

Clinical features, diagnosis, and course of placenta previa

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INTRODUCTION — Placenta previa refers to the presence of placental tissue that extends over the internal cervical os. Sequelae include the potential for severe bleeding and preterm birth, as well as the need for cesarean delivery.

Placenta previa should be suspected in any woman beyond 20 weeks of gestation who presents with painless vaginal bleeding. For women who have not had a second trimester ultrasound examination, antepartum bleeding after 20 weeks of gestation should prompt sonographic determination of placental location **before** digital vaginal examination is performed because palpation of the placenta can cause severe hemorrhage.

INCIDENCE AND RISK FACTORS — In a systematic review including 58 observational studies of placenta previa, incidence ranged from 3.5 to 4.6 per 1000 births [1]. The incidence is severalfold higher early in gestation, but most of these cases resolve before delivery (see '[Ultrasound presentation and course](#)' below).

Purported risk factors, some of which are interdependent, include [2-13]:

- Previous placenta previa
- Previous cesarean delivery (risk increases with an increasing number of cesarean deliveries)
- Multiple gestation
- Multiparity
- Advanced maternal age
- Infertility treatment
- Previous abortion
- Previous intrauterine surgical procedure
- Maternal smoking
- Maternal cocaine use
- Male fetus
- Non-white race

Prelabor cesarean delivery may increase previa risk in a subsequent delivery, more than previous intrapartum cesarean or vaginal delivery [13].

There is a paucity of data regarding the incidence of placenta previa in twin pregnancies. In a retrospective study of the natural history of placenta previa in twins, the incidence of placenta previa in twins was similar to that in singleton pregnancies [14]. However, dichorionic twins had a statistically increased risk of placenta previa compared with monochorionic twins (OR 3.3) or singleton gestations (OR 1.5).

PATHOGENESIS — The pathogenesis of placenta previa is unknown. One hypothesis is that the presence of areas of suboptimally vascularized endometrium in the upper uterine cavity due to previous surgery or pregnancies promotes implantation of trophoblast in, or unidirectional growth of, trophoblast toward the lower uterine cavity [1,2,15]. Another hypothesis is that a particularly large placental surface area, as in multiple gestation or in response to reduced uteroplacental perfusion, increases the likelihood that the placenta will cover or encroach upon the cervical os.

PATHOPHYSIOLOGY — Placental bleeding is thought to occur when gradual changes in the cervix and lower uterine segment apply shearing forces to the inelastic placental attachment site, resulting in partial detachment. Vaginal examination or coitus can also disrupt the intervillous space and cause bleeding. Bleeding is primarily maternal, but fetal bleeding can occur if a fetal vessel is disrupted.

CLINICAL FEATURES

Ultrasound presentation and course — One to 6 percent of pregnant women display sonographic evidence of a placenta previa between 10 and 20 weeks of gestation when they undergo obstetrical ultrasound examination for assessment of gestational age, fetal anatomic survey, or prenatal diagnosis (see '[Diagnosis](#)' below). The majority of these women are

asymptomatic and 90 percent of these early cases resolve [16]. Two theories have been put forth to account for resolution of the previa:

- The lower uterine segment lengthens from 0.5 cm at 20 weeks of gestation to more than 5 cm at term [4]. Development of the lower uterine segment relocates the stationary lower edge of the placenta away from the internal os.
- Progressive unidirectional growth of trophoblastic tissue toward the fundus within the relatively stationary uterus results in upward migration of the placenta. This phenomenon has been termed trophotropism.

Placental atrophy may explain why the portion of the placenta that sonographically appeared to cover the cervix resolves.

The later in gestation the previa persists, the more likely it will be present at delivery. In one series of 714 placenta previas in singleton gestations with a liveborn infant ≥ 25 weeks of gestation, the percent of previas persistent to delivery according to gestational age at identification was as follows [17]:

- Identified at 15 to 19 weeks – 12 percent present at delivery
- Identified at 20 to 23 weeks – 34 percent present at delivery
- Identified at 24 to 27 weeks – 49 percent present at delivery
- Identified at 28 to 31 weeks – 62 percent present at delivery
- Identified at 32 to 35 weeks – 73 percent present at delivery

The likelihood of resolution by the time of delivery is also high in twin gestations, and also dependent on the gestational age of diagnosis. If the previa persists with advancing gestational age, it is less likely to resolve [14,18].

