INTRODUCTION

Access to safe abortion care and family planning services is an integral component of maternal health care [1-4]. This topic will review general issues regarding pregnancy termination, including preprocedure evaluation, choice of method, and complications. Techniques for first- and second-trimester procedures are discussed separately.

- (See "First-trimester pregnancy termination: Uterine aspiration").
- (See "First-trimester pregnancy termination: Medication abortion").
- (See "Overview of second-trimester pregnancy termination").

EPIDEMIOLOGY

Worldwide, the estimated rate for abortion from 2010 to 2014 was 35 per 1000 women ages 15 to 44 [5]. The rate in resource-rich countries was 27 per 1000 and in resource-limited countries was 37 per 1000. The highest rate was in the Caribbean (65 per 1000), and the lowest rate was in North America (17 per 1000) and northern or western Europe (18 per 1000). An estimated 25 percent of pregnancies worldwide ended in induced abortion. Similarly, in the United States, close to one in four women will have an abortion during their reproductive life [6].

Data specific to the United States from the Centers for Disease Control and Prevention (CDC) in 2018 include [7]:

- **Overall abortion rates** – The rate of pregnancy termination was 11.3 per 1000 women ages 15 to 44 years, or 189 per 1000 live births; there was a 1 percent increase in the...
rate of abortions from 2017. The CDC figures are based upon data voluntarily reported to state health agencies and may be incomplete.

- **Abortion rates by age group** – Abortion rates were highest in women ages 20 to 24 (19.1 per 1000 women) and 25 to 29 (18.5 per 1000 women). The rate of abortion in adolescents was 6.0 per 1000 women for those ages 15 to 19 compared with 0.4 per 1000 women for those age <15 years.

- **Impact of specific demographic factors** – Most terminations were performed in women who were unmarried (85 percent) and had one or more children (59 percent). Forty percent of abortions were in women who had had a prior abortion.

- **Racial disparities** – Abortion rates per 1000 women by racial group were 38.7 for non-Hispanic White, 33.6 for non-Hispanic Black, 20.0 for Hispanic, and 7.7 for other races.

- **Distribution by age of gestation** – The vast majority of pregnancy terminations in the United States were performed in the first trimester: 77.7 percent at ≤9 weeks and 92.2 percent at ≤13 weeks of gestation. For later gestational ages, 6.9 percent of abortions were performed at 14 to 20 weeks and 1.0 percent at ≥21 weeks.

Potential barriers to early abortion include expense, delay in recognition and confirmation of pregnancy, parental involvement laws, and lack of access to an abortion provider. Among all United States counties in 2014, 90 percent had no abortion provider [6].

- **Distribution of procedures**

  - **Procedure type** – For procedures occurring at nine weeks of gestation or less, medication abortion accounted for approximately 39 percent of United States patients in 2018 [7]. The range reflects differences by date of survey, the number of states included, and extrapolated data for self-administered medication. For gestational ages of ≥14 weeks, most abortions were surgical; ≤2.2 percent used other methods.

  - **Gestational age** – In the United States in 2018, it was reported that approximately 78 percent of abortions occurred at 9 weeks of gestation or earlier, 92 percent by 13 weeks of gestation or earlier, and 8 percent at 14 weeks or beyond [7].

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**PREPROCEDURE EVALUATION**

**Counseling and informed consent** — A nondirective discussion of alternatives (continuing pregnancy and parenting, adoption, and abortion) is extremely important [8]. After choosing
an abortion, counseling includes a thorough discussion of the various types of pregnancy termination procedures and the risks, benefits, and expected outcome of each to obtain informed consent. (See "Counseling in abortion care".)

In terms of emotional or psychiatric issues associated with abortion, patients may experience a variety of short- and long-term emotions, but the predominant feeling reported is relief [9]. Psychiatric outcomes associated with abortion are discussed separately. (See "Pregnancy termination and potential psychiatric outcomes".)

In the United States, some states have instituted a variety of policies that create barriers to abortion access, and many affect dimensions of clinical care. For example, some states have mandatory waiting times between when the patient is counseled and the actual procedure, some states require parental notification or consent for abortions in minors (minors have the right to seek a court order authorizing the procedure) [10], while others mandate that specific topics, some of which are medically inaccurate, be covered in the counseling session. These restrictive states have higher rates of abortion-related maternal mortality than more liberal states [11]. Abortion providers should be informed about local and federal laws covering their practice. A summary of United States abortion laws can be found through the Guttmacher Institute.

**History and physical examination** — A medical history should be elicited and a focused physical examination performed, as appropriate for the patient.

**Laboratory tests** — Pregnancy must be confirmed. This may be done by urinary or serum human chorionic gonadotropin measurement or pelvic ultrasound, if available.

The patient's hematocrit (or hemoglobin) and RhD status should be determined; other tests may be warranted depending upon the medical or surgical history or indication for the procedure.

Routine testing for gonorrhea and chlamydia infection prior to uterine aspiration is not required. Instead, gonorrhea and chlamydia screening should be based on the United States Preventive Services Task Force and Centers for Disease Control and Prevention guidelines, which recommend screening in all sexually active patients <25 years old and in any patients at increased risk of infection regardless of age. (See "Screening for sexually transmitted infections", section on 'Females'.)

