

Overview of the etiology and evaluation of vaginal bleeding in pregnant women

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INTRODUCTION — Vaginal bleeding is a common event at all stages of pregnancy. The source is virtually always maternal, rather than fetal. Bleeding may result from disruption of blood vessels in the decidua (ie, pregnancy endometrium) or from discrete cervical or vaginal lesions. The clinician typically makes a provisional clinical diagnosis based upon the patient's gestational age and the character of her bleeding (light or heavy, associated with pain or painless, intermittent or constant). Laboratory and imaging tests are then used to confirm or revise the initial diagnosis.

An overview of the etiology and evaluation of vaginal bleeding in pregnant women will be reviewed here. Specific causes of bleeding and their management are discussed in detail separately. (Refer to individual topic reviews on each subject).

FIRST TRIMESTER BLEEDING

Overview — Vaginal bleeding is common in the first trimester (0 to 13^{6/7} weeks), occurring in 20 to 40 percent of pregnant women. It may be any combination of light or heavy, intermittent or constant, painless or painful. The four major sources of nontraumatic bleeding in early pregnancy are:

- Ectopic pregnancy
- Miscarriage (threatened, inevitable, incomplete, complete)
- Implantation of the pregnancy
- Cervical, vaginal, or uterine pathology (eg, polyps, inflammation/infection, trophoblastic disease)

Bleeding related to miscarriage is the most common nontraumatic cause of first trimester bleeding (prevalence of miscarriage 15 to 20 percent of pregnancies). Although bleeding may be heavy, only about 1 percent of expectantly managed women require blood transfusion [1]. Ectopic pregnancy is much less common (prevalence of ectopic pregnancy: 2 percent of pregnancies), but the most serious etiology of first trimester bleeding as rupture of the extrauterine pregnancy is a life-threatening complication; therefore, this diagnosis must be excluded in every pregnant woman with bleeding.

Evaluation — The exact etiology of uterine bleeding in the first trimester often cannot be determined; the goal of the evaluation is to make a definitive diagnosis when possible and exclude the presence of serious pathology in the remaining cases ([algorithm 1](#)). Ectopic pregnancy is particularly important to exclude since it can be life-threatening. Thus, the first step in evaluation is to determine whether the patient has had an ultrasound examination, as well as the results of the test. Prior documentation that the pregnancy is in the normal intrauterine location immediately narrows the differential diagnosis, although the possibility that the prior ultrasound may have missed a heterotopic pregnancy (ie, one intrauterine and one extrauterine pregnancy) or a cornual (interstitial) ectopic pregnancy should always be considered. If in doubt, consider having an experienced sonographer repeat the ultrasound examination. It is also important to determine whether the patient is hemodynamically unstable so that supportive measures and treatment can be rapidly initiated.

History — The extent of bleeding should be determined: is the woman passing blood clots or is the blood soaking through her clothes? Does she feel lightheaded? Does she have significant pelvic pain or cramping? Has she passed any tissue? If she answers yes to these questions, then ectopic pregnancy and miscarriage are much more likely diagnoses than implantation bleeding or cervicovaginal disease (eg, polyps, cervicitis, cancer). On the other hand, it is important to remember that the presence of only light, intermittent, painless bleeding does not exclude the possibility of a life-threatening underlying disorder, such as ectopic pregnancy.

What is the patient's medical history? A past history of ectopic pregnancy or risk factors for ectopic pregnancy (eg, history of pelvic inflammatory disease, presence of an intrauterine contraceptive device, adnexal surgery) increases the probability of this disorder. (See "[Ectopic pregnancy: Epidemiology, risk factors, and anatomic sites](#)".)

A history of two or more consecutive miscarriages or a condition associated with miscarriage (eg, parental chromosomal translocation, maternal antiphospholipid syndrome, uterine anomaly) suggests bleeding may be related to impending pregnancy loss. (See "[Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation](#)".)

Use of assisted reproductive techniques to achieve conception increases the risk of heterotopic pregnancy. (See "[Abdominal pregnancy, cesarean scar pregnancy, and heterotopic pregnancy](#)".)

Physical examination — Orthostatic changes in blood pressure or pulse are indicative of severe blood loss requiring supportive care and rapid treatment. However, occasionally, young pregnant women can have massive bleeding without demonstrating tachycardia or hypotension. Care should be taken to avoid unnecessary delay in the management of such patients.

Any tissue the patient has passed should be examined. Patients may mistake blood clot for the products of conception. If the tissue represents a partial or complete miscarriage, the fetal membranes, fronds indicative of placental villi, or an intact fetus should be visible upon careful examination. Visualization of villi can be facilitated by floating the products of conception in water ([picture 1A-B](#)).

The patient's abdomen should be examined before performing an internal examination. It is best to begin by examining the quadrant where the patient is experiencing the least pain. Gentle percussion is preferred to deep palpation since it causes less pain and guarding. Midline pain is more consistent with miscarriage, while lateral pain is more consistent with ectopic pregnancy. Nongynecologic causes of pain are also to be considered. (See "[Approach to acute abdominal pain in pregnant and postpartum women](#)".)

The clinician should determine whether uterine size is appropriate for the estimated gestational age. The size - gestational age correlation is learned by experience and is often described in terms of fruit (eg, 6- to 8-week size = small pear, 8- to 10-week size = orange, 10- to 12-week size = grapefruit). The uterus remains a pelvic organ until approximately 12 weeks of gestation, when it becomes sufficiently large to palpate transabdominally just above the symphysis pubis. The normal uterus is nontender, smooth, and firm.

