Clinical Updates in Reproductive Health

January 2015

Clinical Updates in Reproductive Health are designed to provide Ipas staff, trainers, partners and other health-care providers with access to up-to-date, evidence-based recommendations. In general, the recommendations are the same as those in the World Health Organization’s 2012 Safe Abortion: Technical and Policy Guidance for Health Systems, Second edition. In rare cases, the recommendations have been modified due to the settings where we work. In addition, if there is more current evidence to inform the recommendations, they will be updated here.

Ipas works around the world to increase women’s ability to exercise their sexual and reproductive rights, especially the right to safe abortion. You can find more information at www.ipas.org.

Revisions: This document is updated once a year; please see the “last reviewed” date for each topic. The information for each Clinical Update topic is current through the listed “last reviewed” date, meaning all relevant published literature up to that date has been considered and included where appropriate.
Acknowledgements

Editor: Alice Mark

Thanks to the following people for giving their time and expertise to the development of this publication:

Dalia Brahmi
Laura Castleman
Jennifer Colletti
Alison Edelman
Mary Fjerstad
Karen Padilla
Alice Mark
Emily Jackson
Bill Powell
Sarah Settle
Laura Schoedler
Jessica Reinholz
Lisette Silva

Thanks also to Ipas staff and consultants who contributed to the development of previous versions of the content in this publication:

Rebecca Allen
Lynn Borgatta
Anne Burke
Catherine Casino
Talemoh Dah
Gillian Dean
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Vinita Goyal
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Radha Lewis
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Lisa Memmel
Regina Renner
CURH-E15 January 2015

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Produced in the United States of America.

Suggested citation:

Ipas works globally to increase women’s ability to exercise their sexual and reproductive rights and to reduce abortion-related deaths and injuries. We seek to expand the availability, quality and sustainability of abortion and related reproductive health services, as well as to improve the enabling environment. Ipas believes that no woman should have to risk her life or her health because she lacks safe reproductive health choices.

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Making Ipas clinical recommendations
First-trimester vacuum aspiration and medical abortion: Screening for ectopic pregnancy

**Recommendation:**
Ectopic pregnancy should be considered in women presenting for abortion who also have a concerning history or exam.

**Strength of recommendation: Strong**

**Quality of evidence: Moderate**

**Last reviewed: December 4, 2014**

**Background**
Although the rate of ectopic pregnancy in women seeking abortion is less than one percent (Edwards & Creinin, 1997), ectopic pregnancy is a leading cause of maternal mortality in the first trimester (CDC, 1995; Khan, Wojdyla, Say, Gulmezoglu, & Van Look, 2006; WHO, 1985).

**Risk factors**
A woman’s medical history and physical exam may indicate an increased risk of ectopic pregnancy; however, half of all ectopic pregnancies occur in women with no risk factors and a benign clinical presentation (Stovall, Kellerman, Ling, & Buster, 1990). Risk factors with the highest associated risk of ectopic pregnancy in pregnant women are shown in this table:

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Risk of ectopic in the current pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous ectopic pregnancy</td>
<td>10-15 percent (Yao &amp; Tulandi, 1997)</td>
</tr>
<tr>
<td>History of tubal surgery, including sterilization</td>
<td>25-50 percent (Barnhart, 2009)</td>
</tr>
<tr>
<td>IUD in place</td>
<td>25-50 percent (Barnhart, 2009)</td>
</tr>
</tbody>
</table>

Other risk factors—such as a history of infertility and assisted reproductive technology, a history of genital or pelvic infections, multiple partners, early age at first intercourse, and smoking—confer lower risks (Barnhart, 2009).

**Screening**
Providers should screen women for risk factors for ectopic pregnancy during the history and physical exam. A screening checklist should include relevant history, such as a history of ectopic pregnancy, tubal ligation, tubal surgery or an IUD in place. The screening checklist should also include signs and symptoms, such as an adnexal mass or pain on examination, or pain and vaginal bleeding.

**Treatment for high-risk women**
A woman desiring abortion who has risk factors for ectopic pregnancy with a benign physical exam can be evaluated further with ultrasound or serial hCG testing, but access to testing may be limited in low-resource
settings (Obed, 2006). A provider may also offer a woman vacuum aspiration with tissue examination to confirm the diagnosis of intrauterine pregnancy rather than a medical abortion. A woman with suspicious signs and symptoms or a concerning physical exam should be diagnosed and treated as soon as possible or transferred immediately to a facility that can manage ectopic pregnancy. Early diagnosis and treatment of ectopic pregnancy can help preserve fertility and save women’s lives.

**Post-procedure screening**
For women undergoing vacuum aspiration, the products of conception should be strained and examined to confirm products of conception in the aspirate. If products of conception are not seen, ectopic pregnancy should be suspected and followed closely.

**Young women**
This recommendation is the same for young women.

**References**


First-trimester vacuum aspiration: Success and complication rates

Summary of evidence:
Vacuum aspiration is effective and safe, with success rates over 98 percent and complication rates under two percent. Serious adverse events during first-trimester vacuum aspiration are very rare.

Quality of evidence: High

Last reviewed: November 24, 2014

Success
Vacuum aspiration success is defined as an abortion requiring no further intervention. In a large United States-based observational study of 11,487 first-trimester aspiration abortions done by physicians, nurse practitioners, certified nurse midwives and physicians assistants, the need for repeat aspiration due to incomplete abortion was 0.28 percent and ongoing pregnancy was 0.16 percent (Weitz et al., 2013).

Complication rates
The total complication rate in this same study was 1.3 percent (Weitz, et al., 2013). Complications included incomplete and failed abortion, infection, perforation and re-aspiration for bleeding or hematometra. The rate of serious adverse events that required hospital-based care (perforation, infection and hemorrhage requiring transfusion) was 0.05 percent. There were no deaths. Studies looking at different cadres of providers (physicians, nurses, nurse midwives, etc.) in other settings have had similar results (Hakim-Elahi, Tovell, & Burnhill, 1990; Jejeebhoy et al., 2011; Warriner et al., 2006). Complication rates are lower with more experienced providers (Child, Thomas, Rees & MacKenzie, 2001).

Mortality rates
In the United States, the mortality rate from legal induced abortion is 0.64 deaths per 100,000 reported abortions (Pazol, Creanga, Zane, Burley, & Jamieson, 2012). In comparison, in the United States in 2009 the mortality rate from live birth was 17.8 deaths per 100,000 live births (CDC, 2013).

Young women
Young women and adolescents have similar success and lower complication rates for first-trimester vacuum aspiration (Cates, Schulz & Grimes, 1983). See Clinical Update on First-trimester safety of vacuum aspiration for adolescent and young women.
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Complications Table

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of women</td>
<td>11,487</td>
<td>170,000</td>
<td>897</td>
<td>2789</td>
</tr>
<tr>
<td>Location</td>
<td>USA</td>
<td>USA</td>
<td>India</td>
<td>South Africa and Vietnam</td>
</tr>
<tr>
<td>Provider type</td>
<td>Physicians and newly trained nurse practitioners, certified nurse midwives and physician assistants</td>
<td>Experienced physicians</td>
<td>Newly trained physicians and nurses</td>
<td>Experienced physicians, midwives and doctor-assistants</td>
</tr>
<tr>
<td>Total minor complication rate</td>
<td>1.3%</td>
<td>0.85%</td>
<td>1% (all reported as incomplete abortion)</td>
<td>1%</td>
</tr>
<tr>
<td>Incomplete abortion</td>
<td>0.3%</td>
<td>Not reported (0.35% re-aspiration rate)</td>
<td>1%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Ongoing pregnancy</td>
<td>0.16%</td>
<td>None reported</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Minor infection</td>
<td>0.12%</td>
<td>0.5%</td>
<td>---</td>
<td>0.1%</td>
</tr>
<tr>
<td>Uncomplicated perforation</td>
<td>0.03%</td>
<td>None reported</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Total major complication rate</td>
<td>0.05% (6 complications, 2 perforations, 3 infections and 1 hemorrhage)</td>
<td>0.07% (hospitalizations for perforation, ectopic pregnancy, hemorrhage, sepsis or incomplete abortion)</td>
<td>0.12% (1 complication, high fever)</td>
<td>None reported</td>
</tr>
</tbody>
</table>

References


First-trimester vacuum aspiration: Safety of vacuum aspiration for adolescent and young women

Recommendation:
- Vacuum aspiration for adolescent and young women is very safe and should be offered as a method of safe abortion.
- Cervical preparation may be considered for young adolescents prior to vacuum aspiration due to their increased risk of cervical injury.
- Clinical services should promote timely access to safe abortion for young women.

Strength of recommendation: Strong

Quality of evidence: Moderate

Last reviewed: December 1, 2014

Background
The World Health Organization defines adolescents as individuals between 10 and 19 years of age, and young women as between 20 and 24 years of age. Adolescents face barriers to accessing safe abortion care and present for abortions at later gestational ages than adult women (Pazol, Creanga, Zane, Burley, & Jamieson, 2012; Sowmini, 2013). Adolescents are at increased risk of complications of unsafe abortion due to delays seeking care, seeking care from unskilled providers and not accessing services when complications arise (Olukoya, Kaya, Ferguson, & AbouZahr, 2001). Increasing access to safe abortion is beneficial for young women.

Safety of vacuum aspiration
A large prospective United States multi-center cohort study of 164,000 women undergoing legal abortion, 50,000 of whom were adolescents, found that mortality and major morbidity were lower in adolescents (Cates Jr, Schulz, & Grimes, 1983). The mortality rate was 1.3 per 100,000 in women under 20 years old compared to 2.2 per 100,000 in women age 20 and older. Serious adverse events including major surgery, hemorrhage with transfusion, and uterine perforation were less common in women under age 20.

Cervical injury
In large prospective cohort studies, very young age (<17 years old) has been associated with cervical injury during vacuum aspiration even after controlling for nulliparity (Cates Jr, et al., 1983; Schulz, Grimes, & Cates, 1983). Cervical preparation may be considered for young women prior to first-trimester vacuum aspiration (Allen & Goldberg, 2007; WHO, 2012).

References


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First-trimester vacuum aspiration: Midlevel providers

Recommendation:
Trained midlevel providers can provide first-trimester vacuum aspiration abortion as safely and effectively as physicians.

Strength of recommendation: Strong

Quality of evidence: High

Last reviewed: September 23, 2014

Background
Access to safe abortion or postabortion care can be increased by expanding the provider base to include midlevel providers. Midlevel providers include cadres of healthcare providers other than physicians such as nurses, nurse midwives, clinical officers and others.

Evidence
Multiple cohort studies and clinical trials in the United States, India, Vietnam and South Africa all show that when vacuum aspiration is performed by nurses, nurse practitioners, nurse midwives, physicians assistants or other cadres of providers, the safety and efficacy is no different than when it is performed by physicians (Freedman, Jillson, Coffin, & Novick, 1986; Goldman, Occhiuto, Peterson, Zapka, & Palmer, 2004; Jejeebhoy et al., 2011; Renner, Brahmi & Kapp, 2012; Warriner et al., 2006; Weitz et al., 2013). The similarity in safety and efficacy is true for both experienced and newly trained providers (Jejeebhoy et al., 2011; Warriner et al., 2006).

Young women
This recommendation is the same for young women.

References


First-trimester vacuum aspiration: Cervical preparation

Recommendation:
Cervical preparation is recommended after 12 to 14 weeks. Before 12 to 14 weeks, cervical preparation may be offered but does not need to be routinely used (WHO, 2012).

Recommended methods for cervical preparation in the first trimester include:
- Misoprostol 400mcg sublingually two to three hours before the procedure
- Misoprostol 400mcg vaginally three hours before the procedure
- Mifepristone 200mg orally 24 to 48 hours before the procedure
- Osmotic dilators placed in the cervix 6 to 24 hours before the procedure

Strength of recommendation: Strong

Quality of evidence: Moderate

Last reviewed: September 28, 2014

Background
Cervical preparation is recommended before surgical abortion for all women over 12 to 14 weeks gestation to prevent complications (Fox & Hayes, 2007; Kapp, Lohr, Ngo, & Hayes, 2010; WHO, 2012). For women at higher risk of complications (young women, nulliparous women, women with cervical abnormalities, or women at later gestational ages) or inexperienced providers there may be a benefit from cervical preparation even before 12 to 14 weeks gestation (Allen & Goldberg, 2007; Grimes, Schulz, & Cates, 1984; Kaunitz, Rovira, Grimes, & Schulz, 1985).

Benefits of cervical preparation
A meta-analysis of 51 randomized controlled clinical trials of cervical preparation in the first trimester showed that procedure time was shorter with cervical preparation but there was no difference in serious outcomes like cervical laceration or uterine perforation in women who were given cervical preparation compared to placebo (Kapp, et al., 2010). The largest multicenter randomized controlled trial of 4,972 women given misoprostol 400mcg vaginally or placebo three hours before a vacuum aspiration showed no difference in the rates of cervical laceration, perforation or infection between the two groups. In this study, the risk of incomplete abortion was lower in the misoprostol group (<1 percent) compared to the placebo group (2 percent), but side-effects were more frequent for women who took misoprostol (Meirik, Huong, Piaggio, Bergel, & von Hertzen, 2012).

Side-effects of cervical preparation
In randomized controlled trials, side-effects of cervical preparation are common (Kapp & vonHertzen, 2009; Meirik, et al., 2012). In the largest randomized controlled trial of misoprostol, 55 percent of women who took misoprostol complained of abdominal pain and 37 percent had vaginal bleeding compared to 22 percent and seven percent in the placebo group (Meirik, et al., 2012). In addition, cervical preparation adds cost, complexity and time to an abortion as women must visit the clinic a day before the procedure to get osmotic dilators or mifepristone or wait in the clinic for two to three hours for misoprostol to work. Because first-trimester abortion is so safe, the gestational age at which the benefit of cervical preparation outweighs the side-effects is not known
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(Kapp, et al., 2010). Women’s satisfaction with cervical preparation has not been studied in randomized controlled trials (Kapp, et al., 2010) but is an important consideration for quality of care and service delivery.

Choice of methods
If cervical preparation is used, the choice of vaginal or sublingual misoprostol, oral mifepristone or osmotic dilators may be based on availability, expense, convenience and preference. Sublingual misoprostol has superior efficacy but more gastrointestinal side effects than vaginal misoprostol (Kapp, et al., 2010). Mifepristone given 24 hours prior to the abortion is superior to misoprostol but adds time and expense to the abortion procedure (Ashok, Flett, & Templeton, 2000). Misoprostol and laminaria have similar efficacy but laminaria placement has increased pain, increased time to procedure and reduced satisfaction for women (Burnett, Corbett, & Gertenstein, 2005; Maclsaac, Grossman, Balistreri, & Darney, 1999).

Young women
Young women may benefit from cervical preparation due to their increased risk of cervical injury during abortion (Schulz, Grimes, & Cates, 1983), but there are no clinical trial data to support the use of cervical preparation in this patient population.

References


misoprostol, and vaginal misoprostol before abortion. *Obstetrics and Gynecology*, 93(5 Pt 1), 766-770.


First-trimester vacuum aspiration: Paracervical anesthesia

Recommendation:
- Paracervical anesthesia is recommended as a component of pain management during first-trimester vacuum aspiration procedures.
- Midlevel providers may give paracervical anesthesia during first-trimester aspiration procedures.

Strength of recommendation: Strong
Quality of evidence: Moderate

Last reviewed: October 14, 2014

Evidence
Many providers use local anesthesia or paracervical block (PCB) for pain management during first-trimester vacuum aspiration (O’Connell et al., 2009). A 2013 systematic review evaluating PCB for gynecologic procedures requiring cervical dilation, including abortion, found that PCB reduced pain during cervical dilation and uterine interventions, although not postprocedure pain, when compared to placebo or no anesthesia (Tangsiriwatthana, Sangkomkamhang, Lumbiganon & Laopaiboon, 2013). In a recent, high-quality randomized controlled trial of 120 women undergoing first-trimester aspiration abortion, women who received PCB had less pain during dilation and aspiration compared to women who received a sham injection. In this study, the overall rate of complications was low and there was no difference between the two groups (Renner, 2012).

Technique (Renner, 2012)
- Load a 20mL syringe with 18mL of lidocaine (one percent) buffered with 2mL sodium bicarbonate (8.4 percent).
- Attach syringe to a 20-gauge spinal needle.
- Infiltrate 2mL into the cervix superficially at the tenaculum site (located at 12 o'clock).
- Grasp the cervix with the single-tooth tenaculum.
- Inject the remaining 18mL in equal amounts at the cervicovaginal junction at the locations of two, four, eight and 10 o'clock. The injection should be continuous from superficial to a depth of three centimeters.
- Pull back on the plunger before injecting anesthesia to prevent intravascular injection.
- Begin dilation three minutes after the PCB is complete.

Midlevel providers
In an international randomized multicenter study comparing 2894 first-trimester procedures done by physician and midlevel providers, midlevel providers had similar safety and efficacy rates as physicians when performing vacuum aspiration with paracervical block (Warriner et al., 2006). The midlevel providers did not have any complications related to use of paracervical anesthesia.

Young women
This recommendation is the same for young women.
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References


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First-trimester vacuum aspiration: Pain management

**Recommendation:**
- Women undergoing first-trimester vacuum aspiration should receive pain medications and non-pharmacologic approaches to treat pain (WHO, 2012).
- General anesthesia is not routinely recommended for first-trimester pain management.

**Strength of recommendation: Strong**

**Quality of evidence: Moderate**

**Last reviewed: November 17, 2014**

**Background**
Most women undergoing first-trimester vacuum aspiration will experience pain (Smith, Stubblefield, Chirchirillo, & McCarthy, 1979). Clinicians consistently underestimate the amount of pain women experience during abortion (Singh et al., 2008).

**Methods of pain management**
For first-trimester vacuum aspiration, a combination of pain medications, local anesthesia (in the form of a paracervical block), and non-pharmacologic measures typically provide pain relief for most women (WHO 2012; Renner et al., 2010). Intravenous sedation may also be offered. General anesthesia increases the risks associated with abortion and is not recommended for routine procedures (Atrash, Cheek, & Hogue, 1988).