**Plan for contraception** — Ovulation can occur as soon as two weeks after a first-trimester abortion; thus, offering immediate contraception (if desired) is important and can be generally initiated the day of the procedure. Contraception counseling is a routine component of preprocedure counseling and assessment. A full discussion of post-
CHOICE OF PROCEDURE

The choice of the type of procedure depends upon gestational age, patient preferences and medical conditions, clinician experience, and availability of medications and equipment.

First trimester

Candidates — The US Food and Drug Administration has approved mifepristone for medication abortion up to 70 days (≤10 weeks) of gestation. Planned Parenthood Federation of America is planning to extend the gestational limit for mifepristone/misoprostol medication abortion to 11 weeks based on reassuring results from unpublished data (see "First-trimester pregnancy termination: Medication abortion"). Patients 12 to 14 weeks are not currently eligible for medication abortion.

Approach — Medication abortion and aspiration abortion are both safe and effective procedures for appropriately selected patients [12]. The choice between the two methods is based upon availability (either in terms of clinic, provider, or remote service delivery access), gestational age, and patient preference. Ideally, patients seeking first-trimester abortion care should have access to both methods and be counseled about the benefits and limitations of each.

The main difference between aspiration and medication abortion is patient experience. The aspiration procedure takes place at a health care facility; is typically completed in less than 15 minutes; is performed under local anesthesia and/or moderate sedation; and greater than 99 percent of the time, allows patients to leave the visit knowing that the abortion is complete [13]. Medication abortion allows for the avoidance of a surgical procedure and anesthesia, and some patients feel that the process seems more natural. Some patients prefer medication abortion because they feel they have a greater degree of control over the process as they manage the procedure privately within their own home [14]. Patients should be counseled that medication abortion takes longer and that they may have a greater awareness of blood loss and passage of pregnancy tissue, particularly at later gestations [15]. For some patients, awareness of these aspects of the process may lead them to choose aspiration abortion.

Other factors that may affect the decision between abortion methods include:

• Comorbidities that favor a medical approach (eg, large uterine fibroid, uterine anomalies).
Patients place significant value on the option to choose between medication and aspiration abortion [16]. In studies where patients are allowed a choice between abortion methods, 35 to 84 percent chose medication abortion. Most patients who select medication abortion report they would opt for medication abortion again (63 to 96 percent) if they had another abortion in the future [17].

**Relative outcomes between medical and surgical approaches** — Aspiration abortion is slightly more effective than medication abortion as it results in termination of pregnancy in over 99 percent of procedures [18]. The success rate of medication abortion with mifepristone and misoprostol is 95 to 98 percent, with 2 to 5 percent of cases requiring further intervention with repeat misoprostol or suction dilation and curettage for retained tissue or continuing pregnancy [19,20]. (See "First-trimester pregnancy termination: Medication abortion", section on 'Complete abortion rates'.)

Overall, complications are more common in medication abortion than in aspiration abortion, driven largely by the need for aspiration to treat retained tissue or ongoing pregnancy [18,21-23]. Representative studies include the following:

- A state-level, insurance claims-based study (n = 50,000 abortion procedures) that captured all emergency department visits following an abortion procedure reported a complication rate of 5.2 percent for medication abortion and 1.3 percent for aspiration abortion [23].

- A study comparing the two methods was conducted at a large abortion clinic (n = 30,146 procedures) and found the efficacy of pregnancy termination was 99.6 percent for medication abortion (which included cases that required repeat misoprostol or uterine aspiration for initially incomplete procedures) and 99.8 percent for the aspiration abortion group. The medication abortion group was more likely to undergo an unanticipated aspiration for ongoing pregnancy or persistent pain, bleeding, or both (2.1 compared with 0.6 percent, respectively) [18].

A complete discussion including all of the potential complications associated with medical and surgical abortion are discussed below. (See 'Complications' below.)

**Second trimester** — The evidence and considerations regarding choice of abortion method in the second trimester are discussed in detail separately. (See "Overview of second-
PREPARATION FOR PROCEDURE

Alloimmunization prevention — Patients with bleeding during pregnancy, including bleeding from spontaneous or induced abortion at any gestational age, who are RhD-negative and unsensitized are given Rh(D) immune globulin to prevent alloimmunization, which concurs with the approach taken by United States and Canadian guidelines [24,25]. However, not all experts agree, and some fertility practices do not administer Rh(D) globulin for losses that occur prior to 56 days (eight weeks) of gestation [26]. In other countries, guidelines vary regarding whether Rh(D) immune globulin is required for first-trimester spontaneous abortion. (See "RhD alloimmunization: Prevention in pregnant and postpartum patients".)

A dose of 50 mcg is effective through the 12th week of gestation due to the small volume of red cells in the fetoplacental circulation (mean red cell volume at 8 and 12 weeks is 0.33 and 1.5 mL, respectively), although there is no harm in giving the standard 300 mcg dose, which is more readily available [24,25]. (See "RhD alloimmunization: Prevention in pregnant and postpartum patients", section on 'Anti-D immune globulin'.)

Confirmation of gestational age — Determining the correct gestational age is a critical part of preabortion care. Three approaches to determining the gestational age include menstrual dating, ultrasound evaluation, and, less commonly, measurement of fetal parts. In this topic, the gestational age refers to the date from the first day of the last menstrual period (LMP).