If the pregnancy is at or beyond 10 to 12 weeks of gestation, a handheld Doppler device can be used to check the fetal heart beat. The fetal heart rate usually can be easily distinguished from the maternal heart rate since the fetal heart rate is typically in the range of 110 to 160 beats per minute; however, the difference in maternal and fetal heart rates can be minimal if the mother has tachycardia [2]. Doppler confirmation of fetal cardiac activity is reassuring, as it indicates bleeding is not related to fetal demise and unlikely to be related to an ectopic pregnancy. On the other hand, loss of a previously detected fetal heart beat should raise suspicion that fetal demise has occurred. However, inability to detect fetal heart motion by Doppler, particularly in the first trimester, may merely reflect the difficulty in blindly finding the location of the tiny fetal heart.

After the abdominal examination, the patient is placed in the lithotomy position. The external genitalia are examined to assess the volume and source of bleeding and then a speculum is inserted into the vagina. If blood clots, products of conception, or both are present, they can be removed with gauze sponges on a sponge forceps. This tissue is examined as described above and, by convention, sent for pathologic examination to confirm the presence of products of conception and to exclude gestational trophoblastic disease. The utility of routine histopathological examination is questionable, as it rarely suggests the underlying cause of the pregnancy failure or establishes a diagnosis of gestational trophoblastic disease [3]. However, pathologists can sometimes diagnose entities that are the probable cause of the loss or associated with recurrent loss. These include massive chronic intervillitis,

massive intervillous fibrin deposition, maternal vasculitis, findings suggestive of some chromosomal anomalies (eg, triploidy, some trisomies), and septic abortion.

Speculum examination may reveal a source of bleeding unrelated to pregnancy; in such cases, further evaluation depends upon the nature of the abnormality:

- Vaginal laceration (see ["Evaluation and management of female lower genital tract trauma"](#))
- Vaginal neoplasm (see ["Vaginal cancer"](#))
- Vaginal warts (see ["Condylomata acuminata \(anogenital warts\) in adults: Epidemiology, pathogenesis, clinical features, and diagnosis"](#))
- Vaginal discharge (see ["Approach to women with symptoms of vaginitis"](#))
- Cervical polyps, fibroids, ectropion (see ["Congenital cervical anomalies and benign cervical lesions"](#))
- Mucopurulent cervical discharge or friability at the cervical os (see ["Acute cervicitis"](#))
- Cervical neoplasm (see ["Invasive cervical cancer: Epidemiology, risk factors, clinical manifestations, and diagnosis"](#))

Visualization of the cervical os helps to distinguish between a threatened and an impending/inevitable miscarriage. Direct visualization of the gestational sac in a dilated cervix is generally sufficient to diagnose an impending/inevitable miscarriage clinically. The cervix will usually also be open with an incomplete or a recent complete miscarriage. An open internal cervical os will admit a small instrument, such as a cotton-tipped swab. Ultrasound can provide additional information in these cases, such as whether or not there are retained products of conception, or the unexpected presence of a twin pregnancy with a second viable gestational sac.

A closed cervix is most consistent with a threatened miscarriage, but not diagnostic. If the cervix appears closed and there are no obvious bleeding lesions, the speculum is removed and a bimanual pelvic examination is performed. With an ectopic pregnancy, findings on pelvic examination may include adnexal, cervical motion, or abdominal tenderness; an adnexal mass; and mild uterine enlargement. However, the physical examination is often unremarkable in a woman with a small, unruptured ectopic pregnancy. (See ["Ectopic pregnancy: Clinical manifestations and diagnosis"](#).)

Uterine size larger than expected for dates suggests a multiple gestation, possibly with miscarriage of one of the multiples, gestational trophoblastic disease (molar pregnancy), or other uterine pathology (fibroids can cause an irregularly enlarged uterus). (See ["Twin pregnancy: Prenatal issues"](#) and ["Hydatidiform mole: Epidemiology, clinical features, and diagnosis"](#) and ["Uterine leiomyomas \(fibroids\): Epidemiology, clinical features, diagnosis, and natural history"](#).)

One review of data from observational studies concluded that ultrasound examination and human chorionic gonadotropin (hCG) concentration (both discussed below) could replace pelvic examination in the initial evaluation of patients with early pregnancy bleeding [4]. However, some diagnoses will be missed with this approach (eg, bleeding from cervical or vaginal lesions), this combination of tests may not distinguish between a complete miscarriage and an ectopic pregnancy (both will have an empty uterus and positive hCG), and the additional cost of the tests can be avoided in some patients. For example, in bleeding patients in whom sonography has previously confirmed a viable singleton intrauterine pregnancy, another examination is not necessary to exclude ectopic pregnancy or to confirm fetal viability if fetal heart motion can be detected by a handheld Doppler device. Additionally, there is no value in checking hCG concentration once the presence of an intrauterine pregnancy has been established sonographically.

Transvaginal ultrasonography — Transvaginal ultrasonography is the cornerstone of the evaluation of bleeding in early pregnancy. It is most useful in bleeding patients with a positive pregnancy test in whom an intrauterine pregnancy has not been previously confirmed by imaging studies. In these women, ultrasound examination is performed to determine whether the pregnancy is intrauterine or extrauterine (ectopic) and, if intrauterine, whether the pregnancy is viable (fetal cardiac activity present) or nonviable. The possibility of heterotopic pregnancy should always be considered. (See ["Abdominal pregnancy, cesarean scar pregnancy, and heterotopic pregnancy"](#).)

It is important to note that the absence of an intrauterine gestational sac is highly suggestive of ectopic pregnancy if more than 5.5 to 6 weeks have elapsed since the first day of the patient's last menstrual period. At earlier gestational ages, however, an intrauterine pregnancy may be present, but not yet identifiable, by ultrasound ([table 1](#)). In these cases, sonographic findings are correlated with hCG levels. The use of sonography and hCG in the differential diagnosis of intrauterine versus extrauterine pregnancy and viable versus nonviable intrauterine pregnancy is described briefly below (see '[Laboratory tests](#)' below) and in detail separately. (See "[Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation](#)" and "[Ectopic pregnancy: Clinical manifestations and diagnosis](#)".)