**Pain medication**
Premedication with non-steroidal anti-inflammatory drugs has been shown in clinical trials to decrease pain during and after the procedure (Roche, Li, James, Fechner & Tilak, 2012; Romero, Turok, & Gilliam, 2008; Suprapto & Reed, 1984; Wiebe & Rawling, 1995); both oral and intramuscular non-steroidal anti-inflammatory medications are effective (Braaten, Hurwitz, Fortin & Goldberg, 2013). Premedication with narcotic analgesics also provides pain relief but may be less effective than non-steroidal anti-inflammatory drugs (Khazin et al., 2011; Lowenstein et al., 2006; Romero, Turok & Gilliam, 2008). A randomized controlled trial of hydrocodone-acetaminophen compared to placebo showed that the addition of hydrocodone-acetaminophen to standard premedication with ibuprofen did not improve pain management and increased postoperative nausea (Micks et al., 2012). Anxiolytics such as lorazepam may be of benefit to some women, but clinical trial evidence does not support their routine use (Wiebe, Podhradsky & Dijak, 2003). Paracetamol is not effective for pain relief during vacuum aspiration (Cade & Ashley, 1993).

**Local anesthesia**
A paracervical block with 20mL of lidocaine (one percent) given three minutes before dilating the cervix has been shown to decrease pain with dilation and aspiration (Renner, Nichols, Jensen, Li, & Edelman, 2012). Paracervical block is a low risk procedure that can be performed by physicians and midlevel providers (Warriner et al., 2006).

**Non-pharmacologic pain management**
Medications should be supplemented with supportive techniques to decrease pain and anxiety. Some techniques
that may be helpful include respectful staff; a clean, secure and private setting; counseling; verbal support; gentle surgical technique; and a heating pad or hot water bottle in the recovery room. In small studies, listening to music has not been shown to improve pain relief, and may increase pain perception for some women (Guerrero et al., 2012; Wu et al., 2012)

**Intravenous sedation**

Intravenous sedation using a combination of narcotics and anxiolytics is an effective means of pain control and improves satisfaction with the abortion procedure (Allen, Kumar, Fitzmaurice, Lifford & Goldberg, 2006; Wong, Ng, Ngai & Ho, 2002). However, providing intravenous sedation increases the expense, complexity and potential risks of an abortion procedure. The increased monitoring necessary to deliver intravenous sedation safely requires facility investments in training and equipment.

**Young women**

Young and nulliparous women report increased pain during abortion procedures (Belanger, Melzack & Lauzon, 1989; Smith et al., 1979). Being attentive to young women’s needs for pain management increases the quality of abortion care.

**References**


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First-trimester vacuum aspiration: Prophylactic antibiotics

**Recommendation:**
Administer prophylactic antibiotics for all women prior to vacuum aspiration (WHO, 2012). Where antibiotics are unavailable, uterine aspiration may still be offered. Therapeutic antibiotics should be administered to all women who are suspected of or who have been diagnosed with an infection.

**Strength of recommendation: Strong**

**Quality of evidence: High**

**Last reviewed: December 4, 2014**

**Background**
A Cochrane meta-analysis of 19 randomized controlled clinical trials showed that administration of prophylactic antibiotics at the time of vacuum aspiration in the first trimester significantly reduces the risk of postabortal infection (Low, Mueller, Van Vliet, & Kapp, 2012). The World Health Organization (WHO, 2012), Society of Family Planning (Achilles & Reeves, 2011) American Congress of Obstetricians and Gynecologists (ACOG, 2009) and Royal College of Obstetricians and Gynaecologists (RCOG, 2011) recommend prophylactic antibiotics for all women having a vacuum aspiration. Giving prophylactic antibiotics is more effective (Levallois & Rioux, 1988) and cheaper (Penney et al., 1998) than screening all women and treating only those with evidence of infection. The inability to provide antibiotics should not limit access to abortion (WHO, 2012), as the overall risk of infection with vacuum aspiration is very low.

**Regimen**
Many antibiotic regimens for abortion prophylaxis have been studied, but the ideal antibiotic, dose and timing has not yet been established (Achilles & Reeves, 2011; Low, Mueller, Van Vliet, & Kapp, 2012). Tetracyclines (doxycycline) and nitroimidazoles (metronidazole and tinidazole) are commonly used because of their clinical efficacy, oral availability, low cost and low risk of allergic reactions (Achilles & Reeves, 2011). Although studies of abortion are limited, (Caruso et al., 2008) evidence from the obstetrical (Costantine et al., 2008), gynecologic (Mittendorf et al., 1993) and general surgery (Classen et al., 1992) literature supports the practice of giving antibiotics before the procedure to decrease the risk of infection. Antibiotic regimens do not need to be extended beyond the immediate postabortion period (Achilles & Reeves, 2011; Levallois & Rioux, 1988; Caruso, et al., 2008; Lichtenberg & Shott, 2003).

The following table lists regimens recommended by professional organizations. These regimens are based on clinical evidence and expert opinion. Providers should choose a regimen based on the expense and availability of the antibiotics as well as practices around testing and treating women for sexually transmitted infections.
**Common Regimens**

<table>
<thead>
<tr>
<th>Common Regimens</th>
<th>Recommender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxycycline 100mg orally one hour before the procedure and 200mg after the procedure or Metronidazole 500mg orally twice daily for five days</td>
<td>American College of Obstetricians and Gynecologists (ACOG, 2009)</td>
</tr>
<tr>
<td>Doxycycline 200mg orally before the procedure or Azithromycin 500mg orally before the procedure or Metronidazole 500mg orally before the procedure</td>
<td>Planned Parenthood Federation of America (PPFA Manual of Medical Standards and Guidelines, 2014)</td>
</tr>
</tbody>
</table>

**Therapeutic antibiotics**

If possible, women at high risk should be screened and treated for sexually transmitted infections in addition to receiving prophylactic antibiotics. Women who have signs and symptoms of active infection should be provided with abortion services without delay and treated appropriately once the procedure is completed.

**Young women**

This recommendation is the same for young women.

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**References**


First-trimester vacuum aspiration: Contraception

Recommendation:
- Immediate initiation of hormonal and non-hormonal contraception and sterilization following first-trimester aspiration abortion is encouraged and considered safe.
- Intrauterine devices (IUD) placement or female sterilization can be performed immediately following a successful, uncomplicated abortion.
- Long-acting contraceptive methods have higher continuation rates and lower repeat pregnancy rates compared to short-acting methods.

Strength of recommendation: Strong

Quality of evidence:
- IUDs and combined oral contraceptives (COCs): High
- Other methods: Low to Moderate

Last reviewed: November 30, 2014

Fertility return
A woman may ovulate within 10 days of an abortion (Boyd et al., 1972) and can become pregnant if she resumes sexual intercourse without using a modern contraceptive method).

Safety and acceptability of postabortion contraception
The 2009 WHO Medical Eligibility Criteria for Contraceptive Use classifies all contraceptive methods as category one, or safe for immediate use, following first-trimester uncomplicated aspiration abortion. Sterilization is classified as acceptable after an uncomplicated abortion. Male sterilization may be performed at any time. Fertility awareness-based methods may be initiated once a woman has had at least one postabortion menses.

In comparison to short-acting methods such as oral contraceptive pills, long-acting methods of birth control such as implants and IUDs have higher continuation rates and lower repeat pregnancy rates than other methods (Blumenthal, Wilson, Remsburg, Cullins & Huggins, 1994; Cameron et al., 2012; Langston, Joslin-Rohr, & Westhoff, 2014; Peipert, Madden, Allsworth & Secura, 2012; Roberts, Silva & Xu, 2010).

Evidence related to specific contraceptive methods

Progestin-only subdermal implants:
Cohorts of women using the etonogestrel contraceptive implant immediately after abortion show high continuation rates, similar to those of women with interval placement (Madden et al., 2012; Mark, Borgatta & Sonalkar 2013).

Intrauterine devices (IUDs):
A 2010 Cochrane review of eleven randomized trials with 7,405 women concluded that IUD insertion immediately after abortion is safe and practical (Grimes, Lopez, Schulz & Stanwood, 2010). This review found no differences in serious adverse events, such as infection or perforation, between immediate and delayed placement. Expulsion
rates were slightly higher with immediate insertion but so were long-term continuation rates. In a recent randomized controlled trial that assigned 575 women to either immediate or delayed insertion, those with delayed insertion were less likely to obtain the device and more likely to have a repeat pregnancy (Bednarek et al., 2011). Requiring a follow-up visit for IUD insertion is a significant barrier to obtaining the IUD (Stanek, Bednarek, Nichols, Jensen & Edelman, 2009).

**Progestin-only injection:**
A study of 132 women using depot medroxyprogesterone acetate immediately after abortion reported no serious adverse events but low method continuation rates (22 percent) at one year and high repeat pregnancy rates (Goldberg, Cardenas, Hubbard & Darney, 2002).

**Combined oral contraceptives (COCs):**
A recent review of seven studies including 1,739 women demonstrated no serious adverse events using COCs immediately after abortion (Gaffield, Kapp & Ravi, 2009). Additionally, women who used COCs immediately demonstrate similar bleeding patterns to women using no contraception, and less bleeding than copper IUD users.

**Combined vaginal ring:**
A cohort study of 81 women who placed a vaginal ring one week after abortion showed no serious adverse events or infections (Fine, Tryggestad, Meyers & Sangi-Haghpeykar, 2007).

**Combined contraceptive patch:**
A trial of 298 women randomized to either immediate postabortion start or delayed start the Sunday after an abortion showed no difference in continuation rates at two and six months. In the 53 percent of women who were able to be contacted at six months, half had stopped using the contraceptive patch (Steinauer, Sokoloff, Roberts, Drey, Dehlendorf & Prager, 2014).

**Young women**
The IUD for women under the age of 20 is classified by WHO as category two, in which the benefits generally outweigh the risks. While risk is slightly increased due to higher rates of sexually transmitted infections and expulsion in this patient population, IUDs are still a safe, effective and recommended method for women under the age of 20. Sterilization may be performed, but a young woman will need special precautions due to the increased risk of regret (WHO, 2009).

**References**


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First-trimester vacuum aspiration: Postabortion IUD use

Recommendation:

- Intrauterine contraceptive device (IUD) placement can be performed immediately following a successful, uncomplicated abortion.
- Long-acting contraceptive methods have higher continuation rates and lower repeat pregnancy rates compared to short-acting methods.

Strength of recommendation: Strong

Quality of evidence: High

Last reviewed: November 30, 2014

Fertility Return

A woman may ovulate within 10 days of an abortion (Boyd et al., 1972) and can become pregnant if she resumes sexual intercourse without using a modern contraceptive method.

Safety and acceptability of postabortion contraception

The 2009 WHO Medical Eligibility Criteria for Contraceptive Use classifies intrauterine contraceptive devices as category one, or safe for immediate use, following first-trimester uncomplicated aspiration abortion.

In comparison to short-acting methods of birth control such as oral contraceptive pills, long-acting methods such as implants and IUDs have higher continuation rates and lower repeat pregnancy rates (Blumenthal, Wilson, Remsburg, Cullins, & Huggins, 1994; Cameron et al., 2012; Langston, Joslin-Rohr, & Westhoff, 2014; Peipert, Madden, Allsworth, & Secura, 2012; Roberts, Silva, & Xu, 2010).

Young women

The IUD for women under the age of 20 is classified by WHO as category two, in which the benefits generally outweigh the risks. While risk may be slightly increased due to higher rates of sexually transmitted infections and expulsion in this patient population, IUDs are still a safe, effective and recommended method for women under the age of 20.

References


First-trimester medical abortion: Safety and efficacy of medical abortion for adolescent and young women

Recommendation:
- Medical abortion for adolescent and young women is safe, effective and acceptable and should be offered as a method of safe abortion to this population.
- Clinical services should promote timely access to safe abortion for young women.

Strength of recommendation: Strong

Quality of evidence: Moderate

Last reviewed: December 1, 2014

Background
The World Health Organization defines adolescents as individuals between 10 and 19 years of age, and young women as between 20 and 24 years of age. Adolescents face barriers to accessing safe abortion care and present for abortions at later gestational ages than adult women (Pazol, Creanga, Zane, Burley, & Jamieson, 2012; Sowmini, 2013). Adolescents are at increased risk of complications of unsafe abortion due to delays seeking care, seeking care from unskilled providers and not accessing services when complications arise (Olukoya, Kaya, Ferguson, & AbouZahr, 2001). Increasing access to safe abortion, including medical abortion, is beneficial for young women.

Efficacy of medical abortion
Clinical trials and cohort studies have shown young women have the same (Haimov-Kochman et al., 2007; Heikinheimo, Leminen, & Suhonen, 2007) or increased (Niinimäki et al., 2011; Shannon et al., 2006) success rates when using mifepristone and misoprostol for medical abortion compared to older women. A large Finnish population-based retrospective cohort study that compared 3,024 adolescents to 24,006 adult women up to 20 weeks gestational age showed that the risk of needing surgical evacuation following medical abortion was significantly lower in adolescents (adjusted odds ratio [OR] = 0.78, 95% confidence interval [CI] = 0.67 to 0.90) compared to adult women (Niinimäki, et al., 2011). In a prospective cohort that included young women, the efficacy of misoprostol-only medical abortion was the same for young women and older women (Bugalho et al., 1996).

Safety of medical abortion
Despite higher rates of chlamydia infection, in a large population-based retrospective cohort study of women up to 20 weeks gestational age, complication rates were similar or lower among adolescents than among adult women, even when controlling for nulliparity. In this study, adolescents had a significantly lower incidence of hemorrhage (OR = 0.87, 95% CI = 0.77 to 0.99), incomplete abortion (OR = 0.69, 95% CI= 0.59 to 0.82), and need for surgical evacuation (OR = 0.78, 95% CI= 0.67 to 0.90). Postabortion infection occurred at similar rates in both cohorts (OR = 0.97, 95% CI = 0.73 to 1.30) (Niinimäki, et al., 2011).
Acceptability of medical abortion

In one small, non-comparative study of 28 adolescents age 14 to 17 using mifepristone and misoprostol medical abortion, 96 percent of adolescents found medical abortion acceptable and 79 percent reported satisfaction with the procedure by four weeks of follow-up (Phelps, Schaff, & Fielding, 2001).

References


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Midlevel providers

**Recommendation:**
Trained midlevel providers can provide first-trimester medical abortion as safely and effectively as physicians.

**Strength of recommendation:** Strong

**Quality of evidence:** High

**Last reviewed:** November 12, 2014

**Background**
Access to safe abortion or postabortion care can be increased by expanding the provider base to include non-physician providers. Midlevel providers include cadres of healthcare providers other than physicians such as nurses, nurse midwives, clinical officers and others.

**Evidence**
A randomized control trial of 1,104 women seeking abortion at less than nine weeks gestation in Nepal compared the efficacy and safety of medical abortion when performed by physicians compared to nurses and auxiliary nurse midwives (Warriner, Wang et al. 2011, Renner, Brahmi & Kapp, 2012). The women in both groups had equivalent rates of successful abortions (96.7 percent overall), defined as not requiring manual vacuum aspiration (MVA) within 30 days of treatment. There were no serious complications reported in either group.

A prospective cohort study of 1,414 Indian women seeking abortion up to eight weeks compared the safety and efficacy of medical abortion when it was performed by three groups of providers including allopathic physicians, ayurvedic (traditional) physicians, and nurses (Jejeebhoy et al., 2012). The providers in this study were newly trained in medical abortion and had not been doing pelvic examination or vacuum aspiration previously. The women in all groups had equivalent rates of successful abortions (95 percent overall). The accuracy of gestational age assessment and determination of success was similar between groups. No women in the study had serious complications.

A randomized control trial of 1,180 Swedish women seeking abortion compared provision of medical abortion by nurse midwives to that provided by doctors in a high-resource setting where ultrasound examination for pregnancy dating was part of the protocol (Kopp Kallner et al., 2014). Provision by nurse midwives was safe, efficacious and highly acceptable to women.

**Young women**
This recommendation is the same for young women.
References


First-trimester medical abortion with mifepristone and misoprostol and misoprostol only: Estimating gestational age before medical abortion

**Recommendation:**
Gestational age can be calculated using a woman’s report of her last menstrual period (LMP) combined with a clinician’s bimanual exam. Use of routine ultrasound for gestational age determination is not necessary (WHO, 2012).

**Strength of recommendation: Strong**

**Quality of evidence: Moderate**

**Last reviewed: November 23, 2014**

**Background**
Providers should determine gestational age to assess a woman’s eligibility for medical abortion. Women and providers can accurately assess gestational age without routine ultrasound (Kaneshiro, Edelman, Sneeringer, & Ponce de Leon, 2011). If gestational age is misestimated, the result is usually not clinically significant because any reduction in effectiveness of medical abortion regimens as gestational age advances is gradual, not sudden (Hamoda, Ashok, Flett, & Templeton, 2005).

**Last menstrual period**
Most women can recall their last menstrual period (LMP) reasonably well regardless of their education and whether they usually record their LMP dates (Harper, Ellertson & Winikoff, 2002; Wegienka & Baird, 2005). In two multi-site international cohort studies of 1,221 women having medical abortion in China, Cuba, India and the United States, women were able to estimate their eligibility accurately over 90 percent of the time (Ellertson et al., 2000; Ellertson, Elul & Winikoff, 1997).

**Bimanual examination**
According to cohort studies of medical abortion, adding a bimanual exam to a woman’s report of her LMP can help a clinician accurately determine gestational age (Blanchard et al., 2007; Bracken et al., 2011; W. Clark et al., 2010; W. H. Clark, Gold, Grossman, & Winikoff, 2007; Fielding, Schaff, & Nam, 2002). A cross-sectional multi-site study of 673 women in South Africa found that providers’ estimates of gestational age were, on average, two days lower than ultrasound estimate and women’s LMP estimates of gestational age were one day lower. The authors concluded that a combination of assessment of menstrual history and physical examination was sufficiently accurate to determine eligibility for medical abortion in most cases when compared to ultrasound (Blanchard, et al., 2007). In a prospective study of 1,016 women at 15 sites in the United States, clinicians correctly estimated eligibility in 87 percent of women. In only one percent of cases did clinicians underestimate gestational age, a potentially important error in medical abortion if underestimation is clinically significant (Fielding, et al., 2002). Finally, a prospective trial of 4,484 women in 10 clinics in the United States showed that if women had gestational age estimated by LMP and a clinician exam, only 1.6 percent of them would have been inappropriately given medical abortion above the gestational age limit compared to when ultrasound was used (Bracken, et al., 2011).
Ultrasound

Ultrasound does not yield exact gestational age measurements due to variability in the sonographer, machines and software (Callen, 2000). In addition, an ultrasound has an inherent margin of error of three to five days before 12 weeks gestation, and the margin of error increases as the pregnancy advances (Hadlock, Shah, Kanon & Lindsey, 1992). For these reasons, if the LMP and ultrasound differ within five days in the first trimester, the LMP is usually used for dating. In cohort studies of medical abortion in low-resource settings such as India, Nepal, Vietnam and Tunisia, lack of ultrasound has not had an impact on the success of medical abortion (Coyaji et al., 2001; Elul et al., 2001; Warriner et al., 2011).

