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Second-Trimester Abortion

In the United States, more than one half of pregnancies are unintended, with 3 in 10 women having an abortion by age 45 years (1). In 2008, 1.2 million abortions occurred in the United States, of which 6.2% took place between 13 weeks of gestation and 15 weeks of gestation, and 4.0% took place at 16 weeks of gestation or later (2, 3). Only 1.3% of abortions are performed at 21 weeks of gestation or later (4). The proportion of abortions performed in the second trimester, usually defined as between 13 weeks of gestation and 26 weeks of gestation (as calculated from the last menstrual period), has remained stable during the past two decades (4). The purpose of this document is to provide evidence-based guidelines for the medical and surgical methods of second-trimester termination as well as for the management of associated complications.

Background

Indications for Second-Trimester Abortion

Second-trimester abortion is an important component of comprehensive women's health care, and women seek termination later in pregnancy for a variety of medical and social reasons. Circumstances that can lead to second-trimester abortion include delays in suspecting and testing for pregnancy, delay in obtaining insurance or other funding, and delay in obtaining referral, as well as difficulties in locating and traveling to a provider (5). Poverty, lower education level, and having multiple disruptive life events, have been associated with higher rates of seeking second-trimester abortion (3). In addition, major anatomic or genetic anomalies may be detected in the fetus in the second trimester and women may choose to terminate their pregnancies (47–95%) (6–8). The identification of major anatomic or genetic anomalies in the fetus through screening and diagnostic testing most commonly occurs in the second trimester, although first-trimester screening and chorionic villus sampling can enable first-trimester diagnosis of aneuploidy. Some obstetric and medical indications for second-trimester termination include preeclampsia and preterm premature rupture of membranes, among other conditions. Additional indications for uterine evacuation in the second trimester are pregnancy failure before 20 weeks of gestation and fetal demise. In 2005, the U.S. fetal mortality rate was 6.22 fetal deaths at 20 weeks of gestation or more per 1,000 live births and fetal deaths, and this rate was higher for teenagers; women aged 35 years and older; and among non-Hispanic black, Hispanic, and American Indian or Alaska Native women (9).

Methods of Second-Trimester Abortion

Both surgical and medical methods of pregnancy termination can be used in the second trimester. Limited evidence suggests that the vast majority (95%) of second-trimester abortions in the United States are performed by dilation and evacuation (D&E); however, terminations by medical abortion may be underreported (10, 11).

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In many areas of the United States, women have limited access to second-trimester abortion, in general, and may not have the option to choose between D&E and medical abortion. In a census of abortion providers, 64% reported offering some services after 12 weeks of gestation, and only 23% reported providing abortions at 20 weeks of gestation and later (2). In another survey of clinics providing second-trimester abortion, only 33% offered medical abortion in addition to D&E (11). Some women with fetal anomalies or medical complications of pregnancy are directed toward medical abortion because of a lack of skilled D&E providers nearby (12). Dilation and evacuation training is not available in all residency programs, and many residents trained in D&E have not performed a sufficient number of procedures to achieve competency in the technique (13–15). In order to help ensure access to D&E, residency training programs should offer integrated abortion training that includes second-trimester D&E, and practicing obstetrician–gynecologists should establish referral relationships with skilled D&E providers.

Legal Issues

Induced abortion remains one of the most regulated medical procedures in the United States. Although the U.S. Supreme Court has determined that state bans on abortion are unconstitutional, it has upheld many state laws that make abortion services less accessible. These laws include specific physician and hospital requirements, gestational age limits, restrictions on use of state funds and private insurance, waiting periods, required parental involvement, specialized facility requirements, and mandatory information requirements (16). The federal Partial-Birth Abortion Ban Act of 2003 was upheld by the U.S. Supreme Court in 2007 and imposes a nationwide prohibition on what the act calls "partial-birth abortions." Although "partial-birth abortion" is not a medical term and is vaguely defined in the law, physicians and lawyers have interpreted the banned procedures as including intact D&E unless fetal demise occurs before surgery. The act does not provide guidance about how physicians should comply with the act or document compliance.