The distance the placenta extends over the internal cervical os is the best predictor of placenta previa at delivery. However, available data correlating gestational age, millimeters of extension over the cervical os, and outcome are insufficient to make precise predictions. Based on available data, at 18 to 23 weeks of gestation, a distance of at least 14 to 15 mm appears to be associated with a 20 percent risk of placenta previa at delivery, and when the distance is at least 25 mm, 40 to 100 percent of previas will be present at delivery [19-22]. In the third trimester, a distance over 20 mm is highly predictive of persistence [23]. An anterior placenta previa appears to resolve more often and more quickly than posterior placenta previa [24].

Bleeding — In the second half of pregnancy, the characteristic clinical presentation is painless vaginal bleeding, which occurs in 70 to 80 percent of cases [25,26]. An additional 10 to 20 percent of women present with both uterine contractions and bleeding, which is similar to the presentation of abruptio placenta [25,26]. (See "[Placental abruption: Clinical features and diagnosis](#)".)

In approximately one-third of affected pregnancies, the initial bleeding episode occurs prior to 30 weeks of gestation; this group is more likely to require blood transfusions and is at greater risk of preterm delivery and perinatal mortality than women whose bleeding begins later in gestation [25-28]. An additional one-third of patients becomes symptomatic between 30 and 36 weeks, while most of the remaining patients have their first bleed after 36 weeks [25,26]. About 10 percent of women reach term without bleeding. The number of antepartum bleeding episodes and need for blood transfusion have been identified as independent predictors for emergency cesarean delivery [29].

For an individual patient, it is not possible to predict whether a bleed will occur, nor the gestational age, volume, or frequency of bleeding. Authors have reported that placentas that cover the os bleed earlier and more than placentas that are proximate to the os [30-33], placentas near the os have a greater risk of bleeding if the placental edge is thick (>1 cm) [34], and identification of an echo-free space in the placental edge covering the internal os [35], cervical length ≤ 3 cm [36-38], and decrease in cervical length in the third trimester [39,40] are predictive of hemorrhage. Although the magnitude of risk may differ according to previa characteristics, all patients with placentas covering or in close proximity to the cervical os are at risk of significant antepartum, intrapartum, and postpartum bleeding. Further study of patient-specific risk factors for bleeding is needed.

Associated conditions — Placenta previa has been associated with an increased risk of several other pregnancy complications. The most serious and best supported of these complications is placenta accreta.

- **Placenta accreta** — Placenta accreta complicates 1 to 5 percent of pregnancies with placenta previa and an unscarred uterus. The presence of placenta previa and one or more cesarean delivery scars places a woman at very high risk for placenta accreta and need for cesarean hysterectomy: one previous cesarean birth (11 to 25 percent), two previous cesarean births (35 to 47 percent), three previous cesarean births (40 percent), and \geq four previous cesarean births (50 to 67 percent) [41-43].

In one large series, composite maternal morbidity in women with placenta previa and zero, one, two, or three prior cesarean deliveries was 15, 23, 59, and 83 percent, respectively, and almost all of the excess composite maternal morbidity in women with a prior cesarean was related to complications associated with placenta accreta [44]. (See "[Exclusion of placenta accreta](#)" below.)