If a provider is unable to assess gestational age through the combination of LMP, history and bimanual examination, a more experienced clinician should perform a bimanual examination or the woman should be referred for an ultrasound. Any woman with a suspected ectopic pregnancy needs further evaluation.

Young women

This recommendation is the same for young women.

References


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Pain management

**Recommendation:**
- All women undergoing medical abortion in the first trimester should be offered pain management (WHO, 2012).
- Non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or diclofenac are more effective than paracetamol or acetaminophen.
- Narcotic analgesics and non-pharmacologic measures may also be used.

**Strength of recommendation:** Strong

**Quality of evidence:** Low

**Last reviewed:** November 17, 2014

**Medications for pain management**

In a study of 6755 women using medical abortion in the first trimester, 78.4 percent reported moderate or severe pain and cramping when using the regimen (Goldstone, Michelson, & Williamson, 2012). Different pain medications for medical abortion have been studied with varying degrees of effectiveness (Jackson & Kapp, 2011). A randomized controlled trial of 120 women showed that ibuprofen is more effective than acetaminophen for pain during first-trimester medical abortion with mifepristone and misoprostol (Livshits et al., 2009). Pre-treatment with ibuprofen is no better for pain management than treatment once cramping starts (Raymond, et al., 2013). Narcotic analgesics are another option for pain control, although the optimal drug, dose and timing is not known. One potential strategy is to provide women with nonsteroidal anti-inflammatory drugs (NSAIDs) and narcotic analgesics and advise them to begin with NSAIDs once cramping starts and alternate the two medications if they continue to experience pain.

**Non-pharmacologic pain management**

In addition to medications, other methods that may help women manage pain during a medical abortion are thorough counseling, a supportive environment and applying a heating pad or hot water bottle to the lower abdomen. These methods are complementary but not adequate substitutes for pain management with medications.

**Quality of evidence**

There is limited trial data to establish the best regimen for pain control (Jackson & Kapp, 2011). The trials that exist use multiple regimens and are difficult to compare.

**Young women**

Young women and nulliparous women have been shown to have higher analgesic requirements during medical abortion (Westhoff, Dasmahapatra, Winikoff & Clarke, 2000; Westhoff, Dasmahapatra & Schaff, 2000). Discussing pain control with young women and giving them the appropriate medications and instructions may be particularly important.
References


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Prophylactic antibiotics

Recommendation:
Routine use of antibiotics is not recommended for women undergoing medical abortion. Women who have signs or symptoms of sexually transmitted infection at the time of medical abortion should be treated appropriately and medical abortion can be provided without delay.

Strength of recommendation: Weak

Quality of evidence: Very low

Last reviewed: November 21, 2014

Risk of infection
The overall risk of infection found in prospective studies of medical abortion using mifepristone and a prostaglandin in the first trimester is approximately 0.3 percent (Achilles & Reeves, 2011). Serious infections requiring hospitalization are very uncommon, with rates in large US retrospective studies ranging from 0.03 percent to 0.09 percent (Fjerstad et al., 2009; Henderson, Hwang, Harper, & Stewart, 2005).

Infectious mortality
Nine cases of fatal Clostridium sepsis occurred in North America following mifepristone and misoprostol medical abortion (Cohen et al., 2007; Fischer et al., 2005; Meites, Zane, & Gould, 2010; Sinave, Le Templier, Blouin, Leveille, & Deland, 2002). One death from group A streptococcus has been reported in Australia and one death from Clostrium sordelli has been reported in Portugal (Reis et al., 2011) in women who used mifepristone and misoprostol. Although the deaths are concerning, the overall infections mortality rate related to medical abortion remains very low at 0.58 per 100,000 procedures (Meites, et al., 2010). This rate is similar to the mortality rate after spontaneous abortion (Creinin, Blumenthal, & Shulman, 2006).

Prophylactic antibiotics
There have been no randomized controlled trials examining the effect of antibiotic prophylaxis on medical abortion outcomes (Low, Mueller, Van Vliet & Kapp, 2012). A retrospective cohort study with historical controls from Planned Parenthood Federation of America showed that changing the route of administration of misoprostol from vaginal to buccal reduced the rate of serious infection from 0.093 percent to 0.025 percent, and routinely giving doxycycline twice a day for seven days starting on the day of mifepristone further reduced the rate to 0.006 percent (Fjerstad, et al., 2009). However, because the baseline rate of infection was so low, the number of women who had to take doxycycline to prevent a single serious infection was 5,000. Given the large number of women who would need to take antibiotics to prevent a single infection coupled with the expense and side effects of antibiotics, the American College of Obstetricians and Gynecologists (ACOG, 2009) the Society of Family Planning (Achilles & Reeves, 2011) and the World Health Organization (WHO, 2012) do not recommend routine antibiotic use. In contrast, the Royal College of Obstetricians and Gynaecologists recommends routine antibiotic use with medical abortion procedures (RCOG, 2011).
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Young women
This recommendation is the same for young women.

References


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Contraception

**Recommendation:**

- Hormonal methods including pills, patches, rings, injectables or implants may be started on the day of the first pill of medical abortion (WHO, 2012).
- IUD insertion and sterilization can be performed when it is reasonably certain that a woman is no longer pregnant.

**Strength of recommendation:** Strong

**Quality of evidence:** Very low

**Last reviewed:** November 30, 2014

**Fertility return**

On average, a woman will ovulate within 20 days of a medical abortion with mifepristone and misoprostol, but can ovulate in as little as eight days (Schreiber, Sober, Ratcliffe & Creinin, 2011). Therefore, all women who wish to delay conception should leave the facility with an effective method of contraception. If she desires an IUD or sterilization she should be counseled that these can be given at the same time as vacuum aspiration if she would prefer to leave the facility with her chosen method. If she still desires medical abortion, an interim method can be given and a follow-up visit made to provide IUD or sterilization when it is reasonably certain she is no longer pregnant.

**Contraceptive start**

Most forms of contraception (including pills, injectables and implants) may be started with the first pill of a medical abortion as long as there are no medical contraindications (WHO, 2009). IUDs may be inserted and sterilization performed as soon as it is reasonably certain that a woman is no longer pregnant (WHO, 2012).

**Contraceptive implants**

A pilot study of 20 women who had the etonogestrel contraceptive implant placed on the day of mifepristone showed high continuation and satisfaction at one year with no medical abortion failures (Sonalkar, Hou, & Borgatta, 2013).

**Intrauterine device**

IUDs inserted within five to ten days of a successful medical abortion have low rates of expulsion and high continuation (Betstadt, Turok, Kapp, Feng & Borgatta, 2011; Säav, Stephansson & Gemzell-Danielsson, 2012). IUD insertion one week after medical abortion has higher uptake and lower pregnancy rates than delayed insertion without an increased risk of expulsion (Shimoni, Davis, Ramos, Rosario & Westhoff, 2011; Saav, et al., 2012).

**Sterilization**

Sterilization may be performed as soon as it is reasonably certain that a woman is no longer pregnant and that a woman is not unduly influenced by the circumstances surrounding her abortion (WHO, 2012).
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**Combined oral contraceptives**
Two randomized controlled trials of combined oral contraceptive pills started immediately after medical abortion compared to placebo showed that pills do not have a significant effect on the efficacy of medical abortion or the quantity or duration of blood loss (Tang, Gao, Cheng, Lee, & Ho, 1999; Tang, Xu, Cheng, Lee, & Ho, 2002).

**Barrier methods**
Barrier methods are safe to use at any time after a first-trimester medical abortion and can be used as a bridge to long-term methods or sterilization.

**Natural family planning**
Natural family planning, or the fertility-awareness method, should only be used after a woman has had at least one postabortion menses and only if she had regular menstrual cycles prior to the abortion (WHO, 2009).

**Quality of the evidence**
There is limited clinical data to support the recommendation of starting hormonal methods on the same day as the first pill of medical abortion. This recommendation is based on expert opinion and pilot data (Sonalkar, Hou, & Borgatta, 2013; WHO, 2012). A woman's immediate need for reliable contraception after medical abortion, coupled with the risk that delayed contraceptive provision reduces uptake, strongly supports the recommendation to start these methods immediately.

**Young women**
The IUD for women under the age of 20 is classified by WHO as category two, in which the benefits generally outweigh the risks. While risk is slightly increased due to higher rates of sexually transmitted infections and expulsion in this patient population, IUDs are still a safe, effective and recommended method for women under the age of 20. Sterilization may be performed, but a young woman will need special precautions due to the increased risk of regret (WHO, 2009).

**References**


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First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Postabortion IUD use

Recommendation:
An IUD can be placed within one week of the medical abortion when it is reasonably certain that a woman is no longer pregnant.

Strength of recommendation: Strong
Quality of evidence: Very Low
Last reviewed: November 30, 2014

Fertility return
On average, a woman will ovulate within 20 days of a medical abortion with mifepristone and misoprostol, but can ovulate in as little as eight days (Schreiber, Sober, Ratcliffe, & Creinin, 2011). If a woman wants an IUD after medical abortion, she can use an interim method starting at the first visit and return to have the IUD placed when it is reasonably certain she is no longer pregnant. If she prefers to leave the facility with an IUD, she may be counseled about vacuum aspiration with immediate insertion as an alternative to medical abortion.

Post-medical abortion IUD use
IUDs may be placed as soon as it is reasonably certain that a woman is no longer pregnant following a medical abortion as long as there are no medical contraindications (WHO, 2012). IUDs placed within five to ten days of a successful medical abortion have low rates of expulsion and high continuation (Betstadt, Turok, Kapp, Feng, & Borgatta, 2011; Sääv, Stephansson, & Gemzell-Danielsson, 2012). IUD insertion one week after medical abortion has higher uptake and lower pregnancy rates than delayed insertion without an increased risk of expulsion (Shimoni, Davis, Ramos, Rosario, & Westhoff, 2011; Saav, et al., 2012).

Young women
The IUD for women under the age of 20 is classified by WHO as category two, in which the benefits generally outweigh the risks. While the risk may be slightly increased due to higher rates of sexually transmitted infections and expulsion in this patient population, IUDs are still a safe, effective and recommended method for women under the age of 20.

References


First-trimester medical abortion with mifepristone and misoprostol: Home use of abortion medications

**Recommendation:**
- Women may take mifepristone in a facility or at home when it is convenient for them to start the abortion regimen.
- Home use of misoprostol in a combined regimen of mifepristone and misoprostol is a safe option for women with pregnancies below nine weeks (63 days) gestation (WHO, 2012). In some settings, home use of buccal misoprostol 800mcg may be offered through 10 weeks (70 days) gestation.

**Strength of recommendation: Strong**

**Quality of evidence:**
- Up to 63 days: High
- 64-70 days: Moderate

**Last reviewed: December 2, 2014**

**Background**
Traditionally, providers have given mifepristone to women to take in a facility to start the abortion regimen. Twenty-four to 48 hours later, women may take misoprostol in a medical facility, their own home or another safe location. Because of women’s individual preferences for privacy, support and timing, they should have options about the location of mifepristone and misoprostol use.

**Home use of mifepristone**
A prospective nonrandomized multicenter cohort study of 301 women showed that half of women who were offered home or facility use of mifepristone chose home use (Swica et al., 2012). Women who used mifepristone at home did not have any difference in success rates, need for telephone or emergency room support and were highly satisfied. The most common reason for electing home use was for flexibility in scheduling the abortion. If women choose home use of mifepristone, they should schedule the medications within one week of their clinic visit as long as it is under the gestational age limit. In a similar study conducted in Azerbaijan, 74 percent of women offered home mifepristone use chose home use, citing presence of their partner and a more private experience as the most common reasons (Louie et al., 2014). Abortion success rates were the same in the home use group.

**Home use of misoprostol up to 63 days**
A systematic review of nine prospective comparative cohort studies with 4,522 women up to 56 days gestation showed that complete abortion rates and adverse events rate were the same for home- or facility-based misoprostol use (Ngo, Park, Shakur, & Free, 2011). Women in the included studies found home use as acceptable as clinic use. Large observational studies up to 59 (Fjerstad et al., 2009) and 63 days (Goldstone, Michelson, & Williamson, 2012, Lokeland et al., 2014, Louie et al., 2014, Raghavan et al., 2013) also confirm the safety and efficacy of home use of misoprostol. The World Health Organization, American College of Obstetricians and
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Gynecologists and Royal College of Obstetricians and Gynaecologists recommend home use of misoprostol up to 63 days (ACOG, 2005; RCOG, 2011; WHO, 2012).

Home use of misoprostol from 64-70 days
A multi-center study of 729 women in the United States comparing a single dose of buccal misoprostol 800mcg at home from 57-63 days and 64-70 days showed no difference in success rates, ongoing pregnancy or adverse events (Winikoff et al., 2012). Offering women up to 10 weeks gestation a single dose of buccal misoprostol at home rather than repeat doses of misoprostol in a facility may be appropriate in some settings (Boersma, Meyboom-de Jong, & Kleiverda, 2011; Winikoff, et al., 2012). This study used ultrasound to determine gestational age for eligibility. Programs using this approach in different conditions should monitor their results to ensure success in their settings.

A prospective, open-label trial conducted in Ukraine, Georgia, India and Tunisia compared outcomes of 703 women who received mifepristone followed by 400mcg of at-home sublingual misoprostol for pregnancies of 57-63 days or 64-70 days gestation (Bracken et al., 2014). Success rates and ongoing pregnancy rates did not differ between groups, although women in the later gestational age group were more likely to receive an additional dose of misoprostol or require intervention for bleeding.

Young women
This recommendation is the same for young women.

References


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*and Reproductive Health Care*, 19(6), 457-464.


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Ultrasound findings at follow-up

**Recommendation:**
Ultrasound is not necessary for medical abortion follow-up and may lead to unnecessary intervention. If clinicians choose to use ultrasound, the only ultrasound finding that requires intervention is an ongoing viable pregnancy.

**Strength of recommendation: Strong**

**Quality of evidence: Moderate**

**Last reviewed: November 25, 2014**

**Background**
Ultrasound is not necessary to provide abortion care (WHO, 2012) but may be common in some settings. Ultrasound for follow-up after medical abortion has diagnostic limitations. Except for the rare case of an ongoing viable pregnancy, intervention after a medical abortion should be based on clinical symptoms and not ultrasound findings.

**Findings**
*Endometrial thickening:* After a successful medical abortion, the endometrium can have varying thickness and have a complex or heterogeneous appearance.

Multiple retrospective and prospective cohort studies have shown that endometrial thickness has a wide range in women after medical abortion, with significant overlap between women with successful and failed medical abortion (Cowett, Cohen, Lichtenberg, & Stika, 2004; Markovitch, Tepper, Klein, Fishman, & Aviram, 2006; Parashar, Iversen, Midbøe, Myking, & Bjørge, 2007; Røbye, Nørgaard, & Nilas, 2004; Tzeng, Hwang, Au, & Chien, 2013). In a pooled analysis of 2,208 women one week after medical abortion, once women with a persistent gestational sac were excluded, the average endometrial thickness was 10.9mm in women who did not require
more intervention and 14.5mm in thirty women who did (Reeves, Fox, Lohr & Creinin, 2009). Although the average endometrial thickness in women who require intervention tends to be higher, because of the range and overlap between successful and unsuccessful abortion, no study has found that there is a thickness above which a diagnosis of unsuccessful medical abortion can be made. The decision of whether to intervene should be made on clinical signs and symptoms, such as ongoing or heavy bleeding, rather than ultrasound findings.

**Persistent gestational sac:** A persistent gestational sac, in which the sac is present but there is no viable embryonic tissue, occurs in less than one percent of medical abortions with the recommended mifepristone and misoprostol regimen (Creinin et al., 2004; Creinin et al., 2007; Winikoff et al., 2008). A persistent gestational sac is not a viable pregnancy and may be managed with aspiration, a second dose of misoprostol or expectant management according to a woman’s preference. In a study of women with a persistent gestational sac within 11 days of medical abortion, a second dose of misoprostol was found to lead to expulsion of a nonviable sac in 69 percent of women (Reeves, Kudva, & Creinin, 2008).

**Ongoing viable pregnancy:** An ongoing pregnancy, in which the sac and an embryo with cardiac activity are present, occurs in less than one percent of medical abortions with the recommended mifepristone and misoprostol regimen (Von Hertzen et al., 2009; Winikoff, et al., 2008). Some women will be able to identify this outcome without ultrasound due to lack of bleeding or continued pregnancy symptoms. A woman with an ongoing pregnancy should be offered uterine evacuation as soon as possible. She may have vacuum aspiration, or a second dose of misoprostol may be considered. The success rate of misoprostol after failed medical abortion is 36 percent (Reeves, Kudva & Creinin, 2008; WHO, 2012). If a woman chooses a second dose of misoprostol, she must be followed to see if it is successful.

**Young women**

This recommendation is the same for young women.

**References**


misoprostol 6 to 8 hours versus 24 hours after mifepristone for abortion. *Obstetrics & Gynecology*, 103(5, Part 1), 851-859.


First-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Risk of fetal malformations after exposure to mifepristone and misoprostol

Recommendation:
Exposure to mifepristone alone has not been shown to cause fetal malformations. Exposure to misoprostol, whether in a combined or misoprostol-only regimen, carries a small increased risk of malformations if the woman has an ongoing pregnancy and decides not to terminate. Women with an ongoing pregnancy after using misoprostol should be counseled about the risk if they choose to carry the pregnancy to term.

Strength of recommendation: Strong

Quality of evidence: Mifepristone: Very low
Misoprostol: Moderate

Last reviewed: November 25, 2014

Background
The expected rate of malformations in the general population is approximately three percent (Dolk, Loane, & Garne, 2010). Exposure to certain medications, infections, radiation or drugs of abuse during embryonic or fetal development may result in an increased risk of malformations if the pregnancy continues.

Mifepristone
Mifepristone exposure may occur if a woman changes her mind and does not take misoprostol after taking mifepristone. Data on continuing pregnancy after mifepristone exposure without misoprostol are limited. The largest prospective study of 46 women continuing a pregnancy after mifepristone only resulted in eight miscarriages and two major malformations in the pregnancies that continued (5.3 percent). Both malformations were not thought to be related to mifepristone exposure but may have been a result of other medical conditions (Bernard et al., 2013).