Physicians should be aware of relevant federal and state abortion regulations so they can provide appropriate treatment for their patients. In 2011, 24 states passed a total of 92 provisions restricting and regulating abortion (17). By the end of 2011, six states had banned all abortions after 20 weeks of gestation based on concerns related to fetal pain beyond this gestational age (16). Medical evidence, however, suggests that fetal perception of pain may not occur until the third trimester (18, 19).

Second-Trimester Abortion Procedures

Following the 1973 Supreme Court decision in Roe v. Wade, which established the legality of abortion in the United States, the techniques of second-trimester abortion changed considerably. Over time, physicians began using first-trimester techniques beyond the 12-week gestational age limit and developed the modern D&E procedure. By the late 1970s, researchers had documented the safety of D&E and concluded that it was safer than the medical abortion techniques used at the time (20).

Dilation and Evacuation

The D&E technique usually requires cervical preparation before the procedure and the use of grasping forceps to remove the fetus. Cervical preparation is recommended before D&E to decrease the risk of cervical trauma (21). Cervical softening and dilation can be achieved by placement of osmotic dilators before the procedure or by the use of prostaglandin analogues, most commonly misoprostol (22, 23). After achieving adequate dilation and administering analgesia and sedation or anesthesia, D&E is accomplished by aspirating the amniotic fluid and removing the fetus with forceps through the cervix and vaginal canal. Usually disarticulation (or dismemberment) occurs as the physician delivers the fetal part grasped in the instrument and pulls it through the cervix. A final suction curettage is often performed to ensure that the uterus is completely evacuated.

Intact D&E is a variation of D&E that requires more advanced cervical dilation, usually achieved over several days. The procedure involves the removal of the intact fetus except for possible decompression of the calvaria (24). The intact D&E procedure is preferable in certain cases, such as when preservation of fetal anatomy is desired. Additionally, compared with D&E, the intact D&E procedure may be associated with lower risks of uterine perforation and infection because it minimizes the use of forceps, and reduces the risk of retained fetal tissue (25).

Medical Abortion

Second-trimester abortion also can be safely accomplished through medical induction or medical abortion. Compared with D&E, termination by induction with misoprostol is less cost-effective, is associated with a greater risk of complications, such as incomplete abortion, and may be prolonged (26–29). Medical abortion may be preferred by some patients and providers for the termination of pregnancies complicated by fetal anomalies, genetic disorders, or maternal health issues (12). Modern medical abortion methods include the use of one or more of the following: prostaglandin analogues, mifepristone,

osmotic cervical dilators, Foley catheters, and oxytocin (30). Misoprostol, either alone or in combination with other agents, is recommended over other instillation agents and uterotonics because of its high efficacy, low cost, and ease of use (Box 1).

Osmotic cervical dilators are sometimes used in conjunction with pharmacologic uterotonic agents; however, osmotic dilators do not provide added benefit to induction with prostaglandin analogues (31, 32).

Box 1: Regimens for Second-Trimester Medical Abortion ⇦

- Mifepristone, 200 mg, administered orally, followed in 24–48 hours by
  - — Misoprostol, 800 micrograms, administered vaginally, followed by 400 micrograms administered vaginally or sublingually every 3 hours for up to a maximum of five doses.*
  - — Misoprostol, 400 micrograms, administered buccally every 3 hours for up to a maximum of five doses also may be used.
- If mifepristone is not available:
  - — Misoprostol, 400 micrograms, administered vaginally or sublingually every 3 hours for up to five doses.* Vaginal dosage is superior to sublingual dosage for nulliparous women.
  - — A vaginal loading dose of 600–800 micrograms of misoprostol followed by 400 micrograms administered vaginally or sublingually every 3 hours may be more effective.
- If misoprostol is not available:
  - — Oxytocin, 20–100 units, infused intravenously over 3 hours, followed by 1 hour without oxytocin to allow diuresis. Oxytocin dosage may be slowly increased to a maximum of 300 units over 3 hours.†

*If the abortion is not complete after five doses, the woman may be allowed to rest for 12 hours before starting the cycle again.

†High-dose oxytocin is not commonly used in the second-trimester because of the inefficient response of the uterus to oxytocin during this gestational period.