Rarely, ultrasound examination reveals unusual causes of uterine bleeding, such as gestational trophoblastic disease or loss of one fetus from a multiple gestation. (See "[Hydatidiform mole: Epidemiology, clinical features, and diagnosis](#)" and "[Twin pregnancy: Prenatal issues](#)", section on '[Risk of early, late, and postnatal loss](#)'.)

In bleeding patients in whom sonography has previously confirmed a viable singleton intrauterine pregnancy, another examination is not necessary to confirm fetal viability if fetal heart motion can be detected by a handheld Doppler device.

Other imaging tests — In the first trimester, transabdominal ultrasound imaging is most useful for assessing free fluid in the abdomen and abnormalities beyond the field of view of a high-frequency vaginal probe [\[5\]](#).

Magnetic resonance imaging is rarely indicated as a second-line imaging modality for further evaluation of limited and nondiagnostic ultrasound, unusual ectopic pregnancy, gestational trophoblastic disease, and differentiating causes of severe pelvic pain and adnexal masses [\[5\]](#).

Computed tomography may be useful in pregnant patients with trauma or acute non-gynecologic pain, for staging of malignancy, or if magnetic resonance imaging is not possible [\[5\]](#).

Laboratory tests — There is no role for monitoring hCG concentration once the presence of an intrauterine pregnancy has been established sonographically. Serial measurements of hCG are helpful during the first six weeks of pregnancy if ultrasonography is nondiagnostic, ie, the site and viability of the pregnancy are not revealed. In this setting:

- Falling beta-hCG concentrations are consistent with a nonviable intrauterine pregnancy or involuting ectopic pregnancy, but do not indicate whether the pregnancy is intrauterine or ectopic.
- Appropriately rising hCG levels are most consistent with a viable intrauterine pregnancy (99.9 percent of viable pregnancies display a rise in hCG greater than 35 percent over 48 hours [\[6\]](#)), but 21 percent of ectopic pregnancies also display rising hCG levels [\[7,8\]](#).
- hCG levels that have plateaued or are rising very slowly (less than 35 percent over 48 hours [\[6\]](#)) suggest an ectopic pregnancy or an abnormal intrauterine pregnancy.

The pattern of hCG change in normal and abnormal pregnancies and its correlation with ultrasound findings are discussed in detail separately, and summarized below. (See "[Ectopic pregnancy: Clinical manifestations and diagnosis](#)".)

Other hormone assays (eg, progesterone, estrogen, inhibin A, pregnancy-associated protein-A [PAPP-A]) are less useful.

Hemoglobin/hematocrit and coagulation studies should be obtained in all women who are hemodynamically unstable (hypotension, tachycardia, orthostasis, syncope). In hemodynamically stable patients, a baseline hemoglobin/hematocrit measurement can be useful in women with heavy vaginal bleeding, particularly if persistent, and in those with ruptured ectopic pregnancy.

Differential diagnosis and management — The information gleaned from the above evaluation is used to determine a diagnosis and plan of management. Women with significant first trimester vaginal bleeding (ie, more than spotting) should have a red blood cell antibody screen checked. Those who are Rh(D) negative are given [anti-D immune globulin](#) to protect against Rh(D) isoimmunization, unless the vaginal bleeding is clearly due to a non-placental, nonfetal source, such as a vaginal laceration. (See "[Prevention of Rhesus \(D\) alloimmunization in pregnancy](#)".)

Ectopic pregnancy — All women with early pregnancy bleeding and pain are assumed to have ectopic pregnancy until this diagnosis has been excluded by laboratory and imaging studies. Women with a history of ectopic pregnancy or other risk factors for the disorder are at highest risk, but many women with ectopic pregnancy have no risk factors.

In the hands of an experienced ultrasonographer, absence of an intrauterine pregnancy on transvaginal ultrasound examination when the hCG concentration is greater than 2000 IU/L (greater than 6000 IU/L for transabdominal ultrasound) strongly suggests ectopic pregnancy (with very experienced sonographers, the hCG threshold may be lower) [9]. An adnexal mass may or may not be seen. The presence of hemodynamic instability and a tender abdomen suggest the ectopic pregnancy has ruptured.

However, the absence of a sonographically identifiable intrauterine pregnancy when the hCG concentration is greater than 2000 IU/L is not absolute proof of ectopic pregnancy. This threshold is somewhat institution-dependent and does not account for the possibility of a very early multiple gestation (hCG levels are higher in multiple gestations) [10].

Diagnosis of intrauterine (viable or nonviable) versus extrauterine pregnancy at hCG concentrations below 2000 IU/L is complicated and discussed in detail separately. (See "[Ectopic pregnancy: Clinical manifestations and diagnosis](#)" and "[Ultrasonography of pregnancy of unknown location](#)".)

Management of ectopic pregnancy is generally medical ([methotrexate](#) therapy) or surgical. (See "[Ectopic pregnancy: Methotrexate therapy](#)" and "[Ectopic pregnancy: Surgical treatment](#)".)

Expectant management can be dangerous for the mother, but may be possible in rare cases. (See "[Ectopic pregnancy: Expectant management](#)".)

Even if an intrauterine pregnancy is diagnosed, the possibility of heterotopic pregnancy should be kept in mind, even though rare. This is particularly important in women who underwent in vitro fertilization since these patients are at increased risk of this pregnancy complication. (See "[Abdominal pregnancy, cesarean scar pregnancy, and heterotopic pregnancy](#)".)

Threatened miscarriage — Uterine bleeding in the presence of a closed cervix and sonographic visualization of an intrauterine pregnancy with detectable fetal cardiac activity is diagnostic of threatened miscarriage. The term "threatened" is used to describe these cases because miscarriage does not always follow uterine bleeding in early pregnancy, even after repeated episodes or large amounts of bleeding. In fact, 90 to 96 percent of pregnancies with both fetal cardiac activity and vaginal bleeding at 7 to 11 weeks of gestation do not miscarry; the higher success rate is associated with bleeding at the later end of the gestational age range [11,12].