Misoprostol
The association between misoprostol and congenital anomalies is better established. Case reports, cohort studies (da Silva Dal Pizzol, Tierling, Schüler-Faccin, Sanseverino & Mengue, 2005; Vauzelle, Beghin, Cournot & Elefant, 2013) and case-control studies (da Silva Dal Pizzol, Knop & Mengue, 2006) show that the incidence of malformations peaks if misoprostol is used between five and eight weeks after a woman's last menstrual period (LMP) and is not associated with anomalies after 13 weeks LMP (Philip, Shannon & Winikoff, 2002). The most typical malformations associated with misoprostol use are Möbius sequence, a rare disorder of cranial nerve palsies associated with limb anomalies and craniofacial defects, and terminal transverse limb defects (da Silva Dal Pizzol, et al., 2006). Although not clearly established, the proposed mechanism is vascular disruption from uterine contractions leading to disordered fetal development (Gonzalez et al., 2005; Shepard, 1995).
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A systematic review of four case-control studies with 4,899 cases of congenital anomalies and 5,742 controls showed an increased rate of misoprostol exposure in cases with anomalies (OR 3.56, 95% CI 0.92-12.98) (da Silva Dal Pizzol, et al., 2006). Misoprostol exposure was 25 times more likely in cases with Möbius sequence and 12 times more likely with terminal transverse limb defects. A prospective follow-up study comparing women who used misoprostol before 12 weeks of pregnancy to women who used antihistamines showed that the rate of fetal malformations was higher in the 236 pregnancies exposed to misoprostol (4%) than in 255 controls (1.8%) although the finding was not statistically significant (OR=2.2, 95% CI = 0.6-7.7) (Vauzelle, et al., 2013). Three malformations (2%) in the misoprostol group were consistent with misoprostol-related anomalies.

Although the rate of misoprostol exposure is higher in children born with characteristic defects such as Möbius sequence, because the anomalies are so rare the overall risk that a woman who takes misoprostol in the first trimester and carries a pregnancy to term will have a child born with a malformation related to misoprostol exposure is low. A woman’s risk of a malformation related to misoprostol exposure is less than 10 per 1,000 exposures (Philip, et al., 2002).

**Young women**

This recommendation is the same for young women.

**References**


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Misoprostol product quality

Recommendation:
Because different misoprostol products have varying quality and can degrade over time, providers should track medical abortion success rates to ensure that they are using an effective product. Providers should store misoprostol in a cool dry place.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 25, 2014

Background
With the increasing use of misoprostol for reproductive health indications, there are concerns about the quality of misoprostol products. If misoprostol degrades, it may lead to decreased success rates with medical abortion and unsuccessful treatment of incomplete abortion and postpartum hemorrhage. A technical memo distributed by Pathfinder International reported that Misotac, a brand of misoprostol manufactured by Sigma, was recalled because batches of the medicine had degraded and no longer contained a sufficient amount of the active ingredient (Pathfinder, 2011).

Differences in quality related to manufacturing
There are at least 30-40 manufacturers of misoprostol worldwide and some manufacturers subcontract, which makes it difficult to enforce Good Manufacturing Practice and ensure quality across all brands (Hall, 2011). Although misoprostol is thought to be stable at normal room temperature, the active pharmaceutical ingredient (misoprostol oil) used in manufacturing must be stored below -20°C. Thus, exposure to heat and humidity during manufacturing, packaging and storage may compromise the quality of misoprostol (Cayman Chemical, 2012).

A 2011 study analyzed 76 misoprostol samples from countries all over the world (Hall, 2011). Two types of misoprostol contained the drug diclofenac and were excluded from analysis. When the remaining 74 samples were tested for content and purity, eight of the 200mcg tablets contained less than 40mcg of active ingredient. The analysis found that three factors influenced misoprostol integrity: 1) impact of moisture at all stages 2) manufacture and quality of the active pharmaceutical ingredient and 3) packaging. Misoprostol that was packaged in double-aluminum blister packs (aluminum on top and bottom) was found to retain the most active ingredient.

Misoprostol brands that have been approved by the European Union or the United States Food and Drug Administration are known to conform to Good Manufacturing Practice and are high quality. The United Nations Population Fund (UNFPA) has added misoprostol to its list of commodities which are available through long-term agreement. UNFPA is committed to procuring products which meet specified requirements and standards, according to internationally recognized quality standards.
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Clinic use and storage
Even misoprostol manufactured in high-quality conditions and packaged well can become inactive if it is shipped or stored in conditions that expose it to heat or humidity for prolonged periods of time. There have not been large field studies on the stability of misoprostol in tropical climates, but laboratory studies show that misoprostol is less stable when exposed to moisture or heat (Chu, Wang, Pang & Rogers, 2007; WHO, 2009). Even in normal room temperature conditions (25°C and 60 percent humidity), when providers cut blister packs to distribute tablets, if the packaging on the remaining stored tablets is inadvertently opened, the tablets’ potency degrades within 48 hours and continues to degrade over time (Berard & Fiala, 2012).

Quality assurance
If providers notice a sudden decrease in medical abortion success rates from expected baseline, they should discard the lot of misoprostol being used and start a new lot. Providers should consult with each other to determine which local misoprostol brands are most effective. Store misoprostol in dry conditions at temperatures at or below 25°C (77°F) (Pfizer, 2002).

References


First-trimester medical abortion with mifepristone and misoprostol: Success and complication rates

Summary of evidence:
A combined regimen with mifepristone and misoprostol is effective and safe, with success rates of over 95 percent and complication rates of less than one percent.

Quality of evidence: High

Last reviewed: December 1, 2014

Background
The most robust data on safety and efficacy of medical abortion come from large studies done in multiple high-volume centers with experienced providers using ultrasound (Cleland, Creinin, Nucatola, Nshom, & Trussell, 2013; Goldstone, Michelson, & Williamson, 2012). Settings with lower volume and new or inexperienced providers may have different results.

Success of medical abortion
Medical abortion success is defined as a complete abortion that needs no further intervention. In a large database review of over 13,000 medical abortions under nine weeks gestation done at private clinics in Australia with mifepristone and buccal misoprostol, the failure rate was 3.5 percent (Goldstone, et al., 2012). In this study, the majority of failures were due to incomplete abortions requiring aspiration. Ongoing pregnancy, a subset of medical abortion failures, is rare, occurring in less than one percent of women using the combined regimen under nine weeks (Cleland, et al., 2013; Goldstone, et al., 2012).

Complication rates
A review of 233,815 medical abortions under nine weeks done at private clinics in the United States from 2009 to 2010 with mifepristone and buccal misoprostol found a complication rate of 0.65 percent (Cleland, et al., 2013). In this study, complications included both serious outcomes such as ongoing pregnancy or an unrecognized ectopic pregnancy and serious adverse events such as transfer, hospitalization, intravenous antibiotics, blood transfusion and death. In this study, the need for an outpatient repeat procedure was not tracked or included in the complication rate. The most common complication was ongoing pregnancy affecting 0.5 percent of the study population. The rate of serious adverse events was 0.16 percent. There was only one death in a woman with an undiagnosed ectopic pregnancy, thereby producing a mortality rate of 0.4 per 100,000 medical abortion procedures.

Young women
Young women and adolescents have similar or higher success rates compared to older women and similar or lower complication rates (Niinimäki et al., 2011). See Clinical Update on First-trimester medical abortion safety and efficacy for adolescent and young women.
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Complications table

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<tr>
<th></th>
<th>Goldstone, 2012</th>
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<tbody>
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<td>Planned Parenthood USA</td>
</tr>
<tr>
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<td>2009-2010</td>
</tr>
<tr>
<td>Incomplete abortion requiring aspiration</td>
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<td>Not reported</td>
</tr>
<tr>
<td>Unrecognized ectopic pregnancy</td>
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</tr>
<tr>
<td>Ongoing pregnancy</td>
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<td>0.5%</td>
</tr>
<tr>
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<td>0.05%</td>
</tr>
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<td>0.02%</td>
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<tr>
<td>Death</td>
<td>0.007% (1 death from infection)</td>
<td>0.0004% (1 death from unrecognized ectopic pregnancy)</td>
</tr>
</tbody>
</table>

References


First-trimester medical abortion with mifepristone and misoprostol: Recommended regimen

**Recommendation:**

- **Up to nine weeks gestation:** Mifepristone 200mg orally followed 24-48 hours later by misoprostol 800mcg buccally, sublingually or vaginally.
- **9-10 weeks gestation:** Mifepristone 200mg orally followed 24-48 hours later by misoprostol 800mcg buccally.
- **10-13 weeks gestation:** Mifepristone 200mg orally followed 36-48 hours later by misoprostol 800mcg vaginally then 400mcg vaginally or sublingually every three hours for a maximum of five doses of misoprostol.

**Strength of recommendation: Strong**

**Quality of evidence:**

- **Up to nine weeks:** High
- **9-10 weeks:** Low
- **10-13 weeks:** Low

**Last reviewed: November 30, 2014**

**Up to nine weeks**

Multiple randomized controlled clinical trials have shown that the combination of mifepristone and misoprostol is an effective medical abortion regimen with success rates ranging from 95 to 98 percent (Kulier et al., 2011; Raymond, Shannon, Weaver, & Winikoff, 2012). Vaginal, buccal and sublingual misoprostol are more effective than oral misoprostol (Kulier et al., 2011). Buccal (Middleton et al., 2005) and sublingual (Tang, Lau, Ng, Lee, & Ho, 2003; von Hertzen et al., 2010) dosing have higher rates of gastrointestinal side effects than vaginal dosing. Sublingual dosing is associated with more side effects than buccal dosing (Chai, Wong, & Ho, 2013). In some settings, buccal or sublingual dosing may be preferred due to infection prevention (Fjerstad et al., 2009), legal restrictions or a woman’s preference.

Although effective, 400mcg of sublingual misoprostol following mifepristone is associated with higher rates of incomplete abortion and ongoing pregnancy (von Hertzen et al., 2010; Raghavan et al., 2013; Bracken et al., 2014), and does not replace the 800mcg dose.

**9-10 weeks**

Evidence is rapidly evolving. The above recommendation is based on one study--a United States multi-center trial of 729 women using mifepristone in a clinic and misoprostol 800mcg buccally at home. There was no difference in successful abortion and ongoing pregnancy in women between eight to nine weeks compared to nine to ten weeks (Winikoff et al., 2012). Overall, the successful abortion rates were 93 percent with ongoing pregnancy rates of three percent in both groups. Offering women up to ten weeks gestation a single dose of buccal misoprostol at home rather than repeat doses of misoprostol in a facility may be appropriate in some settings (Boersma, Myboom-de Jong & Kleiverda, 2011; Winikoff et al., 2012). This study used
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ultrasound to determine gestational age for eligibility. Programs using this approach in different conditions should monitor their results to ensure success in their settings.

A prospective, open-label trial conducted in Ukraine, Georgia, India and Tunisia compared outcomes of 703 women who received mifepristone followed by 400mcg of sublingual misoprostol for pregnancies of 57-63 days or 64-70 days gestation (Bracken et al., 2014). Success rates (95 percent in the 57-63 day group, 92 percent in the 64-70 days group) and ongoing pregnancy rates (two percent in both groups) did not significantly differ, although women in the later gestational age group were more likely to receive an additional dose of misoprostol or require intervention for bleeding.

10-13 weeks
A cohort study of 1,076 women showed a combination of mifepristone and repeat doses of misoprostol is safe and effective between nine and 13 weeks (Hamoda, Ashok, Flett & Templeton, 2005). All women took misoprostol in the health facility. The success rate for this regimen was high at 95.8 percent with a low rate of serious adverse events. Repeat dosing of misoprostol has been shown to increase the efficacy of second-trimester medical abortion and may be used for women in the late first trimester (Wildschut et al., 2011).

Young women
This recommendation is the same for young women.

References


First-trimester medical abortion with mifepristone and misoprostol: Contraindications and precautions

Recommendation:

**Contraindications:**
- Previous allergic reaction to one of the drugs involved
- Inherited porphyria
- Chronic adrenal failure
- Known or suspected ectopic pregnancy

**Precautions:**
- IUD in place. Evaluate for the presence of ectopic pregnancy. If none, remove the IUD.
- Severe uncontrolled asthma or long-term corticosteroid therapy. No evidence exists regarding use of mifepristone in steroid-dependent women. Providers must use clinical judgment if no other alternatives to safe abortion exist. Increase steroid dose for three to four days and monitor the woman very closely. Conditions such as poorly controlled asthma may still be worsened.
- Severe/unstable health problems including but not limited to hemorrhagic disorders, heart disease, and severe anemia. No evidence exists on the use of medical abortion in women with hemorrhagic disorder, heart disease, severe anemia or severe/unstable health problems. Whether to provide medical abortion to women with these conditions will depend on the available options for safe abortion care, referrals, and clinical judgment. If medical abortion is provided, it should be given under close observation.

**Strength of recommendation: Moderate**

**Quality of evidence:** The quality of the evidence is graded for each specific contraindication or precaution below

**Last reviewed:** November 24, 2014

**Definitions**

**Contraindications:** If a woman has these specific conditions, under no circumstances should she be offered medical abortion with mifepristone and misoprostol. Vacuum aspiration should be considered or she should be referred to a facility where she can be offered alternate care.

**Precautions:** If a woman has these specific conditions, medical abortion with mifepristone and misoprostol has higher risks than normal. The risks, benefits and alternatives to medical abortion must be considered. Medical abortion provision may require a higher degree of clinical judgment, skill and monitoring. Referral to a higher-level facility may be appropriate.
Quality of evidence:

**Contraindications**

**Previous allergic reaction to one of the drugs involved**
Allergic reactions have been reported after the use of mifepristone and misoprostol (Hauseknecht, 2003; Schoen, 2014).
*Quality of evidence: High*

**Inherited porphyria**
Porphyrias are rare metabolic disorders in which enzymes in heme are deficient. Theoretically, mifepristone could exacerbate porphyria (Ventura et al., 2009).
*Quality of evidence: Low. No human studies exist, but animal models exhibit the effect of mifepristone (Cable et al., 1994).*

**Chronic adrenal failure**
Mifepristone is a glucocorticoid receptor antagonist (Spitz & Bardin, 1993). Mifepristone blocks negative feedback mechanisms that control cortisol secretion. In women with adrenal insufficiency on long-term corticosteroid therapy, mifepristone exposure may exacerbate the underlying condition (Sitruk-Ware & Spitz, 2003).
*Quality of evidence: Low. There are no data on mifepristone use in pregnant women with adrenal insufficiency, but there is experimental and animal data to support the recommendation.*

**Known or suspected ectopic pregnancy**
Mifepristone and misoprostol do not treat ectopic pregnancy, and use of the medications may delay diagnosis of this life-threatening condition.
*Quality of evidence: High*

**Precautions**

**IUD in place**
A woman who is pregnant with an IUD in place is at significantly elevated risk of ectopic pregnancy (Barnhart, 2009). The woman must be evaluated for the presence of ectopic pregnancy. If negative, the IUD should be removed before starting medical abortion due to the theoretical risk of uterine perforation from contractions during medical abortion and the potential risk of infection (Danco, 2010; Davey, 2006).
*Quality of evidence: Low. There are no studies to verify whether having an IUD in place poses actual risks during medical abortion.*

**Severe uncontrolled asthma or long-term corticosteroid therapy**
Mifepristone is a glucocorticoid receptor antagonist (Spitz & Bardin, 1993). Mifepristone blocks negative feedback mechanisms that control cortisol secretion. In women on long-term corticosteroid therapy for severe or uncontrolled asthma, mifepristone exposure may exacerbate the underlying condition (Sitruk-Ware & Spitz, 2003). There are no direct studies of medical abortion among women on corticosteroid treatment, but one review suggested that increasing the dose of the steroid medications can counteract the cortisol blunting effect of mifepristone (Davey, 2006). For most conditions, adjusting the dose of corticosteroid medications after mifepristone administration and careful monitoring may allow for medical abortion.

Medical abortion in asthmatic women requiring systemic corticosteroids has not been studied. One review
suggests using a high level of caution when giving mifepristone to such women and only doing so if the asthma is well controlled (Davey, 2006). The glucocorticoid dose should be increased for several days before and after mifepristone. Other experts recommend that women with severe, poorly controlled asthma who are on long-term corticosteroids not take mifepristone due to the life-threatening nature of acute asthma exacerbation (Christin-Mairet et al., 2000; Creinin & Gemzell Danielsson, 2009; Sitruk-Ware, 2006). Giving mifepristone to such women risks exacerbating asthma.

Inhaled corticosteroids for asthma are not systemically absorbed and are not a contraindication to mifepristone. Some experts recommend that mifepristone and misoprostol should be available to women with asthma as long as they are not on long-term systemic steroids (Creinin & Gemzell Danielsson, 2009).

Quality of evidence: Moderate

Severe medical problems
Medical abortion studies tend to exclude women with severe anemia or severe medical problems (Christin-Mairet et al., 2000; Sitruk-Ware & Spitz, 2003). Whether to provide medical abortion to women with these conditions will depend on clinical judgment, monitoring and options available for safe abortion care.

Quality of evidence: Low

Young women
This recommendation is the same for young women.

References


First-trimester medical abortion with mifepristone and misoprostol: Confirmation of success

Recommendation:
- Most women can confirm a successful medical abortion with mifepristone and misoprostol.
- Providers may perform a bimanual exam to assist in the confirmation of successful abortion.
- Ultrasound or other testing is needed only in cases where the diagnosis is unclear.

Strength of recommendation: Strong

Quality of evidence: Moderate

Last reviewed: December 1, 2014

Woman’s assessment of successful abortion
Women can accurately assess whether their medical abortion with mifepristone and misoprostol was successful. In multiple studies, women who believed that they had a successful abortion were correct over 99 percent of the time (Cameron, Glasier, Dewart, Johnstone, & Burnside, 2012; Jackson, Dayananda, Fortin, Fitzmaurice, & Goldberg, 2012; Perriera et al., 2010; Rossi, Creinin, & Meyn, 2004). Routine follow-up after medical abortion with mifepristone and misoprostol is not needed (WHO, 2012).