- Menstrual dating - In the first trimester, menstrual dating (if patients are certain of the date of their last period and have regular menses) may be determined from menstrual history and/or by clinical examination. The clinical policy guidelines of the National Abortion Federation (NAF), a professional organization of abortion providers in the United States, Canada, Mexico, and Colombia, do not mandate ultrasound preceding abortion in the first trimester since doing so is not always necessary or even helpful and might impede access to abortion in underserved regions where ultrasound is unavailable [27].

When menstrual dating is used, the date is estimated based upon the interval from the LMP and, prior to aspiration abortion or dilation and evacuation (D&E), is confirmed by bimanual examination and/or ultrasound. The reliability of LMP alone prior to medication abortion is based on confidence in the date and regularity of menstrual cycles. A systematic review of five studies that compared determination of gestational
age by LMP or ultrasound reported that 2.5 to 11.0 percent of patients who were eligible for medication abortion by LMP became ineligible after ultrasound evaluation [28]. (See "Prenatal assessment of gestational age, date of delivery, and fetal weight", section on 'Clinical assessment of gestational age'.)

- **Pelvic ultrasound examination** – Pelvic ultrasound examination may be helpful and is commonly used by abortion providers in the United States. Ultrasound examination is useful if patients are uncertain of their dates, have irregular periods, their uterine size is inconsistent with menstrual dating, or their uterine size cannot be adequately assessed. Ultrasound is also used if ectopic pregnancy or early pregnancy loss is suspected. (See "Prenatal assessment of gestational age, date of delivery, and fetal weight", section on 'Sonographic assessment of gestational age'.)

- **Measurement of fetal parts** – Measurement of fetal parts following abortion can potentially further corroborate gestational age assignment. Several formulas exist to help providers extrapolate gestational age from fetal foot length [29]. Post hoc documentation of gestational age generally offers no clinical or surgical value.

The gestational age guides choices regarding the type of procedure, including:

- **Medication versus aspiration abortion** – The US Food and Drug Administration (FDA) has approved mifepristone for medication termination of intrauterine pregnancy up to 70 days of gestation [30]. Planned Parenthood Federation of America, the largest provider of abortions in the United States, is planning to extend the gestational age for mifepristone/misoprostol abortion to up to 11 weeks based on reassuring results from as yet unpublished studies. (See "First-trimester pregnancy termination: Medication abortion", section on 'Candidates for medication abortion'.)

- **Use of vacuum aspiration** – Vacuum aspiration can typically evacuate pregnancies up to 14 weeks of gestation. More advanced gestations usually require initial use of vacuum aspiration followed by use of forceps.

**Cervical dilation and preparation** — Mechanical dilation of the cervix at the time of surgical aspiration, to allow insertion of instruments and removal of the products of conception, is usually necessary after eight weeks of gestation and sometimes for earlier gestations. Cervical preparation with osmotic dilators and/or prostaglandins are often used prior to surgical abortions performed after 12 weeks of gestation. This is discussed in detail separately. (See "Pregnancy termination: Cervical preparation for surgical procedures" and "Second-trimester pregnancy termination: Induction (medication) termination", section on 'Cervical preparation'.)
Antibiotic prophylaxis — Use of antibiotic prophylaxis varies by procedure type and other factors; this is discussed in detail for each method separately.

- (See "First-trimester pregnancy termination: Medication abortion", section on 'Prophylactic antibiotics'.)
- (See "First-trimester pregnancy termination: Uterine aspiration", section on 'Antibiotic prophylaxis'.)
- (See "Second-trimester pregnancy termination: Dilation and evacuation", section on 'Prophylactic antibiotics'.)
- (See "Second-trimester pregnancy termination: Induction (medication) termination", section on 'Prophylactic antibiotics'.)

Pain management — Pain management also varies by procedure type. For example, nonsteroidal anti-inflammatory drugs, with or without oral narcotics, are often used for first-trimester medical abortions while patients undergoing a second-trimester abortion may receive a paracervical block and intravenous conscious sedation prior to a D&E or an epidural prior to a medication induction. This is discussed in detail separately. (See "First-trimester pregnancy termination: Medication abortion", section on 'Abdominal pain' and "Second-trimester pregnancy termination: Dilation and evacuation", section on 'Anesthesia' and "Second-trimester pregnancy termination: Induction (medication) termination", section on 'Anesthesia'.)

As an adjuvant to the pain medications provided by their health care provider, some patients report the use of marijuana prior to undergoing their abortion procedure; however, marijuana has not been shown to provide additional benefit. In a randomized trial of 70 patients undergoing medical abortion at ≤70 days of gestation, patients that were given ibuprofen plus 5 mg of oral dronabinol (a synthetic form of tetrahydrocannabinol [THC]) compared with ibuprofen alone had similar maximum pain scores (pain score of 7; range 6 to 8 versus 5 to 8 on an 11-point numeric rating scale) and reported similar satisfaction rates with their overall pain management (76 versus 82 percent) [31]. Other secondary outcomes, such as anxiety and nausea, were also similar between groups. Limitations of this study include that it used an FDA-approved derivative of marijuana available by prescription only and did not evaluate higher doses or smoked products, which may provide different results [32].