Uterine bleeding in these cases is likely due to disruption of decidual vessels at the maternal-fetal interface. These separations generally cannot be visualized by ultrasound, but sometimes appear as a subchorionic hematoma. Management is expectant. The diagnosis and outcome of subchorionic hematoma are discussed in more detail separately. (See "[Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation](#)", section on 'Potential predictors of failed pregnancy'.)

Inevitable miscarriage — When miscarriage is inevitable, the cervix is dilated, uterine bleeding is increasing, and painful uterine cramps/contractions are present. The gestational tissue often can be felt or seen through the cervical os; passage of this tissue typically occurs within a short time. Management may be expectant, or a medical or surgical intervention to complete the miscarriage can be undertaken. (See "[Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation](#)" and "[Spontaneous abortion: Management](#)".)

Complete and incomplete miscarriage

Complete miscarriage — When a miscarriage occurs before 12 weeks of gestation, it is common for the entire contents of the uterus to be expelled, thereby resulting in a complete miscarriage. If this has occurred, the uterus is small on physical examination and well contracted with an open or closed cervix, scant vaginal bleeding, and only mild cramping. Ultrasound will reveal an empty uterus and no extrauterine gestation.

A complete miscarriage can be distinguished from an ectopic pregnancy by examining the tissue that was passed to confirm products of conception, by demonstrating falling rather than rising or plateaued hCG levels, and by patient description of diminishing bleeding and pain. No further intervention is needed for complete miscarriage if chorionic

villi are identified by pathologic examination of the products of conception. However, if no villi are identified or no specimens are available for pathologic examination, then serum hCG levels should be followed serially until the level is undetectable. (See ["Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation"](#) and ["Spontaneous abortion: Management"](#).)

Incomplete miscarriage — The membranes may rupture and the fetus may be passed, but significant amounts of placental tissue can be retained, resulting in an incomplete miscarriage. This is most common in the late first trimester and early second trimester. On examination, the cervical os is open, gestational tissue may be observed in the cervix, and the uterine size is smaller than expected for gestational age, but not well contracted. The amount of bleeding varies, but can be severe enough to cause hypovolemic shock. Painful cramps/contractions are often present. Ultrasound reveals tissue in the uterus. Medical or surgical evacuation is generally performed.

Missed abortion — A missed abortion (also called a delayed miscarriage) refers to in-utero death of the embryo or fetus prior to the 20th week of gestation, with retention of the pregnancy for a prolonged period of time. Women may notice that symptoms associated with early pregnancy (eg, nausea, breast tenderness) have abated and they don't "feel pregnant" anymore. Vaginal bleeding may occur. The cervix usually remains closed. Ultrasound reveals an intrauterine gestational sac with or without an embryonic/fetal pole, but no embryonic/fetal cardiac activity. Management may be expectant or a medical or surgical intervention to complete the miscarriage can be undertaken. (See ["Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation"](#).)

Vanishing twin — The term "vanishing twin" has been used to describe a singleton pregnancy which results from very early loss of one member of a multiple gestation. Vanishing twins are often the product of assisted reproduction techniques and can be associated with vaginal bleeding [13]. (See ["Pregnancy outcome after assisted reproductive technology", section on 'Early loss'](#) and ["Twin pregnancy: Prenatal issues", section on 'Risk of early, late, and postnatal loss'](#).)

Vaginitis, trauma, tumor, warts, polyps, fibroids — These conditions are diagnosed by visual inspection, with ancillary tests as indicated (eg, wet mount and pH of vaginal discharge, cervical cytology and/or biopsy of mass lesions, ultrasound examination of fibroids).

Management of bleeding related to these conditions depends upon the specific condition. (Refer to individual topic reviews on each subject).

Ectropion — Cervical ectropion (columnar epithelium exposed to the vaginal milieu by eversion of the endocervix) is a common and normal finding in pregnancy. The exposed columnar epithelium is prone to light bleeding when touched, such as during coitus, insertion of a speculum, bimanual examination, or when a cervical specimen is obtained for cytology or culture. Therapy is unnecessary. (See ["Congenital cervical anomalies and benign cervical lesions", section on 'Ectropion'](#).)

Physiologic or implantation bleeding — This is a diagnosis of exclusion. It is characterized by a small amount of spotting or bleeding approximately 10 to 14 days after fertilization (at the time of the missed menstrual period), and is presumed to be related to implantation of the fertilized egg in the decidua (ie, lining of the uterus) [14], although this hypothesis has been questioned [15]. No intervention is indicated.

Prognosis — Studies consistently show an association between first trimester bleeding and adverse outcome (eg, miscarriage, preterm birth, premature rupture of membranes, fetal growth restriction) later in pregnancy [15-27]. The prognosis is best when bleeding is light and limited to early pregnancy, ie, less than 6 weeks of gestation [15,24]. The prognosis worsens when bleeding is heavy or extends into the second trimester [19-23]. However, no change in pregnancy management is indicated for women with first trimester bleeding. There are no effective interventions, but women can be reassured of the low likelihood of adverse outcome. In particular, bedrest is unnecessary and will not affect outcome. (See ["Preterm birth: Risk factors, interventions for risk reduction, and maternal prognosis", section on 'Vaginal bleeding in early pregnancy'](#).)

The relationship between early pregnancy bleeding and pregnancy outcome is illustrated by the following examples:

- In a series of 550 women followed prospectively from the time of their positive pregnancy test, 117 (21 percent) had bleeding prior to 20 weeks of gestation and 67 miscarried (12 percent, or about one-half of those with bleeding) [28]. Fourteen of 18 pregnancies with heavy bleeding (eg, clots) and moderate pain miscarried (78 percent).