Bimanual exam
Providers may help confirm successful abortion at a follow-up visit by reviewing a patient history and performing a bimanual exam. In one study of 931 women following up after medical abortion in which providers reviewed a woman’s history and performed a bimanual exam, the providers were able to identify successful abortion in over 99 percent of cases (Rossi et al., 2004).

Ultrasound
Ultrasound can be used to confirm successful abortion but is not necessary and can add to the cost and complexity of medical abortion (Kaneshiro, Edelman, Sneeringer, & Ponce de Leon, 2011). Ultrasound is helpful in cases where there is doubt about whether the abortion has been successful.

Serum pregnancy testing
Serum pregnancy testing has been used as an alternative to ultrasound to diagnose successful medical abortion and compares favorably to ultrasound in reducing interventions at the time of follow-up (Clark, Panton, Hann & Gold, 2007; Dayananda, Maurer, Fortin & Goldberg, 2013; Fiala, Safar, Bygdeman & Gemzell-Danielsson, 2003). Serum pregnancy testing is only useful when a pre-treatment hCG has been obtained for comparison. The utility of serum pregnancy testing is low in areas where access to laboratory testing is limited.

Urine pregnancy testing
A negative urine pregnancy test is usually reassuring that an abortion has been successful; however, it is rare, but does occur, that a pregnancy test is negative but a woman is still pregnant (false negative). Urine pregnancy tests often have positive results even when the medical abortion has been successful (false positive) (Cameron...
et al., 2012; Clark et al., 2010; Godfrey, Anderson, Fielding, Meyn, & Creinin, 2007; Perriera et al., 2010). Semi-quantitative urine pregnancy tests have been tested in clinical trials but are not available for use outside of the trial setting (Blum et al., 2012; Lynd et al., 2013). Due to the high rate of false positive results, urine pregnancy testing is not recommended for routine confirmation of success.

Young women
This recommendation is the same for young women.

References


First-trimester medical abortion with misoprostol only: Recommended regimen

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<tr>
<th>Dose</th>
<th>Route</th>
<th>Timing</th>
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<tr>
<td>Misoprostol 800mcg (four 200mcg pills)</td>
<td>Vaginal</td>
<td>Every 3-12 hours for a maximum of three doses</td>
</tr>
<tr>
<td>Misoprostol 800mcg (four 200mcg pills)</td>
<td>Sublingual</td>
<td>Every three hours for a maximum of three doses</td>
</tr>
</tbody>
</table>

Strength of recommendation: Strong

Quality of evidence:
- Up to nine weeks: Moderate
- 9-13 weeks: Low

Last reviewed: November 30, 2014

Success of misoprostol-only medical abortion
The success rate of medical abortion with misoprostol only is around 85 percent (von Hertzen et al., 2007). Misoprostol-only treatment should be considered when mifepristone is not available. In general, misoprostol-only regimens have higher rates of success at lower gestational age (von Hertzen et al., 2007; Zikopoulos et al., 2002), with higher numbers of doses (Carbonell, Varela, Velazco, Tanda, & Sanchez, 1999) and with longer follow-up times (Bugalho, Mocumbi, Faundes, & David, 2000). However, women’s satisfaction decreases the longer the abortion process lasts (Ngai, Tang, Chan, & Ho, 2000).

Misoprostol-only abortion up to nine weeks
The only multicenter randomized controlled trial to compare different misoprostol-only dosing intervals showed that complete abortion rates are equivalent when misoprostol is given vaginally every 3-12 hours or sublingually every three hours for three doses. Sublingual dosing had a higher incidence of side effects than vaginal dosing (von Hertzen et al., 2007).

Misoprostol-only abortion between 9-13 weeks
There is scant evidence to recommend an appropriate dosing regimen between 9-13 weeks. The only direct evidence for this gestational age comes from three small cohort studies where misoprostol 800mcg was given vaginally every 12 or 24 hours for up to three doses (Carbonell Esteve et al., 1998; Carbonell et al., 1999; Carbonell et al., 2001). However, there is strong evidence in randomized controlled trials of misoprostol-only in the early second trimester that support using a vaginal dosing interval of every three hours over 13 weeks (von Hertzen et al., 2009). Given the evidence supporting repeat doses of sublingual or vaginal misoprostol below nine and above 13 weeks, the evidence-based regimen for below nine weeks may be used between 9-13 weeks.

Young women
This recommendation is the same for young women.
References


First-trimester medical abortion with misoprostol only:
Contraindications and precautions

Recommendation:

Contraindications:
- Previous allergic reaction to misoprostol.
- Known or suspected ectopic pregnancy.

Precautions:
- Intrauterine device (IUD) in place. Evaluate for the presence of ectopic pregnancy. If none, remove the IUD.
- Severe/unstable health problems including but not limited to hemorrhagic disorders, heart disease and severe anemia. No evidence exists on the use of medical abortion in women with hemorrhagic disorder, heart disease, severe anemia or severe/unstable health problems. Whether to provide medical abortion to women with these conditions will depend on the available options for safe abortion care, referrals, and clinical judgment. If medical abortion is given, it should be under close observation.

Strength of recommendation: Moderate

Quality of evidence: The quality of the evidence is graded for each specific contraindication or precaution below.

Last reviewed: November 24, 2014

Definitions

Contraindications: If a woman has these specific conditions, under no circumstances should she be offered medical abortion with misoprostol only. Vacuum aspiration should be considered or she should be referred to a facility where she can be offered alternate care.

Precautions: If a woman has these specific conditions, medical abortion with misoprostol only has higher risks than normal. The risks, benefits and alternatives to medical abortion must be considered. Medical abortion provision may require a higher degree of clinical judgment, skill and monitoring. Referral to a higher-level facility may be appropriate.

Contraindications

Previous allergic reaction to misoprostol:
Very rare allergic reactions have been reported after the use of misoprostol (Schoen, 2014).
Quality of evidence: Low
**Clinical Updates in Reproductive Health**

**Known or suspected ectopic pregnancy:**
Misoprostol does not treat ectopic pregnancy and use of the medications may delay diagnosis of this life-threatening condition.

*Quality of evidence: High*

**Precautions**

**IUD in place:**
A woman who is pregnant with an IUD in place is at significantly elevated risk of ectopic pregnancy (Barnhart, 2009). The woman must be evaluated for the presence of ectopic pregnancy. If negative, the IUD should be removed before starting medical abortion due to the theoretical risk of uterine perforation from contractions during medical abortion and the potential risk of infection (Danco, 2010; Davey, 2006). There are no studies to verify whether having an IUD in place poses actual risks during medical abortion.

*Quality of evidence: Low*

**Severe/unstable health problems:**
Medical abortion studies tend to exclude women with severe anemia or severe medical problems (Christin-Maitre, Bouchard & Spitz, 2000; Sitruk-Ware, 2006) Whether to provide medical abortion to women with these conditions will depend on clinical judgment, monitoring and options available for safe abortion care.

*Quality of evidence: Low*

**Young women**
This recommendation is the same for young women.

**References**


**Clinical Updates in Reproductive Health**

**Second-trimester abortion, dilatation and evacuation and medical abortion: Comparing methods**

**Recommendation:**
- Dilatation and evacuation (D&E) and medical abortion (MA) with mifepristone and misoprostol or misoprostol only are safe and effective methods of second-trimester abortion (WHO, 2012).
- MA has a higher rate of retained products and failed initial method and minor adverse events.
- Significant adverse events do not differ between the two methods.
- D&E requires a trained, experienced provider and specialized equipment.
- When both methods are available and a woman is eligible, she should be allowed to choose the method that is appropriate for her.

**Strength of recommendation:** Strong

**Quality of evidence:** Moderate

**Last reviewed:** November 30, 2014

**Comparison of methods**
In retrospective cohort studies, women in the second trimester who have medical abortion (MA) compared to dilatation and evacuation (D&E) have an increased rate of failed abortion and retained products of conception with a need for further intervention (Autry, Hayes, Jacobson & Kirby, 2002; Bryant, Grimes, Garrett, & Stuart, 2011). The rate of major adverse events including infection, transfusion, hysterectomy and death is not increased.

The largest randomized trial of second-trimester abortion methods included 122 women and showed a similar rate of complications between D&E and MA with mifepristone and misoprostol (Kelly, Suddes, Howel, Hewison & Robson, 2010). However, women randomized to MA had more bleeding and pain and were less satisfied than women who had D&E. A pilot randomized trial of 18 women comparing D&E and MA with misoprostol only had a higher rate of adverse events in the women undergoing MA (Grimes, Smith, & Witham, 2004). Both randomized trials had difficulty with recruitment due to women’s strong preferences for one type of procedure over another.

In published studies of MA compared to D&E, rates of intervention for MA may be artificially high because failed MA was defined as no delivery within 24 hours (Bryant, et al., 2011) and retained placenta was diagnosed after two hours (Grimes, et al., 2004). In practice, more time may be allowed for successful MA to occur.

**The importance of choice**
In settings where D&E and MA are available, if a woman is a candidate for either procedure, she should be offered a choice. A study of women undergoing second-trimester abortions for fetal abnormalities demonstrated that when women chose whether to undergo D&E or MA, their rates of post-procedure depression did not differ (Burgioine et al., 2005). Choice of methods is very individual – some women prefer the speed, predictability and comfort of D&E, while others prefer a more “labor-like” process with an intact fetus (Kelly, et al., 2010; Kerns, et al., 2012). Some women may want to see or hold an intact fetus while others prefer not to. In some cases, an intact fetus may allow for a more comprehensive fetal autopsy where it is needed.
Young women
This recommendation is the same for young women.

References


Second-trimester medical abortion and dilatation and evacuation (D&E): Gestational dating

Recommendation:
Accurate assessment of gestational age is important for second-trimester abortion services, especially when dilatation and evacuation is used. Gestational age can be estimated by a woman’s report of her last menstrual period (LMP) and a physical exam. Ideally, ultrasound should be used to confirm the duration of pregnancy.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 23, 2014

Background
Errors in gestational dating can increase the risks associated with second-trimester abortion. In facilities using dilatation and evacuation (D&E), if gestational age is underestimated, providers may not have the experience and equipment to complete the procedure safely. Accurate assessment of gestational age may help providers and women choose a safer procedure or indicate the need for referral to another facility.

Dating
There is no evidence to recommend the most appropriate way to confirm gestational age in the second trimester prior to abortion care (Kulier & Kapp, 2011). In the United States, 99 percent of providers use ultrasound in the second trimester, but data is lacking from international sites (O’Connell, Jones, Lichtenberg, & Paul, 2008).

Ideally, providers should use ultrasound to confirm the duration of the pregnancy and also use the date of the last menstrual period and pelvic exam to check size, consistency and position of the uterus. A single biparietal diameter is a simple and accurate method to confirm gestational age (Goldstein & Reeves, 2009). A femur length measurement can be used to confirm the biparietal diameter or used if there are technical difficulties in obtaining a biparietal measurement.

In settings where it is not possible to confirm gestational age by ultrasound, it is extremely important that staff be adequately trained in pregnancy dating. After the abortion, clinicians can confirm gestational age by comparing actual fetal measurements (fetal foot length) to the expected gestational age (Drey, Kang, McFarland, & Darney, 2005). This comparison gives the clinicians feedback regarding the accuracy of their pre-procedure dating estimates.

Young women
This recommendation is the same for young women.
References


Second-trimester medical abortion and dilatation and evacuation (D&E): Induced fetal demise

Recommendation:
Induced fetal demise prior to second-trimester medical abortion or dilatation and evacuation (D&E) does not increase the safety of abortion and is not recommended for medical indications. There may be legal or ethical indications for inducing fetal demise.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 24, 2014

Background
Some providers use induced fetal demise prior to second-trimester medical abortion or dilatation and evacuation (D&E). In some cases, patients, providers or staff may prefer that fetal demise occurs before an abortion procedure (Jackson, Teplin, Drey, Thomas & Darney, 2001). Before medical abortion, induced fetal demise can prevent transient fetal survival. Although the rate of complications in women with digoxin injection may be acceptably low in some published case series (Steward, Melamed, Kim, Nucatola & Gatter, 2012), there is no current evidence that shows a medical benefit for the practice.

Evidence related to induced fetal demise
D&E: A randomized, controlled trial of induced fetal demise with digoxin prior to D&E which compared digoxin to saline injection showed no benefit to digoxin and an increased rate of vomiting (Jackson et al., 2001). A retrospective cohort study comparing women with digoxin injection prior to D&E with historical controls showed an increase in complications including more hospital admissions, extramural deliveries, and infections in women who had digoxin (Dean et al., 2012).

Medical abortion: There are no trials to evaluate the safety and efficacy of induced fetal demise before medical abortion with the currently recommended second-trimester regimens.

Technique
Fetal demise can be achieved prior to a second-trimester abortion by injecting either potassium chloride directly into the fetal heart or digoxin into the fetus or amniotic fluid or interrupting the fetal umbilical cord.

Potassium chloride: Potassium chloride injection requires skill in ultrasound guidance techniques and has more potential risk from maternal intravascular injection including cardiac arrest (Borgatta & Kapp, 2011; Coke, Baschat, Mighty & Malinow, 2004). It is not recommended in a low-resource setting.

Digoxin: In a pharmacokinetic study of eight women who had intra-amniotic injection of digoxin 1mg prior to second-trimester D&E, maternal serum digoxin levels were in the low therapeutic range and were not associated with cardiac changes (Drey, Thomas, Benowitz, Goldschlager & Darney, 2000). A pilot randomized trial of
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Intraamniotic or intrafetal digoxin at doses of 1mg or 1.5mg showed an overall rate of fetal demise of 87 percent with no difference in efficacy based on the dose or route of administration (Nucatola, Roth & Gatter, 2010). To be effective, digoxin intra-amniotic injection should be performed one to two days before the planned abortion procedure. Digoxin may be given transabdominally or transvaginally (Tocce, Sheeder, Edwards, & Teal, 2013).

Transecting the fetal cord: In one retrospective case series of 407 women having D&E between 16 and 23 weeks gestation, after amniotomy was performed the cord was brought to the level of the external os by electric vacuum aspiration and transected. Fetal asystole occurred in all cases with a mean time of 3.35 ± 2.11 minutes (range <1 to 11 minutes) from the time of umbilical cord transection (Tocce, Leach, Sheeder, Nelson, & Teal, 2013).

Young women
This recommendation is the same for young women.

References


Second-trimester dilatation and evacuation or medical abortion: Contraception

Recommendation:
Immediate initiation of hormonal and non-hormonal contraception following second-trimester dilatation and evacuation (D&E) or medical abortion is encouraged and considered safe.

Strength of recommendation: Strong

Quality of evidence:
- Intrauterine Device after D&E: Moderate
- Other contraceptive methods: Low

Last reviewed: November 30, 2014

Contraceptive methods other than intrauterine device (IUD)
Although the immediate use of most methods of contraception has not been formally studied following second-trimester abortion, because of the demonstrated safety of contraception after first-trimester vacuum aspiration and medical abortion, the World Health Organization (WHO) categorizes the immediate initiation of hormonal injections, implants, combined hormonal contraception (pills, patches and rings) and progestin-only pills as category 1, or safe for use.

IUD
A Cochrane meta-analysis of 11 trials of immediate postabortal IUD following surgical abortion use concluded that although expulsion rates may be higher with immediate placement, continuation is higher with no increase in complications (Grimes, Lopez, Schulz, & Stanwood, 2010). In two randomized controlled trials of immediate versus delayed IUD placement after second-trimester D&E, rates of IUD use are significantly higher with immediate insertion, and without an increase in infection or complication rates (Cremer et al., 2011; Hohmann et al., 2012). Expulsion rates for women who had immediate insertion in both studies were low (3.1 percent and 6.8 percent) and were not different from delayed insertion. Notably, in both of these studies, about half of women randomized to delayed insertion did not come back to have the IUD inserted. Requiring a follow-up visit for IUD insertion is a significant barrier to obtaining the IUD (Stanek, Bednarek, Nichols, Jensen, & Edelman, 2009). No studies exist of IUD placement immediately following second trimester medical abortion and the WHO Medical Eligibility Criteria recommendations do not differ based on the type of abortion performed, whether medical or surgical. Although not directly translatable, the evidence from post-partum IUD insertion is reassuring (Grimes, Shulz, Van Vliet, & Stanwood, 2007). Because of the possible increased risk of expulsion, the WHO classifies IUD insertion after an uncomplicated second-trimester abortion as category 2, which means the advantages of using the method generally outweigh the risks (WHO, 2009).

Quality of evidence
There is limited clinical data to support the recommendation of starting methods other than the IUD immediately after second-trimester D&E. This recommendation is based on expert opinion (WHO, 2009). A woman's immediate need for reliable contraception after abortion, coupled with the risk that delayed contraceptive provision reduces uptake, strongly supports the recommendation to start these methods immediately.
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Young women
The IUD for women under the age of 20 is classified by WHO as category two, in which the benefits generally outweigh the risks. While risk is slightly increased due to higher rates of sexually transmitted infections and expulsion in this patient population, IUDs are still a safe, effective and recommended method for women under the age of 20. Sterilization may be performed, but a young woman will need special precautions due to the increased risk of regret (WHO, 2009).

References


Second-trimester medical abortion and dilatation and evacuation (D&E): Follow-up

**Recommendation:**
Routine follow-up care is not necessary unless desired or requested by the woman or necessary for her chosen contraceptive method. She should receive adequate information regarding her postabortion care and warning signs prior to being sent home.

**Strength of recommendation: Weak**

**Quality of evidence: Very low**

**Last reviewed: November 24, 2014**

**Follow-up**
There is no scientific data to demonstrate that routine follow-up is beneficial after second-trimester abortion performed by a trained health-care provider. In addition, there is no evidence to suggest that a pelvic examination is beneficial in an asymptomatic woman if she does return for a routine follow-up visit.

**Young women**
This recommendation is the same for young women.

**Quality of evidence**
Very low. The recommendation is based on expert opinion (WHO, 2012).

**References**
Second trimester dilation and evacuation or medical abortion: Safe disposal of products of conception

Recommendation:
Follow standards and guidelines from your setting for disposal of products of conception. For low resource settings, burial in a properly built and maintained pit (placenta pit) is a recommended disposal method (WHO 2013).

Strength of recommendation: Strong

Quality of evidence: High

Last reviewed: December 8, 2014

Background
Products of conception are pathologic waste, which is a category of health-care waste that includes human tissues, blood and bodily fluids. Pathologic waste is considered infectious waste because it is capable of spreading blood-borne diseases. Proper management of infectious waste is important to reduce health risks and environmental pollution.