Determination of procedure setting — The site of pregnancy termination depends upon the method, gestational age, patient characteristics, and local regulations. First-trimester medication abortion typically occurs at a medical office or clinic and then the patient's home or other place of choice, although other options for accessing the medications are used in
some settings (telemedicine, pharmacy, postal options). FDA restrictions on prescribing mifepristone limit direct pharmacy access. First-trimester aspiration abortion and second-trimester D&E are typically performed in outpatient settings, such as in a clinic, a clinician's office equipped with a procedure room, an ambulatory surgery center, and sometimes in a hospital-based procedure or operating room. Second-trimester induction can be performed in appropriately staffed and equipped outpatient facilities or hospitals, on a labor and delivery unit, or on a family planning unit within the hospital. Hospitalization may be required for patients with medical conditions that place them at higher risk of medical or surgical complications (eg, cardiac disease, coagulopathy). Additional information on the setting by procedure type is discussed separately.

- (See "First-trimester pregnancy termination: Medication abortion", section on 'Settings'.)
- (See "First-trimester pregnancy termination: Uterine aspiration", section on 'Procedure setting'.)
- (See "Overview of second-trimester pregnancy termination", section on 'Procedure setting'.)

**Safety by setting** — Various types of outpatient settings appear to be safe for abortion procedures. In a study of over 50,000 abortions from a United States private insurance database, across all types of procedures, the incidence of adverse events was comparable for procedures performed in either an ambulatory surgery center or office-based setting (any adverse event: 3.3 versus 3.3 percent; major event: 0.3 versus 0.3 percent) [33]. Also, among the over 12,000 second-trimester or later abortion procedures in the study, there was no difference in the incidence of adverse events associated with ambulatory surgery centers compared with office-based settings (2.6 versus 2.6 percent).

**Guidelines for staff and equipment** — Clinics or hospitals that provide pregnancy termination must have the appropriate medical staff, equipment, and medication to perform the procedure and manage complications and to provide analgesia and anesthesia. The National Abortion Federation (NAF), a professional organization of abortion providers in the United States, Canada, Mexico, and Colombia, has issued clinical policy guidelines regarding medical personnel and facilities that provide pregnancy termination care [34]. These stipulate, for example, that abortions should be provided by a licensed practitioner. The minimum requirements for a facility include on-site presence of a medical staff member with updated basic life support certification; an oxygen delivery system, oral airways, self-inflating respirator bags and bronchodilators; and uterotonic and vasopressors, including epinephrine. In settings in which opioids or benzodiazepines are used, appropriate antagonists must be available.
It is useful for outpatient clinics to have written protocols to address emergencies, particularly indications for emergency transport to a hospital and contact information for personnel who are able to be immediately available to facilitate transport.

**FOLLOW-UP**

After a surgical aspiration, patients may pass small clots of blood from the vagina. They also may experience some lower abdominal cramping and vaginal bleeding that is comparable to menstrual flow in volume and that decreases over time. Most patients experience mild lower abdominal cramping for two to four days after the procedure, which can be treated with nonsteroidal anti-inflammatory drugs. The provider should be called if heavy bleeding, fever, or abdominal pain develops. Postprocedure care and instructions are provided in writing and reviewed verbally (table 1).

Many providers schedule a follow-up visit or telephone call two to four weeks after the abortion procedure to confirm that the abortion is complete and to diagnose and treat complications. This is generally not necessary when inspection of the pregnancy tissue confirms completion. There is no evidence that routine in-person follow-up after first-trimester abortion is necessary to detect conditions that patients themselves could be taught to recognize [35]. Patient education about signs of incomplete abortion, ectopic pregnancy, and infection may be adequate, with more intensive or in-person follow-up offered to those who might benefit from additional contact or who require more psychosocial support.

Patients are educated that they should contact the clinicians if pregnancy symptoms have not resolved within one week or if menses have not returned by six to eight weeks after the procedure [35]. Persistent symptoms could represent ongoing intrauterine or ectopic pregnancy or incomplete abortion.

After induced abortion, human chorionic gonadotropin (hCG) is detectable for as long as 60 days, with a median of 30 days after uterine evacuation [36-40]; therefore, the presence of hCG is not generally useful for diagnosis of incomplete abortion and should not be ordered for this indication.

Historically, patients have been counseled to avoid vaginal intercourse and use of tampons for two weeks after the procedure to reduce the risk of infection. However, these instructions are not evidence-based and are no longer advised by the author.

**COMPLICATIONS**
**Overall** — The rate of complications associated with pregnancy termination depends upon the method, gestational age, patient characteristics, and clinician skill and experience. In general, the risk of a major complication is low. This was illustrated in a retrospective study of California Medicaid data from 54,911 abortion procedures, which found an overall complication rate of 2.1 percent [23]. Rates of major (require hospital admission, surgery, or transfusion) and minor complications were:

- **First-trimester aspiration** – Major 0.16 percent; minor 1.10 percent
- **Medication abortion** – Major 0.31 percent; minor 4.88 percent

Complication rates may be higher in patients with medical conditions. A study based on national United States inpatient data from 2000 to 2011 of patients who underwent a medically necessary abortion (defined as needed to protect a patient's health; n = 538,016,845) reported a rate of severe maternal morbidity of 62.4 per 10,000 hospitalizations [41].