- In a prospective series in which all subjects (n = 16,506) had a viable pregnancy at enrollment at 10 to 14 weeks, the frequency of preterm delivery in those with no, light, or heavy first trimester bleeding was about 6, 9, and 14 percent, respectively, and the frequency of spontaneous loss before 24 weeks of gestation was 0.4, 1, and 2 percent, respectively [19]. Because these subjects were enrolled late in the first trimester and with sonographically confirmed fetal viability, women with very early bleeding and miscarriage had already been excluded.

In a third series, vaginal bleeding occurring in more than one trimester was associated with a greater than seven-fold increased risk of preterm premature rupture of membranes (OR 7.4; 95% CI 2.2-25.6) [23].

A retrospective registry-based study including over one million women found that, compared to women without bleeding, first trimester bleeding increased the risk of preterm birth at 28 to 31 weeks (0.9 versus 0.3 percent; OR 2.98, 95% CI 2.50-3.54) and at 32 to 36 weeks (6.1 versus 3.6 percent; OR 1.65, 95% CI 1.57-1.77), and increased the risk of placental abruption (1.4 versus 1.0 percent; OR 1.48; 95% CI 1.30-1.68) [25]. In addition, women with first trimester bleeding in their first pregnancy were more likely to bleed in their second pregnancy than women with no bleeding in their first pregnancy (8.2 versus 2.2 percent; OR 4.05; 95% CI 3.78-4.34).

SECOND AND THIRD TRIMESTER BLEEDING

Overview — Vaginal bleeding is less common in the second trimester (14^{0/7}ths to 27^{6/7}ths weeks) and third trimester (28^{0/7}ths weeks to delivery). The major causes of bleeding at these times are:

- Bloody show associated with labor (by definition, labor occurs after 20 weeks) or, less commonly, cervical insufficiency
- Miscarriage (by definition, miscarriage occurs before 20 weeks)
- Placenta previa
- Abruption placenta
- Uterine rupture (rare)
- Vasa previa (rare)

Cervical, vaginal, or uterine pathology (eg, polyps, inflammation/infection, trophoblastic disease) and non-tubal ectopic pregnancy are other etiologies.

Prior to 20 weeks of gestation

Evaluation — The evaluation of pregnant women with vaginal bleeding prior to 20 weeks is similar to that in the first trimester (see above); however, ectopic pregnancy is less of a concern because over 95 percent of ectopic pregnancies occur in the fallopian tube and virtually all tubal ectopic pregnancies will have been diagnosed by this time. Although abdominal, heterotopic, cervical, cornual, and cesarean scar ectopic pregnancies often present at more advanced gestations than tubal ectopics, these types of ectopic pregnancy are rare.

The first step in the evaluation is to determine the extent of bleeding and whether bleeding is accompanied by pain. The presence of only light, intermittent, painless bleeding suggests bloody show from cervical insufficiency, a small marginal placental separation, or a cervical or vaginal lesion (eg, polyp, infection, cancer). Heavier bleeding, particularly when associated with pain, is more consistent with impending miscarriage or a larger placental separation (ie, abruption). Hemoglobin/hematocrit and coagulation studies should be obtained in all women who are hemodynamically unstable (hypotension, tachycardia, orthostasis, syncope). A baseline hemoglobin/hematocrit measurement can be useful in women with heavy vaginal bleeding, particularly if persistent.

As discussed above, loss of a previously detected fetal heart beat should raise suspicion that fetal demise has occurred, but inability to detect the fetal heart by Doppler is subject to physician error and should always be confirmed by ultrasound examination. On the other hand, Doppler confirmation of fetal cardiac activity is reliable and reassuring.

An abdominal examination is performed to assess for pain or other abnormalities and uterine size. At 16 weeks of gestation, the uterine fundus is palpable about midway between the symphysis pubis and umbilicus, while at 20

weeks, it is palpable at about the level of the umbilicus. After the abdominal examination, the patient is placed in the lithotomy position. The external genitalia are examined and then a speculum is inserted into the vagina. As discussed above, physical examination may reveal a nonpregnancy-related source of bleeding, such as cervical ectropion, an abnormal growth, a laceration, or sanguineous-purulent discharge.

Direct visualization of a dilated cervix or fetal membranes may be sufficient to diagnose impending miscarriage if contractions are present, or cervical insufficiency in the absence of contractions.

Transvaginal ultrasonography is also the cornerstone in the evaluation of bleeding in the second trimester. The primary goals are to determine whether the placenta is covering the cervical os (placenta previa), whether there is evidence of decidual hemorrhage causing placental separation (ie, abruptio placenta), and whether the cervix shows signs suggestive of cervical insufficiency (short length, dilated internal os, prolapse of the fetal membranes). (See ["Second-trimester evaluation of cervical length for prediction of spontaneous preterm birth"](#) and ["Cervical insufficiency"](#).)

Differential diagnosis

Miscarriage — (See ["Threatened miscarriage"](#) above and ["Inevitable miscarriage"](#) above and ["Complete and incomplete miscarriage"](#) above and ["Missed abortion"](#) above.)

Cervical insufficiency — The diagnosis of cervical insufficiency is clinical; the classic presentation is cervical dilatation and effacement in the second trimester with fetal membranes visible at or beyond the external os in the absence of contractions. Symptoms include one or more of the following: vaginal fullness or pressure; vaginal spotting or bleeding; an increased volume of watery, mucousy, or brown vaginal discharge; and vague discomfort in the lower abdomen or back. In asymptomatic patients, the sonographic finding of a short cervix in a woman with a previous preterm birth supports the diagnosis. (See ["Cervical insufficiency"](#) and ["Second-trimester evaluation of cervical length for prediction of spontaneous preterm birth"](#).)

Cervical, vaginal, or uterine pathology — (See ["Vaginitis, trauma, tumor, warts, polyps, fibroids"](#) above.)

