleman, MD

Lori Mankowski Gettle, MD, MBA
Steven Goldstein, MD
Safwan Safar Halabi, MD
Jamie Hui, MD
Mary S. Newell, MD, FACR
Beverley Newman, MB, BCh, BSc, FACR
Kathryn Pennington, MD
Matthew S. Pollack, MD, FACR
Reem Abu-Rustum, MD
Pallavi Sagar, MD
Cicero T Silva, MD
William L Simpson Jr, MD, FACR
Bethany Skinner, MD
Timothy L. Swan, MD, FACR
Scott Young, MD

REFERENCES

1. American College of Radiology. ACR–AIUM–SPR–SRU practice parameter for the performance of an ultrasound examination of the abdomen and/or retroperitoneum. 2017; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/US-Abd-Retro.pdf>. Accessed January 8, 2018.
2. American College of Radiology. ACR–SPR–SRU practice parameter for performing and interpreting diagnostic ultrasound examinations. 2017; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/US-Perf-Interpret.pdf>. Accessed July 20, 2018.
3. Langer JE, Oliver ER, Lev-Toaff AS, Coleman BG. Imaging of the female pelvis through the life cycle. *Radiographics*. 2012;32(6):1575-1597.
4. Timor-Tritsch IE, Monteagudo A, Rebarber A, Goldstein SR, Tsybal T. Transrectal scanning: an alternative when transvaginal scanning is not feasible. *Ultrasound Obstet Gynecol*. 2003;21(5):473-479.
5. Stagno SJ, Forster H, Belinson J. Medical and osteopathic boards' positions on chaperones during gynecologic examinations. *Obstet Gynecol*. 1999;94(3):352-354.
6. Davenport MS, Brimm D, Rubin JM, Kazerooni EA. Patient preferences for chaperone use during transvaginal sonography. *Abdom Radiol (NY)*. 2016;41(2):324-333.
7. Walker DK, Salibian RA, Salibian AD, Belen KM, Palmer SL. Overlooked diseases of the vagina: a directed anatomic-pathologic approach for imaging assessment. *Radiographics*. 2011;31(6):1583-1598.
8. Wildenberg JC, Yam BL, Langer JE, Jones LP. US of the Nongravid Cervix with Multimodality Imaging Correlation: Normal Appearance, Pathologic Conditions, and Diagnostic Pitfalls. *Radiographics*. 2016;36(2):596-617.
9. Young SW, Saphier NB, Dahiya N, et al. Sonographic evaluation of deep endometriosis: protocol for a US radiology practice. *Abdom Radiol (NY)*. 2016;41(12):2364-2379.
10. Abuhamad A, Minton KK, Benson CB, et al. Obstetric and gynecologic ultrasound curriculum and competency assessment in residency training programs: consensus report. *Am J Obstet Gynecol*. 2018;218(1):29-67.
11. Ascher SM, Imaoka I, Lage JM. Tamoxifen-induced uterine abnormalities: the role of imaging. *Radiology*. 2000;214(1):29-38.

12. Behr SC, Courtier JL, Qayyum A. Imaging of mullerian duct anomalies. *Radiographics*. 2012;32(6):E233-250.
13. Williams PL, Laifer-Narin SL, Ragavendra N. US of abnormal uterine bleeding. *Radiographics*. 2003;23(3):703-718.
14. Di Donato N, Bertoldo V, Montanari G, Zannoni L, Caprara G, Seracchioli R. Question mark form of uterus: a simple sonographic sign associated with the presence of adenomyosis. *Ultrasound Obstet Gynecol*. 2015;46(1):126-127.
15. Nalaboff KM, Pellerito JS, Ben-Levi E. Imaging the endometrium: disease and normal variants. *Radiographics*. 2001;21(6):1409-1424.
16. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 734 Summary: The Role of Transvaginal Ultrasonography in Evaluating the Endometrium of Women With Postmenopausal Bleeding. *Obstetrics & Gynecology*. 2018;131(5):945-946.
17. American College of Radiology. ACR–ACOG–AIUM–SRU practice parameter for the performance of sonohysterography. 2015; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/US-Hysterog.pdf>. Accessed January 8, 2018.
18. Fong K, Kung R, Lytwyn A, et al. Endometrial evaluation with transvaginal US and hysterosonography in asymptomatic postmenopausal women with breast cancer receiving tamoxifen. *Radiology*. 2001;220(3):765-773.
19. Benacerraf BR, Shipp TD, Bromley B. Which patients benefit from a 3D reconstructed coronal view of the uterus added to standard routine 2D pelvic sonography? *AJR Am J Roentgenol*. 2008;190(3):626-629.
20. Abuhamad AZ, Singleton S, Zhao Y, Bocca S. The Z technique: an easy approach to the display of the mid-coronal plane of the uterus in volume sonography. *J Ultrasound Med*. 2006;25(5):607-612.
21. Graupera B, Pascual MA, Hereter L, et al. Accuracy of three-dimensional ultrasound compared with magnetic resonance imaging in diagnosis of Mullerian duct anomalies using ESHRE-ESGE consensus on the classification of congenital anomalies of the female genital tract. *Ultrasound Obstet Gynecol*. 2015;46(5):616-622.
22. Mavrelou D, Naftalin J, Hoo W, Ben-Nagi J, Holland T, Jurkovic D. Preoperative assessment of submucous fibroids by three-dimensional saline contrast sonohysterography. *Ultrasound Obstet Gynecol*. 2011;38(3):350-354.
23. Sakhel K, Benson CB, Platt LD, Goldstein SR, Benacerraf BR. Begin with the basics: role of 3-dimensional sonography as a first-line imaging technique in the cost-effective evaluation of gynecologic pelvic disease. *J Ultrasound Med*. 2013;32(3):381-388.
24. Santoro GA, Wiczorek AP, Dietz HP, et al. State of the art: an integrated approach to pelvic floor ultrasonography. *Ultrasound Obstet Gynecol*. 2011;37(4):381-396.
25. Shipp TD, Bromley B, Benacerraf BR. The width of the uterine cavity is narrower in patients with an embedded intrauterine device (IUD) compared to a normally positioned IUD. *J Ultrasound Med*. 2010;29(10):1453-1456.
26. Cohen HL, Tice HM, Mandel FS. Ovarian volumes measured by US: bigger than we think. *Radiology*. 1990;177(1):189-192.
27. Bodelon C, Pfeiffer RM, Buys SS, Black A, Sherman ME. Analysis of serial ovarian volume measurements and incidence of ovarian cancer: implications for pathogenesis. *J Natl Cancer Inst*. 2014;106(10).
28. Brown DL, Zou KH, Tempny CM, et al. Primary versus secondary ovarian malignancy: imaging findings of adnexal masses in the Radiology Diagnostic Oncology Group Study. *Radiology*. 2001;219(1):213-218.
29. Jarvela IY, Sladkevicius P, Kelly S, Ojha K, Nargund G, Campbell S. Three-dimensional sonographic and power Doppler characterization of ovaries in late follicular phase. *Ultrasound Obstet Gynecol*. 2002;20(3):281-285.