Data from Borgatta L, Kapp N. Clinical guidelines. Labor induction abortion in the second trimester. Society of Family Planning. Contraception 2011;84:4–18; Ashok PW, Templeton A, Wagaarachchi PT, Flett GM. Midtrimester medical termination of pregnancy: a review of 1002 consecutive cases. Contraception 2004;69:51–8; Kapp N, Borgatta L, Stubblefield P, Vragovic O, Moreno N. Mifepristone in second-trimester medical abortion: a randomized controlled trial. Obstet Gynecol 2007;110:1304–10; *and* Ngoc NT, Shochet T, Raghavan S, Blum J, Nga NT, Minh NT, et al. Mifepristone and misoprostol compared with misoprostol alone for second-trimester abortion: a randomized controlled trial. Obstet Gynecol 2011;118:601–8.

Mifepristone followed in 24–48 hours by misoprostol is the most effective regimen for second-trimester medical abortion, with up to 91% efficacy within 24 hours of initiation of misoprostol and with a significantly shorter induction interval and fewer adverse effects than misoprostol alone (30, 33, 34). However, mifepristone may not be available in all settings, and misoprostol as a single agent is effective for medical abortion (Box 1).

Abdominal Surgery

In rare instances, second-trimester abortion may be performed by hysterectomy or hysterotomy. These procedures are associated with a much higher risk of complication than D&E or medical abortion and should only be performed when the latter two procedures have failed or are contraindicated (35).

Effecting Fetal Demise

No evidence currently supports the use of induced fetal demise to increase the safety of second-trimester medical or surgical abortion. Techniques used to cause fetal demise include division of the umbilical cord, intra-amniotic or intrafetal digoxin injection, or fetal intracardiac potassium chloride injection. Some providers of second-trimester surgical abortion use these methods to ensure fetal demise before the procedure or because they believe it facilitates D&E by causing maceration. A randomized, placebo-controlled clinical trial found that injection of 1 mg of intra-amniotic digoxin did not decrease procedure time or provider-reported technical difficulty or complications, but did increase vomiting (15). A retrospective cohort study found an increased complication rate after digoxin use, including increased odds of infection (odds ratio [OR], 5.9; 95% confidence interval [CI], 1.7–20.1), spontaneous abortion (OR, 6.9; 95% CI, 4.2–9.7), and hospitalization (OR, 6.9; 95% CI, 4.2–9.7) compared with controls that did not receive digoxin (36). However, another study reporting on a large case series (37) found a much lower rate of complications, including spontaneous abortion (0.3%; 95% CI, 0.2–0.5%, compared with 1.9% [36]) and infection (0.04%; 95% CI, 0–0.2%, compared with 3.4% [36]). In its 2010 *Clinical Guidelines* on the topic, the Society of Family Planning concluded that current evidence does not support the use of induced fetal demise to improve the safety of D&E (38). With medical abortion after 20 weeks of gestation, induced fetal demise may be preferable to the woman or provider in order to avoid transient fetal survival after expulsion. Based on limited evidence, induced fetal demise before medical abortion may shorten induction time (30).

Complications

The mortality rate associated with abortion is low (0.6 per 100,000 legal, induced abortions), and the risk of death associated with childbirth is approximately 14 times higher than that with abortion (39, 40). Abortion-related mortality increases with each week of gestation, with a rate of 0.1 per 100,000 procedures at 8 weeks of gestation or less, and 8.9 per 100,000 procedures at 21 weeks of gestation or greater (41).

Rare complications associated with both D&E and medical abortion include hemorrhage, cervical laceration, retained products of conception, and infection (42–44). Uterine perforation can occur with D&E, whereas uterine rupture can occur with medical abortion (42–44).