Ectopic pregnancy — Ectopic pregnancy is rare at this gestational age. When an ectopic pregnancy is diagnosed after the first trimester, the location is likely to be non-tubal (abdominal, cervical, cesarean scar, or cornual) or heterotopic (ie, coexistent intrauterine and extrauterine pregnancies). (See ["Abdominal pregnancy, cesarean scar pregnancy, and heterotopic pregnancy"](#) and ["Cervical pregnancy"](#).)

Abruptio placentae — Hemorrhage into the decidua basalis can cause bleeding, cramping, and placental separation. The diagnosis is one of exclusion since placental separation usually cannot be visualized on ultrasound examination. The presence of a subchorionic hematoma or placenta that covers the internal cervical os supports the diagnosis. (See ["Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation"](#), section on ["Pelvic ultrasound"](#).)

Bleeding after 20 weeks of gestation — 'Bloody show' is the term used to describe the small amount of blood with mucus discharge that may precede the onset of labor by as much as 72 hours. The term antepartum bleeding typically refers to uterine bleeding after 20 weeks of gestation that is unrelated to labor and delivery. Antepartum bleeding complicates 4 to 5 percent of pregnancies. The major causes are:

- Placenta previa (20 percent)
- Abruptio placenta (30 percent)
- Uterine rupture (rare)
- Vasa previa (rare)

In the remaining cases, the exact etiology of the antepartum bleeding cannot be determined and is frequently attributed to marginal separation of the placenta.

Evaluation — In contrast to bleeding in the first half of pregnancy, digital examination of the cervix **should be avoided** in women presenting with bleeding in the second half of pregnancy until placenta previa has been excluded. Digital examination of a placenta previa can cause immediate, severe hemorrhage. Hemoglobin/hematocrit and coagulation studies should be obtained in all women who are hemodynamically unstable (hypotension, tachycardia,

orthostasis, syncope). A baseline hemoglobin/hematocrit measurement can be useful in women with heavy vaginal bleeding, particularly if persistent, and in those with concealed retroplacental hemorrhage.

Differential diagnosis

Placenta previa — Placenta previa should be suspected in any woman who presents with vaginal bleeding in the second half of pregnancy. Classically, the absence of abdominal pain and uterine contractions was considered the clinical feature that distinguished between placenta previa and abruptio placenta, which is the other major cause of vaginal bleeding at this time. However, some women with placenta previa have uterine contractions in addition to bleeding; thus, the diagnosis of placenta previa must be determined by sonographic examination. (See "[Placenta previa: Epidemiology, clinical features, diagnosis, morbidity and mortality](#)".)

Abruptio placenta — Abruptio placenta refers to premature separation of a normally implanted placenta prior to delivery of the infant. The most common risk factors include prior placental abruption, trauma, smoking, cocaine use, hypertension, and preterm premature rupture of the membranes.

Clinically, placental abruption typically presents with vaginal bleeding (80 percent), uterine tenderness (70 percent), and uterine contractions (35 percent), with or without nonreassuring fetal testing. Uterine tenderness is caused by extravasation of blood into the myometrium (called a Couvelaire uterus, an enlarged bluish-purple uterus due to the extravasation of blood through the myometrium to the serosa). In severe cases, blood can even penetrate to the peritoneal cavity. The amount of vaginal bleeding may not be a reliable indicator of the severity of the hemorrhage since bleeding may be concealed (retained in the uterine cavity). Ultrasound may show placental separation, but this is uncommon (only 2 percent of abruptions can be visualized on ultrasound); the major purpose of ultrasound examination is to exclude placenta previa. Abruption ranges from mild to severe (life-threatening) and may be acute or chronic. (See "[Placental abruption: Clinical features and diagnosis](#)".)

The possibility of abruption should always be considered in women who are being evaluated for trauma (eg, motor vehicle crash, fall, domestic violence). (See "[Initial evaluation and management of pregnant women with major trauma](#)", section on 'Abruptio placentae'.)

Cervical, vaginal, or uterine pathology — (See '[Vaginitis, trauma, tumor, warts, polyps, fibroids](#)' above.)

Uterine rupture — Uterine rupture is a rare cause of vaginal bleeding. In women with uterine bleeding and a previous cesarean delivery or transmyometrial surgery, the possibility of uterine rupture should always be considered. It usually occurs during labor or as a result of abdominal trauma, but can rarely occur without an obvious precipitating cause. Abdominal pain, fetal heart rate abnormalities, and maternal hemodynamic instability due to intra-abdominal bleeding are likely and indicate an obstetric emergency. (See "[Uterine rupture after previous cesarean delivery](#)" and "[Uterine rupture: Unscarred uterus](#)".)

Vasa previa — In vasa previa, fetal blood vessels are present in the membranes covering the internal cervical os. The membranous vessels may be associated with a velamentous umbilical cord or they may connect the lobes of a bilobed placenta or the placenta and a succenturiate lobe. Rupture of the vasa previa is an obstetric emergency and may lead to fetal death. (See "[Velamentous umbilical cord insertion and vasa previa](#)".)

Prognosis — As with first trimester bleeding, episodes of second and third trimester bleeding are also associated with adverse pregnancy outcome, primarily preterm birth. (See "[Preterm birth: Risk factors, interventions for risk reduction, and maternal prognosis](#)", section on 'Vaginal bleeding in early pregnancy'.)

The risk of adverse outcome appears to depend on the degree of bleeding (worse outcome with heavier bleeding) and the cause (worse outcome with bleeding from non-previa source) [29]. Antepartum bleeding of unknown origin in the second half of pregnancy has been reported to increase the risk of preterm birth two- to three-fold [30,31].

Management — The management of pregnant women with vaginal bleeding in the second and third trimesters depends on the numerous factors, including the gestational age, the cause of bleeding, the severity of bleeding, and fetal status. Management is discussed in the individual topic reviews on the specific causes of vaginal bleeding.