30. Kinkel K, Hricak H, Lu Y, Tsuda K, Filly RA. US characterization of ovarian masses: a meta-analysis. *Radiology*. 2000;217(3):803-811.
31. Sato S, Yokoyama Y, Sakamoto T, Futagami M, Saito Y. Usefulness of mass screening for ovarian carcinoma using transvaginal ultrasonography. *Cancer*. 2000;89(3):582-588.
32. Levine D, Brown DL, Andreotti RF, et al. Management of asymptomatic ovarian and other adnexal cysts imaged at US: Society of Radiologists in Ultrasound Consensus Conference Statement. *Radiology*. 2010;256(3):943-954.
33. Timmerman D, Valentin L, Bourne TH, et al. Terms, definitions and measurements to describe the sonographic features of adnexal tumors: a consensus opinion from the International Ovarian Tumor Analysis (IOTA) Group. *Ultrasound Obstet Gynecol*. 2000;16(5):500-505.
34. Langer JE, Oliver ER, Lev-Toaff AS, Coleman BG. Imaging of the Female Pelvis through the Life Cycle. *Radiographics*. 2012;32(6):1575-1597.
35. Timor-Tritsch IE, Monteagudo A, Tsymbal T. Three-dimensional ultrasound inversion rendering technique facilitates the diagnosis of hydrosalpinx. *J Clin Ultrasound*. 2010;38(7):372-376.
36. Funt SA, Hann LE. Detection and characterization of adnexal masses. *Radiol Clin North Am*. 2002;40(3):591-608.
37. Kaakaji Y, Nghiem HV, Nodell C, Winter TC. Sonography of obstetric and gynecologic emergencies: Part II, Gynecologic emergencies. *AJR Am J Roentgenol*. 2000;174(3):651-656.
38. Laing FC, Brown DL, DiSalvo DN. Gynecologic ultrasound. *Radiol Clin North Am*. 2001;39(3):523-540.
39. Polat P, Suma S, Kantarcy M, Alper F, Levent A. Color Doppler US in the evaluation of uterine vascular abnormalities. *Radiographics*. 2002;22(1):47-53.
40. Guerriero S, Condous G, van den Bosch T, et al. Systematic approach to sonographic evaluation of the pelvis in women with suspected endometriosis, including terms, definitions and measurements: a consensus opinion from the International Deep Endometriosis Analysis (IDEA) group. *Ultrasound Obstet Gynecol*. 2016;48(3):318-332.
41. Benacerraf BR, Groszmann Y, Hornstein MD, Bromley B. Deep infiltrating endometriosis of the bowel wall: the comet sign. *J Ultrasound Med*. 2015;34(3):537-542.
42. Hudelist G, Fritzer N, Staettner S, et al. Uterine sliding sign: a simple sonographic predictor for presence of deep infiltrating endometriosis of the rectum. *Ultrasound Obstet Gynecol*. 2013;41(6):692-695.
43. American College of Radiology. ACR practice parameter for communication of diagnostic imaging findings. 2014; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/CommunicationDiag.pdf>. Accessed January 8, 2018.
44. American College of Radiology. ACR technical standard for diagnostic medical physics performance monitoring of real time ultrasound equipment. 2016; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/US-Equip.pdf>. Accessed January 8, 2018.

*Practice parameters and technical standards are published annually with an effective date of October 1 in the year in which amended, revised or approved by the ACR Council. For practice parameters and technical standards published before 1999, the effective date was January 1 following the year in which the practice parameter or technical standard was amended, revised, or approved by the ACR Council.

Development Chronology for this Practice Parameter

- 1991 (Resolution 10)
- Revised 1995 (Resolution 37)
- Revised 1999 (Resolution 36)
- Revised 2004 (Resolution 23)
- Amended 2006 (Resolution 35)
- Revised 2009 (Resolution 19)

Revised 2014 (Resolution 23)
Revised 2019 (Resolution 27)