**Hemorrhage** — Postabortion hemorrhage may result from uterine atony, a cervical laceration, uterine perforation, or retained tissue. Other causes of hemorrhage include infection, uterine arteriovenous malformation, placenta accreta, vaginal laceration, and coagulopathy (secondary to release of tissue thromboplastin into the maternal venous system). Hemorrhage is generally uncommon and occurs in less than 1 percent of abortions [42]. Treatment of postabortion hemorrhage is similar to postpartum hemorrhage following vaginal delivery. (See "Postpartum hemorrhage: Medical and minimally invasive management".)

The Society of Family Planning guidelines advise the following general approach to postabortion hemorrhage [42]:

- Assessment and examination, including repair of bleeding cervical or vaginal lacerations. The risk of cervical laceration can be reduced by using cervical preparation with osmotic dilators or prostaglandins.
- Uterine massage and medical uterotonic therapy.
- Resuscitative measures (eg, fluid replacement, oxygenation) with laboratory evaluation and possible reaspiration or intrauterine balloon tamponade.
- Additional interventions (eg, embolization, surgery).

Uterine atony can be treated with uterotonic agents, including:

- **Methylergonovine maleate** – Methylergonovine maleate is a semisynthetic ergot alkaloid that causes myometrial contractions. The initial dose is 0.2 mg given
intragamely (IM) [43]. While repeat dosing is controversial, in the setting of severe hemorrhage, some providers repeat methylergonovine maleate 0.2 mg IM every two to four hours. Hypertension is the most common adverse reaction; the drug should not be used in patients with existing hypertension [43]. (See "Postpartum hemorrhage: Medical and minimally invasive management", section on 'Administer additional uterotonic drugs and consider tamponade'.)

- **Carboprost** – Carboprost tromethamine injection (commercial name Hemabate) is a synthetic 15 methyl-PGF2 alpha that causes myometrial contractions [44]. The initial dose is 250 mcg IM. Repeat doses may be given at 15 to 90 minute intervals, for a total dose not to exceed 2 mg (ie, eight doses). Common side effects include nausea, vomiting, diarrhea, and flushing. Carboprost should not be given to patients with asthma. (See "Postpartum hemorrhage: Medical and minimally invasive management", section on 'Administer additional uterotonic drugs and consider tamponade'.

- **Misoprostol** – Misoprostol (PGE1) tablets can be given as 800 to 1000 mcg per rectum or sublingually [42]. Use of misoprostol for uterine atony is off-label. It may be helpful in settings where injectable uterotonics are unavailable or contraindicated (eg, hypertension, asthma). (See "Postpartum hemorrhage: Medical and minimally invasive management", section on 'Administer additional uterotonic drugs and consider tamponade'.

Retained products of conception may result in excessive bleeding; the uterus should be explored and evacuated if appropriate. As a temporizing measure to tamponade bleeding, a Foley catheter can be placed into the uterine cavity and the 30 mL balloon expanded with 50 to 60 mL saline or water.

Pelvic embolization may be used for treatment of hemorrhage if other measures are not successful and the patient is stable [45,46]. Bleeding that continues despite all other measures may require uterine artery ligation or hysterectomy, but this is rare after abortion. (See "Postpartum hemorrhage: Management approaches requiring laparotomy".)

**Uterine perforation** — Suspected uterine perforation requires further evaluation. The specific location of a uterine perforation determines the symptoms and degree of hemorrhage.

Two factors associated with a decreased risk of perforation during pregnancy termination are surgeons' experience (residents have a 5.5-fold increase in perforations as compared with attending staff) and achievement of adequate preoperative cervical dilation with osmotic dilators [47].
Uterine perforation is discussed in detail separately. (See "Uterine perforation during gynecologic procedures").

**Infection/retained products of conception** — Retained tissue is an uncommon complication of pregnancy termination. Patients may develop postabortion endometritis either with or without retained gestational tissue.

Signs and symptoms are similar for isolated endometritis and endometritis with retained products of conception and include fever, tender uterus, lower abdominal pain, and greater than expected uterine bleeding. Ultrasonography can evaluate for retained products in the uterine cavity. Any physical or sonographic evidence of retained products of conception should prompt consideration of suction curettage to complete evacuation of the uterus. (See "Retained products of conception in the first half of pregnancy").

In the absence of detectable retained material, a presumptive diagnosis of endometritis may be made and treated with a trial of broad spectrum antibiotic therapy, with coverage of anaerobes (eg, cefotetan [2 grams intravenously] plus doxycycline [100 mg intravenously or orally] every 12 hours). This regimen can be completed as an outpatient oral regimen for a 14 day course. An alternative outpatient regimen is ceftriaxone 250 mg IM in a single dose plus doxycycline 100 mg orally twice a day for 14 days with or without metronidazole 500 mg orally twice a day for 14 days.

Generalized abdominal tenderness, guarding, tachycardia, high fever, and prostration suggest advanced sepsis. These patients require aggressive therapy with broad spectrum intravenous antibiotics, prompt assessment for retained products of conception and removal if present, evaluation for uterine perforation, and monitoring and support in an intensive care unit.