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the

Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "[Patient education: Threatened miscarriage \(The Basics\)](#)")

SUMMARY AND RECOMMENDATIONS

- The clinician typically makes a provisional clinical diagnosis of the cause of vaginal bleeding based upon the patient's gestational age and the character of her bleeding (light or heavy, associated with pain or painless, intermittent or constant). Laboratory and imaging tests are then used to confirm or revise the initial diagnosis. (See '[Introduction](#)' above.)
- The four major causes of bleeding in early pregnancy are: ectopic pregnancy; threatened or impending miscarriage; physiologic (ie, related to implantation of the pregnancy), and cervical, vaginal, or uterine pathology. Transvaginal ultrasonography is the cornerstone of the evaluation of bleeding in early pregnancy. (See '[First trimester bleeding](#)' above.)
- An important goal in the evaluation of women with bleeding in early pregnancy is to exclude the possibility of ectopic pregnancy, since ruptured ectopic pregnancy can result in severe hemorrhage and death. (See '[Ectopic pregnancy](#)' above.)
- The major causes of bleeding in the second and third trimesters are ([algorithm 2](#)): bloody show associated with labor (by definition, labor occurs after 20 weeks) or cervical insufficiency; miscarriage (by definition, miscarriage occurs before 20 weeks); placenta previa; abruptio placenta; and, rarely, uterine rupture or vasa previa. Cervical, vaginal, or uterine pathology (eg, polyps, inflammation/infection, trophoblastic disease) and non-tubal ectopic pregnancy are other etiologies. (See '[Second and third trimester bleeding](#)' above.)
- Digital examination of the cervix **should be avoided** in women presenting with bleeding in the second half of pregnancy until placenta previa has been excluded because digital examination of a placenta previa can cause immediate, severe hemorrhage. (See '[Bleeding after 20 weeks of gestation](#)' above.)
- For women with uterine bleeding who are Rh(D)-negative, we recommend [anti-D immune globulin](#) to protect against Rh(D) alloimmunization ([Grade 1B](#)). (See "[Prevention of Rhesus \(D\) alloimmunization in pregnancy](#)".)

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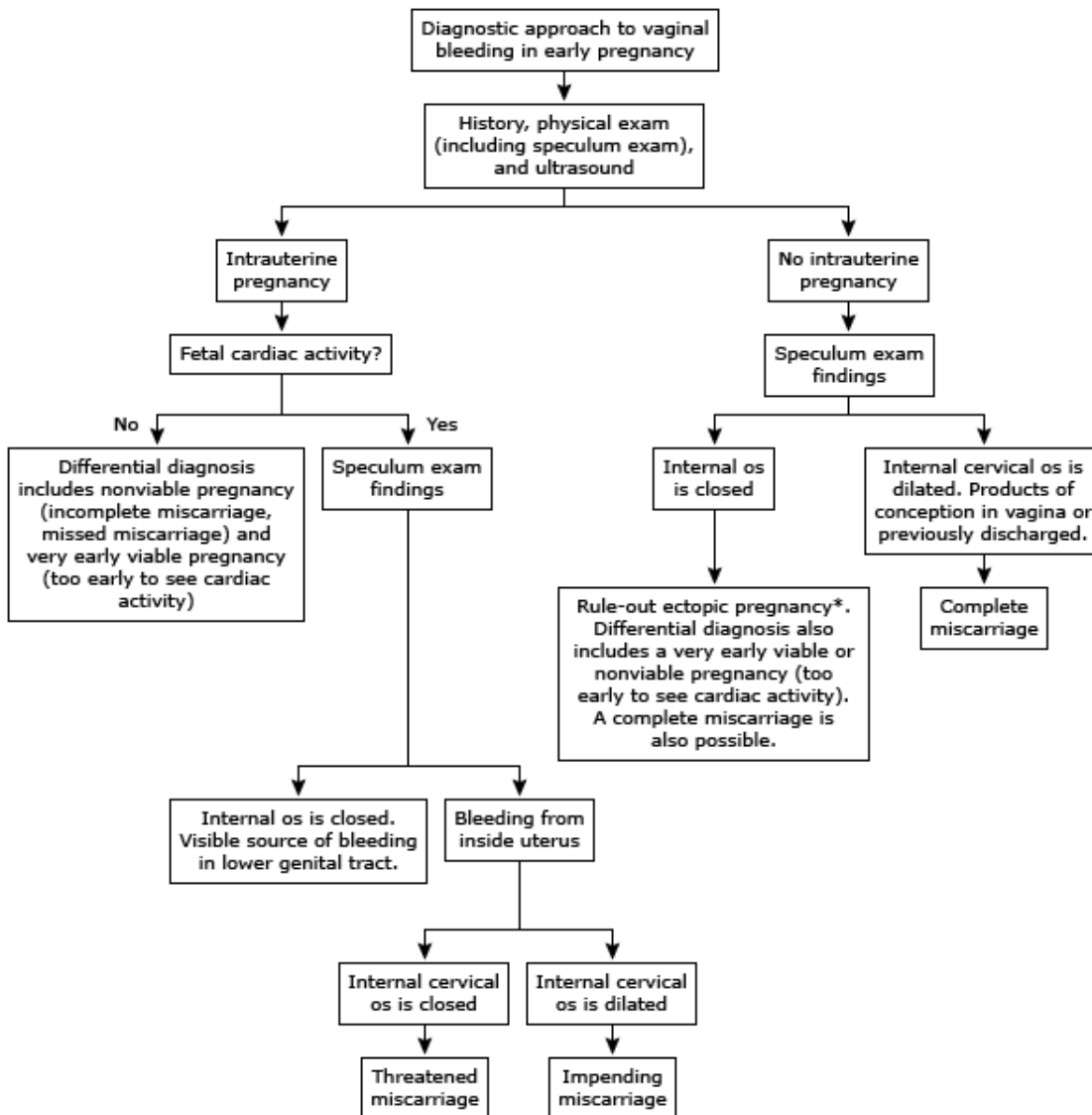
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Topic 6799 Version 26.0

GRAPHICS

Approach to the evaluation of early pregnancy bleeding



When evaluating early pregnancy bleeding, it is important to also consider the possibility of heterotopic pregnancy and the loss of one gestation from a multiple gestation.