- **Preterm birth** – A systematic review and meta-analysis of placental implantation abnormalities and risk of preterm delivery found high preterm delivery rates among patients with placenta previa and low-lying/marginal placenta (43.5 and 26.9 percent, respectively) [45]. Women with placenta previa had a fivefold greater risk of preterm birth than patients without placenta previa (relative risk 5.32, 95% CI 4.39-6.45). In a population-based study of women with previa, 28 percent delivered between 34 and 37 weeks of gestation and 17 percent delivered before 34 weeks of gestation [5].
- **Preterm labor and rupture of the membranes** — Antepartum bleeding from any cause is a risk factor for preterm labor and premature rupture of membranes. (See "[Pathogenesis of spontaneous preterm birth](#)", section on '[Decidual hemorrhage](#)' and "[Preterm premature \(prelabor\) rupture of membranes](#)".)
- **Malpresentation** — The large volume of placenta in the lower portion of the uterine cavity predisposes the fetus to assume a noncephalic presentation [46-49]. Noncephalic presentation at delivery is also related to the increased risk of delivery before term, when noncephalic presentations are more common.
- **Intrauterine growth restriction** — An increased risk of intrauterine growth restriction has been reported by multiple [8,25,50-55], but not all [27,28,50,56-58], investigators, and remains controversial. If a reduction in fetal growth occurs, it is likely to be mild or due to confounding factors.
- **Vasa previa and velamentous umbilical cord** — Vasa previa and velamentous umbilical cord insertion are uncommon, but when present they are often associated with placenta previa. (See "[Velamentous umbilical cord insertion and vasa previa](#)".)
- **Congenital anomalies** — Population-based cohort studies have reported a small increase in the overall rate of congenital anomalies in pregnancies complicated by placenta previa, but no single anomaly or syndrome was associated with the disorder [8,28,59,60].
- **Amniotic fluid embolism** — A large population-based cohort study reported a strong association between placental pathology, such as placenta previa, and amniotic fluid embolism [61].

DIAGNOSIS — Placenta previa should be suspected in any woman beyond 20 weeks of gestation who presents with vaginal bleeding. For women who have not had a second or third trimester ultrasound examination, antepartum bleeding should prompt sonographic determination of placental location **before** digital vaginal examination is performed because palpation of the placenta can cause severe hemorrhage.

The diagnosis of placenta previa is based on identification of placental tissue covering the internal cervical os on an imaging study, typically ultrasound. Transabdominal ultrasound examination is performed as the initial examination; if it shows placenta previa or the findings are uncertain, transvaginal sonography should be performed to better define placental position.

If the placental edge covers the internal os, the placenta is labeled a previa ([image 1](#)) [62]. If the placental edge is <2 cm from, but not covering, the internal os, the placenta is labeled as low-lying ([image 2](#)). Placenta previa should be described by the distance (millimeters) that the placenta covers the internal cervical os. A low lying placenta should be described by the distance (millimeters) between the internal cervical os and the inferior edge of the placenta [63].

Ultrasonography

Transabdominal — Transabdominal ultrasonography is used for initial placental localization. The sonographic diagnosis of placenta previa requires the identification of echogenic homogeneous placental tissue covering or proximate to the internal cervical os (a distance greater than 2 cm from the os excludes the diagnosis of previa). Sagittal, parasagittal, and transverse sonographic views should be obtained with the patient's bladder partially full.

Specific points that should be appreciated when performing sonographic examination for placenta previa include:

- An over-distended bladder can compress the anterior lower uterine segment against the posterior lower uterine segment to give the appearance of a previa ([image 3](#)). The diagnosis of placenta previa should not be made without confirming placental position after the patient has emptied her bladder. Care should be taken to not make the diagnosis of placenta previa when the lower uterine segment is contracting, which commonly occurs after a woman empties her bladder.
- A previa can be missed near term if the fetal head is low in the pelvis since acoustic shadowing from or compression of placental tissue by the fetal skull may obscure the placental location. In these cases, the cervix may be better visualized by placing the patient in Trendelenburg position and/or gently pushing the fetal head cephalad.
- The sonographic diagnosis of a complete central previa is readily made since the placenta is centered over the cervix and placental tissue is imaged anterior and posterior to the cervix. Complete noncentral previas, particularly when lateral, are more difficult to confirm. Transverse views at and above the internal cervical os should facilitate an accurate diagnosis.
- The placental location may also be obscured by a hematoma or a lower uterine segment contraction.

The overall false positive rate of transabdominal ultrasound for diagnosis of placenta previa is high (up to 25 percent), so the diagnosis should be confirmed by transvaginal ultrasound unless the previa is clearly central [64,65].