Postabortion Hemorrhage

Although uncommon, postabortion hemorrhage is a serious complication that must be promptly recognized and managed. Because postabortion hemorrhage has been defined differently in different studies, the Society of Family Planning recently proposed a definition that includes "both a clinical response to excessive bleeding, such as transfusion or admission, and/or bleeding in excess of 500 mL" (45). Hemorrhage requiring transfusion occurs in 0.1–0.6% of D&E procedures and in 0.7% of second-trimester medical abortions (21, 46–50). Risk factors for hemorrhage include advanced maternal age, insufficient cervical dilation, use of general anesthesia, and a medical history of more than one cesarean delivery (21, 51, 52). Reported etiologies of postabortion hemorrhage include retained products of conception, uterine atony, cervical laceration, uterine perforation or rupture, abnormal placentation, and disseminated intravascular coagulopathy (DIC). One case series of postabortion uterine artery embolization for refractory hemorrhage identified the following etiologies: uterine atony (52%), abnormal placentation (17%), cervical laceration (12%), uterine perforation (7%), lower uterine segment bleeding without atony (5%), and DIC (5%) (53).

Retained products of conception. Retained tissue or incomplete abortion has been reported in less than 1% of cases of D&E, but occurs in at least 8% of cases of medical abortion that involve use of the mifepristone regimen (21, 46–50). In several cohort studies, incomplete abortion was significantly more common after medical abortion with misoprostol compared with D&E (26–28, 54).

Uterine atony. *Uterine atony*, defined as hypocontractility of the uterine body and fundus, is a common cause of hemorrhage. In a review of 3,000 D&E procedures, uterine atony occurred in 2.6% of cases, and increased patient age and increased gestational age were independent predictors of this complication (51). It also may be increased in cases of prior cesarean delivery.

Cervical laceration. Cervical lacerations occur in up to 3.3% of second-trimester abortion cases and have been reported after both D&E and medical abortion (26, 51, 55). Risk factors for cervical lacerations include mechanical dilation, nulliparity, advanced gestational age, and provider inexperience.

Uterine perforation. The frequency of uterine perforation in second-trimester surgical abortion has been reported to be 0.2–0.5% (21, 46, 48, 49, 56, 57). Perforations are associated with advanced gestational age, multiparity, and provider inexperience, and are less likely to occur with adequate cervical preparation (58). Severe pain or visualization of extrauterine tissue in the vaginal field can alert the surgeon to a perforation. Brisk bleeding is not common unless an artery is lacerated. It always is important to consider bowel and bladder injuries when perforation is suspected in the second trimester. When a perforation is diagnosed before the termination is complete, it may be necessary to finish the abortion under direct visualization by laparotomy or laparoscopy if the patient becomes hemodynamically unstable. If the patient is stable, it may be possible to complete the procedure under ultrasonographic guidance or later, after initial management of the perforation.

Uterine rupture. Although uterine rupture associated with medical abortion has been reported among women with both scarred and unscarred uteri, the magnitude of the risk of this complication is unknown (30). Uterine rupture was reported in 1 patient in a series of 1,002 consecutive cases of second-trimester medical abortion (50). In a systematic review of studies of second-trimester induction abortion that included misoprostol, the risk of uterine rupture in women with prior cesarean delivery was 0.28% (95% CI, 0.08–1.00%), whereas the risk of uterine rupture in women without prior cesarean delivery was 0.04% (95% CI, 0.01–0.20%) (59). Because the risk of uterine rupture associated with prior cesarean delivery is similar to the risk among women without a prior cesarean delivery, guidelines support the safety of misoprostol specifically and medical abortion generally in women with one prior cesarean delivery (30, 60).

Abnormal placentation. Women with prior cesarean deliveries are at an increased risk of placenta accreta and warrant special attention (61), particularly if ultrasonography indicates a low-lying placenta or placenta previa. When there is a suspicion of abnormal placentation, D&E is the preferred abortion method, and preparations should be made for possible hemorrhage by ensuring

the procedure is performed at an appropriate facility with accessibility to blood products, interventional radiology, and the capability to perform a hysterectomy if necessary. Because the positive predictive value of ultrasonography to diagnose placenta accreta may be as low as 65%, preoperative uterine artery embolization is not generally recommended (53, 62, 63). Although the diagnostic accuracy of magnetic resonance imaging is similar to ultrasonography for placenta accreta (63), magnetic resonance imaging may be useful to confirm accreta and identify patients who should be referred to a tertiary care center that has interventional radiology and surgical services immediately available.

