

**American College of Radiology  
ACR Appropriateness Criteria®**

**Clinical Condition:** Second and Third Trimester Bleeding

**Variant 1:** No other signs or symptoms.

Radiologic Procedure	Rating	Comments	RRL*
US pregnant uterus transabdominal	9		None
US pregnant uterus transperineal	8		None
US pregnant uterus transvaginal	6		None
MRI pelvis	2		None
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 2:** Internal cervical os not visible by transabdominal ultrasound.

Radiologic Procedure	Rating	Comments	RRL*
US pregnant uterus transperineal	9		None
US pregnant uterus transvaginal	8		None
US pregnant uterus repeat transabdominal	4		None
MRI pelvis	2		None
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

**Variant 3:** Placenta previa diagnosed before 32 weeks.

Radiologic Procedure	Rating	Comments	RRL*
US pregnant uterus 32-34 weeks	8		None
US pregnant uterus once per month	4		None
<b>Rating Scale:</b> 1=Least appropriate, 9=Most appropriate			<b>*Relative Radiation Level</b>

An ACR Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the FDA have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

## SECOND AND THIRD TRIMESTER BLEEDING

Expert Panel on Women's Imaging: Amy Thurmond, MD<sup>1</sup>; Arthur C. Fleischer, MD<sup>2</sup>; Rochelle F. Andreotti, MD<sup>3</sup>; Marcela Böhm-Vélez, MD<sup>4</sup>; Elliot K. Fishman, MD<sup>5</sup>; Mindy M. Horrow, MD<sup>6</sup>; Hedvig Hricak, MD, PhD<sup>7</sup>; Carolyn Zelop, MD.<sup>8</sup>

### Summary of Literature Review

Vaginal bleeding after the first trimester of pregnancy and before term may be due to premature delivery, placenta previa, placental abruption, placenta accreta or its variants, or of unknown origin. Placenta previa can be excluded if the placenta is shown to lie away from the internal os of the cervix, which can almost always be accomplished by transabdominal ultrasound examination of the cervix and lower uterine segment with the bladder full [1]. If the anatomy is obscured by the fetal head, by hematoma, by a suspected lower uterine segment contraction, or by an overly full bladder, transperineal scanning [1,2] or more commonly transvaginal scanning [3] with the bladder empty will almost always result in the correct diagnosis. Magnetic resonance imaging (MRI) has been suggested as an alternative to transvaginal or transperineal scanning if ultrasound is inconclusive [4]; however, MRI is rarely needed.

Placenta previa diagnosed in the second trimester may not persist until term because of growth of the lower uterine segment [5]. One should avoid the use of terms such as "low-lying placenta", "marginal previa", "total previa", or "complete previa" since these terms are vague and difficult to quantify. It is better to describe the relationship of the inferior placenta to the internal cervical os in centimeters. If a placenta extends to, or partially covers, the internal os of the cervix before 28 weeks gestation, there is a 4%-5% chance it will persist in this abnormal location until term, as compared to more than a 50% chance if it completely covers the os at 28 weeks [6]. At any point in gestation if the placenta covers the cervix and is fully implanted on both the anterior and posterior walls of the lower uterine segment, placenta location is unlikely to change [6].

Placental abruption can be imaged by ultrasound. However, the echogenicity of clot and the echogenicity of placenta can be similar, and therefore a normal exam does not exclude abruption [7]. In general, in a patient with second or third trimester bleeding, in the absence of

diagnosis of placenta previa by ultrasound, the management of the pregnancy depends on the clinical circumstances. If clinical circumstances or ultrasound findings are confusing, MRI may help better define the location of the placenta and the presence of abruption [8].

### Relative Radiation Level Information

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® [Radiation Dose Assessment Introduction](#) document.

Relative Radiation Level Designations	
Relative Radiation Level	Effective Dose Estimate Range
None	0
Minimal	< 0.1 mSv
Low	0.1-1 mSv
Medium	1-10 mSv
High	10-100 mSv

### References

1. Hertzberg BS, Bowie JD, Carroll BA, et al. Diagnosis of placenta previa during the third trimester: role of transperineal sonography. *AJR* 1992; 159(1):83-87.
2. Hertzberg BS, Kliever MA, Baumeister LA, et al. Optimizing transperineal sonographic imaging of the cervix: the hip elevation technique. *J Ultrasound Med* 1994; 13(12):933-936.
3. Hilpert PL, Kurtz AB. The role of transvaginal ultrasound in the second and third trimesters. *Semin Ultrasound CT MR* 1990; 11(1):59-70.
4. Kay HH, Spritzer CE. Preliminary experience with magnetic resonance imaging in patients with third-trimester bleeding. *Obstet Gynecol* 1991; 78(3 pt 1):424-429.
5. Taipale P, Hiilesmaa V, Ylostalo P. Transvaginal ultrasonography at 18-23 weeks in predicting placenta previa at delivery. *Ultrasound in Obstet Gynecol* 1998; 12(6):422-425.
6. Langlois SL, Miller AG. Placenta previa--a review with emphasis on the role of ultrasound. *Aust N Z J Obstet Gynaecol* 1989; 29(2):110-116.
7. Glantz C, Purnell L. Clinical utility of sonography in the diagnosis and treatment of placental abruption. *J Ultrasound Med* 2002; 21:837-840.
8. Verswijvel G, Grieten M, Gyselaers W, et al. MRI in the assessment of pregnancy related intrauterine bleeding: a valuable adjunct to ultrasound? *JBR-BTR* 2002; 85(4):189-192.

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