Transvaginal — Randomized trials and prospective comparative studies have established the superior performance of transvaginal sonography (TVS) over transabdominal sonography for diagnosis of placenta previa [46,66,67]. Transabdominal ultrasound examination is performed as the initial examination; if it shows placenta previa or the findings are uncertain, TVS should be performed to better define placental position. TVS generally provides a clearer image of the relationship of the edge of the placenta to the internal cervical os than transabdominal ultrasound. In one study of 100 suspected cases, sensitivity, specificity, and positive and negative predictive values of TVS for diagnosis of placenta previa were 87.5, 98.8, 93.3, 97.6 percent, respectively [68].

TVS can be performed safely in patients with previa since the optimal position of the vaginal probe for visualization of the internal os is 2 to 3 cm away from the cervix and the angle between the cervix and vaginal probe is sufficient to prevent the probe from inadvertently slipping into the cervical canal [69].

Translabial (transperineal) ultrasound imaging is an alternative technique that provides excellent images of the cervix and placenta [70]. The use of three-dimensional (3D) ultrasound may also improve accuracy [71].

Magnetic resonance imaging — Magnetic resonance imaging (MRI) is well-suited to the assessment of placental-cervical relationships because of the differing magnetic resonance characteristics of the two tissues. However, it is not used for diagnosis of placenta previa because of its high cost, limited availability, and the well-established safety and accuracy of transvaginal sonography [63]. MRI is most useful for diagnosis of complicated placenta previa, such as previa-accreta and previa-percreta [72]. (See "[Clinical features and diagnosis of the morbidly adherent placenta \(placenta accreta, increta, and percreta\)](#)", section on 'Magnetic resonance imaging'.)

DIFFERENTIAL DIAGNOSIS

Exclusion of placenta accreta — When placenta previa is diagnosed, the possibility of placenta previa-accreta/percreta should be considered. The normal interface between the placenta and bladder is characterized by a hypoechoic boundary that represents the myometrium and the normal retroplacental myometrial vasculature. When placenta accreta is present, this hypoechoic boundary is lost and the placenta appears contiguous with the bladder wall. On ultrasound, intraplacental sonolucent spaces (ie, lacunar flow) may be observed adjacent to the involved uterine wall. The diagnosis of placenta accreta is reviewed in detail separately. (See "[Clinical features and diagnosis of the morbidly adherent placenta \(placenta accreta, increta, and percreta\)](#)".)

MORBIDITY AND MORTALITY

Maternal — Placenta previa increases the risk of antepartum (RR 9.8), intrapartum (RR 2.5), and postpartum hemorrhage (RR 1.9) [73]. For this reason, women with placenta previa are more likely to receive blood transfusions (12 versus 0.8 percent without previa [49]) and undergo postpartum hysterectomy, uterine/iliac artery ligation, or embolization of pelvic vessels to control bleeding (2.5 versus 0 percent without previa [49]). The risk is particularly high in those with previa-accreta. (See '[Bleeding](#)' above and '[Associated conditions](#)' above and "[Clinical features and diagnosis of the morbidly adherent placenta \(placenta accreta, increta, and percreta\)](#)".)

Rapid, significant loss of intravascular volume can lead to hemodynamic instability, decreased oxygen delivery, decreased tissue perfusion, cellular hypoxia, organ damage, and death. The maternal mortality rate associated with placenta previa is less than 1 percent in resource-rich countries [74], but remains high in resource-poor countries where maternal anemia, lack of medical resources, and home births are common [49].

Neonatal — Neonatal morbidity and mortality rates in pregnancies complicated by placenta previa have fallen over the past few decades because of improvements in obstetrical management (eg, antenatal corticosteroids, delayed delivery when possible), the liberal use of cesarean delivery, and improved neonatal care. The principal causes of neonatal morbidity and mortality are related to preterm delivery, rather than anemia, hypoxia, or growth restriction [75].

In a systematic review and meta-analysis of placental implantation abnormalities and risk of preterm delivery, placenta previa was associated with a three- to fivefold increase in risk of preterm delivery (RR 5.32, 95% CI 4.39-6.45), neonatal intensive care unit admission (RR 4.09, 95% CI 2.80-5.97), neonatal death (RR 5.44, 95% CI 3.03-9.78), and perinatal death (RR 3.01, 95% CI 1.41-6.43) compared with no placenta previa [45].

MANAGEMENT — (See "[Management of placenta previa](#)".)