Disseminated intravascular coagulation. Copious hemorrhage may result in coagulopathy, so the provider must be prepared to manage DIC. In addition, when a patient presents with a fetal demise in the second trimester, she is at an increased risk of DIC (64). In the event of persistent postabortion hemorrhage, blood should be drawn and evaluated for hemoglobin, hematocrit, and coagulation parameters. When the international normalized ratio is elevated or there is clinical suspicion for coagulopathy, there should be a low threshold for the administration of fresh frozen plasma or cryoprecipitate.

Infection. The prevalence of postabortion infection in the second trimester has been reported to be 0.1–4%, although this outcome has not been clearly defined in all studies (21, 46–48, 50). Symptoms and signs usually arise within the first few days after the abortion, and patients presenting with postabortion infection should be evaluated for retained products of conception. Ascending genital tract infections are polymicrobial and should be treated with a broad-spectrum antibiotic regimen (65). Administration of prophylactic antibiotics decreases the risk of infection after surgical abortion by 40% and, therefore, should be provided to all patients undergoing D&E (66). Both tetracyclines and metronidazole provide significant and comparable protection against postabortal pelvic inflammatory disease. One of the most effective and inexpensive regimens is 100 mg of doxycycline taken orally 1 hour before the abortion followed by 200 mg after the procedure (67). Although mild infection has been reported after medical abortion (50), prophylactic antibiotics for second-trimester medical abortion currently are not recommended (68).

Embolism. The incidence of fatal and nonfatal pulmonary embolism is 10–20/100,000 abortions (69, 70). Amniotic fluid embolism occurs in between 1 in 10,000 and 1 in 80,000 pregnancies, and when it occurs after second-trimester abortion, it has a mortality rate of 80% (70, 71).

Clinical Considerations and Recommendations

▶ *What is the preferred procedure for second-trimester abortion?*

When comparing methods for second-trimester abortion, providers should consider safety, effectiveness, cost, logistics, patient preference, and indication. Dilation and evacuation is safe and effective and has advantages over termination by medical abortion. The timing of D&E is predictable, and although it may require preoperative outpatient visits for cervical preparation, the procedure usually is faster and may be more cost-effective than medical abortion (72). Medical abortion or intact D&E may be preferable when autopsy is desired. Intact D&E also may be the preferred method when uterine instrumentation should be minimized, such as in the case of chorioamnionitis, or with certain fetal anomalies, such as severe hydrocephalus, that may make extraction or delivery difficult.

Dilation and evacuation is associated with fewer complications (up to 4%) than medical abortion involving misoprostol regimens (up to 29%), with the most common complication of medical abortion being retained placenta (21%) (26–28, 54). However, these results may not be applicable to medical abortions involving mifepristone combined with misoprostol because randomized trials demonstrate that this regimen has faster times to completion, decreased hospital time, and a lower risk of retained placenta, compared with regimens with misoprostol used alone (33, 34). A pilot randomized controlled trial comparing outcomes of women undergoing midtrimester abortion by D&E versus medical abortion with mifepristone and misoprostol, reported fewer adverse events, specifically less pain and gastrointestinal adverse effects, in women undergoing D&E (29). This trial failed to recruit its target sample size because most potential study participants strongly preferred D&E and declined to be randomized (29). Another randomized controlled trial from the United Kingdom found that women assigned to D&E reported less pain and were more likely to say they would opt for the same procedure again compared with those who underwent induction with mifepristone and misoprostol; overall complications were similar between the two groups (73). Regardless, medical abortion is the preferred method of second-trimester abortion if a trained D&E provider is not available.

Patient preference also should be taken into account. Although some women may prefer medical abortion, research has shown that many patients prefer D&E and

consider it less emotionally challenging than induction (12, 74). Indirect evidence suggests that women seek out D&E services even when it causes significant delays in abortion (5, 12).

▶ *What is the appropriate management of postabortion hemorrhage?*

Management of postabortion hemorrhage consists of developing a primary, secondary, and tertiary treatment plan (45).