**Maternal mortality** — Maternal mortality is lowest before 8 weeks of gestation and increases rapidly after 18 weeks of gestation (<0.3 per 100,000 induced abortions at ≤8 weeks versus 7 per 100,000 at 16 to 20 weeks and 11 per 100,000 at ≥21 weeks) [48]. Overall, elective abortion at any gestational age is safer than carrying a pregnancy to term. Estimated maternal mortality by pregnancy outcome is shown in the table (table 2).

First-trimester procedures are safer than second-trimester procedures (0.1 to 0.4 deaths per 100,000 first-trimester procedures versus 1.7 to 8.9 deaths per 100,000 second-trimester procedures) [48]. Aspiration abortion has the lowest maternal mortality rate of any surgical pregnancy termination method. One study reported no maternal deaths in 170,000 consecutive first-trimester suction curettage procedures [49]. Moreover, the overall death rate from all legal abortions (0.7 per 100,000 operations [50]) was far less than the maternal mortality rate of 8.8 per 100,000 live births in the United States from 1998 to 2005 [48,51]. For counseling purposes, this risk can be compared with other procedures, such as plastic
surgery procedures (0.8 to 1.7 deaths per 100,000) or dental procedures (0 to 1.7 deaths per 100,000) [50].

Deaths from unsafe illegal abortions account for a significant percentage of all maternal deaths worldwide. The World Health Organization estimated that 8 percent of maternal mortality was due to abortion-related complications in the setting of unsafe abortion [52]. In some resource-limited countries where abortion is illegal, ≥25 percent of all maternal deaths are abortion related [53]. Deaths in places where abortion is illegal have decreased due to increased reliance on medication abortion and better treatment of complications [54].

SPECIAL CONSIDERATIONS

Abortions during COVID-19 — During the current coronavirus disease 2019 (COVID-19) pandemic, where access to medical care may be limited, there has been increased pressure to halt abortion services [55]. The American College of Obstetricians and Gynecologists, together with a number of other professional societies, issued a statement in March 2020 that they "do not support COVID-19 responses that cancel or delay abortion services" as abortion services are time-sensitive and an essential component of women's health care [56].

Other recommendations that have been published regarding abortion services and COVID-19 include the following:

- The Planned Parenthood Federation of America has adopted the recommendations of the National Abortion Federation to temporarily forgo Rh typing (and administration of anti-D immune globulin to D-negative patients) for abortions performed <56 days (<8 weeks) of gestation as the risk of alloimmunization is thought to be negligible in these cases. (See "First-trimester pregnancy termination: Medication abortion", section on 'Potential laboratory testing'.)

- Practices are increasing utilization of telemedicine visits to avoid in-person visits; for example, more medication abortions are being offered through videoconferencing sessions, and medications are being distributed by the clinician remotely (eg, by mail). In addition, postabortion follow-up visits are occurring over the phone as soon as one week after misoprostol administration, with the patient using a home urine pregnancy test four weeks after taking misoprostol (instead of a transvaginal ultrasound or serum human chorionic gonadotropin [hCG] level) to confirm the abortion is complete. (See "First-trimester pregnancy termination: Medication abortion", section on 'Settings' and "First-trimester pregnancy termination: Medication abortion", section on 'Final step: Follow-up and confirmation of complete abortion'.)
Unsafe abortion — Using standards set by the World Health Organization, abortion is considered medically safe when recommended methods are used by trained persons. Applying these criteria, 45 percent of abortions are considered unsafe, and nearly 22 million unsafe abortions occurred worldwide in 2015 [54,57]. Unsafe abortion is a major factor in maternal morbidity and mortality and accounts for a proportion of maternal deaths worldwide each year. The risk of complications and death from unsafe abortion is inversely related to the provider's skill, conditions for performing the procedure, and availability of appropriate equipment. Some unsafe abortions are self-induced; the consequences in these cases also depend on whether the patient accesses medication abortion and whether the patient seeks medical care. In general, abortion care in restrictive settings has become less unsafe due to increased reliance on medication abortion and improved postabortion care treatment. (See "Unsafe abortion").

Ongoing pregnancy — Ongoing pregnancy is more likely to be a complication of early rather than late abortion. All patients will continue to have an elevated level of hCG for a short period following pregnancy termination. Return of the serum hCG concentration to undetectable following pregnancy termination varies widely from 7 to 60 days [37]. The duration depends primarily upon the hCG concentration at the time of termination. The hCG concentration peaks at 8 to 11 weeks at approximately 90,000 milli-international units. This is in contrast with term pregnancy for which the hCG concentration is lower. The decline in serum hCG is rapid for the first several days (half-life 9 to 31 hours) and then proceeds more slowly (half-life 55 to 64 hours) [58-60]. (See "Human chorionic gonadotropin: Biochemistry and measurement in pregnancy and disease").

An ongoing intrauterine pregnancy may occur after an attempted pregnancy termination if the products of conception are not closely examined by an experienced clinician at the time of the procedure to verify successful completion. (See "First-trimester pregnancy termination: Uterine aspiration", section on 'Tissue evaluation'.)