RECURRENCE — Placenta previa recurs in 4 to 8 percent of subsequent pregnancies [4].

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: Placenta previa \(The Basics\)](#)")

SUMMARY AND RECOMMENDATIONS

- Placenta previa should be suspected in any woman beyond 20 weeks of gestation who presents with painless vaginal bleeding. For women who have not had a second trimester ultrasound examination, antepartum bleeding after 20 weeks of gestation should prompt sonographic determination of placental location **before** digital vaginal examination is performed because palpation of the placenta can cause severe hemorrhage. (See '[Introduction](#)' above.)
- Previous placenta previa, previous cesarean deliveries, and multiple gestation are major risk factors for placenta previa. (See '[Incidence and risk factors](#)' above.)
- The distance from the placental edge to the internal cervical os is the best predictor of placenta previa at delivery, but available data correlating gestational age, millimeters of extension over the cervical os, and outcome are insufficient to make precise predictions. (See '[Ultrasound presentation and course](#)' above.)
- The characteristic clinical presentation is painless vaginal bleeding, which occurs in 70 to 80 percent of cases. An additional 10 to 20 percent of women present with both uterine contractions and bleeding, which is similar to the presentation of abruptio placenta. In approximately one-third of affected pregnancies, the initial bleeding episode occurs prior to 30 weeks of gestation. (See '[Bleeding](#)' above.)
- Some conditions that may be associated with placenta previa include placenta accreta, malpresentation, preterm labor or premature rupture of the membranes, vasa previa and velamentous insertion of the umbilical cord. (See '[Associated conditions](#)' above.)
- The diagnosis of placenta previa is based upon identification of placental tissue covering or proximate to the internal cervical os on transvaginal ultrasound examination. (See '[Diagnosis](#)' above.)

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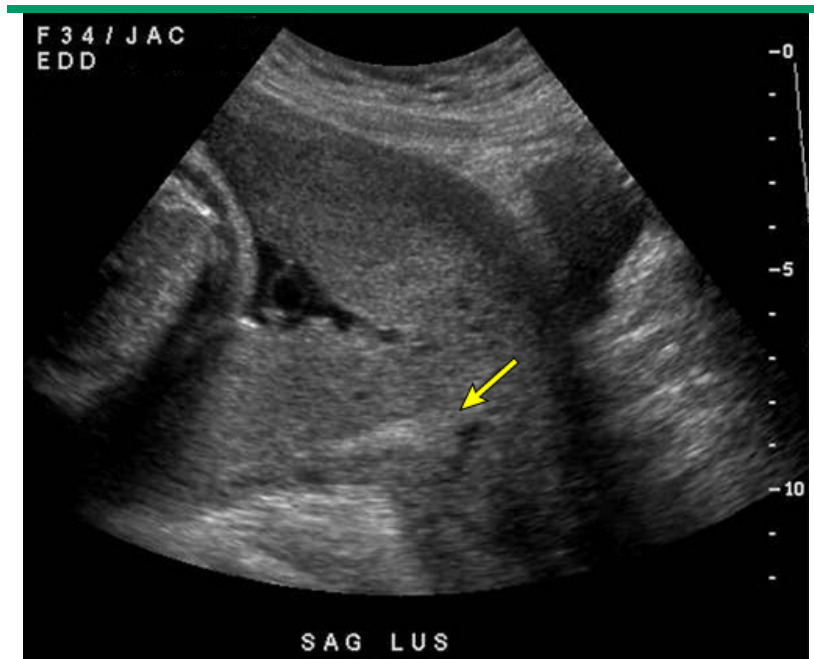
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GRAPHICS