Recommendations for first- and second-trimester products of conception are the same. Products of conception should be handled with respect in accordance with prevailing religious, cultural and aesthetic norms. Unless local funeral procedures are being observed, disposal should be in accordance with guidelines for infectious waste.

Pathological waste handling, sorting, storage and transport
Handling
Personnel who handle pathologic waste should wear appropriate protective clothing (heavy-duty gloves, industrial apron, overalls/coveralls, leg protectors and/or industrial boots, face mask). Staff should handle pathological waste as little as possible before disposal.

Sorting
Pathologic waste should be separated from other health-care waste, placed in a leak-proof plastic bag or sealed container, and clearly marked with a biohazard symbol.

Interim storage
Interim storage should ideally be short-term. Usually waste should be stored for only a few hours before disposal. If the pathologic waste must be stored, the storage area should be secure, contained, and marked by a biohazard sign. The storage area should be sealed or tiled to allow easy disinfection. The time from generation of the waste to treatment should not exceed the following:
Temperate climate | Warm climate
---|---
72 hours in winter | 48 hours during the cool season
48 hours in summer | 24 hours during the hot season

**Transport**

Some health facilities will dispose of pathologic waste off-site. Since the transport staff will be handling the waste, they must be educated about the infectious nature of the waste as well as the sensitivity surrounding the disposal of products of conception.

**On-site pathologic waste disposal**

**Burial**

Burial of pathologic waste in a properly built and maintained pit (“placenta pit”) to allow for natural biodegradation is suitable for low-resource areas. The type of pit and dimensions should be built according to the amount of infectious waste the facility produces. Guidelines for pit construction can be found in the EngenderHealth, WHO, Médecins Sans Frontières and JHPIEGO manuals in the reference section. Some basic rules to follow include:

- Restrict access to authorized personnel only, and fence in the area to keep out animals, scavengers and children.
- Line the pit with a material of low permeability (clay, dung, river silt); a cement bottom should be used if available.
- The bottom of the pit should be at least 1.5 to two meters above the groundwater level and at least 50 meters from crops or water sources; the pit should be located away from areas that flood.
- Only infectious waste should be buried.
- Each waste layer should be covered by a 10cm layer of soil (ash or charcoal can also be used to reduce odor and speed up decomposition).
- The pit should be closed when the waste is 50cm below the ground surface.

**Incineration**

The benefit of incineration is a reduction in waste volume and weight and the elimination of microorganisms and recognizable material. Incinerators can range from large, sophisticated, permanent, high-temperature industrial models to very basic small ones (such as drum or brick units) that operate at much lower temperatures. Burning in an industrial incinerator is preferred, but if one is not available, a drum or brick incinerator can be used. Incinerators, particularly simple units, may release toxic chemicals into the air and do not run efficiently when burning pathologic waste with high moisture content.

If small incinerators are the only option, best practices include:

- Effective waste reduction and segregation, ensuring only the smallest amount of combustible waste is incinerated
- Using a design engineered to reach sufficient temperatures to allow complete combustion
- Placing incinerators away and downwind from health-care buildings and residential areas or where crops are grown
- Using a clearly described method of operation
- Periodic maintenance
- Not incinerating certain waste, which includes pressurized gas containers (aerosol cans), reactive chemical waste, silversalts and photographic/radiographic wastes, polyvinyl chloride (PVC) plastics, or waste with high mercury or cadmium content
Important: Construction guidelines for incinerators can be found in the EngenderHealth, WHO, Medecins Sans Frontieres and JHPIEGO manuals in the reference section.

**Pouring into a safe sewage system**
Liquid infectious waste may be poured directly into a sink or drain connected to an adequately treated sewer or pit latrine. Rinse the sink, drain or toilet thoroughly and clean with disinfectant cleaning solution daily or more frequently if heavily used or soiled (EngenderHealth, 2011; Tietjen, Bossemeyer, & MacIntosh, 2003).

**Open-air burning**
Open-air burning is not recommended. If the only option available, it should be done in a confined area (in a dugout pit and covered with soil when finished).

**Open dumping**
Open dumping is never an acceptable option due to the infectious nature of pathologic waste.

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**References**


Second-trimester dilatation and evacuation (D&E): Cervical preparation

Recommendation:
- Routine preoperative cervical preparation is recommended before dilatation and evacuation (D&E) (WHO, 2012).
- Osmotic dilators, misoprostol and mifepristone are all choices for cervical preparation. The choice depends on availability, expense, gestational age and timing of the procedure.

Strength of recommendation: Strong

Quality of evidence: High

Last reviewed: November 10, 2014

Background
Cervical preparation prior to second-trimester dilatation and evacuation (D&E) reduces the risk of complications (Fox & Krajewski, 2013; Peterson, Berry, Grace, & Gulbranson, 1983). Some methods, including misoprostol and synthetic osmotic dilators, may be used for same-day cervical preparation in the early second trimester. There is limited data to suggest the best method because the trials that exist have heterogeneous comparisons, small enrollment numbers and include few women with pregnancies over 20 weeks. Although trials may show differences in cervical dilation, they are not large enough to show differences in more serious outcomes like cervical or uterine injuries or inability to complete the procedure (Newmann et al., 2010). Moreover, method choice is often limited by availability, especially in low-resource settings.

Possible cervical preparation methods include:

<table>
<thead>
<tr>
<th>Method</th>
<th>Dosing</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osmotic dilators (laminaria or synthetic osmotic dilators)</td>
<td>6-24 hours prior to procedure</td>
<td>Synthetic osmotic dilators may be used the day of the D&amp;E.</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>400mcg buccally or vaginally three hours prior to procedure</td>
<td>Limited data to support use as a single agent over 18 to 20 weeks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be combined with osmotic dilators or mifepristone.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be repeated as needed.</td>
</tr>
<tr>
<td>Mifepristone</td>
<td>200mg orally 24-48 hours prior to procedure</td>
<td>No data to support use as a single agent over 16 weeks.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May be combined with misoprostol.</td>
</tr>
</tbody>
</table>
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Osmotic dilators
Numerous cohort studies have demonstrated that osmotic dilators are safe and effective and their use does not increase infectious morbidity (Bryman, Granberg, & Norström, 1988; Fox & Krajewski, 2013; Jonasson, Larsson, Bygdeman, & Forsum, 1989; Peterson, et al., 1983). A Cochrane meta-analysis of cervical preparation before D&E showed that osmotic dilators provide better cervical dilation when compared to prostaglandins throughout the second trimester and decreased procedure time in the early second trimester. There is not sufficient evidence to recommend a specific dilator type (laminaria or synthetic dilators) or regimen (Newmann, Dalve-Endres, & Drey, 2008). Decisions about the number and timing of dilators to place should be individualized and take into consideration the dilator’s type and size, the woman’s gestational age, parity and cervical compliance, and the provider’s experience (Fox & Krajewski, 2013; Newmann, et al., 2008).

Misoprostol
Misoprostol has been studied as an alternative or supplement to osmotic dilators and has been used as a single agent for cervical preparation before 16-18 weeks gestation. One randomized controlled trial of 84 women up to 16 weeks showed that women who had 400mcg vaginal misoprostol three to four hours before the procedure had less cervical dilation and longer procedure times than women with overnight laminaria. However, all of the procedures could be completed and women preferred misoprostol to laminaria (Goldberg et al., 2005). A more recent randomized controlled trial of 125 women at 12-15 weeks compared buccal misoprostol 400mcg given three to four hours prior to the procedure to a single synthetic osmotic dilator and showed similar preoperative dilation, satisfaction and side effects. Misoprostol patients had more discomfort during cervical ripening, but all patients could be done on the same day (Bartz, Maurer, Allen, Fortin, Kuang, & Goldberg, 2013). In an observational study of 429 women in Vietnam between 13-18 weeks gestation, misoprostol alone was found to be adequate for cervical preparation, but nine percent of women required repeat dosing (Castleman, Oanh, Hyman, Thuy, & Blumenthal, 2006). Repeat dosing every two hours of misoprostol 200-600mcg was used to successfully complete same-day second-trimester D&E in one single-center case series of 1,081 women from 17-20 weeks (Maurer, Jacobson, & Turok, 2013). In this series, most women were given 400mcg and had an average of three doses before successfully completing the D&E.

Although misoprostol might not produce as great a degree of cervical dilation, it is cheap, safe (Nucatola, Roth, Saulsberry, & Gatter, 2008), and more readily available than osmotic dilators in some low-resource settings and may be used for cervical preparation prior to D&E up to 18 weeks gestation (Baird, Castleman, Hyman, Gringle, & Blumenthal, 2007). Misoprostol may be given to women with a prior cesarean delivery, as uterine rupture is rare in this setting (Fox & Hayes, 2007).

Misoprostol plus laminaria
Two randomized controlled trials have shown that misoprostol added to laminaria improves cervical dilation and operating time over 19-21 weeks (Edelman, Buckmaster, Goetsch, Nichols, & Jensen, 2006; Drey et al., 2013). This effect was not seen at lower gestational ages and side effects were greater with women using misoprostol.

Mifepristone

Mifepristone
In a randomized trial of 50 women between 14-16 weeks gestation, women who had cervical preparation with osmotic dilators had a slightly shorter procedure time and greater dilation compared to mifepristone, but women had less pain with mifepristone and strongly preferred mifepristone to osmotic dilators (Borgatta et al., 2012).

In one randomized clinical trial of 900 women between 12-20 weeks gestation given mifepristone with
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misoprostol, the combined regimen improved dilation compared to misoprostol alone but had an increased rate of preprocedure fetal expulsions (Carbonell et al., 2007). A single-center retrospective cohort study of 512 women from 14-19 weeks showed mifepristone and misoprostol prior to D&E to be as effective as misoprostol alone or misoprostol and laminaria (Searle, Tait, Langdana, & Maharaj, 2014).

Young women
This recommendation is the same for young women.

References


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Second-trimester dilatation and evacuation (D&E): Pain management

Recommendation:

- Women undergoing second-trimester dilatation and evacuation (D&E) should receive pain medications and non-pharmacologic approaches to treat pain (WHO, 2012).
- A combination regimen of local anesthesia (paracervical block), non-steroidal anti-inflammatory drugs and narcotic analgesics with or without anxiolytics is recommended. If the personnel, monitoring and equipment are available to safely provide deeper levels of sedation, these services may be offered. The increased risks of deep sedation or general anesthesia must be weighed against the benefits to the woman.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 17, 2014

Pain during second-trimester dilatation and evacuation
There is a lack of published evidence regarding the level of pain associated with dilatation and evacuation (D&E). Most experts agree that D&E is more painful than first-trimester vacuum aspiration; D&E requires more dilation, longer procedure times and deeper uterine manipulation.

Regimens for pain control
Specific studies in second-trimester D&E are lacking. The optimal regimen for pain management has not been established. Most international consensus statements focus on the minimum amount of anesthesia at which a D&E can be performed to ensure access at lower-level facilities rather than optimizing pain control (RCOG, 2011; WHO, 2012). Ipas recommends a combination of local anesthesia (paracervical block) with NSAIDs and narcotic analgesics with or without anxiolytics. Medications may be given orally or parenterally (Baird, Castleman, Hyman, Gringle & Blumenthal, 2007).

Some women may need deeper sedation based on the clinical situation. Intravenous sedation may be offered in facilities where there is a trained provider with adequate equipment for patient monitoring. General anesthesia increases the risks associated with abortion and is not recommended for routine procedures (Atrash, Cheek, & Hogue, 1988; WHO, 2012). If general anesthesia is used, the addition of a paracervical block does not appear to help with postoperative pain control (Lazenby, Fogelson & Aeby, 2009). Medication choice and sedation level depend on the woman’s preference as well as the level of provider training, supplies and monitoring equipment in the facility.

Young women
This recommendation is the same for young women.
References


Second-trimester dilatation and evacuation (D&E): Prophylactic antibiotics

Recommendation:
Administer prophylactic antibiotics for all women prior to dilatation and evacuation (D&E). Where antibiotics are unavailable, D&E may still be offered. Some providers start antibiotics at the time of osmotic dilator placement, but there are no studies comparing different start times and the risk of infection.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 29, 2014

Background
There is evidence to support the use of prophylactic antibiotics before first-trimester vacuum aspiration. However, evidence in the second trimester is more limited. Because of the demonstrated benefit of first-trimester antibiotics, the World Health Organization (WHO, 2012), Society of Family Planning (Achilles & Reeves, 2011), American Congress of Obstetricians and Gynecologists (ACOG, 2009) and Royal College of Obstetricians and Gynaecologists (RCOG, 2011) recommend prophylactic antibiotics for all women having dilatation and evacuation (D&E). Giving prophylactic antibiotics is more effective (Levallois & Rioux, 1988) and cheaper (Penney et al., 1998) than screening all women and treating only those with evidence of infection. Because the rate of infection after D&E is very low, the inability to provide antibiotics should not limit access to abortion (Peterson, Berry, Grace & Gulbranson, 1983; WHO, 2012).

Regimen
Many antibiotic regimens for abortion prophylaxis have been studied, but the ideal antibiotic, dose and timing has not yet been established (Achilles & Reeves, 2011). Tetracyclines (doxycycline) and nitroimidazoles (metronidazole and tinidazole) are commonly used because of their clinical efficacy, oral availability, low cost and low risk of allergic reactions (Achilles & Reeves, 2011; O’Connell, Jones, Lichtenberg, & Paul, 2008). Although studies of abortion are limited (Caruso et al., 2008) evidence from the obstetrical (Costantine et al., 2008), gynecologic (Mittendorf et al., 1993) and general surgery (Classen et al., 1992) literature supports the practice of giving antibiotics before the procedure to decrease the risk of infection. Antibiotic regimens do not need to be extended beyond the immediate postabortion period (Achilles & Reeves, 2011; Levallois & Rioux, 1988; Caruso, et al., 2008; Lichtenberg & Shott, 2003).

The following table lists some common regimens used in clinical practice or recommended by professional organizations. These regimens are based on clinical evidence and expert opinion. Providers should choose a regimen based on the expense and availability of the antibiotics as well as practices around testing and treating women for sexually transmitted infections.
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<table>
<thead>
<tr>
<th>Common regimens</th>
<th>Recommender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxycycline 100mg orally one hour before the procedure and 200mg after the procedure or Metronidazole 500mg orally twice daily for five days</td>
<td>American Congress of Obstetricians and Gynecologists (ACOG, 2009)</td>
</tr>
<tr>
<td>Doxycycline 200mg orally before the procedure Or Azithromycin 500mg orally before the procedure Or Metronidazole 500mg orally before the procedure</td>
<td>Planned Parenthood Federation of America (PPFA Manual of Medical Standards and Guidelines, 2014)</td>
</tr>
</tbody>
</table>

Antibiotics with cervical preparation

Although not well studied, cervical preparation with osmotic dilators does not appear to increase the risk of infection (Fox & Hayes, 2007; Jonasson, Larsson, Bygdeman & Forsum, 1989). Some providers start antibiotics at the time of osmotic dilator placement, but there are no studies comparing different start times and the risk of infection (O’Connell, et al., 2008).

Therapeutic antibiotics

If possible, women at high risk should be screened and treated for sexually transmitted infections in addition to receiving prophylactic antibiotics. Women who have signs and symptoms of active infection should be provided with abortion services without delay and treated appropriately once the procedure is completed.

Young women

This recommendation is the same for young women.

References


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Second-trimester medical abortion with mifepristone and misoprostol or misoprostol only: Previous uterine scar

Recommendation:

<22-24 weeks gestation with one uterine scar
No regimen changes necessary. To view the recommended regimens, see our Clinical Updates on Second-trimester medical abortion regimen with mifepristone and misoprostol or Second-trimester medical abortion regimen with misoprostol only.

>22-24 weeks gestation with one uterine scar or throughout second trimester with more than one uterine scar
Consider removing the misoprostol loading dose and decreasing the misoprostol dose with or without increasing the misoprostol dosing interval. There is insufficient evidence to suggest that these interventions will decrease the risk of uterine rupture in these women.

Strength of recommendation: Weak

Quality of evidence: Very Low

Last reviewed: November 29, 2014

Risk of uterine rupture with medical abortion
Uterine rupture has been reported during second-trimester medical abortion in women both with and without a uterine scar. The risk of uterine rupture for any woman undergoing a second-trimester medical abortion is very rare, occurring in less than 1/1,000 women (Goyal, 2009). In a meta-analysis of 16 studies of 3,556 women undergoing second-trimester medical abortion with combined or misoprostol-only regimens, there were three women who suffered uterine rupture resulting in a rate of 0.28 percent with a previous cesarean section and 0.04 percent without a previous cesarean section (Goyal, 2009).

One single-center retrospective review of 279 women undergoing second-trimester abortion with misoprostol every four hours included 26 women with more than one scar. These women received misoprostol 200mcg every four hours; three had a uterine rupture. (Küçükgöz Güleç et al., 2013).

Regimen for women with a uterine scar
Due to the rarity of uterine rupture in women with a previous scar, no clear guidance can be obtained from the published literature (Borgatta & Kapp, 2011; Daponte, Nzewenga, Dimopoulos & Guidozzi, 2006; Daskalakis et al., 2004; Dickinson, 2005).

Expert opinion supports:
1. No change in medical abortion regimen for women whose gestation is less than 22-24 weeks.
2. After 22-24 weeks gestation with a single uterine scar or throughout the second trimester with more than one uterine scar:
   a. No misoprostol loading dose.
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b. Consider decreasing the dose of misoprostol with or without increasing the dosing interval (Ho et al., 2007; Küçükgöz Güleç et al., 2013).
c. There is insufficient evidence to suggest that changing the dosing regimen will decrease the risk of uterine rupture.

Young women
This recommendation is the same for young women.

References


Second-trimester medical abortion: Pain management

Recommendation:
- All women undergoing medical abortion in the second trimester should be offered pain management (WHO, 2012).
- Prophylactic non-steroidal anti-inflammatory drugs reduce the need for narcotic analgesics during second-trimester medical abortion.
- All women should be given NSAIDs beginning with misoprostol. Narcotic analgesics, anxiolytics, and non-pharmacologic measures may be used as needed. If the personnel, monitoring and equipment are available, regional anesthesia or patient-controlled anesthesia may be offered.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 17, 2014

Pain during second-trimester medical abortion
In multiple cohort studies of second-trimester medical abortion, the majority of women require pain medication (Ashok, Templeton, Wagaarachchi & Flett, 2004; Gemzell-Danielsson & Östlund, 2000; Goh & Thong, 2006; Hamoda, Ashok, Flett & Templeton, 2004; Rose, Shand & Simmons, 2006). Advanced gestational age, number of misoprostol doses and induction-to-abortion interval are associated with increased pain during medical abortion (Hamoda, et al., 2004). Pain rarely starts after taking mifepristone but becomes more pronounced after misoprostol and typically peaks with expulsion.

