ACR Appropriateness Criteria® on Abnormal Vaginal Bleeding

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In evaluating a woman with abnormal vaginal bleeding, imaging cannot replace definitive histologic diagnosis but often plays an important role in screening, characterization of structural abnormalities, and directing appropriate patient care. Transvaginal ultrasound (TVUS) is generally the initial imaging modality of choice, with endometrial thickness a well-established predictor of endometrial disease in postmenopausal women. Endometrial thickness measurements of ≤5 mm and ≤4 mm have been advocated as appropriate upper threshold values to reasonably exclude endometrial carcinoma in postmenopausal women with vaginal bleeding; however, the best upper threshold endometrial thickness in the asymptomatic postmenopausal patient remains a subject of debate. Endometrial thickness in a premenopausal patient is a less reliable indicator of endometrial pathology since this may vary widely depending on the phase of menstrual cycle, and an upper threshold value for normal has not been well-established. Transabdominal ultrasound is generally an adjunct to TVUS and is most helpful when TVUS is not feasible or there is poor visualization of the endometrium. Hysterosonography may also allow for better delineation of both the endometrium and focal abnormalities in the endometrial cavity, leading to hysteroscopically directed biopsy or resection. Color and pulsed Doppler may provide additional characterization of a focal endometrial abnormality by demonstrating vascularity. MRI may also serve as an important problem-solving tool if the endometrium cannot be visualized on TVUS and hysterosonography is not possible, as well as for pretreatment planning of patients with suspected endometrial carcinoma. CT is generally not warranted for the evaluation of patients with abnormal bleeding, and an abnormal endometrium incidentally detected on CT should be further evaluated with TVUS.

Key Words: Appropriateness Criteria®, vaginal bleeding, endometrium, transvaginal ultrasound, hysterosonography, MRI

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SUMMARY OF LITERATURE REVIEW

Virtually every woman will at some point in her lifetime experience episodes of vaginal bleeding that will be perceived as abnormal. Menses begins at puberty and extends to menopause. The average menstrual cycle is 29 days long, with a range of 23 to 39 days [1]. Overall, the length of the menstrual cycle remains relatively constant throughout the reproductive years, but as a woman approaches menopause, the cycle gradually shortens. Although blood loss is difficult to quantify, most loss occurs in the first few days of menses, and bleeding generally lasts from 2 to 7 days. The cycle length and the volume

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and duration of bleeding remain fairly constant for a woman throughout her reproductive years. After menopause, bleeding ceases completely. Abnormal vaginal bleeding may include noncyclic, excessive, or prolonged bleeding in a premenopausal patient or any vaginal bleeding in a postmenopausal patient. Differential considerations vary with patient age, hormonal status, and risk factors for endometrial carcinoma [2,3]. Perimenopausal patients with abnormal bleeding are a special clinical challenge because menstrual bleeding is less predictable in this age group. Hematuria, which occasionally may be misinterpreted as abnormal vaginal bleeding, should be excluded by clinical history and physical examination.

Endometrial carcinoma is the most common gynecologic cancer in the United States, with a mean age at diagnosis of 60 years [4]. Abnormal uterine bleeding is the most common clinical presentation, with only about 15% of cancers occurring in women without bleeding [5,6]. Appropriate evaluation of a patient with abnormal vaginal bleeding will allow for early diagnosis of endometrial carcinoma and the best opportunity for cure. Therefore, endometrial carcinoma should be rigorously excluded in any postmenopausal or perimenopausal patient with abnormal bleeding as well as in younger patients with significant risk factors, such as obesity and anovulation. However, even in postmenopausal patients, endometrial cancer accounts for only up to 10% of uterine bleeding, with endometrial atrophy being the most common etiology [7].

Anovulatory bleeding is the most common etiology of abnormal bleeding in premenopausal patients [8]. However, anatomic abnormalities such as endometrial and cervical polyps and submucosal fibroids may also be a cause and are found in up to 40% of premenopausal patients evaluated for this symptom [9]. Other abnormalities that may cause abnormal bleeding include endometrial hyperplasia, fibroids, adenomyosis, cervical and vaginal neoplasia, and other less common uterine tumors and coagulopathies. Pregnancy-related complications should always be excluded in any woman of reproductive age with abnormal bleeding.

In a premenopausal patient without risk factors for endometrial carcinoma, a trial of medical therapy may initially be undertaken if anovulatory cycles are suspected. In a postmenopausal patient or if bleeding persists despite medical therapy in a premenopausal patient, endometrial sampling or imaging is warranted. Although imaging procedures cannot replace definitive histologic diagnosis, they play an important role in screening, characterizing anatomic abnormalities, and directing appropriate patient care, often preventing unnecessary diagnostic procedures. Imaging is often essential for further evaluation of a patient with inconclusive biopsy results or persistent bleeding despite negative findings.

In the setting of abnormal vaginal bleeding, office endometrial sampling now has largely replaced dilatation and curettage, but issues of access to the endometrial cavity and sampling error limit the clinical value of a negative result. Furthermore, only about 60% of the endometrial cavity is curetted with dilatation and curettage, and many focal lesions may be missed, making the detection of focal structural causes for bleeding a vital role of imaging in this clinical setting [10].

Transvaginal Ultrasound

Transvaginal ultrasound (TVUS) is generally the initial imaging procedure of choice for evaluating abnormal vaginal bleeding because of its ability to depict endometrial pathology, its widespread availability, and its excellent safety profile and cost effectiveness [11-15] (see Variants 1 and 2). In postmenopausal patients, endometrial thickness is a well-established predictor of endometrial disease, and TVUS is the mainstay in detecting and characterizing abnormal endometrial thickening, with highly reproducible measurements [16-18]. "Endometrial thickness" refers to the double thickness measurement (the sum of the thickness of the two endometrial layers, excluding any intracavitary fluid). If an abnormally thickened endometrium is identified, nonfocal endometrial biopsy is generally advocated as the next diagnostic

Variant 1. Postmenopausal vaginal bleeding; first study (endometrial sampling may also be performed initially, followed by imaging if results are inconclusive or symptoms persist despite negative findings)

Radiologic Procedure	Rating	Comments	Relative Radiation Level
Ultrasound pelvis transvaginal	9		O
Ultrasound pelvis transabdominal	8		O
Ultrasound hysterosonography	6	Three-dimensional imaging may be a useful adjunct to standard 2-D imaging if intracavitary abnormality is suspected.	O
Ultrasound pelvis with Doppler	4		O
CT pelvis with contrast	2		☢☢☢
MRI pelvis without and with contrast	2		O

Note: Rating scale: 1, 2, and 3 = usually not appropriate; 4, 5, and 6 = may be appropriate; 7, 8, and 9 = usually appropriate.