Primary Treatment

Primary treatment begins with an immediate visual and digital cervical examination to assess for cervical lacerations, bimanual examination to assess uterine tone, and ultrasonography to identify reaccumulation of blood or retained tissue. Some clinicians use a cannula test, in which an 8–10-mm cannula is inserted into the fundus and slowly withdrawn, to distinguish lower uterine segment or high cervical bleeding from fundal bleeding due to uterine atony.

If atony is suspected, management includes prompt uterine massage and administration of uterotonic agents. Methylergonovine maleate is an appropriate first-line uterotonic agent unless contraindicated, as in patients with hypertension. Misoprostol is an effective agent in the setting of postabortion hemorrhage, and doses of 800–1,000 micrograms are recommended. Although studies of misoprostol pharmacokinetics suggest that vaginal administration achieves the highest peak concentration, it is usually not feasible in the setting of hemorrhage (75). Rectal administration is often used (especially if the patient is intubated), but the Society of Family Planning's guidelines suggest that buccal or sublingual routes of 800–1,000 micrograms of misoprostol may be preferable to rectal administration based on pharmacokinetic data (45). Although often used, oxytocin may not be effective because there are few oxytocin receptors in a uterus during the second trimester.

Secondary Treatment

If refractory or excessive bleeding occurs, secondary treatment includes obtaining additional intravenous access and administering fluid resuscitation. Further assessment may include assessment of hemoglobin, hematocrit, coagulation parameters, creatinine (in anticipation of possible uterine artery embolization), and blood type and crossmatch for possible transfusion (if not previously obtained). Blood and coagulation factors should be available in the setting of hemorrhage because DIC is possible.

If refractory bleeding is thought to be due to atony or lower uterine segment bleeding, a Foley catheter or intrauterine balloon should be inserted to tamponade the endometrial cavity. Both the Foley catheter (inflated using 30 mL or 60 mL of saline) and the intrauterine balloon (inflated using 120–250 mL of saline) have been successfully used for postabortion hemorrhage (51, 76–78). Once the bleeding has stopped after tamponade by the balloon and treatment with uterotonic agents, the balloon can be removed.

Tertiary Treatment

For persistent refractory bleeding, tertiary treatment methods include uterine artery embolization, laparoscopy, laparotomy, or hysterectomy. Uterine artery embolization for refractory hemorrhage has been described in case series (53, 79, 80). In the largest series, intervention with uterine artery embolization was 100% successful in avoiding hysterectomy in cases due to atony, cervical laceration, DIC, and lower uterine segment bleeding (53). With suspected placenta accreta, uterine artery embolization was successful in 43% of cases (53). In general, in a clinically stable patient, hysterectomy should only be considered after other treatments have failed. Overall, hysterectomies occur following 1.4/10,000 abortions in the United States, with uterine perforation as the most common cause (81).

If a cervical laceration is found, its extent should be evaluated, and temporary measures of hemostasis, such as application of direct pressure by ring forceps, should be attempted. Minor abrasions can be treated with basic ferric subsulfate solution or silver nitrate. Significant lacerations of the cervix may require repair with absorbable sutures. High cervical tears can be sutured or treated by applying pressure with an intrauterine Foley catheter; sutures also may be placed at the 3-o'clock position and the 9-o'clock position on the cervix. If bleeding continues after repair of a high cervical tear, a uterine artery laceration should be considered as a possible etiology of hemorrhage. Targeted uterine artery embolization can be attempted in such a case (53, 79, 80), but if embolization is not possible, laparotomy may be required for stabilization.

▶ *How can complications associated with second-trimester abortion be prevented or minimized?*

Several measures can prevent and minimize complications from second-trimester abortion, including obtaining a thorough medical history and performing a physical examination to identify and manage risk factors for complications, accurately dating pregnancy by ultrasonography, localizing the placenta (especially in women with prior uterine surgery), and assessing preoperative hemoglobin level and blood type. The use of vasopressin in the paracervical block may decrease blood loss from

D&E as reported in one randomized controlled trial (82). For women with medical complications, consultations with appropriate specialists can minimize risk. Women with prior cesarean deliveries are at an increased risk of abnormal placentation. Patients with placenta previa and prior cesarean delivery who are past 14 weeks of gestation should have focused imaging and counseling, and if placenta accreta is suspected, they should be cared for in a setting with access to resuscitative equipment and personnel (45). Given that provider inexperience is associated with a higher risk of complications with D&E, training in the procedure is an important way to prevent complications.