Regimens for pain control
All women undergoing medical abortion in the second trimester should be offered pain management, but there is little evidence regarding the optimal regimen. One randomized trial of 74 women undergoing second-trimester medical abortion with mifepristone and misoprostol found that prophylactic treatment with a non-steroidal anti-inflammatory drug (diclofenac 100mg orally) at the time of misoprostol administration reduced the need for intravenous opiates when compared to treatment with paracetamol and codeine (Fiala, Swahn, Stephansson & Gemzell-Danielsson, 2005). In this study, treatment with NSAIDs did not affect abortion outcome.

In the largest cohort study of 1,002 women having second-trimester mifepristone and misoprostol medical abortion, a combination of oral and parenteral narcotic analgesics and nonsteroidal anti-inflammatory drugs was provided at four to six hour intervals as required (Ashok, et al., 2004). Although it is not evidence based, a combination regimen involving prophylactic NSAIDS given at the time of misoprostol, plus oral and/or parenteral narcotic analgesics, is an effective way of delivering pain management according to a woman’s particular needs (Baird, Castleman, Hyman, Gringle, & Blumenthal, 2007). If the personnel, monitoring and equipment are available, regional (i.e. epidural) or patient-controlled anesthesia may be offered.

Young women
This recommendation is the same for young women as for adult women.
References


Second-trimester medical abortion with mifepristone and misoprostol: Safety and efficacy

Summary of evidence:
A combined regimen with mifepristone and misoprostol is preferred for second-trimester medical abortion (WHO, 2012). The combined regimen is safe and effective, with expulsion rates of over 99 percent, induction-to-abortion time of around six hours and major complication rates of less than one percent.

Quality of evidence: High

Last reviewed: November 30, 2014

Expulsion rates
In the largest cohort study of 1,002 women having second-trimester medical abortion using the recommended mifepristone and misoprostol regimen, the complete expulsion rate was 98.3 percent at 24 hours and 99.2 percent at 36 hours (Ashok, Templeton, Wagaarachchi & Flett, 2004).

Induction-to-abortion interval
In the cohort study mentioned above, the median time to fetal expulsion was 6.25 hours, with a range of 0-67.5 hours. The induction-to-abortion interval was longer in nulliparous women, older women and women at a later gestational age (Ashok, et al., 2004). The addition of mifepristone to the medical abortion regimen consistently reduces the induction-to-abortion interval (Kapp, Borgatta, Stubblefield, Vragovic & Moreno, 2007; Ngoc et al., 2011).

Complication rates
The rate of major complications from mifepristone and misoprostol medical abortion in the second trimester is low, although minor complications such as needing a procedure for bleeding or retained products of conception are more frequent than for dilatation and evacuation (Autry, Hayes, Jacobson, & Kirby, 2002). In the cohort of 1,002 women, 81 women (8.1 percent) needed surgery for uterine evacuation, the majority for retained placenta. Only two out of the 1,002 women needed a surgical evacuation to terminate the pregnancy (Ashok, et al., 2004). In this study, serious complications such as hemorrhage blood transfusion or unanticipated surgery occurred in eight women (<1 percent). In a meta-analysis of studies of medical abortion, the overall rate of uterine rupture is 0.08 percent, with a rate of 0.28 percent in women with a previous cesarean section (Goyal, 2009). A Finnish register-based study compared incidence of preterm birth, low birth weight, small for gestational age infants and placental complications in subsequent pregnancies after medical abortion in either the first (n=3427 women) or second (n=416) trimester in primigravid women (Mannisto et al., 2014). No differences were observed between the two groups of women, suggesting second trimester medical abortion does not increase risk of these outcomes in subsequent pregnancies.

References


Second-trimester medical abortion with mifepristone and misoprostol: Recommended regimen

Recommendation:
For women who are 13-24 weeks gestation:
Mifepristone 200mg by mouth, followed 24-48 hours later by misoprostol 800mcg vaginally for one dose, then 400mcg vaginally or sublingually every three hours for four more doses (WHO, 2012).

Strength of recommendation: Strong

Quality of evidence: Up to 20 weeks gestation, moderate. 20-24 weeks gestation, low.

Last reviewed: November 30, 2014

Background
Mifepristone combined with misoprostol is the preferred regimen for medical abortion in the second trimester as it combines high efficacy, a short induction-to-abortion interval and an excellent safety profile (Wildschut et al., 2011).

Mifepristone dose and timing
Mifepristone 200mg given orally is as effective as a 600mg dose (Webster, Penney, & Templeton, 1996). When mifepristone is given 12-24 hours instead of 36-48 hours before misoprostol, the induction-to-abortion interval is slightly longer but the abortion rate at 24 hours is similar (Shaw, Topp, Shaw, & Blumenthal, 2013). Simultaneous dosing of mifepristone and misoprostol can be a useful strategy if medical or social issues require an even shorter time interval between the two medications (Chai et al., 2009) because the combined regimen at any timing is more effective than misoprostol alone.

Misoprostol loading dose
Published clinical trials have used a higher loading dose of vaginal misoprostol 600mcg (Chai, et al., 2009; el-Refaey & Templeton, 1995) or 800mcg (Hamoda, Ashok, Flett, & Templeton, 2005). The largest case series of 1,002 women undergoing mifepristone-misoprostol second-trimester abortion used a loading dose of misoprostol 800mcg vaginally with a resulting median induction-to-abortion interval of 6.25 hours and 24-hour efficacy of 97.1 percent (Ashok, Templeton, Wagaarachchi, & Flett, 2004). When compared to the 800mcg vaginal loading dose, a 600mcg sublingual loading dose has similar efficacy but higher pain medication requirements (Hamoda, et al., 2005). A single, small randomized controlled trial assigned 77 women to receive a loading dose of misoprostol (600mcg, followed by 400mcg every six hours) and 80 to a no-loading dose regimen (400mcg every six hours) (Pongsatha & Tongsong, 2014). Median induction-to-abortion intervals and rates of complete abortion at 24 and 48 hours did not differ between groups; the loading dose group suffered significantly more misoprostol-related side effects.

Misoprostol dosing
Route
Vaginal dosing has superior efficacy when compared to oral dosing (Wildschut, et al., 2011). Sublingual dosing has
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similar efficacy to vaginal, but it is associated with higher pain medication requirements (Hamoda, et al., 2005). Oral dosing is inferior to vaginal and sublingual dosing (Ho, Ngai, Liu, Wong, & Lee, 1997; Tang, Chan, Kan, & Ho, 2005). More research is needed to determine the most effective dose and timing for buccal misoprostol (Ellis, Kapp, Vragpvoc & Borgata, 2010).

**Dose**

Misoprostol 400mcg vaginally has higher expulsion rates, shorter induction-to-abortion intervals and similar side effects compared to 200mcg vaginally (Brouns, van Wely, Burger & van Wijngaarden, 2010). The 400mcg dose is equally effective when given sublingually (Hamoda, et al., 2005).

**Timing**

In studies of misoprostol only, induction-to-abortion intervals were shorter and efficacy at 24 hours was higher when misoprostol was given every three hours compared to every six hours with similar rates of adverse events (Wong, Ngai, Yeo, Tang & Ho, 2000).

**Quality of evidence**

The recommendation is based on multiple randomized clinical trials and a Cochrane meta-analysis comparing different mifepristone and misoprostol doses, dosing intervals and routes of administration in the second trimester (Wildschut, et al., 2011). Most randomized controlled trials of medical abortion in the second trimester do not include women over 20 weeks gestation.

**Young women**

This recommendation is the same for young women.

**References**


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Second-trimester medical abortion with misoprostol only: Safety and efficacy

Summary of evidence
A combined regimen with mifepristone and misoprostol is preferred for second-trimester medical abortion (WHO, 2012). Where mifepristone is not available, misoprostol only is safe and effective with expulsion rates of over 90 percent at 48 hours, average induction-to-abortion time of around 12 hours and major complication rates of less than one percent.

Quality of evidence: Moderate

Last reviewed: November 30, 2014

Expulsion rates
In the largest international randomized controlled trial of 681 women having second-trimester medical abortion using the recommended misoprostol-only regimen, the complete expulsion rate was 84.8 percent at 24 hours and 94.3 percent at 48 hours (Von Hertzen et al., 2009). Other randomized trials using vaginal or sublingual misoprostol every three hours show similar expulsion rates of 90 percent to 95 percent at 48 hours (Bhattacharjee, Saha, Ghoshroy, Bhowmik & Barui, 2008; Tang, Lau, Chan, & Ho, 2004). In nulliparous women, vaginal misoprostol has higher expulsion rates than sublingual misoprostol (Von Hertzen, et al., 2009).

Induction-to-abortion interval
In the trial cited above, the median time to fetal expulsion was 12 hours with a range of 4.1-61.8 hours, with parous women having faster induction-to-abortion times than nulliparous women (Von Hertzen, et al., 2009). Increasing the dosing interval of misoprostol increases the induction-to-abortion time (Wong, Ngai, Yeo, Tang, & Ho, 2000).

Complication rates
The rate of major complications from misoprostol-only abortion in the second trimester is low. In the trial cited above, 12 adverse events (0.02 percent) were reported, with none of them being serious (Von Hertzen, et al., 2009); ten women required blood transfusions.

References


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Reproduction, 24(1), 106-112.


Second-trimester medical abortion with misoprostol only: Recommended regimen

Recommendation:
For women who are 13-24 weeks gestation:
Misoprostol 400mcg vaginally or sublingually every three hours for up to five doses. Vaginal dosing is more effective than sublingual dosing for nulliparous women (WHO, 2012).

Strength of recommendation: Strong

Quality of evidence: Up to 20 weeks gestation, moderate. 20-24 weeks gestation, low.

Last reviewed: November 30, 2014

Background
In the second trimester, a combination regimen with mifepristone and misoprostol has shorter induction-to-abortion intervals and higher success rates than misoprostol only (Wildschut et al., 2011). If mifepristone is not available, a misoprostol-only regimen with dosing every three hours is an acceptable alternative (Wildschut et al., 2011; WHO, 2012).

Vaginal route
In randomized controlled clinical trials, misoprostol 400mcg vaginally every three hours is associated with a median induction-to-abortion interval of 10-15 hours and a 48-hour successful abortion rate of 90 percent to 95 percent (Bhattacharjee, Saha, Ghoshroy, Bhowmik & Barui, 2008; Tang, Lau, Chan, & Ho, 2004; von Hertzen et al., 2009). Increasing the dosing interval decreases the efficacy of medical abortion (Wong, Ngai, Yeo, Tang & Ho, 2000).

Sublingual route
In a meta-analysis of 1,178 women from three randomized controlled trials, misoprostol 400mcg sublingually is similar (Bhattacharjee, et al., 2008) or slightly inferior to vaginal dosing when given every three hours (Tang, et al., 2004; von Hertzen, et al., 2009; Wildschut, et al., 2011). In the trials that showed reduced efficacy, the difference was driven by an inferior response to sublingual misoprostol in nulliparous women only. Of note, all of these studies found women prefer the sublingual route to the vaginal route.

Other routes
Buccal route: One randomized trial of 64 women showed buccal misoprostol was as effective as vaginal misoprostol. However, all of the women in this trial received a loading dose of misoprostol 400mcg vaginally and were randomized to 200mcg buccally or vaginally every six hours (Ellis, Kapp, Vragpvo & Borgata, 2010). More studies are needed before recommending buccal misoprostol for this purpose.

Oral route: In multiple randomized clinical trials, oral dosing has been shown to be less effective with longer induction-to-abortion intervals than vaginal dosing (Akoury et al., 2004; Bebbington et al., 2002; Behrashi & Mahdian, 2008).
Quality of evidence: The recommendation is based on multiple randomized clinical trials and a Cochrane meta-analysis comparing different misoprostol doses, dosing intervals and routes of administration in the second trimester (Wildschut, et al., 2011). Most randomized controlled trials of medical abortion in the second trimester do not include women over 20 week’s gestation.

Young women
This recommendation is the same for young women.

References


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Misoprostol for treatment of incomplete and missed abortion (postabortion care) under 13 weeks uterine size: Recommended regimen

Recommendation:
Incomplete Abortion: Misoprostol 600mcg orally in a single dose or 400mcg sublingually in a single dose (WHO, 2012).

Missed abortion: Misoprostol 800mcg vaginally in a single dose or 600mcg sublingually every three hours for a maximum of three doses (1,800mcg).

Strength of recommendation: Strong

Quality of evidence: Moderate

Last reviewed: November 29, 2014

Definitions
Incomplete abortion: An abortion—whether spontaneous or induced—in which some pregnancy tissue passes out of the uterus but some remains.

Missed abortion: A kind of miscarriage; the pregnancy ends, but the tissue remains in the uterus.

Incomplete abortion
In a Cochrane review of twelve studies of 2,894 women presenting with incomplete abortion under 13 weeks, management with misoprostol showed a slightly lower incidence of completion compared to vacuum aspiration, but success rates were high for both methods (Neilson, Gyte, Hickey, Vazquez, & Dou, 2013). In the analysis, oral and sublingual misoprostol showed similar efficacy and side effect profiles. Lengthening the time to follow-up increases the success of misoprostol treatment.

Missed abortion
A single dose of misoprostol 800mcg vaginally results in successful uterine evacuation in more than 80 percent of women (Ngoc, Blum, Westheimer, Quan, & Winikoff, 2004). Some studies have used repeat doses of misoprostol 800mcg vaginally after 24 (Barcelo et al., 2012; Graziosi, Mol, Ankum, & Bruinse, 2004; Muffley, Stitely, & Gherman, 2002) or 72 (Gilles et al., 2004; Zhang et al., 2005) hours with a resulting increase in the complete abortion rates. However, it is unclear whether the increase in complete abortion is due to the additional prostaglandin dose or the increased time to evaluation. When women are managed expectantly after a single dose of misoprostol, their complete abortion rates increase over time (Ngoc et al., 2004). Misoprostol 600mcg sublingually repeated every three hours for a maximum of two more doses achieves similar success rates (Tang, Ong, Tse, Ng, Lee, & Ho, 2003; Tang et al., 2006). A recent trial randomized 310 women, 91 percent of whom had early missed abortion, to receive either 400mcg or 800mcg of misoprostol vaginally as a single dose with a second dose 24 hours later if the products of conception had not yet passed (Petersen et al., 2013). Both doses were equally effective in completing the abortion, although more women in the 400mcg group
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received a second dose of misoprostol.

Young women
This recommendation is the same for young women. In a secondary analysis of 485 misoprostol users (Creinin et al., 2006) nulliparity was associated with twice the likelihood of successful treatment with a single dose of 800mcg vaginal misoprostol.

References


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Treatment of incomplete and missed abortion (postabortion care) over 13-week uterine size (second trimester): Recommended regimen

**Recommendation:**
- Misoprostol in a dose of at least 200mcg vaginally, sublingually or buccally may be given every six hours.
- Pretreatment with mifepristone 200mg orally one to two days before misoprostol may decrease the time from induction to expulsion.
- The misoprostol-only or mifepristone-misoprostol regimen for induced abortion in the second trimester can be used.
- Where skilled providers and supportive facilities exist, dilation and evacuation may be offered.

**Strength of recommendation:** Strong

**Quality of evidence:** Low

**Last reviewed:** November 21, 2014

**Background**
The majority of postabortion care (PAC) research and programs focus on women in the first trimester with uterine size less than 13 weeks (Ipas, 2013). However, where unsafe abortion is prevalent, as many as 40 percent of women needing PAC present in the second trimester (MOH Kenya, 2013). Women may present with incomplete abortion, retained placenta, fetal demise or ruptured membranes, all of which require uterine evacuation. Currently, no widely recognized guidance exists regarding how to manage PAC at later gestations or larger uterine size (WHO, 2012).

**Medical regimens**
Evidence is limited to suggest the optimal medical regimen for second-trimester PAC, but a systematic review of the literature suggests that at least 200mcg vaginally, sublingually or buccally given every six hours is an effective regimen (Bracken, 2014; Mark, 2014). Pretreatment with mifepristone one to two days prior to misoprostol may reduce the time to expulsion (Stibbe, 2012). Expert opinion supports using regimens similar to second-trimester medical abortion until further evidence is generated (Mark, 2014).

**Dilation and evacuation (D&E)**
No studies have compared medical management versus vacuum aspiration or D&E for PAC in the second trimester. However, D&E is recommended for induced abortions in the second trimester and can be offered to women for postabortion care where skilled providers and supportive facilities exist (WHO, 2012).

**Young women**
This recommendation is the same for young women.
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**References**


Vacuum aspiration for treatment of incomplete and missed abortion (postabortion care): Prophylactic antibiotics

Recommendation:
Routine prophylactic antibiotics are recommended for treatment of incomplete or missed abortion with vacuum aspiration (commonly referred to as postabortion care). Where antibiotics are unavailable, uterine aspiration may still be offered. Women with signs or symptoms of infection should be given therapeutic antibiotics.

Strength of recommendation: Weak

Quality of evidence: Very low

Last reviewed: November 21, 2014

Background
Scant literature exists supporting routine antibiotics during vacuum aspiration for incomplete or missed abortion (commonly referred to as postabortion care) (May, Gülmezoglu, & Ba-Thike, 2007). However, routine prophylactic antibiotics are recommended before vacuum aspiration for induced abortion (WHO, 2012), and therefore in the absence of evidence, it seems prudent to administer prophylactic antibiotics for vacuum aspiration when used for postabortion care, especially in areas where unsafe abortion is prevalent (Achilles & Reeves, 2011). The inability to provide antibiotics should not limit access to vacuum aspiration (WHO, 2012), as the overall risk of infection is low.

Regimen
Many antibiotic regimens for abortion prophylaxis have been studied, but the ideal antibiotic, dose and timing has not yet been established (Achilles & Reeves, 2011). Tetracyclines (doxycycline) and nitroimidazoles (metronidazole and tinidazole) are commonly used because of their clinical efficacy, oral availability, low cost and low risk of allergic reactions (Achilles & Reeves, 2011). A short pre-operative course of oral doxycycline or metronidazole may be used in clinical practice.