Alternatively, ongoing pregnancy may rarely result from a multiple gestation in which only one of the sacs is removed. In one series of 12,138 consecutive abortions with careful examination of the pathologic specimen, three continuing pregnancies were later diagnosed and attributed to clinician error [61]. Two were at six weeks and one was at eight weeks of gestation. A second series reported an ongoing pregnancy rate of 1.3 per 1000 procedures for pregnancies less than six weeks of gestation [62]. The type and risk of possible damage to the ongoing pregnancy from an attempted abortion cannot be quantified. Direct or indirect injury to the developing embryo could occur. (See "First-trimester pregnancy termination: Medication abortion", section on 'Teratogenicity'.)

Future pregnancies — While conflicting results have been reported from studies evaluating whether prior induced abortion is a risk factor for preterm delivery or low birth weight in a
subsequent pregnancy, the evidence overall suggests that abortion has no effects on subsequent pregnancy \[63-66\].

- **First-trimester aspiration abortion** – Data conflict regarding the effect of first-trimester aspiration abortion on subsequent pregnancy outcomes. Variables that may have affected outcomes include study design, abortion techniques, and time period of the included studies, which may reflect changes in postabortion or pregnancy care.

  - A 1983 review of 10 studies of the long-term impact of first-trimester aspiration abortion found that patients whose first pregnancy ended in induced abortion had no greater risk of bearing low birth weight babies, delivering prematurely, or suffering spontaneous abortions in subsequent pregnancies than patients who carried their first pregnancy to term \[63\].

  - In a 2015 meta-analysis of 31 studies including over 900,000 patients with a history of surgical abortion compared with patients without uterus instrumentation, prior surgical abortion was associated with an increased relative risk of preterm delivery, low birth weight, and small for gestational age (SGA) infants, although the absolute risk remained small \[67\]. The reported outcomes were: (1) preterm birth, 5.4 versus 4.4 percent, odds ratio (OR) 1.52, 95% CI 1.08-2.16; (2) low birth weight, 7.3 versus 5.9 percent, OR 1.41, 95% CI 1.22-1.62; and (3) SGA, 10.2 versus 9.0 percent, OR 1.19, 95% CI 1.01-1.42.

- **First-trimester medication abortion** – Several studies have reported similar risk of adverse obstetric outcomes among patients with first-trimester medication abortion compared with no uterus instrumentation or surgical abortion \[67,68\]. In the above 2015 meta-analysis, the risk of preterm birth was similar for patients with prior medication abortion compared with those with no uterus evacuation (28.2 versus 29.5 percent, OR 1.50, 95% CI 1.00-2.25; three studies, 10,253 patients) \[67\]. A 2013 study of over 8000 primigravid patients reported similar rates of preterm delivery, low birth weight, SGA infants, or placental complications in subsequent singleton pregnancies among patients who had undergone either medication or surgical abortion \[68\].

- **Second-trimester evacuation abortion** – A Finnish register study of over 88,000 primigravid patients who underwent either first- or second-trimester pregnancy termination and had a subsequent live birth reported similar risks of preterm delivery, low birth weight, SGA infants, and placental complications between the two trimester groups \[69\]. Two older series addressing future pregnancy in patients who underwent a prior second-trimester evacuation procedure using laminaria did not report any cases of spontaneous midtrimester loss nor an increased risk of spontaneous preterm birth \[70,71\]. (See "Preterm birth: Risk factors, interventions for risk reduction, and maternal prognosis", section on 'History of abortion'.)
The possibility of a link between induced abortion and subsequent placental problems has also been studied. A report of all primigravid patients delivering in Denmark from 1980 to 1982 used data from the Danish Birth, Hospital Discharge, and Induced Abortion Registries to compare the risk of placental complications in subsequent pregnancy among 15,727 patients who underwent first-trimester termination and 46,026 patients who did not have a termination [72]. There was no difference in the risk of placenta previa, but patients with a previous termination had a slightly higher rate of retained placenta (OR 1.17, 95% CI 1.02-1.35).

**Breast cancer** — A United States National Cancer Institute meta-analysis included individual data from 83,000 women in 16 countries in 53 studies and reported that the risk of breast cancer was not increased in those with a history of induced abortion (relative risk 0.93, 95% CI 0.89-0.96) [73]. Other published studies have confirmed this conclusion [74-77]. By contrast, a meta-analysis of 36 comparative studies in China found that a history of induced abortion was associated with a significant increase in the risk of breast cancer (OR 1.44, 95% CI 1.29-1.59) [78].

**Ongoing health** — In a prospective cohort study of 874 patients with undesired pregnancy that compared the long-term health impact of first-trimester abortion, second-trimester abortion, and pregnancy continuation with birth, self-rated health and chronic pain outcomes were similar between the first- and second-trimester abortion groups at five years [79]. When abortion was compared with live birth, fair to poor health was reported by more patients who continued the pregnancy to birth than patients who underwent first- or second-trimester termination (27, 20, and 21 percent, respectively). A detailed discussion about the effects of abortion on mental health are discussed elsewhere. (See "Pregnancy termination and potential psychiatric outcomes".)

**SOCIETY GUIDELINE LINKS**

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Pregnancy termination".)

**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 topic (see "Patient education: Abortion (The Basics)"

- Beyond the Basics topic (see "Patient education: Abortion (pregnancy termination) (Beyond the Basics)"

**SUMMARY AND RECOMMENDATIONS**

- A nondirective discussion of alternatives (continuing pregnancy and parenting, adoption, and abortion) is extremely important. Once the patient has chosen abortion, counseling includes a thorough discussion of the types of pregnancy termination procedures and the risks, benefits, and expected outcome of each procedure to obtain informed consent. (See 'Counseling and informed consent' above.)