Complete placenta previa

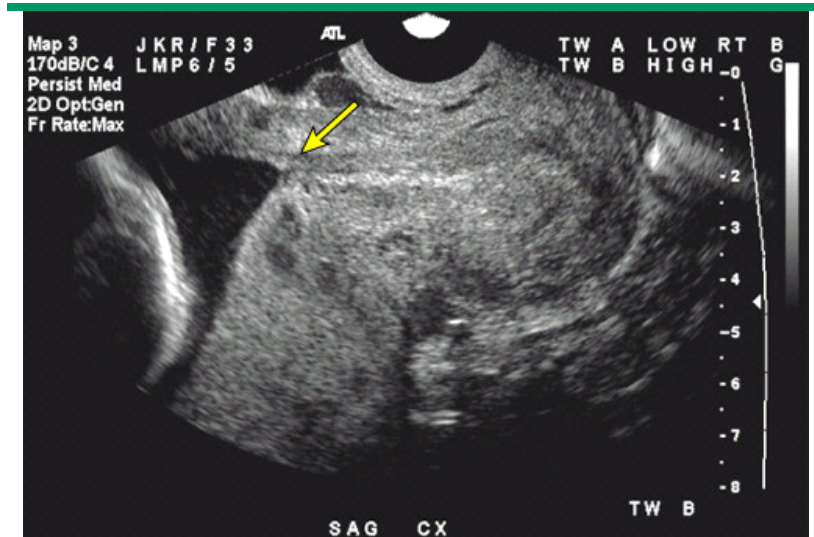


Transabdominal study shows the placenta completely covering the internal os (arrow). A central placenta previa occurs when the internal os is approximately equidistant from the anterior and posterior placental edges; 20 to 30 percent of complete previas are central.

Courtesy of Deborah Levine, MD.

Graphic 74665 Version 4.0

Low lying placenta

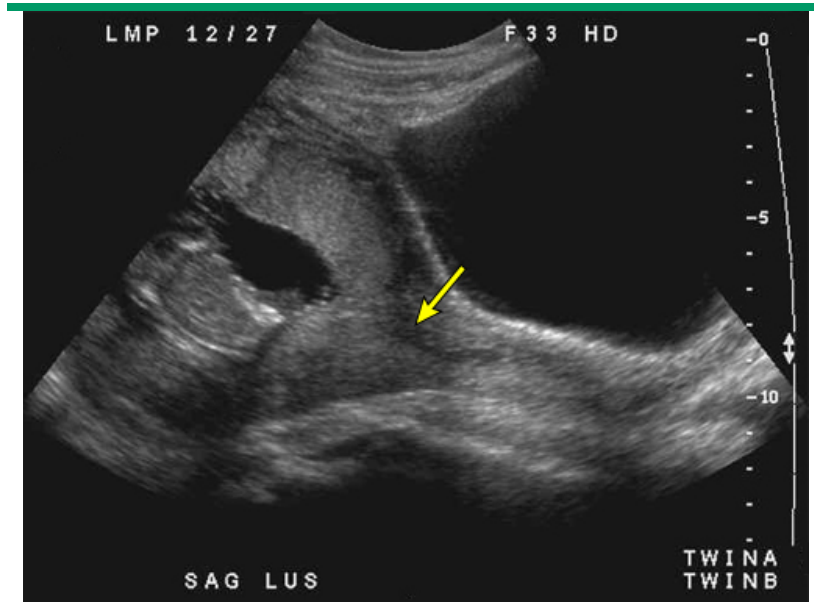


Transvaginal study shows a posterior placenta with the tip of the placenta on the internal os (arrow). The placenta is adjacent to the internal os, but does not cover it.

Courtesy of Deborah Levine, MD.

Graphic 55703 Version 4.0

Overdistended bladder mimicking placenta previa



Transabdominal study shows an over-distended bladder giving the appearance of a previa in a patient with NO placenta previa. An over-distended bladder can compress the anterior lower uterine segment against the posterior lower uterine segment, thereby mimicking placenta previa. The arrow points to the cervical os.

Courtesy of Deborah Levine, MD.

Graphic 76545 Version 3.0

Contributor Disclosures

Charles J Lockwood, MD, MHCM Consultant/Advisory Boards: Celula [Aneuploidy screening (No current products or drugs in the US)]. **Karen Russo-Stieglitz, MD** Nothing to disclose **Deborah Levine, MD** Nothing to disclose **Susan M Ramin, MD** Nothing to disclose **Vanessa A Barss, MD, FACOG** Nothing to disclose

Contributor disclosures are reviewed for conflicts of interest by the editorial group. When found, these are addressed by vetting through a multi-level review process, and through requirements for references to be provided to support the content. Appropriately referenced content is required of all authors and must conform to UpToDate standards of evidence.

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