Insufficient cervical dilation has been associated with an increased risk of hemorrhage and cervical laceration with D&E, and studies support routine cervical preparation to decrease these risks (21, 23, 51). Cervical dilation protocols for D&E vary according to gestational age and include same-day preparation with misoprostol or a hygroscopic cervical dilator, osmotic dilators placed 1 or more days before the procedure, or a combination of misoprostol and osmotic dilators (11, 22, 23). Limited data indicate mifepristone also can be used for cervical preparation before D&E at 14–16 weeks of gestation, although more research is needed (83).

▶ *Is intraoperative ultrasonography necessary in second-trimester abortion?*

Real-time ultrasonographic guidance during D&E is not used universally, and its utility depends on the training level of the provider. A study comparing the rate of uterine perforation before and after the adoption of intraoperative ultrasonography for second-trimester abortion showed that its use in a training program significantly decreased the risk of this complication (84). Although intraoperative ultrasonography may be helpful, especially during training, its use is not required.

▶ *Are there special considerations in the management of second-trimester fetal demise and termination for fetal anomalies?*

Options for the management of second-trimester pregnancy termination for fetal anomalies and fetal demise are similar to those for other indications and include D&E and medical abortion. Dilation and evacuation is the preferred method because it is associated with a lower risk of complications than medical induction (26, 27, 85); however, patient preference, the need for fetal autopsy, and the availability of a skilled provider may influence this decision (86). Although many obstetric providers believe that women terminating a pregnancy for fetal anomalies and fetal demise prefer induction of labor to D&E, this may not be the case (12, 87). When allowed to undergo the procedure of their choice, grief resolution appears to be similar between women that choose D&E and those that choose medical abortion for pregnancy termination (88). Although autopsy for further diagnosis usually is not needed in cases of a fetus with an abnormal karyotype, an autopsy of an intact fetus may alter the final diagnosis and patient counseling in some cases of structural malformations identified by ultrasound (89–92).

▶ *What can be done to reduce delays that contribute to second-trimester abortion?*

A cross-sectional study of women presenting for abortion in the second trimester at a large urban abortion clinic found that it took these women an average of 3 weeks longer to suspect they were pregnant than women who presented in the first trimester, and more than one half were already past the second trimester when they underwent pregnancy tests. In addition, logistic delays, including receiving inappropriate or delayed referrals and difficulty in finding a provider, contributed to patients presenting for second-trimester abortion, thus linking the paucity of second-trimester providers to delay (5). Poor women, African American women, and teenagers are more likely to report delays in accessing abortion care (5, 93, 94).

Interventions to improve and facilitate early identification of pregnancy should be encouraged, including efforts to educate women about the signs and symptoms of pregnancy. Strategies to increase access to early abortion services, such as increasing the number of clinicians who provide either early aspiration or medical abortion and expanding the use of telemedicine to provide early medical abortion, might help reduce second-trimester abortion (95). All physicians should facilitate timely referrals for abortion care to reduce delays in accessing services. In addition, state and federal abortion policies that restrict access to abortion services should be repealed because they can contribute to delays in accessing care and higher morbidity rates (17).

▶ *What contraceptive methods can be provided after second-trimester abortion?*

Approximately one half of the women seeking abortion have had prior abortions and thus are at high risk of repeat, unintended pregnancy (96). Women should initiate contraception immediately after an abortion because ovulation can resume as early as 21 days after the procedure. Except for hysteroscopic sterilization, diaphragm, or cervical cap, all forms of contraception can be considered after second-trimester abortion and initiated on the day of the procedure (97–99).