Therapeutic antibiotics
Women who present with signs and symptoms of infection should be treated with broad spectrum oral or intravenous antibiotics according to the severity of the infection.

Quality of evidence
A Cochrane review of antibiotics for incomplete abortion found only one randomized controlled trial from Zimbabwe with 140 women that showed no benefit from a course of oral tetracycline after uterine evacuation (May, Gülmezoglu, & Ba-Thike, 2007; Seeras, 1989). United States trials of prophylactic oral (Ramin et al., 1995) or intravenous doxycycline (Prieto, Eriksen & Blanco, 1995) and a Thai trial of intramuscular cefoxitin (Titipant & Cherdchoogieat, 2012) before evacuation for incomplete abortion have shown no reduction in postoperative infection with antibiotics.
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Young women
This recommendation is the same for young women.

References


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Postabortion hemorrhage

Recommendation:
When hemorrhage occurs, providers need to perform rapid diagnosis and management. Hemorrhage caused by atony may be treated with uterine massage, uterotonic medications, reaspiration, tamponade or surgery as a last resort. Women need close monitoring and treatment for shock.

Strength of recommendation: Strong

Quality of evidence: Low

Last reviewed: November 10, 2014

Background
Hemorrhage after abortion is rare, occurring in 0-3 per 1,000 cases following first-trimester vacuum aspiration, and 0.9-10 per 1,000 cases following second-trimester uterine evacuation (Kerns & Steinauer, 2013). Definitions of postabortion hemorrhage vary, making comparisons of incidence, risk factors and treatments across studies difficult. One clinically relevant definition is a response to excessive bleeding, such as transfusion or hospital admission, and/or bleeding in excess of 500mL (Kerns & Steinauer, 2013).

Diagnosis
When postabortion hemorrhage is suspected, clinicians should take a rapid, systematic approach to assessing and treating women. Initial assessment includes a visual and digital inspection of the cervix for laceration, a bimanual examination to assess for uterine atony, and ultrasound examination or repeat aspiration to evaluate for retained pregnancy-related material or blood.

Management
Cervical lacerations may be treated with direct pressure with gauze or a sponge-holding forcep, application of topical clotting agents like Monsel’s solution and silver nitrate, or absorbable sutures.

Uterine atony requires a rapid, sequential response starting with uterine massage, to uterotonics, reaspiration, uterine tamponade and finally to surgical measures. Providers should move quickly to the next step if bleeding is not controlled. When uterotonic medications are used, additional or repeat doses may be used if bleeding does not improve after the first dose.

Uterotonic medications and dosages (Lichtenberg & Grimes, 2009)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylergonovine</td>
<td>0.2mg intramuscularly or intracervically; repeat after 15 minutes for a maximum of five doses. Avoid in women with hypertension.</td>
</tr>
<tr>
<td>Misoprostol</td>
<td>200-800mcg orally, rectally or sublingually (WHO, 2012).</td>
</tr>
<tr>
<td>Oxytocin</td>
<td>20 units in one liter of intravenous fluid at a rate of 60 drops/minute; maximum of three liters of fluid.</td>
</tr>
<tr>
<td>Intrauterine tamponade</td>
<td>Sterile gauze, 30-75mL Foley catheter balloon or inflated condom placed in uterus.</td>
</tr>
</tbody>
</table>
Reaspiration is appropriate if there is evidence of retained tissue or accumulation of blood in the uterus on ultrasound.

If tamponade successfully stops the bleeding, the Foley balloon, gauze or inflated condom should be left in place for several hours while the patient is observed. If she remains stable after the balloon or gauze is removed, she may be discharged.

Surgical measures like hysterectomy, uterine compression sutures, uterine artery ligation or uterine artery embolization can be performed for bleeding that cannot be controlled by other measures. Providers at health centers without available operating rooms or expertise should have clear protocols for resuscitation and transfer to a higher level of care.

All women who experience postabortal bleeding should be managed appropriately for potential shock with IV line placement, supplemental oxygen, fluid resuscitation, and replacement of blood products as indicated.

**Young women**

This recommendation is the same for young women.

**References**


Pain medication table

Though the medications shown below are commonly used for pain management during vacuum aspiration and dilatation and evacuation, many other options exist. This table does not cover general anesthetic agents.

Both anxiolytics and narcotics may cause respiratory depression, especially when they are used together. Accordingly, lower doses should be used when they are together than when they are separate. When medications are given intravenously immediately before a procedure they should be given slowly and intermittently by a specially trained provider. Problematic side effects can be avoided by repeated small intravenous doses that are titrated to a woman’s level of pain and sedation. The peak analgesic effect should occur during the procedure to avoid excessive post procedure sedation.

Even clinicians using lighter sedation analgesia must be able to manage respiratory arrest, in the unlikely event that an unintentional overdose should occur. Providers should be trained in airway management and cardiopulmonary resuscitation, and resuscitative equipment and appropriate antagonist drugs (naloxone and flumazenil) should be available.

* Disclaimer: This resource is designed to be a supplemental resource for clinicians and is NOT intended to serve as a replacement for drug label information or clinical judgment that accounts for patients' and facilities' unique circumstances.

Last reviewed: December 12, 2014

<table>
<thead>
<tr>
<th>Drug type</th>
<th>Generic drug name</th>
<th>Dose and timing</th>
<th>Half-life</th>
<th>Side effects</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local anesthetic</td>
<td>Xylocaine</td>
<td>15-20ml of 0.5%-1% solution in a paracervical block not to exceed 4.5mg/kg</td>
<td>60-90 minutes</td>
<td>Buzzing in ears; dizziness; numbness in lips, mouth and tongue; metallic taste; seizures (rare)</td>
<td>Pull back plunger before injecting to avoid intravascular injection. Wait three minutes for medication to take effect.</td>
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<td></td>
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<td></td>
<td></td>
<td>Mild reaction (itching, rash, and hives) can be treated with 25-50mg diphenhydramine IM or IV.</td>
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<td></td>
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<td></td>
<td>For intense reaction or respiratory distress, obtain IV access immediately. Give epinephrine 0.4mg subcutaneously and diazepam 5mg slow IV push. Support</td>
</tr>
</tbody>
</table>

*Disclaimer: This resource is designed to be a supplemental resource for clinicians and is NOT intended to serve as a replacement for drug label information or clinical judgment that accounts for patients’ and facilities’ unique circumstances.*
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<table>
<thead>
<tr>
<th>NSAID</th>
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<tbody>
<tr>
<td>Ibuprofen</td>
<td>Oral: 400-800mg one hour before the procedure</td>
<td>4-6 hours</td>
<td>Possible gastrointestinal upset</td>
<td>Do not use in women with active peptic ulcer disease or renal failure.</td>
</tr>
<tr>
<td>Naproxen</td>
<td>Oral: 550mg one hour before the procedure</td>
<td>4-6 hours</td>
<td>Possible gastrointestinal upset</td>
<td>Do not use in women with active peptic ulcer disease or renal failure.</td>
</tr>
<tr>
<td>Ketorolac</td>
<td>Oral: 20mg one hour before procedure&lt;br&gt;IV: 30mg over at least 15 seconds 30-60 minutes before procedure&lt;br&gt;IM: 60mg 30-60 minutes before procedure&lt;br&gt;For women less than 50kg, all doses should be halved</td>
<td>4-6 hours</td>
<td>Single dose IM ketorolac prior to surgery may reduce opioid use and postoperative pain (de Oliveira, 2012; Roche, 2011).&lt;br&gt;Do not use in women with active peptic ulcer disease, renal failure, breastfeeding or sensitivity to other NSAIDs.&lt;br&gt;Breakthrough pain should be managed with narcotics rather than increasing ketorolac beyond the recommended doses.</td>
<td></td>
</tr>
<tr>
<td>Analgesic</td>
<td>Acetaminophen</td>
<td>Oral: 500-1,000mg 30-60 minutes before procedure</td>
<td>3-6 hours</td>
<td>Not a first-line pain medication for vacuum aspiration or medical abortion. May be used as an antipyretic.&lt;br&gt;Liver toxicity from overdose (maximum dose = 4,000mg/day) is a risk.</td>
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</table>

respiration. If wheezing is present, inhaler may be helpful.

Allergic reaction is very rare. Reactions that do occur may be due to preservatives in multi-dose vials. Preservative-free lidocaine allergy is extremely rare.

NSAID

Ibuprofen: 400-800mg one hour before the procedure<br>Possible gastrointestinal upset

Naproxen: 550mg one hour before the procedure<br>Possible gastrointestinal upset

Ketorolac: Oral: 20mg one hour before procedure<br>IV: 30mg over at least 15 seconds 30-60 minutes before procedure<br>IM: 60mg 30-60 minutes before procedure<br>Single dose IM ketorolac prior to surgery may reduce opioid use and postoperative pain (de Oliveira, 2012; Roche, 2011).<br>Do not use in women with active peptic ulcer disease, renal failure, breastfeeding or sensitivity to other NSAIDs.<br>Breakthrough pain should be managed with narcotics rather than increasing ketorolac beyond the recommended doses.

Acetaminophen: 500-1,000mg 30-60 minutes before procedure<br>3-6 hours<br>Not a first-line pain medication for vacuum aspiration or medical abortion. May be used as an antipyretic.<br>Liver toxicity from overdose (maximum dose = 4,000mg/day) is a risk.
<table>
<thead>
<tr>
<th>Narcotic/analgesic combination</th>
<th>Acetaminophen 300mg + codeine 30mg</th>
<th>Oral: 1-2 tablets one hour before procedure</th>
<th>3-6 hours</th>
<th>Drowsiness, light-headedness, nausea and vomiting, decreased breathing rate, loss of consciousness</th>
<th>If respiration is compromised, assist with breathing (airway management, oxygen and ambu bag) and reverse with naloxone (see below). Be aware of combining with other acetaminophen containing products. Liver toxicity from overdose of acetaminophen (maximum dose = 4,000 mg/day) is a risk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen 500mg + hydrocodone 5mg</td>
<td>Oral: 1-2 tablets one hour before procedure</td>
<td>4-6 hours</td>
<td>Drowsiness, light-headedness, nausea and vomiting, decreased breathing rate, loss of consciousness</td>
<td>If respiration is compromised, assist with breathing (airway management, oxygen and ambu bag) and reverse with naloxone (see below). Be aware of combining with other acetaminophen containing products. Liver toxicity from overdose of acetaminophen (maximum dose = 4,000 mg/day) is a risk.</td>
<td></td>
</tr>
<tr>
<td>Narcotic</td>
<td>Meperidine</td>
<td>Oral: 100-150mg 30-60 minutes before procedure</td>
<td>IV: 25-50mg 5-15 minutes prior to procedure</td>
<td>IM/SC: 50-100mg 30-90 minutes prior to procedure</td>
<td>4-6 hours</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>IV: 50-100mcg immediately before procedure (may repeat every 10-15 minutes, not 30-60 minutes</td>
<td>Drowsiness, light-headedness, weakness, bradycardia, decreased breathing rate, loss of consciousness</td>
<td>If respiration is compromised, assist with breathing (airway management, oxygen and ambu bag) and reverse with naloxone (see below). More rapid onset and shorter duration of action than morphine. Meperidine 60-80mg = morphine 10mg.</td>
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<tbody>
<tr>
<td>Fentanyl</td>
<td>IM: 50-100mcg 30-60 minutes before procedure</td>
<td>consciousness, hypotension, seizures</td>
<td>(see below).&lt;br&gt;More rapid onset and shorter duration of action than meperidine.&lt;br&gt;Fentanyl 100mcg = meperidine 75mg = morphine 10mg.&lt;br&gt;Onset of action is 2-7 minutes when given IV.</td>
</tr>
<tr>
<td>Tramadol</td>
<td>IV/IM: 50-100mg 15-30 minutes before the procedure&lt;br&gt;Oral/suppository: 50-100mg 60-90 minutes prior to the procedure</td>
<td>Drowsiness, light-headedness, sweating, weakness, fatigue, seizures</td>
<td>If respiration is compromised, assist with breathing (airway management, oxygen and ambu bag) and reverse with diazepam.&lt;br&gt;Less respiratory depression than morphine or meperidine&lt;br&gt;Tramadol 100mcg = morphine 10mg</td>
</tr>
<tr>
<td>Anxiolytic (Benzodiazepine)</td>
<td>Diazepam</td>
<td>Oral: 10mg one hour before procedure&lt;br&gt;IV: 2.5mg IV 20 minutes before procedure</td>
<td>Blurred vision, dizziness, disorientation, pain and redness on injection, decreased breathing rate, loss of consciousness</td>
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</table>
### Midazolam
- **IV:** 1-2mg immediately before the procedure, then 0.5-1mg IV every five minutes as needed, not to exceed 5mg
- **IM:** 0.07-0.08mg/kg or about 5mg up to one hour before procedure
- **Onset of action:** 1-5 minutes when given IV and 15-30 minutes when given IM.
- **Duration of action:** 1-4 hours
- **Side effects:** Blurred vision, dizziness, disorientation, CNS and respiratory depression
- **If respiration is compromised:** Assist with breathing (airway management, oxygen and ambu bag) and reverse with flumazenil (see below).

Midazolam 2.5mg = diazepam 10mg.
Stronger amnestic effect than diazepam.
Onset of action is 1-5 minutes when given IV and 15-30 minutes when given IM.

### Lorazepam
- **Oral:** 1-2mg 30-60 minutes before procedure
- **IV:** 2mg given over one minute before the procedure
- **IM:** 0.05mg/kg up to a maximum of 4mg within two hours before the procedure
- **Onset of action:** 14 hours
- **Side effects:** Blurred vision, dizziness, disorientation, decreased breathing rate, loss of consciousness
- **If respiration is compromised:** Assist with breathing (airway management, oxygen and ambu bag) and reverse with flumazenil (see below).

Amnestic effect.
 Occasionally may increase patient anxiety.

### Reversal agent for narcotic
**Naloxone**
- **IV:** 0.4mg vial mixed in 10mL saline. Give 1mL (40mcg/mL) every two minutes until reversal is seen
- **Naloxone’s duration of action:** One hour and may wear off before the narcotic. Therefore, patients treated with naloxone must be monitored closely for several hours.
- **Maintain airway and respirations while giving naloxone.**
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| Reversal agent for benzodiazepine | Flumazenil | IV: 0.2mg every minute until respirations return. Do not exceed 1mg | Flumazenil's duration of action is one hour and may wear off before the benzodiazepine. Therefore, patients treated with flumazenil must be monitored closely for several hours. In the event of overdose with narcotic and benzodiazepine, reverse the narcotic first with naloxone and use flumazenil subsequently if needed. Maintain airway and respirations while giving flumazenil. |

**References:**


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Making Ipas clinical recommendations

When a specific clinical recommendation is made within Ipas's *Clinical Updates in Reproductive Health*, there are two elements included to help put the clinical information in perspective:

1. Quality of evidence
2. Strength of the recommendation

**Quality of evidence** reflects the extent to which we can be *confident* that an *estimate of the effect of an intervention* is adequate to support recommendations (Guyatt et al., 2008).

**Strength of a recommendation** reflects the extent to which we can be *confident* that the desirable effects of an intervention outweigh the undesirable effects (Guyatt, Oxman, Kunz, Falck-Ytter et al. 2008). In other words, adherence to the recommendation will *do more good than harm*.

Last reviewed: December 31, 2014

**Quality of evidence**

Clinical evidence, and the recommendations based on the evidence, can be of varying quality. Sources of evidence range from small studies or case reports to well-designed large clinical studies that have minimized bias. The quality of evidence is defined as the "extent to which one can be confident that an estimate of effect or association is correct."

When assessing the quality of evidence, the following criteria are considered (Oxman & Group, 2004):

1. the study design
2. the consistency of the results across available studies
3. precision of the results (wide or narrow confidence intervals)
4. the applicability with respect to populations, interventions and settings where the proposed intervention may be used
5. the likelihood of publication bias

Ipas uses the principles of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system, a four-level system of grading quality of evidence that works as follows:

- **A high** grade is assigned when further research is very unlikely to change our confidence in the estimate of effect.
- **A moderate** grade indicates that further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- **A low** grade indicates that further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- **A very low** grade is reserved for when any estimate of effect is very uncertain.

Based on these grading criteria, randomized trials are initially given a high grade, observational studies are initially labeled as having a low quality of evidence, and any other evidence is very low. However, the grade could decrease if the evidence is based on poor study quality, inconsistent results, indirect evidence, imprecise or sparse
Strength of a recommendation

Strength of recommendation is determined by the balance between desirable and undesirable consequences of alternative management strategies (for example, manual vacuum aspiration versus dilatation and curettage), quality of evidence, variability in clients’ values and preferences, and resource availability and use (Guyatt, Oxman, Kunz, Falck-Ytter et al. 2008). Desirable effects can include improved health outcomes, less burden for providers and health systems, and greater savings. Undesirable effects can include harm to patients, greater burden (for example, the demands of adhering to an onerous recommendation) and increased costs.

Strong recommendations are granted when the desirable effects of an intervention or adherence with a recommendation clearly outweigh the undesirable effects (Guyatt, Oxman, Vist et al. 2008).

Weak recommendations are made when evidence suggests that desirable effects of an intervention and recommendation probably outweigh the undesirable effects but there are small benefits or benefits that may not be worth the costs, and there is an absence of high-quality evidence (Guyatt, Oxman, Vist et al. 2008).

The difficulty in developing guidelines based on quality of evidence is that the studies evaluated may not have comparable patient populations, health-care settings or resources as those to whom the recommendations are targeted. Those developing guidelines should take into account the patient population, nature of the intervention, cost-effectiveness and opportunity cost of an alternate intervention, feasibility of intervention in the specified health-care setting, and societal cost (Guyatt, Oxman, Vist et al. 2008; Guyatt, Oxman, Kunz, Jaeschke et al. 2008; WHO 2012). Similar to the World Health Organization’s approach, Ipas should help countries “localize” recommendations by providing technical assistance when necessary.

Can you have a strong recommendation based on low-quality evidence?

Yes. There are many factors that influence the strength of a recommendation.

For example, although there is limited evidence about the safety and efficacy of providing hormonal contraception during medical abortion, several factors increase the strength of the recommendation that women can be offered hormonal contraception at the time of the first pill of a medical abortion regimen: 1) the value of integrating contraception into abortion care to prevent unintended pregnancy, 2) the low theoretical risk that it interferes with the mechanism of action of mifepristone or misoprostol, and 3) the risk that women who do not get a contraceptive method at the time of abortion will not return.

References


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