* An ectopic pregnancy can be excluded using a combination of serial human chorionic gonadotropin (hCG) levels and ultrasound examinations.

Graphic 88947 Version 1.0

Chorionic villi



One method of distinguishing placenta from organized clot is to rinse with water and then float the tissue in a dish of water, preferably with a good light source underneath. Villi have a frond-like appearance, which has been described as similar to seaweed floating in the ocean

Courtesy of Errol R Norwitz, MD, PhD.

Graphic 78715 Version 1.0

Chorionic villi²



Courtesy of Errol R Norwitz, MD, PhD.

Graphic 61424 Version 1.0

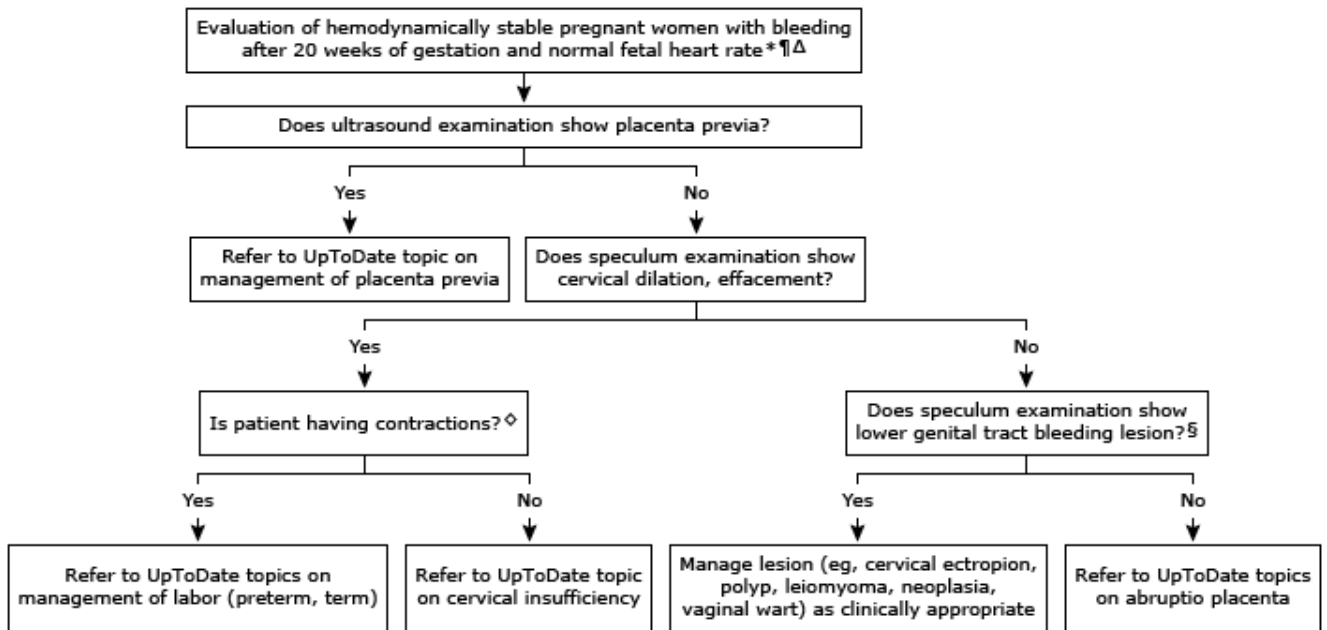
Timing of first appearance of gestational landmarks on transvaginal ultrasound examination

Landmark	First appearance on transvaginal ultrasound examination
Gestational sac	4.5 to 5 weeks
Yolk sac	5 weeks
Cardiac activity	5.5 to 6 weeks
Measurable crown-rump length	6 weeks

The yolk sac is visible when the mean gestational sac diameter (MSD) is 8 mm and fetal cardiac activity can be observed when MSD is 16 mm. For transabdominal sonograms, the corresponding MSDs are larger than 20 and 25 mm, respectively. $MSD = (\text{length} + \text{height} + \text{width of the gestational sac}) / 3$. In addition, $MSD(\text{mm}) + 30 = \text{gestational age}(\text{days})$.

Graphic 83304 Version 5.0

Evaluation of late pregnancy bleeding



* Hemodynamic instability and fetal heart rate abnormalities may represent obstetric emergencies that both influence the likely diagnosis and require modification of the evaluation.

¶ In women with uterine bleeding and a previous cesarean delivery or transmyometrial surgery, the possibility of uterine rupture should always be considered. Uterine rupture is most likely to occur during labor or as a result of abdominal trauma but may occur spontaneously. Abdominal pain, fetal heart rate abnormalities, and maternal hemodynamic instability due to intra-abdominal bleeding are likely but not always present.

Δ Women with bleeding and contractions in the second trimester but less than 20 weeks of gestation are diagnosed with threatened miscarriage rather than labor. Ectopic pregnancy is rare at this gestational age; the location is generally non-tubal (eg, corneal or abdominal) and may be detected by careful ultrasound examination.

◇ Bloody show is the term used to describe the small amount of blood with mucus discharge that may precede the onset of labor by as much as 72 hours.

§ If there is no visible blood on speculum examination, consider rectal bleeding (such as hemorrhoids) as the possible source of bleeding.

Graphic 110390 Version 2.0

Contributor Disclosures

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