- Pregnancy must be confirmed by urinary or serum human chorionic gonadotropin measurement or pelvic ultrasound, if available. The gestational age should be determined by both menstrual history and examination; ultrasound examination is useful if there is any uncertainty and at advanced gestational ages. (See 'Confirmation of gestational age' above.)

- As ovulation can occur as soon as two weeks after a first-trimester abortion, contraception counseling is typically offered to patients during their preprocedure counseling and assessment. (See 'Plan for contraception' above.)

- For patients undergoing abortion at <70 days of gestation, either medication or surgical abortion are appropriate options. The choice between medication abortion and aspiration is based upon gestational age, availability, and patient preference. Patients who place value on avoiding surgery or anesthesia and who are willing to accept more discomfort and awareness of blood and tissue loss may opt for a medication abortion. Patients who place a high value on completing the procedure in one visit are more likely to choose aspiration abortion. (See 'Choice of procedure' above.)

- RhD status should be determined. RhD-negative patients should receive anti-D immune globulin after the procedure. (See 'Alloimmunization prevention' above.)
• Mechanical cervical dilation before uterine aspiration is generally required after eight weeks of gestation (and sometimes before). Cervical preparation with osmotic dilators and/or prostaglandins is generally necessary after 14 weeks of gestation to more slowly dilate the cervix before dilation and evacuation. (See 'Cervical dilation and preparation' above.)

• Potential complications include hemorrhage, uterine perforation, infection, and retained products of conception. The overall risk of major complication is low. Postprocedure care instructions are provided verbally and in writing (table 1). (See 'Follow-up' above and 'Complications' above.)

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REFERENCES


Overview of pregnancy termination - UpToDate

https://www.uptodate.com/contents/overview-of-pregnancy-termination/print

1979; 135:731.


Topic 3313 Version 43.0
## Taking care of yourself after a uterine aspiration or D&E

### What problems should I watch out for?

Contact your clinician if you:
- Have a fever higher than 100.4°F (38°C) or have chills
- Have too much bleeding (soaking 2 maxi-pads an hour for 2 hours straight)
- Have bad cramps that don’t get better over time or with ibuprofen (Advil, Motrin) or Norco
- Have green, yellow, or bad-smelling vaginal discharge
- Your period hasn’t come after 2 months (and you’re not using a hormonal birth control method)

### How should I take care of myself?

You may return to usual activities, but it may be a good idea to avoid vigorous exercise for a few days. Avoid an activity if it causes pain or if you notice that your bleeding is increasing.

During the 24 hours after receiving sedation or at any time while taking narcotic pain medicines (such as Norco or Tylenol with codeine), do not drive or operate machinery, drink alcohol, or make any important decisions. Follow the instructions on your prescription bottle(s).

### What should I expect?

It is normal to have bleeding.
Bleeding is different for every person. You may bleed only 1 day, or off and on for up to a month. The flow may be anything from just spotting or brown discharge to fairly heavy. You may bleed more when you exercise or lift heavy objects. You should bleed less when you rest.

It is normal to have cramps for a few days.
Take ibuprofen (Advil, Motrin). If you need something stronger (or have an allergy to ibuprofen), take Norco. You may want to put a hot water bottle or heating pad on your belly or back to help you feel better.

It is normal to have swollen breasts and have milk letdown.
Do not touch or squeeze your breasts or nipples. You will feel more comfortable if you wear a tight bra or sports bra even at night. If you have pain, apply cold ice packs to your breasts and/or take ibuprofen. The pain and fluid will go away more quickly the less your breasts or nipples move or are touched.

It is normal to have a range of emotions.

It is normal not to have another period for 1 to 2 months.
Even if your period hasn’t come back yet, you can still get pregnant. You can get pregnant as soon as 2 weeks after your procedure.

### Should I make a follow-up appointment?

A follow-up appointment is not required unless you are experiencing symptoms that worry you. However, if you are due for your Pap smear, want to refill or change your birth control method, or ask other questions about your health, please make an appointment with your local health care provider.

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D&E: dilation and evacuation.

*Courtesy of Jody Steinauer, MD, MAS.*

Graphic 126344 Version 1.0
### Estimated pregnancy related maternal mortality

<table>
<thead>
<tr>
<th>Type of pregnancy</th>
<th>Death rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal pregnancy termination</td>
<td>0.567 per 100,000 terminations</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>1.19 per 100,000 miscarriages</td>
</tr>
<tr>
<td>Live birth</td>
<td>7.06 per 100,000 live births</td>
</tr>
<tr>
<td>Ectopic pregnancy</td>
<td>31.9 per 100,000 ectopic pregnancies</td>
</tr>
</tbody>
</table>


*Adapted from Grimes D. Am J Obstet Gynecol 2006; 194:92.*

Graphic 63961 Version 2.0
Contributor Disclosures

Jody Steinauer, MD, MAS  Nothing to disclose  Robert L Barbieri, MD  Nothing to disclose  Alana Chakrabarti, MD  Nothing to disclose

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