Intrauterine devices (IUDs) are highly effective reversible forms of contraception that can be safely placed immediately after abortion and decrease the rate of repeat abortion (100–102). Immediate insertion of IUDs after second-trimester D&E is associated with higher adherence, lower pregnancy rates, and high patient satisfaction compared with delayed insertion at the time of a follow-up visit (103–105). Few trials examine expulsion rates of modern, T-shaped IUDs when placed immediately after D&E; however, the expulsion rate may be slightly higher than after interval placement. One study that examined post-D&E insertion of the levonorgestrel IUD randomized women to either immediate or delayed (3–6-week) insertion (104). All women in the immediate-insertion group received IUDs, compared with only 46% in the delayed-insertion group, primarily because a sizeable proportion of women in the delayed-insertion group did not return for the insertion. At 6 months, the expulsion rate was not statistically different between the immediate-insertion group (6.8%; 95% CI, 1.4%–18.7%) and the delayed-insertion group (5.0%; 95% CI, 0.1–24.9%). Another study that examined insertion of copper IUDs after D&E randomized women to either immediate placement or delayed (2–4 weeks) placement (103). Although there was a trend toward increased expulsion in the immediate-placement group (3.1%; 95% CI, 0–8.0%) compared with the delayed-placement (0%) group, this difference was not statistically significant. In this study, women randomized to immediate placement were significantly more likely to have an IUD at 6 months compared with women randomized to delayed placement (relative risk, 11.2; 95% CI, 5–26) (103). Other reported complications, including pelvic inflammatory disease and perforation, are rare and do not appear to occur at higher rates with immediate postabortion insertion versus delayed postabortion insertion of IUDs (100, 105). No published studies report on IUD insertion immediately after second-trimester medical induction, but the Royal College of Obstetricians and Gynaecologists endorses this practice (106).

Summary of Recommendations and Conclusions

The following recommendations and conclusions are based on good and consistent scientific evidence (Level A):

- Cervical preparation is recommended before D&E to decrease risk of cervical trauma.
- Mifepristone followed in 24–48 hours by misoprostol is the most effective regimen for second-trimester medical abortion.
- Misoprostol as a single agent is effective for medical abortion.
- Administration of prophylactic antibiotics decreases the risk of infection after surgical abortion and, therefore, should be provided to all patients undergoing D&E.
- Except for hysteroscopic sterilization, diaphragm, or cervical cap, all forms of contraception can be considered after second-trimester abortion and initiated on the day of the procedure.

The following recommendations and conclusions are based on limited or inconsistent scientific evidence (Level B):

- Dilation and evacuation is associated with fewer complications than medical abortion involving misoprostol regimens.
- When there is a suspicion of abnormal placentation, D&E is the preferred abortion method, and preparations should be made for possible hemorrhage by ensuring the procedure is performed at an appropriate facility with accessibility to blood products, interventional radiology, and the capability to perform a hysterectomy if necessary.
- The use of vasopressin in the paracervical block may decrease blood loss from D&E.
- Methylergonovine maleate is an appropriate first-line uterotonic agent unless contraindicated, as in patients with hypertension. Misoprostol is an effective agent in the setting of postabortion hemorrhage, and doses of 800–1,000 micrograms are recommended.
- If refractory bleeding is thought to be due to atony or lower uterine segment bleeding, a Foley catheter or intrauterine balloon should be inserted to tamponade the endometrial cavity.
- Because the risk of uterine rupture associated with prior cesarean delivery is similar to the risk among women without a prior cesarean delivery, guidelines support the safety of misoprostol specifically and medical abortion generally in women with one prior cesarean delivery.

The following recommendations are based primarily on consensus and expert opinion (Level C):

- In order to ensure access to D&E, residency training programs should offer integrated abortion training that includes second-trimester D&E.

- All physicians should facilitate timely referrals for abortion care to reduce delays in accessing services.
- Interventions to improve and facilitate early identification of pregnancy should be encouraged, including efforts to educate women about the signs and symptoms of pregnancy.

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The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1990–November 2012. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles. When reliable research was not available, expert opinions from obstetrician–gynecologists were used.

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

I	Evidence obtained from at least one properly designed randomized controlled trial.
II-1	Evidence obtained from well-designed controlled trials without randomization.
II-2	Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.
II-3	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.
III	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A—Recommendations are based on good and consistent scientific evidence.

Level B—Recommendations are based on limited or inconsistent scientific evidence.

Level C—Recommendations are based primarily on consensus and expert opinion.

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